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TRIBUTE

A TRIBUTE TO AND IN MEMORY-DR. DAVID BRIGGS (1948 – 2024)

AM BHA (NSW), MHM PHD (UNE), DR PH (HON.NU), FACHSM, FHKCHSE

- *Editor-in-Chief of Asia Pacific Journal of Health Management 2007 to 2022*

Dr. David Briggs served as the Editor-in-Chief for the APJHM for 15 years and was responsible for the formation, development and steering the professional growth and impact of this publication. David was appointed by the Australasian College of Health Service Management (ACHSM) in the second year of the journal's establishment which was introduced as the College's own applied, peer reviewed journal aimed at communicating the development and practice of the field of health management within the Asia Pacific region. David held strongly to his vision - *We are committed to being inclusive and seen as a practitioner journal that has a mix of academic and operational management authors. We encourage analysis of management practice, perspectives, public policy as well as research*. Through this work and leadership, he held to the need for a profession to have a deep specialised body of knowledge and mechanisms to contribute to and share that knowledge. As Editor, David promoted inclusiveness, outreach, research and experiential learning at the national and international levels.

David contributed to patient care and health system development over many years and through a unique career range of roles and contributions. He was a senior executive and chief executive in NSW hospital and health service delivery; engaged in academic roles for health management as a researcher, author and teacher and as an active adjunct professor at three universities including two in Thailand; was a long-term serving President of the Society for Health Administration Programs in Education (SHAPE) that promotes excellence in health service management education and research in Australia, New Zealand, Asia and the Pacific; as a health and aged care services accreditation surveyor with the Australian Council on Healthcare Standards and the Aged Care Standards; as well as in governance responsibilities as Chair of the New England Medicare Local and then Deputy Chair of the Hunter New England and Central Coast Primary Health Network.

David believed that ... *being a professional requires an expectation that you contribute and give back to your profession and encourage others in their career and in these commitments*. He was part of the ACHSM College for some 50 years. He took on formal responsibilities as National and NSW State President and served on many committees and working groups. He mentored and supported emerging and senior leaders and managers in their careers across Australia, in Asia and other parts of the world. In 2004 he was awarded the College's Gold Medal for exceptional leadership and his pursuit of excellence in health services delivery in the country. He was subsequently awarded life membership of the College.

David was appointed as a Member of the Order of Australia in 2020 for significant service to the community, health management and to education.

On many occasions, and it was truly clear, David identified that his approach, work and commitments were through and with his family – we give sincere condolences to Mrs. Val Briggs, David's immediate and extended families. We thank them for what they have done for the profession.

In 2006, representatives of the then ACHSM Federal Council, national office staff, SHAPE and interested College members came together to develop the proposed College journal - APJHM. We are indebted to David for his large role in enabling it and encouraging professional participation.

Dr Mark Avery
Editor-In-Chief

ACHSM Asia-Pacific Journal of Health Management shape

EDITORIAL

SUPPORTIVE LEADERSHIP FOR IMPACT ON BUILDING ORGANISATION RESILIENCE

Dr Mark Avery

Editor-in-Chief, Asia Pacific Journal of Health Management

The health, aged and social care service sectors routinely need to deal with the consequences of stress in the delivery of care and support services; trauma; interpersonal conflict; accidents; rationing; and sustainability. For sustained and healthy functioning health workers need intrinsic and extrinsic support for resilience or the ability to maintain confident, steady and healthy functioning in response to such consequences of stress [1]. Those providing direct and indirect care [2] and those working in varied and challenging areas and location of care delivery [3] need constructs and skills to build and deal with resilience individually as well as in conjunction with collective opportunities within their organisations (teams, units, groups and organisations).

Supportive leadership practice provides both responsibility and opportunity for leaders and managers to enable and create environments and opportunities to ensure collectively health workers and volunteers have environments and practices where they experience cohesive, valued and understanding professionally and personally. Objectives here are for cultures of trust and collaboration. Through enabling well-being and development creates opportunity for enhancement of motivation, job satisfaction and quality of care and support.

Strong leadership focussing on the value of teams and teamwork, corporate-wide emotional support and psychological safety to foster an effective and constant supportive work environment. Open communication encourages safe voices, contributions and transparency. Leaders who are approachable and authentic model empathy and understanding of the real challenges in health care delivery. Practical applications of well-being could incorporate peer sport mechanisms, resilience training and access to mental health and well-being services.

In complex organisations and settings mentoring offers valuable partnering through both the connections of pairing experienced professionals with those with less experience for sustained trust and safety and the individual opportunities for learning. Mentoring promotes perspective, knowledge sharing, skill development and emotional support.

Investment and support for continuous professional development and also resilience training in health and aged care continues building and renewing clinical skills, adaption for evolving practices and improvement for patient care. Such learning is fundamental to professional growth and development but also provides surety and perspective in the face of stressors. Resilience learning boosts ability to handle stress, recover from stress impact and returning to maintaining high performance.

Leadership is a multi-faceted responsibility which needs to have strong incorporation of emotional and psychological well-being for staff and stakeholders in health. The strong integration of professional development for resilience provides for professional empowerment.

PAPERS FROM THE CPCE-SHAPE HEALTH CONFERENCE 2024

The College of Professional and Continuing Education (CPCE) in Hong Kong and the Society for Health Administration Programs in Education (SHAPE) jointly held the *CPCE-SHAPE Health Conference 2024* in July 2024 in hybrid mode from Hong Kong and online.

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The conference theme was *Healthcare System Sustainability: Implications for healthcare management, education and research*.

Conference presenters were invited to submit their conference presentations for publication in APJHM in a number of formats (research articles, practice analyses and practice briefs) and the collection of papers for this successful event are included in this issue of the journal.

Mark Avery
Editor-in-Chief

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ACHSM Asia-Pacific Journal of Health Management

VIEWPOINT ARTICLE

EVALUATING BOIL WATER ADVISORY POLICIES AND PRACTICES: HEALTH OUTCOMES IN HONG KONG

Simpson S. C. Tam[*1], *Ben Y. F. Fong*[2]

School of Clinical Medicine, University of Cambridge, United Kingdom

Division of Science, Engineering and Health Studies, College of Professional and Continuing Education, The Hong Kong Polytechnic University, Hong Kong, China

Correspondence: sct55@cam.ac.uk

ABSTRACT

Boiling water (BW) is a common global practice, especially in Asia, for ensuring safe drinking water, though it does not remove chemical contaminants. The World Health Organisation recommends BW as an emergency measure against microbial contamination. In Hong Kong, the Water Supplies Department ensures water quality through strict regulations and extensive monitoring. Comparisons with Norway and Canada reveal effective practices such as water safety planning and risk-based advisories. Norway mandates water safety planning and uses messaging notifications for water advisories, ensuring high compliance, while Canada issues site-specific BW advisories based on risk assessments.

Hong Kong faces unique challenges, such as a warm climate and complex building infrastructure, which impact water quality. Many buildings lack proper maintenance, leading to potential health risks and necessitating regular maintenance. Health management, public health education and expert guidance are essential for promoting efficient practices and ensuring safe drinking water.

KEYWORDS

boiling water, boil water advisor, public health, drinking water, sustainability, climate change

BACKGROUND AND REASONS FOR BOIL WATER ADVISORY

Boiling water (BW) has historically been a norm in everyday life since Pasteur discovered that heat could kill microorganisms. In a study from 67 national surveys and reports, 33% of households or an estimated population of 1.1 billion people report the practice of household water treatment and of which BW is the most common [1]. The practice is particularly prevalent in Asian nations, with virtually universal daily practice in Uzbekistan (99%), Mongolia (95%), Vietnam (91%) and Indonesia (91%) [1].

As defined in the Guidelines for Drinking-water Quality by the World Health Organisation [2], safe drinking water should not pose any significant health risk across a lifetime of consumption, considering various degrees of vulnerabilities at different life stages including infancy, childhood, and elderly. The guidelines recommend BW as a travel advisory and emergency measure. The surveillance agency detects microbial contamination threatening public health. When evaluating various drinking-water disinfection methods for use by travellers, BW ensures that all pathogens are killed but failed to remove

turbidity and does not offer chemical disinfectant, as compared to chlorine, to remove the contamination.

Cohen and colleagues performed a meta-analysis to examine the link between boiling drinking water and health outcomes, instead of water quality [3]. The study indicated that the effectiveness of removing pathogens and organisms, as well as the outcome of pathogen inactivation below 100 degrees Celsius, depends on factors such as temperature, duration, and the type of organism involved [3]. Inadequate access to water increases the likelihood of infection with soil-transmitted helminth species through ingestion [4]. Although water is not the only possible transmission route of protozoal infection, BW is generally a protective practice against multiple protozoa, particularly in less developed regions.

GOVERNMENT POLICY AND PRACTICE IN HONG KONG

In Hong Kong, the Water Supplies Department (WSD) have five principal functions and services: to plan and manage water resources and water supply systems; to design and construct waterworks projects; to operate and maintain water supply and distribution systems; to control the quality of water supply to customers; and to provide customer services and to enforce the Waterworks Ordinance [5].

In the 1960s, a water supply restriction was put in place due to the local rain yield being unable to satisfy the surging population resulting from the mass migration from mainland China. During the worst period, household taps only offered water for four hours every four days [6]. People had to learn how to conserve water and adjust their lifestyles to a bare minimal water supply. Then, in 1963, the Dongjiang-Shenzhen Water Supply Scheme was established through a consensus between the Governments of Guangdong Province and Hong Kong. Since 1982, Hong Kong citizens have been enjoying a stable and around-the-clock water supply.

The water supply issue soon faded away from the everyday conversation but then resurfaced in the news headline in 2015 following the elevated lead level found in the drinking water sample collected in public housing estates and education institutions [7]. The Development Bureau, WSD-led Task Force on Investigation of Excessive Lead Content in Drinking Water, Housing Authority, Commission of Inquiry and International Expert Panel on Drinking Water Safety jointly ascertained the causes of excess lead, reviewed and evaluated the adequacy of the existing regulatory standard, and more importantly, formulated recommendations on safe drinking water in general. This is perhaps an example of a contaminant that the water boiling advisory (WBA) cannot eliminate and should prompt public reflection on its limitations. Since September 2017, the WSD has adopted the provisional guideline values described in the World Health Organisation Guidelines for Drinking-water Quality as the local Hong Kong Drinking Water Standards (HKDWS) by referencing international practices and an expert panel, in which the Drinking Water Safety Advisory Committee, constituted by experts from academia and the medical sector, has deliberated and agreed on these standards [8,9].

Since December 2017, the WSD has been implementing an enhanced territory-wide water quality monitoring programme. This includes collecting random daytime samples at consumer taps, based on the population of respective supply areas [10]. For the year 2021/2022, the WSD collected over 170,000 samples for water quality control. Of those, 35,551 and 3,210 were bacteriological and biological samples, respectively [11]. The WSD initiated testing residual chlorine and E. coli in May 2021 from consumer taps under the enhanced programme [12]. In line with the HKDWS, the concentration of E. coli should not exceed 0 cfu/100ml. Chlorine has been effective in killing most pathogenic bacteria [13], and some viruses and parasites slowly [14]. A small amount of residual chlorine in the water pipe system is sufficient to keep the concentration of E. coli at a minimum. In other words, the safety and quality of drinking water can be maintained even if WBA is not practised.

NOTABLE OVERSEAS EXAMPLES AND PRECEDENT CASES

Norway and Canada have been selected as notable examples due to their strong public health systems and high human development index. By examining these two developed nations from Europe and America, researchers can compare how boiling water practices are integrated into public health recommendations and regulations. This comparative analysis is particularly relevant to Hong Kong, where boiling water is a common practice rooted in traditional Asian culture. Understanding these variations can enhance the appreciation and implementation of best practices, contributing to improved health outcomes in Hong Kong.

NORWAY

BWA is a tool to prevent waterborne illness in the instance of microbiological contamination [2]. In Norway, water safety planning is a legal requirement for water supplies [15]. In the event of a planned and unplanned water outage, the water supplier in the municipality of Bareum, Norway, issues precautionary BWA to residents via short messaging service (SMS) notifications. The SMS notification is moderately effective with 67% of local citizens reporting receipt of it [16]. Of those who remembered the receipt of the notification, 72% follows the guidance from the local water supplier [16]. The predominant reason for non-compliance was the perception that the water was safe to drink after flushing the tap until the water ran clear.

In August 2019, a routine water sample was collected from an elevated water reservoir in the Drammen municipality. The sample tested positive for intestinal enterococci resulting in an issuance of BWA to residents within the affected water supply area [17]. A study team examined the perception and compliance to BWA, revealing an effective compliance rate of 92% [17]. The primary reasons for non-compliance were the perceived minimal risk of getting sick and misconceptions about waterborne infections and their transmission.

CANADA

The Federal-Provincial-Territorial Committee on Drinking Water is responsible for establishing the guidelines for Drinking Water Quality in Canada. The BWA is in place to strengthen public health risk management and advise the public to treat the water prior to consumption.

If E. coli is detected in the drinking water sample, it may indicate potential human or faecal contamination, or even pathogenic microorganisms, and may trigger emergency BWA. On several occasions, after investigation and site-specific risk assessment, a precautionary BWA may be issued to mitigate risks that emerged with local maintenance or planned repairs, the persistent presence of total coliforms, minor equipment malfunction, unexpected changes in source water quality and any form of breach in system integrity. From 2010 to 2012, the predominant reasons for BWA concerning water quality were pressure loss in the distribution system (46%), the detection of total coliforms (15%) and suspected contamination (12%) [18].

THE CASE OF AND ADVICE TO HONG KONG

While Norway has a robust texting alert system, Canada employs risk assessed, site-specific BWA instead of longstanding, blanket advisories which Hong Kong can take a lesson from. However, we must consider the challenges of maintaining water quality in warm and humid climates. The cultural background and building structures differ significantly, with Hong Kong having a more convoluted pipeline system. Therefore, the WSD should develop its policy according to its local context and customary practices.

As of December 2023, there were approximately 3,100 buildings without owners' corporations or any form of residents' organisations, or engagement with property management companies [19]. The absence of property management will lead to potential risks of the environmental hygiene and maintenance of communal facilities falling short of standards. Poor or infrequent maintenance of the sanitary condition of water storage tanks may result in the accumulation of sediments or debris [12]. Besides, certain conditions such as temperature, humidity, stagnation of water and cross connection of potable pipes with non-potable pipes, may cause the ingress of contaminants [12]. Although the drinking water produced by the treatment works in Hong Kong is safe and comparable to that of many advanced countries and regions, the quality of tap water at the consumer end is affected by the condition of maintenance of inside service of the buildings. The tap water in a user's home is potable if the management company follows proper upkeep procedures [9]. This includes maintaining the interior pipes, regularly cleansing water storage tanks, and frequently monitoring water quality in line with the HKDWS [9]. With reference to the localised green building certification system, a similar system can be initiated by the joint force between WSD and professional bodies to highlight buildings with potable tap water supply.

Despite that BW is commonly used to ensure a clean water supply, it is not a bulletproof practice, as evident in incidents of excessive lead in water. The practice of BW may have arisen from previous generations being accustomed to contaminated and pathogen-rich water supplies, and it may have become an inherited routine in Chinese families. The key to untangling this perpetual cycle, however, lies with the government and its Advisory Committee on Water Supplies (ACWS), consisting of

department representatives, engineers, surveyors, and academics. Due to the complex nature of water quality standard setting, the ACWS upholds a compelling obligation to maintain close connections with professional bodies, property management companies, and stakeholders.

CONCLUSION

Public health and the integrity of the water supply system are sensitive topics necessitating continuous monitoring and surveillance. BWA is generally considered an emergency response to biological contamination. However, in the world of energy crisis and climate change, BWA should be perceived as a socio-economic issue that is worth re-thinking. If Hong Kong continues to practise BWA, it is not because of the pathogenic microorganisms in the water, but because of the psychological fear of not treating the water. The belief in BWA and its practice in the local community has been perpetual for generations and generations. Nonetheless, many Hong Kong residents have lived in Western countries where people drink water off the tap. Expert advice and public health education should work in tandem to correct stigmatised myths, deliver the correct message and encourage the next generation to reflect on the most efficient practice in the treatment and utilisation of household water supply in the pursuit of sustainable development goals for humankind.

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CONFLICTS OF INTEREST

Author ST and BF declared that they have no relevant financial or non-financial interests to disclose.

DECLARATION

The research has not been presented, published or posted online before, in whole or in part.

AUTHOR CONTRIBUTIONS

All authors contributed to the study's conception and design. Simpson S. C. Tam performed a literature review, material preparation and the first draft of the manuscript. Simpson S. C. Tam and Ben Y. F. Fong commented on the first draft and worked on the final version of the manuscript. All authors have read and approved the final manuscript.

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RESEARCH ARTICLE

DEVELOPING AN INNOVATION CULTURE MEASUREMENT CONSTRUCT FOR HEALTHCARE ORGANIZATIONS

Mark Klassen, C. Brooke Dobni, Kyle Hertes

Edwards School of Business, University of Saskatchewan, Canada

Correspondence: mklassen@edwards.usask.ca

ABSTRACT

OBJECTIVE

To develop an innovation culture measurement model specific to healthcare, by amending the original scale items of the Dobni innovation culture construct and model developed in 2008.

DESIGN

The project performed exploratory factor analysis from data collected on surveys, using redesigned scale items from the original Dobni innovation culture measurement.

SETTING

Managers and administrators from a Provincial Health Services Authority in Canada.

RESULTS

An exploratory factor analysis was performed on the 43 scale items used in the survey. The scale items were reduced to 31 and loaded on to new factors creating an Innovation Culture Measurement Model specific to healthcare.

CONCLUSION

Although exploratory, the new model and scale items provide a foundation for researchers to advance innovation culture measurement in healthcare. Academically, measuring innovation culture has created a rich research stream, but to date has not exclusively focused on healthcare. Pragmatically, measuring innovation culture provides healthcare leaders and policy setters a benchmark to assess internally over a period of time or towards other entities.

KEYWORDS

innovation, healthcare, culture, measurement, survey

INTRODUCTION

Innovation in healthcare is recognized by academics and healthcare practitioners as essential to reduce costs, improve the quality of services, and enable organizational success, however successful innovation execution is also known to be challenging [1,2,3,4]. The urgency for innovative healthcare solutions and speed of change are only increasing.

"We need approaches to the solutions that aren't just arithmetic and additive, but are in some sense logarithmic. This will require us to reach across historic boundaries and

unlock the potential of collaboration across the usual disciplines." Jeffrey S. Flier, MD – Dean of the Faculty of Medicine, Harvard University. [5]

Although innovation is difficult to execute, having a strong innovation culture is well established as a critical determinant of innovation [6,7]. One of the research areas that has garnered attention is the measurement of innovation culture. Pragmatically, the value of measurement is "what gets measured, gets done" and starting with a benchmark of how innovative an organization culture is, promotes a roadmap for improvement. Academically, innovation culture measurement provides an opportunity for researchers to measure innovation determinants individually and collectively in innovation culture models. As a result, significant theory and evidence in the literature has evolved developing measurement scales of innovation culture including: Aiman-Smith, Goodrich, Roberts, & Scinta [8], Anderson & West [9], Danks, Rao, & Allen [10], Dobni [11], Remneland-Wikhamn & Wikhamn [12], Tohidi, Mohsen Seyedaliakbar, & Mandegari [13], and Wang & Ahmed [14]. To date, the Dobni model is established as the most referenced innovation culture construct [15].

This study focuses on innovation culture measurement in healthcare, which addresses a primary critique of researchers and potentially offers a pragmatic tool for healthcare practitioners and policy setters. Over the past decade, our innovation culture measurement studies have utilized and extended the Dobni [16] model to research organizational innovation in a global context. We consistently find organization culture to be a linchpin of success [17,18,19,20]. Across an array of industries and countries, high (low) innovating firms have strong (weak) innovation cultures. High innovating firms also outperform low innovators on critical cultural determinants such as leadership, knowledge management, process and resources.

Although informative, one of the critiques of the innovation culture measurement research stream is that measurement constructs can be generic and lack specific industry context [21]. We agree with this critique, especially given the complexity of the healthcare industry. Our motivation for this research is to adapt the Dobni innovation culture measurement construct to consider healthcare context. By doing this, researchers will have a more relevant instrument and practitioners can interpret results from a healthcare perspective. This study uses the same research method and approach as the original Dobni innovation measurement construct research.

METHODS

Scale items developed in the Dobni model were redesigned to contextualize measuring innovation culture in the healthcare. Changes were based on secondary literature and terminology related to healthcare such as patient management, hospitals and roles. Extensive changes were not made to ensure construct validity of the Dobni model were still relevant. Consistent with the Dobni survey, a seven-point Likert scale accompanies these scale items. Incorporating a Likert scale allowed respondents to accurately indicate the degree or extent to which they agree with the described scale item. In the end 43 scale questions were used. Factor loadings are presented in the results section.

A Provincial Health Authority from a Canadian Province represented the population for data collection. The data collection process involved administering a survey questionnaire to 75 management and operational level employees within a division of the Authority. This was done to ensure that the data collected was relatively homogenous given the exploratory nature of this research. It was also important that survey respondents had common knowledge of the division's goals as it related to health care delivery. Surveys were administered digitally to mitigate travel and exposure to large gatherings amid the COVID-19 pandemic.

The survey link was electronically administered to employees, of which the response rate was 56% (42 completed surveys). Our contact point within the Authority voluntarily administered the survey to employees. Although participants did not voluntarily include information of their organizational position, multiple levels of categorical hierarchy rank were captured through ongoing communication with contact points. These categories include executive/ senior management, middle level management and operational level employees. Data was collected between February and March of 2021. No responses were discarded because of significant missing values, or incomplete information. The 42 completed surveys were analyzed and interpreted using SPSS v27. The sample size is considerably smaller than other surveys we have conducted using similar techniques and survey instruments. The survey was administered during the

COVID-19 pandemic and likely contributed to the smaller sample.

An application was put forward to the University of Saskatchewan Research Ethics Office consistent with the University of Saskatchewan Policies and Procedures for Ethics in Human Research. The application contains extensive details related to the nature and scope of the research. Ethics clearance was received.

RESULTS

DOBNI MODEL OVERVIEW

The Dobni model is a survey instrument developed in 2008 that measures innovation culture. The survey was developed through extensive theoretical inquiry and has been empirically tested. The initial model was comprised of 69 constructs used to explain 12 drivers of innovation. The original model framed the 12 drivers of innovation into four perspectives: intent, infrastructure, influence and implementation. Subsequent research has reframed the survey to fit the context of the research inquiry. The survey has been beneficial for academics interested in researching innovation culture using quantitative methods and for practitioners trying to assess their innovation culture state and plan for innovation improvements. For example, practitioners have translated the Likert scale constructs to provide organizations with an innovation culture score out of 100.

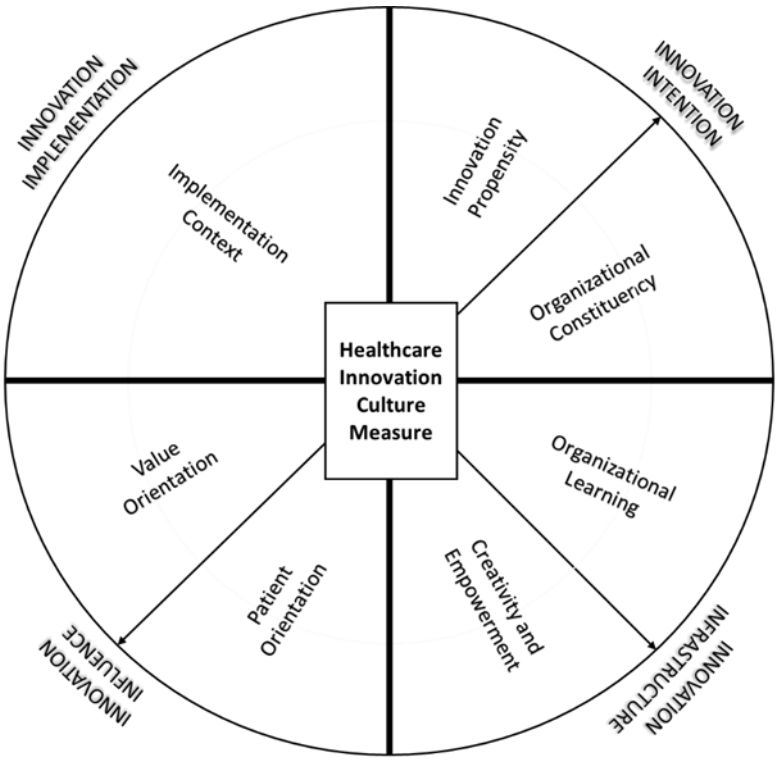
SCALE ITEM DEVELOPMENT

Consistent with the method used in the Dobni model, exploratory factor analysis was used to identify the smallest number of interpretable factors that adequately explained the correlations among the scale items.[1] The forty-three scale items initially loaded onto eight definable factors with eigenvalues greater than one. However, twelve of the scale items were dropped because their Cronbach alpha values fell below 0.5. Appendix 1 illustrates factor loadings and the items that have been deleted (strikeover) in efforts to enhance the model.

EXPLORATORY MODEL DEVELOPMENT

In order to present the findings in a more meaningful pragmatic way, the model is presented in Figure 1 utilizing the framework of the Dobni model.

FIGURE 1: HEALTHCARE INNOVATION CULTURE MEASUREMENT MODEL



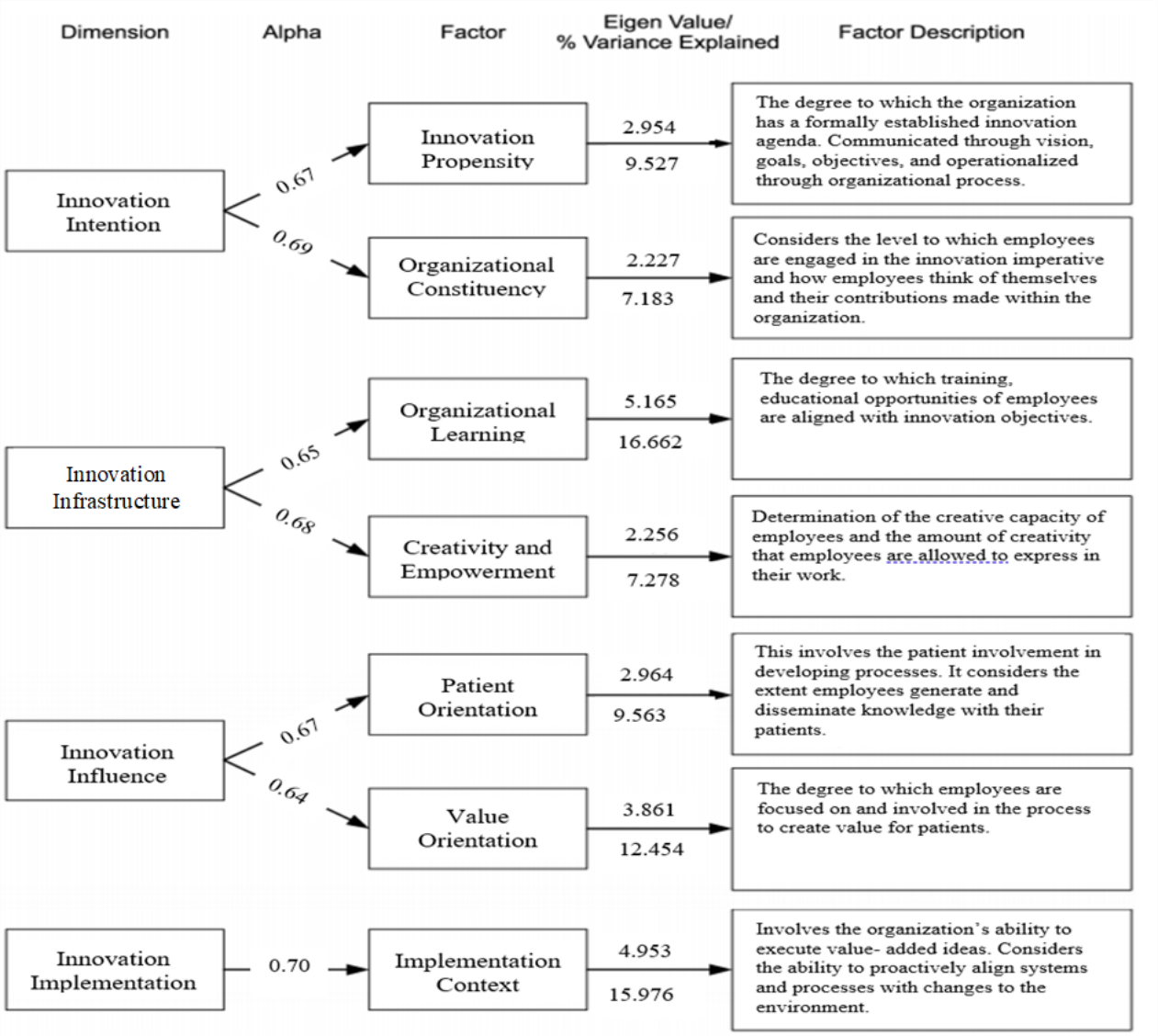
[1] This analysis was performed using the extraction method principal components and the rotation procedure used was varimax rotation

The model is created through the exploratory factor analysis and the authors' interpretive experience in innovation modeling. The model is consistent with other innovation culture measurement models we have researched [22,23,24] that are framed after the Dobni model, but differs in simplicity and healthcare focus. The model categorizes four main innovation perspectives – intention, infrastructure, influence and implementation. Each perspective is defined and impacted through the innovation drivers. For example, the more an organization demonstrates an innovation agenda (driver: innovation propensity) and the more employees are engaged in innovation activities (driver: organizational constituency), the more an organization will demonstrate an intent to innovate (perspective: innovation intention). Organizations can assess their innovation culture measure by "averaging" the scores of each innovation driver. For example, if the average score for each innovation driver was 5 out of 7 (or 71.4%), then the innovation culture measure for the organization would be 71.4%. We have often compared scores of different organizations or compared a score of an organization to an industry average. This provides a notable benchmark and platform to measure improvement.[2] These were subsequently titled, described, and are displayed in Figure 1.

In addition to a pragmatic contribution, our motivation for this research was to advance an innovation culture measurement instrument, so that other researchers could extend the scholarly body of knowledge. Figure 2 below presents the final factor model with statistical findings and descriptions.

[2] Consistent with exploratory research, scale items were deleted if the Cronbach coefficient alpha value were below 0.5. According to Hinton [25], an alpha value above 0.5 shows moderate reliability. In total, twelve scale items were dropped, falling below the 0.5 thresholds as outlined within the factor analysis solution. The coefficients produced were reasonably uniform and two significant ranges emerged. The lower range, 0.50-0.62, consisted of thirteen scale items, while the higher range 0.65-0.768 consisted of seventeen scale items. All of these scale items satisfy the 0.5 threshold. Further analysis was undertaken to re orientate the model around fewer, more distinctive factors. This was accomplished by forcing the remaining items on to fewer factors until the model was optimized with a 7-factor solution.

FIGURE 2: FACTOR MODEL



DISCUSSION

STATEMENT OF PRINCIPAL FINDINGS

The basis of this study is derived from the groundwork and initial modeling of Dobni. After testing and identifying thirty-one scale items, seven factors represented the smallest interpretable correlations for measuring innovation culture within healthcare. As seen in Figure 1, the model defines the dimensions of innovation culture as innovation intention, infrastructure, influence, and implementation. These dimensions are consistent with the Dobni model and allow for integration to other model applications. The produced factors were then assigned a label that described what scale items loaded on each factor. The explained factors contain the average alpha of the scale items, and the eigenvalues explain how much variance of the scale items explains a single factor. Eigenvalues greater than one indicate the factor items explain more than one unique variable and all factors contained more than one scale item leading to higher reliability.

The central contribution is the model in Figure 2 and the scale items in Table 1. Although exploratory, they are presented to advance researchers' ability to measure innovation culture in the context of healthcare.

TABLE 1: FINALIZED 7-FACTOR SCALE FOR DOBNI INNOVATION CULTURE MEASUREMENT (HEALTHCARE)

(presented in order of variance explained)

Organizational Learning	
	1. I believe that I am trusted to act in our unit's best interests with minimal supervision.
	2. I am encouraged to challenge decisions and actions if I think there is a better way.
	3. As an employee, I am empowered to generate ideas.
	4. I feel comfortable making suggestions for enhancements to processes and services.
	5. Our unit's communications are open and honest.
	6. Performance management information is used for improvement rather than for control.
Implementation Context	
	1. Our unit/area provides employees with time and space to pursue ideas.
	2. Our unit/area is prepared to redirect or leverage current resources (administrative, human and financial) to support innovation.
	3. Our unit/area has put resources (administrative, human and financial) behind our innovation agenda.
	4. My manager knows me well enough to get a feel for my creative potential.
	5. I am given the time/opportunity to develop and express my creative potential.
	6. If I have an idea, there is a process that I can access to have it formally considered on a timely basis.
	7. Innovation is rewarded through our unit's performance management system.
Value Orientation	
	1. We can modify systems and processes fairly quickly and as necessary to take advantage of new opportunities.
	2. We actively search for new ideas and innovations in all we do.
	3. Our current operational processes are robust enough to accommodate innovation.
Patient Orientation	
	1. When it comes to delivering services (e.g. patient care or client services), there is effective collaboration between departments.
	2. There is co-ordination as opposed to confusion among practices teams within our area.
	3. Ideas and plans flow smoothly through hierarchy (from generation to consideration to implementation). That is, they don't get held up by rules and roadblocks.
	4. The knowledge that we gain in interacting with patients/clients is considered when considering innovative approaches to providing the service.
Innovation Propensity	
	1. A coherent set of innovation goals and objectives has been communicated in our organization/area.
	2. Managers have the autonomy to speed up, slow down, change course or cancel initiatives altogether.
	3. Missed opportunities and mistakes are viewed as an opportunity to reflect and learn, as opposed to a basis for punishment.
Creativity and Empowerment	
	1. My unit uses my creativity to its benefit.
	2. I know how I personally contribute to innovation.
	3. There is an expectation to develop new skills, capabilities and knowledge that is directed toward supporting innovation.

Organizational Constituency

1. Senior leaders support/encourage innovation in my area.
2. I am rewarded intrinsically (non-monetary rewards) for being creative.
3. Employees in this organization/area act as a team as it concerns pursuing innovation goals and objectives.
4. Innovation is rewarded through our unit's performance management system.
5. Our practice teams are comprised of key people to help with the establishment and reinforcement of innovation.

STRENGTHS AND WEAKNESSES

The primary strength of this study is it provides a quantitative and empirical construct to measure innovation culture in healthcare. This directly addresses critiques of past innovation culture measurement research, that have opined that the constructs are not specific to nor adequately address the uniqueness of healthcare. The primary weakness relates to the exploratory nature of our methods. Our results are less robust compared to other more established models, including our own non-healthcare studies. However, the evolution of surveys and models, ultimately begins with exploration and the results as presented are encouraging for subsequent validation.

MEANING OF THE STUDY

Measuring innovation culture in healthcare has a number of practical implications for healthcare management and policy development, including:

- A practical survey to measure innovation culture, from a healthcare perspective at a country, region, organization, and department level. The measurement allows for benchmarking over a period of time as well comparisons to other entities.
- Construct analysis can provide healthcare managers and policy setter guidance on resource allocation and management attention. For example, if Organizational Learning is "high" and but Innovation Propensity is "low", then managers may want to allocate more resource effort into the innovation processes of moving an idea forward versus, employee learning initiatives.
- The model provides a categorization of innovation through the dimensions and factors. This allows managers to discuss innovation in broad strategic context. It also allows researchers with a typology mindset to categorize other relevant innovative research in an integrative manner. For example, the recent study by Lloyd et al. [26] leverages the Dobni model [27] classification to explore innovation in a rural context.
- Innovation measurement provides an opportunity to advance goal setting and targeting development. We have seen through our research organizations setting improvement targets (e.g. 5% improvement in innovation culture score) or establishing concrete initiatives (e.g. establishing an innovation moment similar to a safety moment but dedicated to innovation discussions).
- Measuring innovation culture leads to increased confidence in monitoring performance of a healthcare entity. Governance models in healthcare, regardless of the degree of privatization, are increasingly demanding reporting of results. Innovation scores that are validated through research can be a significant signal of advancement and provide healthcare leaders and policy setters with a reporting mechanism to manage expectations.
- The most significant deviation in this study from the original Dobni model, was the aggregation of constructs around patient orientation. This suggests that healthcare leaders need to ensure the patient perspective is put at the forefront to ensure a strong and meaningful innovation culture as it concerns services delivery.

UNANSWERED QUESTIONS AND FUTURE RESEARCH

Further construct development through replication and repetition is encouraged to enhance validity of the innovation measurement survey. Research can be expanded in several directions. In addition to replication, causal relationships between the factors are an interesting aspect of innovation. Case studies methods would also be fruitful to understand context within the innovation determinants identified in this research. The primary limitation of this study is the size of the research sample. An increased sample size would provide greater validity and insight into scale refinement.

CONCLUSION

In conclusion, this research explored the development of innovation culture measurement construct. Leveraging the initial work of Dobni, a survey was created and tested that

contextualized the scale items for healthcare context. Adapting the Dobni model for healthcare fills a void in the academic research as innovation culture measurement studies have not been customized for healthcare. This creates future research opportunities for scholars to advance the scale items enhancing the validity of the scale items and model. Pragmatically, measuring innovation culture in healthcare provides a tangible benchmark to launch improvement efforts, track results and increase reporting capabilities. The most notable deviation to the original Dobni model was the importance of patient orientation in developing an effective innovation culture. Given the complexities of the healthcare industry and the need to innovate, measuring innovation culture can be a powerful tool for healthcare leaders and policy setters.

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APPENDIX 1: INITIAL FACTOR LOADINGS OF SCALE ITEMS

Factor Items	Factor Loading
Innovation goals of your work area	
1. A coherent set of innovation goals and objectives has been communicated in our organization/area.	0.624
2. Senior leaders support/encourage innovation in my area.	0.655
3. We actively search for new ideas and innovations in all we do.	0.677
Organization/work area support for your contribution to innovation	
1. My manger knows me well enough to get a feel for my creative potential.	0.622
2. My unit uses my creativity to its benefit.	0.772
3. There is an expectation to develop new skills, capabilities and knowledge that is directed toward supporting innovation.	0.721
4. Our practice teams are comprised of key people to help with the establishment and reinforcement of innovation.	0.709
5. Employees in this organization/area act as a team as it concerns pursuing innovation goals and objectives.	0.772
~~6. Our innovation activities are often disrupted by such things as changes in management or sponsorship.~~	~~0.110~~
7. Our current operational processes are robust enough to accommodate innovation.	0.724
8. I believe that my contributions are valued by my managers.	0.731
Your contribution to innovation	
~~1. I consider myself to be a creative/innovative person.~~	~~0.109~~
~~2. As an employee, I understand what innovation means and how it can benefit my area.~~	~~0.419~~
3. I know how I personally contribute to innovation.	0.601
~~4. I have the skills and knowledge necessary to support innovation in my area.~~	~~0.296~~
5. I feel comfortable making suggestions for enhancements to processes and services.	0.630
6. I am given the time/opportunity to develop and express my creative potential.	0.726
Empowerment for innovation	
1. As an employee, I am empowered to generate ideas.	0.717
2. I am encouraged to challenge decisions and actions if I think there is a better way.	0.744
3. I believe that I am trusted to act in our unit's best interests with minimal supervision.	0.787
4. I am rewarded intrinsically (non-monetary rewards) for being creative.	0.718
Patient/client involvement in innovation	
~~1. I believe it is important to involve patients/clients input into potential innovation.~~	~~0.407~~
~~2. We understand what processes we must focus on to deliver value to patients/clients.~~	~~0.245~~

~~3. Our patients/clients help us to define what is of value to them.~~	~~0.433~~
~~4. We have a reliable and valid process that includes interaction with patients/clients.~~	~~0.380~~
5. The knowledge that we gain in interacting with patients/clients is considered when considering innovative approaches to providing the service.	0.622
~~6. We can sense when patients/clients are either under served or over served, and make adjustments accordingly.~~	~~0.366~~

Communication and collaboration for innovation

1. When it comes to delivering services (e.g. patient care or client services), there is effective collaboration between departments.	0.550
~~2. Logistical procedures (e.g. moving patients, equipment, scheduling tests, etc.) hinder innovation efforts.~~	~~0.077~~
3. Our unit's communications are open and honest.	0.537
4. There is co-ordination as opposed to confusion among practices teams within our area.	0.596
5. Ideas and plan flow smoothly through hierarchy (from generation to consideration to implementation). That is, they don't get held up by rules and roadblocks.	0.537
~~6. We can quickly facilitate changes to our plans and practices based on new information, patient/client feedback, or leadership teams' desire to change.~~	~~0.456~~

Resources for innovation

1. Our unit/area is prepared to redirect or leverage current resources (administrative, human and financial) to support innovation.	0.673
2. Our unit/area has put resources (administrative, human and financial) behind our innovation agenda.	0.679
3. Our unit/area provides employees with time and space to pursue ideas.	0.573
4. If I have an idea, there is a process that I can access to have to formally considered on a timely basis.	0.676

Evaluation for innovation

~~1. We have metrics to measure the effectiveness of our initiatives.~~	~~0.299~~
2. We can modify systems and processes fairly quickly and as necessary to take advantages of new opportunities.	0.551
3. Managers have the autonomy to speed up, slow down, change course or cancel initiatives altogether.	0.587
4. Performance management information is used for improvement rather than control.	0.759
5. Innovation is rewarded through our unit's performance management system.	0.723
6. Missed opportunities and mistakes are viewed as an opportunity to reflect and learn, as opposed to a basis for punishment.	0.645

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RESEARCH ARTICLE

MANAGERS OF AGED CARE RESIDENTIAL SERVICES IN AUSTRALIA 2006-2021: TRANSFORMATION REFORM

Jo. M. Martins[1], *Godfrey Isouard**[2]

1. Centre for Health Policy and Management, NSW, Australia
2. School of Health, University of New England, Armidale NSW, Australia

Correspondence: gisouard@optusnet.com.au

ABSTRACT

INTRODUCTION:

Aged care in Australia is going through a transformation reform to respond to the growing number of aged people in need of support in daily living. Given the importance of ensuring quality and safety in aged care, it is relevant and informative for this study to assess the changes that have taken place in the number and characteristics of managers of aged care residential services in relation to the people they serve.

OBJECTIVES:

This article provides analyses of the number and characteristics of managers of aged care residential services in relation to number of aged people, residents of aged care facilities and people employed in them.

DESIGN:

The research design follows specifications provided by the authors for tabulations prepared by the Australian Bureau of Statistics (ABS) from the censuses of population conducted by ABS in 2006 and 2021. Analyses undertaken by the authors show changes that have taken place in the number of managers of aged care residential facilities in relation to the number of aged people, residents of aged care facilities, and people employed in them. Further, the analyses examine changes in the demographic characteristics of managers, their working hours and income, over time.

FINDINGS:

There was a substantial decline in the proportion of the growing number of people aged 70 years and over who lived in aged care residential services during the 15-year period. While there was a large increase in the number of employees and managers per resident, and a slight increase in the number of managers per employee. The proportion of female managers fell, and the average age of managers increased slightly. The proportion of managers at graduate level rose substantially. Although the average income of aged care residential services managers was similar to that in all industries in 2021, their increase was larger than in all industries during the 15-year period. Average hours worked remained similar over time. The proportion of Australia-born managers declined while that of managers born in Asia rose substantially, and the proportion of indigenous managers about doubled during the 15-year period.

IMPLICATIONS:

Relevance to those concerned with the evolving transformation of aged care in Australia and those interested with management training of the growing number of managers of aged care residential services.

KEYWORDS
Health service managers, aged care residential services, health labour force, training and career path development.

INTRODUCTION

The number of aged people has increased substantially and will continue to grow rapidly, as the Baby Boomer generation born after World War II (in the later 1940s and earlier 1960s) gets in their 70s and 80s. Accordingly, the number of people 70 years of age and over rose from about 1.9 million to 3.1 million (+63.2%) in the 15-year period from 2006 to 2021 [1]. As the numbers are bound to rise over the next decades, and as disability increases with age, the need for support of various kinds will grow [2]. The federal Department of Health (DH) reported that the federal government subsidy for aged care residential services amounted to $14.1 billion in 2021 [3]. It represented about 59.7% of the federal government funding for aged care services that included support in the home. In spite of the increase in aged care services provided in the home, the number of people in aged care residential services rose from about 154,900 in 2006 to 183,900 in 2021 [3, 4], an increase of 18.7%. This proportional growth is well below the rise in the number of people aged 70 years and over, as efforts were made to support older people in their own homes.

The appropriateness of services rendered to aged people in need of support has been the object of considerable concern and has gone through what has been described earlier as a transformation reform to enhance the effectiveness of the services subsidised by the federal government [5]. Nevertheless, a more recent Royal Commission into Aged Care Quality and Safety has found that …there is no clear statement in the Aged Care Act of the basic responsibility of approved providers to ensure that the care provided to residents is safe and of high quality… [6] and …We consider that changes need to be made to improve the governance and leadership of aged care providers… [6]. These concerns were added to with the emergence of the COVID-19 epidemic [7]. Therefore, it is relevant and informative to assess the changes that have taken place in the number and characteristics of managers of aged care residential services. This is the subject of the following analysis.

DATA SPECIFICATIONS

The data used in the following assessment was provided by the Australian Bureau of Statistics (ABS) sourced from the censuses of the Australian population carried out in 2006 and 2021, following specifications prepared by the authors. Consequently, it follows ABS's Australian occupation and industry classifications. Detailed definitions of ABS's classifications were provided and available in Martins & Isouard [8]. However, definitions regarding manager classifications are provided in the Appendix. As in the case of other data from the censuses, the data used in the analysis is from answers to related questions posed in the censuses. However, the answers to the questions are the subject of post-enumeration surveys and tests to ensure the quality and reliability of the data. The data relates to managers in aged care residential services in both the public and private sectors. The classification of managers follows the classification used by ABS with four categories: (i) managers no further defined, (ii) chief executive officers and general managers, (iii) specialist managers and (iv) service managers. The data also follow ABS's coding for age, sex, marital status, field and level of education, indigenous status, country of birth, hours worked and individual income. To allow the comparison of attributes the authors requested ABS to provide similar data for health service and all industries managers. To protect the confidentiality of individual data, ABS made some small changes to the numbers provided in some cells. These were adjusted by the authors without significant material impact. The sources for other data used are in accordance with the references given. The figures for managers in all industries for 2006 excluded managers in agriculture. Nevertheless, this does not result in any differences in findings in a material way for managers in all industries. The authors have followed ABS' definition of sex and gender. Sex is the biological characteristics of males and females, while gender is the psychological and social characteristics that are culturally determined from belief systems of what masculine and feminine behaviour is or ought to be [9].

As stated, the data used in the analysis are from tabulations provided by ABS. It is relevant to point out that the information given in the various tables are the result of the analysis carried out by the authors. Accordingly, although

the sources usually given in the tables are those from ABS' original sources, the results shown are the work of the authors.

GROWING DEMAND AND STAFF

Efforts to support people in their own homes, in more recent years, meant that their number in aged care residential services (ACRS) rose at a much slower pace than in the past. An expression of the drive to improve care led to a substantial increase in both the number of people employed in ACRS and the number of managers. This meant that the number of ACRS residents to employees declined from 1.21 residents per employee in 2006 to 0.71 in 2021. In parallel, the number of employees per manager also fell to some extent from a ratio of 20.7 employees per manager in 2006 to that of 18.2 in 2021 (Table 1).

LARGE GROWTH IN MANAGERS

It is apparent that the increase in the number of managers in ACRS grew at considerable faster rate (+128.7%) than that of all industries (+25.2%) during the 15-year period 2006-2021. The growth is even higher than the large increment in health services (+119.6%) during the same period (Table 2).

TABLE 1. NUMBER OF AGED PEOPLE AND STAFF OF AGED CARE RESIDENTIAL SERVICES, AUSTRALIA, 2006 AND 2021

People and staff	2006	2021	2021 /2006
People aged 70 & over (000s)	1,887.0	3,079.5	+1,507.0
ACRS residents	154,900	183,900	+29,000
ACRS employees	128,300	258,500	+130,200
ACRS managers	6,200	14,200	+8,000
ACRS residents per 1,000 people aged 70 & over	*82.1*	*59.7*	*-22.4*
ACRS residents per employee	*1.21*	*0.71*	*-5.0*
ACRS residents per ACRS manager	*25.0*	*13.0*	*-12.0*
ACRS employee per ACRS manager	*20.7*	*18.2*	*-2.5*

Note: (ACRS) is aged care residential services. The numbers have been rounded to the nearest hundred.
Sources: References [1] [3] [4] [10] [11]. Analysis made by the authors.

TABLE 2. NUMBER OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH SERVICES AND ALL INDUSTRIES, AUSTRALIA, 2006 AND 2021

Service	Number of managers		% increase 2021/2006
	2006	2021	
Aged care residential services	6,200	14,200	+129.0
Health services	19,400	42,600	+119.6
All industries	1,202,300	1,505,300	+25.2

Note: The numbers have been rounded to the nearest hundred.
Sources: References [10] [11]]. Analysis made by the authors

The growth in manager numbers was greatest at the top level (the combined number of chief executive officers/general managers/managers no further defined) (+167.2%) during the 15-year period 2006-2021. It was lowest but still large (+120.8%) at the specialist manager level, which includes managers more concerned with direct resident support and service. However, growth in numbers was even more substantial among service support managers engaged in such services as food, hospitality and cleaning services (+132.5) (Table 3)

The uneven growth in different categories of staff led to substantial changes in the ratios between top managers and other managers. Thus, the number of specialist and service managers per top managers declined from 8.6 in 2006 to 7.2 in 2021. The change was particularly large in the case of the ratio of specialist managers that fell from 6.1 in 2006 to 5.0 in 2021. The changes in ACRS managers between 2006 and 2021 were larger than those in health services over the same period (Figure 1).

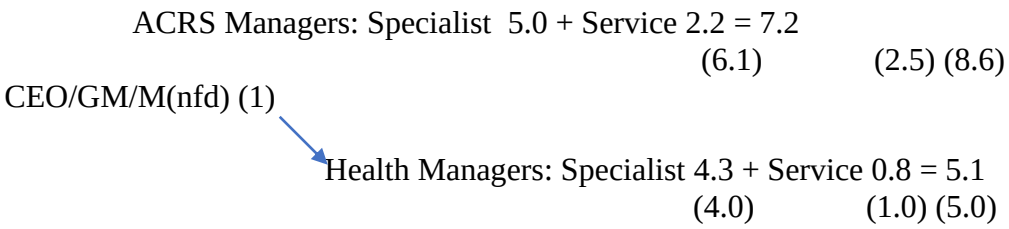
TABLE 3. MANAGERS OF AGED CARE RESIDENTIAL SERVICES, BY CATEGORY, AUSTRALIA, 2006 AND 2021

Category	Number of managers		*% increase 2021/2006*
	2006	2021	
CEO/GM	526	1,474	*+180.2*
Managers no further defined	123	260	*+111.4*
Sub-total	649	1,734	*+167.2*
Specialist	3,932	8,681	*+120.8*
Service	1,619	3,764	*+132.5*
All managers	6,200	14,179	*+128.7*

Note: (CEO/GM) are chief executive officers and general managers; M(nfd) are managers no further defined.

Sources: References [10] [11]. Analysis made by the authors.

FIGURE 1. AVERAGE SPECIALIST AND SERVICE MANAGERS PER CHIEF EXECUTIVE OFFICER, AGED CARE RESIDENTIAL AND HEALTH SERVICES, AUSTRALIA, 2006 AND 2021



Note: (CEO/GM/M(nfd) is the combined categories of chief executive officer/general manager/manager no further defined. (ACRS) is aged care residential services. The figures in brackets are the ratios for 2006.

Sources: References [10] [11]. Analysis made by the authors

SEX OF MANAGERS

The majority of employees in ACRS are females and so are the managers. However, while 82.5% of employees were females in 2021 only 64.5% of managers were females, this led to a gap of 18.0% between the two proportions. Nevertheless, this represents a reduction in the gap by 3.2% between 2006 and 2021 (Table 3).

The differences in the proportions of female and male managers becomes more accentuated when the proportions are assessed by category of managers. Accordingly, the gap in the proportion of female managers in relation to of female employees is considerably higher in the case of chief executive/general manager category (-27.5%) than that of specialist managers (-11.2%), but the gap became even larger in the case of service managers (-29.7%). Nevertheless. this is a substantial change from even larger gaps in 2006 (Table 5).

TABLE 4. AGED CARE RESIDENTIAL SERVICES PROPORTION OF FEMALE MANAGERS AND EMPLOYEES, AUSTRALIA, 2006 AND 2021

Year	Female %		% Gap managers-employees
	Employees	Managers	
2006	87.4	66.2	-21.2
2021	82.5	64.5	-18.0

Sources: References [3] [4] [10] [11]]. Analysis made by the authors.

TABLE 5. AGED CARE RESIDENTIAL SERVICES PROPORTION OF FEMALE MANAGERS BY CATEGORY, AUSTRALIA, 2006 AND 2021

Category	Female percentage (%)		2021 Percentage (%) managers-employees
	2006	2021	
CEO/GM	42.6	55.0	--27.5
Managers no further defined	56.1	63.1	-19.4
	45.1	56.2	-26.3
Specialist managers	74.0	71,3	-11.2
Service managers	55.7	52.8	-29.7
All managers	66.2	64.5	-18.0

Note: (CEO/GM) are chief executive officers and general managers.

Sources: References [3] [4] [10 [11]. Analysis made by the authors.

AGE OF MANAGERS

The average age of managers of ACRS of about 49.4 years in 2021 was similar to that in 2006. However, it continued to be older than the average for health services managers (47.3 years in 2021) and the much younger average for managers in all industries (45.3 years in 2021) (Table 6).

The average age of chief executive officers/general managers in ACRS was substantially older (52.9 years) than the average of other managers in the same outfits in 2021. It was also older than that in both health services (50.0 years) and all industries (49.9 years). This was also an increase on the average age for 2006 (50.6 years). While the average ages of the more numerous specialist managers declined between 2006 and 2021 (49.5 and 48.2 years respectively) that of service managers rose somewhat (from 48.8 to 51.0 years) (Table 7).

TABLE 6. AGE OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH SERVICES AND ALL INDUSTRIES, AUSTRALIA, 2006 AND 2021

Age	Age (years)		
	Aged care residential	Health	All industries
2021			
Average	49.4	47.3	45.3
Median	50.3	47.4	45.0
Standard deviation	*11.3*	*11.2*	*12.1*
Coefficient of variation	*0.23*	*0.24*	*0.27*

2006			
Average	49.2	46.0	43.5
Median	50.1	46.6	43.5
Standard deviation	*10.0*	*10.0*	*11.6*
Coefficient of variation	*0.20*	*0.22*	*0.27*

Sources: References [10] [11]. Analysis made by the authors.

TABLE 7. AGE OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH SERVICES AND ALL INDUSTRIES, AUSTRALIA, 2006 AND 2021

Category	Age (years)		
	Aged care residential	Health	All industries
2021			
CEO/GM	52.9	50.0	49.9
Managers no further defined	48.1	48.3	47.9
Specialist	48.2	47.1	45.3
Service	51.0	45.8	43.4
All managers 2021	49.4	47.5	45.3
2006			
CEO/GM	50.6	47.8	47.4
Managers no further defined	53.1	47.4	47.2
Specialist	49.5	45.7	43.5
Service	48.8	45.4	41.9
All managers 2006	49.2	46.0	43.5

Note: (CEO/GM) are chief executive officers and general managers.

Sources: References [10] [11]. Analysis made by the authors.

FIELD OF STUDY OF MANAGERS

In 2021, the field of study of 30.6% of managers in ACRS was management and commerce. This was also the most common field of study of managers in health services and all industries. It was followed by health studies (24.5%) in line with health services (28.4%), but as would be expected much different from the average in all industries (3.7%). The third most common field of study was that of social and related fields (14.8%) followed by food, hospitality and personal services (4.5%), that was above the proportion in health services (1.7%), where much of related services are outsourced. As might be expected, the pattern was substantially different from that of the average for all industries, as shown by the relative difference standard index of 46.9 (Table 8).

Although there were some communalities in the fields of study of female and male managers of ACRS, there were also some differences. In 2021, females were more likely to have health as their field of study (32.0%) than males (10.8%), the same applied to social and related fields (17.4% versus 9.9%), and also in education (3.0% versus 1.5%). While males were more likely to have engaged in engineering (9.8% versus 0.5%), architecture (8.1% versus 0.4%), food and hospitality (6.6% versus (3.4%), information technology (4.2% versus 0.9%). The proportions were more closely related in the largest group of managers with management and commerce qualifications (males 34.0% and females 28.7%), and also in the case of the few with academic training in natural and physical sciences (males 1.3% and females 1.0%) (Table 9).

TABLE 8. FIELD OF STUDY OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH SERVICES AND ALL INDUSTRIES, AUSTRALIA, 2021

Field of study	Percentage of total (%)		
	Aged care residential	Health	All industries
Management & commerce	30.6	29.2	28.6
Health	24.5	28.4	3.7
Social & related fields	14.8	12.7	12.1
Food, hospitality & personal services	4.5	1.7	3.3
Engineering & related technologies	3.8	3.6	11.2
Architecture & building	3.1	1.0	5.5
Education	2.5	2.4	4.2
Information technology	2.0	2.8	4.0
Natural & physical sciences	1.1	5.5	3.0
Other	13.1	12.7	24.4
All managers	100.0	100.0	100.0
Relative difference index	*46.9*	*53.8*	*Standard*

Note: The relative difference index=[∑|{ai/bi)*100}-100|}/(2*n); where (ai) is the proportion of managers in field of study (i) in given service; (bi) is the proportion of managers in field of study (i) in all industries; (n) is the number of fields of study groups. (Other) includes managers whose field of study was inadequately described, not stated, or without field of study (in relation to post-school qualifications).

Source: Reference [10]. Analysis made by the authors.

TABLE 9. FIELD OF STUDY OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, BY SEX, AUSTRALIA, 2021

Field of study	Percentage of total (%)		
	Females	Males	Persons
Management & commerce	28.7	34.0	30.6
Health	32.0	10.8	24.5
Social & related fields	17.4	9.9	14.8
Food, hospitality & personal services	3.4	6.6	4.5
Engineering & related technologies	0.5	9.8	3.8
Architecture & building	0.4	8.1	3.1
Education	3.0	1.5	2.5
Information technology	0.9	4.2	2.0
Natural & physical sciences	1.0	1.3	1.1
Other	12.7	13.8	13.1
All managers	100.0	100.0	100.0

Note: (Other) includes managers whose field of study was inadequately described, not stated, or without field of study (in relation to post-school qualifications).

Source: Reference [10]. Analysis made by the authors.

LEVEL OF EDUCATION OF MANAGERS

The level of education of ACRS managers rose substantially during the 15-year period 2006-2021. The graduate level rose from 44.9% in 2006 to 53.2% in 2021. This proportional rise was similar to that in health services but lower than that in all industries. Nevertheless, the average level in ACRS was higher than that in all industries (45.9%), but lower than that in health services (65.7%) (Table 10).

The rise in the proportion of ACRS managers at graduate level was associated with a higher proportion of female managers at that level (55.1%) than males (49.7%) in 2021 (Table 11).

Further assessment of the level of education of ACRS managers showed that chief executive officers/general managers had a considerable higher proportion at graduate level (72.3%) than the average for all managers (53.2%). This was followed by specialist managers (63.9%) and managers no further defined (60.4%). The level of education of most service managers usually concerned with food, hospitality and other related services was mostly at diploma/certificate level (54.2%) in 2021 (Table 12).

TABLE 10. LEVEL OF EDUCATION OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH AND ALL INDUSTRIES, AUSTRALIA, 2006 AND 2021

Education level	Percentage of total (%)		
	Aged care residential	Health	All industries
2021			
Postgraduate	20.6	32.6	17.4
Bachelor	32.6	32.4	28.5
Graduate subtotal	53.2	65.7	45.9
Diploma/certificate	34.2	23.2	31.9
Other	12.6	11.8	22.2
All managers 2021	100.0	100.0	100.0
2006			
Postgraduate	15.0	25.8	9.6
Bachelor	29.9	30.0	19.9
Graduate subtotal	44.9	55.8	29.5
Diploma/certificate	31.9	24.2	31.5
Other	23.2	20.0	39.0
All managers 2006	100.0	100.0	100.0

Note: (Other) includes managers whose field of study was inadequately described, not stated, or without field of study (in relation to post-school qualifications).

Sources: [10] [11]. Analysis made by the authors.

TABLE 11. LEVEL OF EDUCATION OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES BY SEX, AUSTRALIA, 2021

Level of education	Percentage of total (%)		
	Females	Males	Persons
Postgraduate	20.0	21.7	20.6
Bachelor	35.1	28.0	32.6
Graduate subtotal	55.1	49.7	53.2

Diploma/certificate	32.4	38.1	34.3
Other	12.5	12.2	12.5
All managers	100.0	100.0	100.0

Note: (Other) includes managers whose field of study was inadequately described, not stated, or without field of study (in relation to post-school qualifications).
Source: Reference [10]. Analysis made by the authors.

TABLE 12. LEVEL OF EDUCATION OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, BY CATEGORY, AUSTRALIA, 2021

Level of education	Percentage of total (%)				
	CEO/GM	M (nfd)	Specialist	Service	All
Postgraduate	36.2	30.0	23.8	6.5	20.6
Bachelor	36.1	30.4	40.1	14.0	32.6
Graduate subtotal	72.3	60.4	63.9	20.5	53.2
Diploma/certificate	20.5	31.2	28.2	54.2	34.3
Other	7.2	8.4	7.9	25.3	12.5
All managers	100.0	100.0	100.0	100.0	100.0

Note: (Other) includes managers whose field of study was inadequately described, not stated, or without field of study (in relation to post-school qualifications).
Source: Reference [10]. Analysis made by the authors.

INCOME OF MANAGERS

The average weekly income of ACRS managers was $2,139 in 2021. It was lower but close to the average for all industries ($2,154) and more substantially lower than the average for all health services ($2,303) (Table 13). Their income was the equivalent of about $111,400 per year in 2021.

The rise in weekly income of ACRS managers of 62.5% between 2006 and 2021 was somewhat larger than the average for all industries (60.6%) and even more so than that for health services (53.6%) (Table 14).

The average weekly income of ACRS top managers in 2021 was 46.8% higher than the average for all ACRS managers.

Further, on average the ACRS weekly income of female mangers was 10.3% lower than that of males. The difference prevailed for managers in all categories, but it was larger (-16.2%) in the case of specialist managers and lower in the case of service managers (-6.9%) (Table 15).

In 2021, the average weekly income of ACRS managers tended to peak in their middle fifty years of age. It is noticeable that the difference between the more highly paid male managers and those of females tends to be larger in the age range from their 30s to their 50s, but close earlier and later in their working lives (Chart1).

TABLE 13. AVERAGE WEEKLY INCOME OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH AND ALL INDUSTRIES, AUSTRALIA, 2021

Weekly income	Aged care residential	Health	All industries
Average weekly income ($)	2,139	2,303	2,154
Median weekly income ($)	1,934	2,177	1,892
Standard deviation ($)	1,022	1,039	1,167
Coefficient of variation	0.48	0.45	0.54

Note: The average and median are for the weekly gross income of managers in the week before the census. The figures exclude those managers who did not declare their income at the time of the census about 0.4%, 0.5% in the case of health services and 0.6% in all industries.
Source: Reference [10]. Analysis made by the authors

TABLE 14. AVERAGE WEEKLY INCOME OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH AND ALL INDUSTRIES, AUSTRALIA, 2006 AND 2021

Year	Aged care residential	Health	All industries
2021 Average weekly income ($)	2,139	2,303	2,154
2006 Average weekly income ($)	1,316	1,499	1,341
% Increase 2006-2021	+62.5	+53.6	+60.6

Note: The average and median are for the weekly gross income of managers in the week before the census. The figures exclude those managers who did not declare their income at the time of the census about 0.4%, 0.5% in the case of health services and 0.6% in all industries.

Source: References [10 [11]. Analysis made by the authors

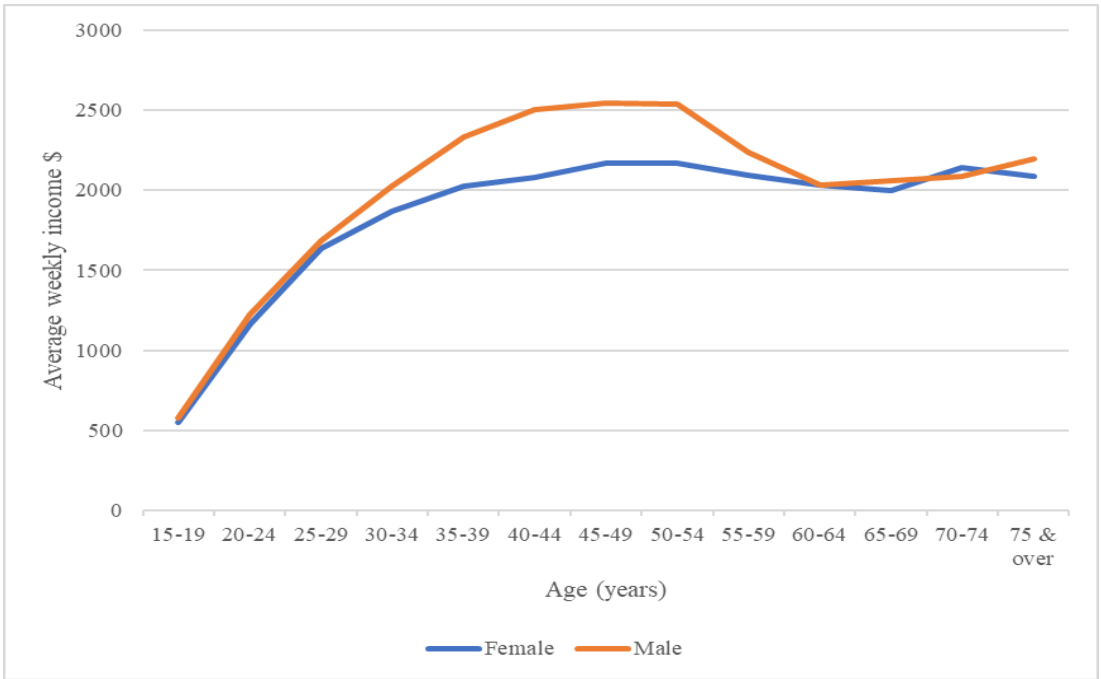
TABLE 15. AVERAGE WEEKLY INCOME OF MANAGERS OF AGED CARE RESIDENTIAL SERVICES, BY CATEGORY, AUSTRALIA, 2021

Manager category	Average weekly income ($)			Female percentage below male income (%)
	Female	Male	Persons	
CEO/GM	2,956	3,364	3,139	-12.1
Managers no further defined	2,332	2,672	2,463	-12.7
Specialist	2,144	2,559	2,263	-16.2
Service	1,387	1,490	1,436	-6.9
All managers	2,055	2,292	2,139	-10.3
CEO/GM % above average	*+43.8*	*+46.8*	*+46.8*	

Note: (CEO/GM) are chief executive officers and general managers. The average income of managers is their weekly gross income of managers in the week before the census. The figures exclude those managers who did not declare their income at the time of the census about 0.4%.

Source: Reference [10]. Analysis made by the authors

CHART 1. AVERAGE WEEKLY INCOME FEMALE AND MALE MANAGERS AGED CARE RESIDENTIAL SERVICES, BY AGE, AUSTRALIA, 2021



Source: Reference [10]. Analysis made by the authors.

HOURS WORKED BY MANAGERS

On average managers of ACRS worked 42.2 hours per week in 2021. This is closer to the average for all industries (42.8 hours) than the lower average for health services (41.1 hours). These were somewhat shorter hours than in 2006, especially in the case of managers in all industries, which average declined by 4 hours. However, there were considerable differences among managers as the coefficients of variation indicate (0.40 in ACRS and 0.43 for all industries) (Table 16).

Chief executive officers/general managers worked on average 6.7 hours per week longer than the average for all managers in ACRS (42.2 hours) in 2021. This was close to the average of that category of managers for all industries (48.3 hours), but more than that for health services (45.6 hours). Service managers in ACRS worked on average considerably less hours (37.5 hours), while other managers worked somewhat above average (Table 17).

On average, in 2021, ARCS male managers worked about one hour (1.1 hours) longer than female managers. This difference was similar but shorter than that in health services and in all industries (Table 18).

TABLE 16. AVERAGE HOURS WORKED PER WEEK BY MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH AND ALL INDUSTRIES, AUSTRALIA, 2006 AND 2021

Weekly work hours	Aged care residential	Health	All industries
2021			
Average weekly hours worked	42.2	41.1	42.8
Median weekly hours worked	39.9	40.2	40.4
Standard deviation	*17.0*	*16.9*	*18.3*
Coefficient of variation	*0.40*	*0.41*	*0.43*
2006			
Average weekly hours worked	43.3	41.9	46.9
Median weekly hours worked	39.8	39.7	43.6
Standard deviation	*16.1*	*17.8*	*19.6*
Coefficient of variation	*0.42*	*0.42*	*0.42*
2021-2006			
% difference of average	-2.6	-1.9	-9.2

Note: The average working hours of managers are those in the week before the census. The figures exclude 0.4% of managers who did not stated the number of hours worked in aged care residential services, 0.4% in health and 0.7% in all industries.

Sources: References [10] [11]. Analysis made by the authors.

TABLE 17. AVERAGE HOURS WORKED PER WEEK BY MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH AND ALL INDUSTRIES, BY CATEGORY, AUSTRALIA, 2021

Category	Average hours worked per week		
	Aged care residential	Health	All industries
CEO/GM	48.9	45.6	48.3
Managers no further defined	43.4	39.3	42.4
Specialist	43.1	41.4	44.2
Service	37.5	36.2	38.3
All managers	42.2	41.1	42.8

Note: (CEO/GM) are chief executive officers and general managers. The average working hours of managers are those in the week before the census. The figures exclude 0.4% of managers who did not stated the number of hours worked in aged care residential services, 0.4% in health and 0.7% in all industries.

Source: Reference [10]. Analysis made by the authors.

TABLE 18. AVERAGE HOURS WORKED PER WEEK BY MANAGERS OF AGED CARE RESIDENTIAL SERVICES, HEALTH AND ALL INDUSTRIES, FEMALE AND MALE, AUSTRALIA, 2021.

Weekly work hours	Average hours worked per week					
	Aged care residential		Health		All industries	
	Female	Male	Female	Male	Female	Male
Average	41.8	42.9	39.3	43.8	38.7	45.6
Median	39.7	40.1	40.0	40.5	39.5	40.7
Standard deviation	*17.4*	*16.5*	16.9	16.7	17.7	18.1
Coefficient of variation	*0.41*	*0.38*	0.43	0.38	0.46	0.40

Note: The average working hours of managers are those in the week before the census. The figures exclude 0.4% of managers who did not s tated the number of hours worked in aged care residential services, 0.4% in health and 0.7% in all industries.

Source: Reference [10]. Analysis made by the authors.

This slightly longer average hours of work by males applied to all categories, with exception of managers no further defined, when female managers worked on average 4.9 hours longer than males in 2021 (Table 19).

TABLE 19. AVERAGE HOURS WORKED PER WEEK BY MANAGERS OF AGED CARE RESIDENTIAL SERVICES, BY SEX, AUSTRALIA, 2021

Category	Average hours worked per week		
	Female	Male	Persons
CEO/GM	49.1	48.7	48.9
Managers no further defined	45.4	40.5	43.4
Specialist	42.4	44.7	43.1
Service	36.7	38.4	37.5
All managers	41.8	42.9	42.2

Note: The average working hours of managers are those in the week before the census. The figures exclude 0.4% of managers who did not stated the number of hours worked in aged care residential services.

Source: Reference [10]. Analysis made by the authors.

On average, full-time managers worked 46.8 hours per week in 2021. Chief executive officers/general managers worked 6.7 hours longer than the average, and service managers 3.6 hours less than the average, with managers no further defined and specialist managers at respectively 48.8 and 46.9 hours. Female managers worked on average 0.6 hours more than male managers on average. The average number of hours worked were similar in the categories of chief executive officers/general managers, managers no further defined and specialist managers, but female service managers worked longer hours than male service managers (+1.8 hours) (Table 20).

TABLE 20. AVERAGE HOURS WORKED PER WEEK BY FULL-TIME MANAGERS OF AGED CARE RESIDENTIAL SERVICES, BY SEX AND CATEGORY, AUSTRALIA, 2021

Category	Average hours worked per week		
	Female	Male	Persons
CEO/GM	53.4	53.8	53.5
Managers no further defined	48.7	48.9	48.8

Specialist	46.8	47.1	46.9
Service	44.2	42.4	43.2
All managers	47.0	46.4	46.8

Note: (CEO/GM) are chief executive officers and general managers. Full-time managers are those who worked 35 hours or more per week. The average working hours of managers are those in the week before the census. The figures exclude 0.4% of managers who did not stated the number of hours worked in aged care residential services.

Source: Reference [10]. Analysis made by the authors.

MANAGER MARITAL STATUS

At the time of the 2021 census, 62.6% of ACRS managers were married or in a partnership. This was close to that in health services (63.0%) and the average for all industries (61.9%). The proportion of never married ACRS managers (17.5%) was lower than in health services (21.7%), but more so than in all industries (25.7%), while the proportion of divorced/separated (18.3%) was higher than the proportions in health services (14.2%), and the much lower average for all industries (11.5%) (Table 21). In this context, it is relevant to mention that the average age of ACRS managers is older than that of managers in health services and all industries (Table 6).

TABLE 21. MARITAL STATUS OF MANAGERS IN AGED CARE RESIDENTIAL SERVICE, HEALTH AND ALL INDUSTRIES, AUSTRALIA, 2021

Marital status	Percentage of total (%)		
	Aged care residential	Health	All industries
Never married	17.5	21.7	25.7
Married	62.6	63.0	61.9
Divorced/separated	18.3	14.2	11.5
Widowed	1.6	1.1	0.9
All	100.0	100.0	100.0

Note: (Married) includes those in a partnership.

Source: Reference [10]. Analysis made by the authors.

COUNTRY OF BIRTH OF MANAGERS

There has been a substantial change in the country of birth of mangers of ACRS in the 15-years 2006-2021. Accordingly, the proportion of ACRS managers who were born in Australia declined from 73.5% in 2006 to 65.7% in 2021. This is akin to the decline in the proportions of Australian born managers in health services (74.3% in 2005 to 69.0% in 2021) and all industries (73.2% in 2006 and 67.6% in 2021). A major change was the drop in the proportion of ACRS managers born in other countries in Europe from 9.4% in 2006 to 3.3% in 2021, while those in other countries outside Europe rose substantially from 2.6% in 2006 to 18.2% in 2021. This is attributed to a much greater proportion of ACRS managers born in Asian countries. These changes were like those in health services and all industries (Table 22).

The proportion of Australia-born ACRS managers was highest in the chief executive officer/general manager category (71.0%) in 2021, and lowest in the specialist manager category (63.7%). Similar pattern applied to the those born in the United Kingdom and Ireland. While the proportion of those managers born elsewhere, including Asia, was highest in the specialist manager category (Table 23).

TABLE 22. COUNTRY OF BIRTH OF MANAGERS IN AGED CARE RESIDENTIAL SERVICES, HEALTH AND ALL INDUSTRIES, AUSTRALIA, 2021

Country of birth	Percentage of total (%)		
	Aged care residential	Health	All industries
2021			
Australia	65.7	69.0	67.6
New Zealand & Oceania	4.0	3.5	3.5
United Kingdom & Ireland	8.8	8.9	7.1
Other Europe	3.3	2.9	3.6
Other	18.2	15.7	18.2
All managers 2021	100.0	100.0	100.0
2006			
Australia	73.5	74.3	73.2
New Zealand & Oceania	3.9	3.0	3.5
United Kingdom & Ireland	10.6	10.7	8.4
Other Europe	9.4	8.4	10.9
Other	2.6	3.6	4.0
All managers 2006	100.0	100.0	100.0

Note: The figures do not include 0.4% of managers in aged care residential services, 0.2% of health managers and 0.2% of all industries managers who did not state their country of birth in the census.

Sources: References [10] [11]. Analysis made by the authors.

TABLE 23. COUNTRY OF BIRTH OF MANAGERS IN AGED CARE RESIDENTIAL SERVICES BY CATEGORY, AUSTRALIA, 2021

Country of birth	Percentage of total (%)				
	CEO/GM	M(nfd)	Specialist	Service	All
Australia	71.0	68.4	63.7	68.0	65.7
New Zealand & Oceania	4.3	5.6	3.8	4.4	4.0
United Kingdom & Ireland	9.1	9.4	8.8	8.8	8.8
Other Europe	2.8	5.6	3.3	3.6	3.3
Other	12.8	11.0	20.4	15.2	18.2
All managers	100.0	100.0	100.0	100.0	100.0

Note: : (CEO/GM) are chief executive officers and general managers; M(nfd) are managers no further defined. The figures do not include 0.4% of managers in aged care residential services who did not state their place of birth in the census.

Source: Reference [10]. Analysis made by the authors.

INDIGENOUS STATUS

The proportion of ACRS managers of indigenous status was 1.4% in 2021. This was about the same as that for all industries (1.3%), but lower than that for health services (2.1%). The ACRS proportion in 2021 was a substantial increase on that in 2006 (0.6%), as was the case in health and the average for all industries (Table 24).

A feature of the substantial change was that it resulted in a higher proportion of indigenous managers of ACRS in the chief executive officer/general manager category (2.2%) and manager no further defined (3.1%) than the average for the more numerous categories of specialist (1.3%) and service (1.3%) managers (Table 25).

TABLE 24. INDIGENOUS STATUS OF AGED CARE RESIDENTIAL SERVICE MANAGERS, HEALTH AND ALL INDUSTRIES, BY SEX, AUSTRALIA, 2006 AND 2021

Sex	Indigenous percentage (%)		
	Aged care residential	Health	All industries
2021			
Females	1.6	2.4	1.6
Males	1.1	1.6	1.1
All managers 2021	1.4	2.1	1.3
2006			
Females	0.8	1.3	0.8
Males	0.1	1.1	0.5
All managers 2006	0.6	1.2	0.6

Note: The figures do not include 0.2% of managers in aged care residential services, 0.2% in health and 0.2% in all industries who did not state their indigenous status.

Sources: References [10] [11]. Analysis made by the authors.

TABLE 25. INDIGENOUS STATUS OF AGED CARE RESIDENTIAL SERVICE MANAGERS, BY SEX AND CATEGORY, AUSTRALIA, 2021

Category	Percentage of total (%)		
	Female	Male	Persons
CEO/GM	2.2	2.2	2.2
Managers no further defined	1.9	4.9	3.1
Specialist	1.5	0.8	1.3
Service	1.7	0.8	1.3
All managers	1.6	1.1	1.4

Note: (CEO/GM) are chief executive officers and general managers. The figures do not include 0.2% of managers in aged care residential services, who did not state their indigenous status.

Source: Reference [10]. Analysis made by the authors.

DISCUSSION

Efforts to keep aged people in their own homes and avoid institutionalisation have resulted in a substantially lower rate of growth in the number of people in ACRS, in recent years. Apprehension with the quality of care provided in ACRS was expressed by a Royal Commission, however, previous concerns led to a substantial rise in the number of people employed in ACRS, the number of managers and the level of their qualifications before the Royal Commission. Among other things, this meant that the number of employees and managers per resident rose substantially during the 15-year period under review.

Accordingly, the number of ACRS managers more than doubled from 2006 to 2021 (+128.7%) and the number of CEO/GMs rose by 180.2%. It is noteworthy that most of the managers of ACRS were female (64.5%), however, this proportion was much lower than the proportion of female ACRS employees (82.5%) in 2021. Thus, leaving a considerable gap between the proportion of female employees and that of female managers. The proportion of female CEO/GMs was also considerably lower (55.0%) than that of all ACRS managers (64.5%).

ACRS managers tended to be much older (49.4 years) than the average for all industries (45.3 years), and even older than those in health services (47.3 years) in 2021. This was

similar to 2006. As might be expected, CEO/GMs were on average older (52.9 years) than other ACRS managers and those at similar level in health services (50.0 years), and the average for all industries (49.9 years).

As might be expected, the analysis of the field of study of ACRS managers showed a considerable difference in composition from that for all industries: the proportion of ACRS managers with health qualifications was much higher (24.5%) in comparison to that in all industries (3.7%), but closer to the proportion in health services (28.4%). Concern with the qualifications of ACRS managers was associated with a rise of the proportion at graduate level from 44.9% in 2006 to 53.2% in 2021. This was substantially higher than the average for all industries (45.9%) but lower than that in health services (65.7%) in 2021. The proportion of ACRS CEO/GMs with graduate qualifications was much higher at 72.3% than the average of 53.2% for all ACRS managers in 2021. In spite of their higher academic qualifications, ACRS managers earned less on average per week ($2,139) than the average for all industries ($2,154) and even lesser than those in health services ($2,303) in 2021.

The observed larger proportion of managers born overseas, especially in Asia, in all industries and health services also took place in ACRS. Thus, the number of ACRS managers born in Australia declined from 73.5% in 2006 to 65.7% in 2021. This change was similar to that in all industries, but somewhat lower than that in health services. The proportion of ACRS managers born outside Europe and Oceania declined substantially while the proportion of others born elsewhere, especially in Asia, rose from 2.6% in 2006 to 18.2% in 2021. Similarly, the proportion of ACRS managers who identified themselves as of Indigenous status almost doubled from 0.6% in 2006 to 1.4% in 2021. This was about the same average as that for all industries (1.3%) but below the proportion in health services of 2.1% in 2021.

The critical comments of the Royal Commission mentioned earlier after the considerable increase in the number of ACRS managers, the rise in their qualifications, and the larger number of people employed per resident leads to the Commission's comment that changes are necessary in the governance and leadership of ACRS that are not necessarily entirely addressed by the larger number of higher qualified managers. A study of senior management perspectives in a limited number of ACRS in Queensland points to some of the leadership skills and attributes perceived as important in the provision of effective ACRS: stewardship, professional development, knowledge of the healthcare environment, information technology and finance [12].

LIMITATIONS

This paper provides a rare contribution to the analysis of the substantial changes that have taken place in the number and characteristics of managers of aged care residential services in Australia. However, this effort has limitations. The data used is that provided in the Australian population censuses for 2006 and the most recent in 2021. It uses data at national level. Therefore, it does not handle differences that must exist between states and territories or features not included in the censuses. Accordingly, it provides an important but restricted view of the management of aged care residential services in Australia, and by implication of the quality and appropriateness of the services provided.

CONCLUSION

In the period 2006-2021 major changes took place in the number of people employed in ACRS with an increase in the number of employees per resident. Thus, the number of employees per resident about doubled during that period. Whilst the growth in the number of managers resulted in a smaller number of employees per manager. Accordingly, not only did the number of employees grow but they were potentially more closely supported by the larger number of managers. This was especially so in the case of chief executive officer/general managers whose numbers more than doubled during the 15-year period. This considerable growth in the number of ACRS managers was associated with a rise in their academic qualifications. In spite of their higher academic qualifications, ACRS managers earned less on average in 2021 than the average for managers in all industries. This might reflect, the observed lower average income of female managers than that of males in all industries but also in health services. The problems encountered in ACRS during the COVID 19 crisis points to the importance of continuing to improve the management of aged care residential services.

Abbreviations

ABS Australian Bureau of Statistics

ACRS Aged Care Residential Services

ANZCO Australian and New Zealand Standard Classification of Occupations

CEO/GM Chief Executive Officer/General manager

DH Commonwealth Department of Health

M(nfd) Managers no further defined

$ Australian dollars

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APPENDIX

MANAGER CLASSIFICATIONS

The classification of managers in this paper is in accordance with ABS's adopted ANZCO: Australian and New Zealand Standard Classification of Occupations. According to it, managers are engaged in the planning, organisation, direction, control, coordination and review of organisations and/or departments. In other words, managers set the overall direction and objectives of organisations and/or their departments to make certain that set objectives are met. They are concerned with the allocation of assets and resources. They direct, control and/or coordinate the activities of organisations and/or their departments, either personally or through subordinates. They are concerned with monitoring and evaluating the overall or departmental performance of the organisation and changing policies and processes to make certain that set objectives are met. They are also engaged in the representation and/or negotiation of the interests of their organisations and/or departments.

Chief executive officers and general managers are engaged and responsible for the planning, organisation, direction, control, coordination and review of the overall operations of organisations, their major activities and representation of and negotiation on behalf of their organisations. Their tasks include the setting of the overall direction and goals of their organisations. They are concerned with the overall setting of the operations of their organisations. In addition, they are responsible for the performance of their organisation is in line with set objectives. Further, they represent their organisations in public relations and negotiations with other organisations and regulatory authorities.

Specialist managers have more direct duties in the planning, organisation, control and coordination of given functions within the overall organisational setting, such in the production and distribution of services, the management of human and financial resources and other ancillary functions. Thus, their tasks include development and implementation of strategies concerned with monitoring and ensurance that policies and plans are followed and evaluation of their outcome, in terms of work progress, performance, and adjustment of processes and resources to achieve set goals. They control budget planning and report on performance and control of expenditure in their area of responsibility. They are involved in personnel planning and training and their performance. They may be involved in the representation of their organisation at given levels and also negotiations with other departments and other outside organisations, such as suppliers of good and services.

Hospitality and service managers are concerned with the organisation and operation of accommodation, cleaning, transport and provisions such as food. They are concerned with the selection, training and supervision of related staff [13].

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RESEARCH ARTICLE

UNDERSTANDING PATIENT FLOW FROM THE PERSPECTIVES OF PATIENT MOVEMENT EXPERTS

Pieter Jan Van Dam[1], Mitchell Dwyer [2], Malgorzata O' Reilly [3], Sarah Prior[4], James Montgomery[5], Richard Turner[2,6]*

1 University of Tasmania. School of Nursing, Hobart, Tasmania, Australia
2 University of Tasmania. Tasmanian School of Medicine, Hobart, Tasmania, Australia
3 University of Tasmania. School of Natural Sciences, Hobart, Tasmania, Australia
4 University of Tasmania. Tasmanian School of Medicine, Burnie, Tasmania, Australia
5 University of Tasmania. School of ICT, Hobart, Tasmania, Australia
6 Tasmanian Health Service, Royal Hobart Hospital, Hobart, Tasmania, Australia

Correspondence: Pieter.vandam@utas.edu.au

ABSTRACT

BACKGROUND:

Poor patient flow or patient movement through a healthcare organisation can lead to adverse outcomes for patients and organisational inefficiency. Many hospitals have addressed suboptimal patient flow by increasing resources, such as bed stock and staffing; however, this is an unsustainable approach. In determining the nature of poor patient flow issues, it is important to collect data from healthcare professionals who manage patient flow daily. Doing so provides insights into the current state of patient flow management in its entirety, whilst also helping with the development of sustainable solutions.

METHODS:

Thirteen semi-structured interviews were conducted with healthcare professionals who were directly involved with patient flow at a referring hospital in Tasmania, Australia.

RESULTS:

Using a thematic analysis method, four major themes were developed. The first major theme was: 'managing patient flow' which centered around known and unknown demands on bed availability. The second theme, 'communication for decisions', highlighted the essential role of communication in maintaining patient flow. The third theme, 'tools as enablers and barriers, relates to the number of software programs which can both help and hinder patient flow. The final theme of 'increasing complexity' is related to an apparent trend towards greater numbers of patients requiring care of an increasingly specialised nature.

CONCLUSIONS:

The findings of this study provide great insights into patient flow issues, with potential solutions identified to address them.

KEYWORDS

Patient flow, Lean, Communication, Complexity, Tools

INTRODUCTION

Patient flow can be defined as the movement of patients through the entire healthcare facility [1] encompassing arrivals, admissions, and discharges. In an ideal state, a hospital's capacity is perfectly matched to its demand, allowing patients to flow through the system seamlessly [2]. Suboptimal patient flow, on the other hand, can lead to adverse outcomes for patients and organisational inefficiency. It contributes to Emergency Department (ED) crowding, bed access block, and increased length of stay (LOS), all of which pose substantial risks to patient safety [3,4]. Indeed, the risk of inpatient mortality for patients admitted via the ED during crowded periods can be as much as 34% higher compared to those admitted during non-crowded periods [5]. The impact of poor patient flow is also felt throughout hospitals more broadly, in the form of a decreased quality of care for admitted patients [6] and reduced financial performance [7], among other factors.

Benjamin and Jacelon distinguish between patient flow and patient flow *management*, defining the latter as "the application of holistic perspectives, dynamic data, and complex considerations of multiple priorities to enable timely, efficient, and high-quality patient care" (p.429) [8]. In practice, this often means managing patient admissions from EDs, operating theatres and outpatient clinics [9], and doing so while factoring in the unique needs of patients and the characteristics of available bed stock [8]. Notwithstanding their central role in a hospital's functioning, until recently relatively little was known about the roles of clinicians charged with maintaining patient flow and the factors driving their decision-making [10]. The extant literature on this topic is predominantly focused on the roles of specialist nursing staff designated as Patient Flow Managers (PFMs) [10]. Given that flow management requires the cooperation of multiple professions in several intertwined activities and interactions [11], there is impetus to learn more about the contribution of other clinicians (e.g., ED doctors, surgeons) towards patient flow.

Despite the numerous professions and a myriad of factors involved in patient flow management, a 2018 systematic review noted that, historically, most solutions aimed at improving patient flow did so by simply increasing resourcing (e.g., bed stock, staffing), an approach which is wholly unsustainable [12]. This review and another [13] cautioned against addressing patient flow in this way, instead emphasising the need to work with clinicians whose roles involve managing patient flow to devise strategies that are both cost-effective and feasible. One approach towards improving patient flow that has been applied with moderate success is the use of 'Lean' principles, which examine processes and seek to identify areas of waste [14]. Lean identifies eight types of waste:

- defects – spending time on doing something incorrectly;
- overproduction – doing more than what is required;
- transportation – unnecessary moving of patients through a hospital;
- waiting – for procedures; inventory – excess stock;
- motion – employees move more than necessary;
- overprocessing – work not valued by health consumers;
- human potential – healthcare professionals are not engaged, heard or supported [15].

The utilisation of Lean thinking in healthcare is an increasingly popular strategy for improvement of service efficiency, with many patient flow studies focusing on increasing patient throughput [16,17] and bed block issues [18,19]. Nicosia et al. investigated the use of Lean as a patient flow improvement tool from the nursing staff perspective and suggests that, although Lean is effective, more research is needed to understand how to reduce competing demands and time stress for nurses [20]. Moreover, a variety of decision-making tools have been developed for service planners using Lean principles. One of these tools is a system dynamics decision support tool for older people. The tool or model represents patient flow through the ED starting from a call for help through to ED presentation, admission, and discharge [21]. In many EDs, voices have been raised expressing the need for formal and accurate tools assisting hospital and patient flow managers with decision making processes to ensure high quality person-centered care [22]. Data mining and the use of machine learning to predict ED admissions coupled with algorithms to develop predictive models, has been put forward as a potential solution to assist with patient flow [23]. The setting for this study was a medium-sized referring hospital in Tasmania, Australia, which has been impacted by patient flow issues. This hospital provides care for up to 250,000 residents, including acute, sub-acute, mental health, aged care, and ambulatory services. The hospital's ED sees 60,000 presentations a year. In 2019, the accumulation of issues led to 93% access block and

ramping of 13.5% of ED presentations. Unfortunately, the issues resulted in several near misses, putting patients at risk. The hospital ED presentations are increasing year by year 34.3% since 2009-2010. Furthermore, ED waiting times were consistently below the 4-hour target between 2009 and 2018, and the rate of adverse events per 1,000 ED presentations also doubled during the period 2015-2018. In 2019, software technologies were put in place to deal with some of the issues. However, this intervention only has been partly successful. The aim for this study is therefore to gain insights and a deeper understanding about factors that influence patient flow and use them to build models for optimising patient flow. Doing so will not only provide further insight into the current state of patient flow management in its entirety but will also identify wasteful processes to be targeted in future lean interventions helping to reduce length of stay, and improve quality of care, organisational efficiency and effectiveness.

MATERIALS AND METHODS

A pragmatic qualitative approach was employed, conducting in-depth consultations with 13 clinicians and managers at a referring hospital in Tasmania, Australia. Purposive sampling took place, identifying participants who were involved with the patient flow under investigation. The number of participants were not known at the start of the study, as this was determined by reaching data sufficiency [24]. The method of purposive sampling was employed to increase the depth of understanding and to select participants that have in-depth knowledge about patient flow. To ensure that the right participants were identified, one of the researchers (who is also a clinician employed by the same hospital) provided a list of potential candidates. Sixteen participants were contacted and 13 agreed to be interviewed. Interviewees were clinicians from a variety of discipline backgrounds - nursing, allied health, and medicine - who held the positions of Patient Flow Manager, Clinical Nurse Consultant, Nursing Director, Emergency Medicine Physician, and Hospital Director.

Staff were sent an email inviting them to participate in the study. This email contained a brief overview of the study, information about participation, and a consent form. Consent was obtained from participants by having them sign and return a copy of this form, either via email or in person. If, after a period of two weeks, there was no reply received to the initial email, the researchers sent one follow up email as a final attempt to recruit the staff member.

DATA COLLECTION

Participants were asked to nominate a suitable time and location to be interviewed. All interviews were held in person, with the majority being conducted in the participants' place of work, and the remainder inside offices in the University of Tasmania's Hobart City Campus. All participants were allocated a unique identifier in the form of a pseudonym. Interviews were conducted by several of the researchers (MD, PVD, and MO) all of whom were experienced interviewers, and did not work directly with the participants being interviewed. A semi-structured interview guide was used to elicit participants' understanding of the factors involved in patient flow management. A set of questions were used for all participants, and more in-depth information was obtained by using prompting questions. Participants were given the option of withdrawing their participation after interviews had concluded; however, none opted to do so. All interviews (n=13) lasted between 14 and 48 minutes and took place between May 2022 and January 2023.

DATA ANALYSIS

Interviews were digitally recorded and then transcribed by a third party, before being analysed using a thematic network analysis [25]. Thematic networks aim to explore the significance of an idea or understanding of an issue. The analysis involves the following stages: code material; identify themes; construct thematic networks; describe and explore thematic network; and interpret patterns. Each stage of analysis involves interpretation leading to an abstract level of analysis, by developing basic themes, organising themes, and overarching global themes. These latter themes group the meaning of the basic and organising themes, showing the meaning of the data [25]. In this study, global themes represent the position of the participants regarding patient flow issues. All transcripts were checked by two members of the research team to ensure accuracy and to improve rigour.

ETHICAL APPROVAL

Ethical approval was obtained from the Tasmanian Health and Medical Human Research Ethics Committee (HREC No 23633) and site-specific approval from the Research Governance Office of the Tasmanian Health Service.

RESULTS

The main areas of discussion in the interviews focused on facilitators, barriers, and potential solutions to an optimal patient flow. Data sufficiency was reached after 13

interviews, as no new insights emerged. Four global themes were developed through the process of data analysis: Managing Patient Flow, Communicating for Decisions, Tools as Enablers and Barriers, and Increasing Complexity.

Theme 1: Managing Patient Flow

The global theme of 'managing patient flow' involved known and unknown demands. The unknown demands were derived from receiving direct admissions via outpatient clinics and general practitioner clinics, causing issues in finding beds for patients who required admission. Direct admissions were not incorporated in daily planning, and therefore, beds were often not allocated as needed. Most participants regarded the role of the PFMs as key in ensuring that patients are placed in a bed located in an appropriate clinical area. This concept was referred to as 'getting it right'.

Getting the patients in the right location for their care. That's what patient flow is about. It's about the right patient in the right location, getting the right care. (Participant 4)

The PFM role was likened to being a chess player moving pieces around on a board. PFMs were in control of most of the patients' movements and their role required looking ahead for potential good matches between a patient's requirements and the appropriate bed.

When you see a good move, look for a better one. (Participant 6)

The role concentrates on improving safety, dealing with patients' behavioural issues, and working on better patient outcomes.

A stroke patient goes to the stroke ward, it's been demonstrated that they have a lesser length of stay, and they end up with less complications. It's easier for the nurses. It's easier for allied health staff it's easy for the doctors to see them, review them, and doctors aren't having to go here, there in the hospital, everywhere, just to find their patients. (Participant 7)

Their role was defined as complex, requiring clinical skills, and good understanding of clinical capacity. The role was seen as challenging at times, due to competing demands, and as sometimes being emotionally draining.

Quite often, patients more with elective theatre cases will be postponed. That really sticks in my craw. Um, because quite often these patients have waited a long time for theatre. it puts their lives out of kilter as well. (Participant 9)

Theme 2: Communicating for Decisions

This global theme highlighted that effective and efficient communication is vital in reducing confusion and ensuring that patients receive the right care. It was found that at times disagreements between clinicians led to delays in getting patients transferred to the most suitable wards. To establish more effective and efficient communication, morning 'safety huddles' were introduced to discuss admissions and discharges. From the perspective of the participants, the conversations centred on the exchange of information about issues potentially affecting patients and staff in providing the best patient journey possible.

There's a meeting every day at 8:15, where all of the stream leads, and the Assistant Director of Nursing s and facilities, and cleaners and everyone meets, and goes through a summary of the organisational status, for ten minutes. (Participant 8)

Although these huddles contributed to better planning, often the quality of communication declined during the day and evening. This meant that delays in making decisions about patient admission, transfer, and discharge occurred. Repeated processing was a common theme shared by many participants. This was exemplified by the process for admitting patients, where patients in the ED are often assessed by three different medical teams, causing significant delays.

The admission process usually happens in ED. Um, and that's where, say it was a Gen Med patient, a Gen Med doc will go down and admit the patient, sort the paperwork. Sort what the care plan for this patient is. And then, once that admission is done, the patient's then moved up, is ready to move up to the ward. But, at times Gen Med refuses to accept the patient and the process starts again. (Participant 10)

Theme 3: Tools as Enablers and Barriers

A wide variety of barriers and enablers exist in using tools designed to assist patient flow. The tools identified in this study included a range of technology-based programs that are designed to aid in the management of patients. They include Patient Flow Manager, Trak-ED, iPatient Manager (iPM), Emergency Theatre Booking System (ETBS), ED Navigator, and Medtasker. The use of multiple software programs, and how information derived from these

programs contributed to losing oversight of patient movements. Participants articulated that software programs are only useful tools when the information they produce assists with the task to be achieved, which was not always the case. Participants then spoke about the use of paper-based lists, printed information and verbally received information as other tools for communicating about patient flow and managing the clinical and administrative loads. Many of the participants took a pragmatic approach to handling patient flow by using all methods available.

The processes that are involved with patient flow is using the systems that we have available to see, to visualise, where patients are and where they need to go. (Participant 1)

Some of the other barriers identified related to staff members not documenting the correct information into the system.

People often don't realise what sort of information they can get out of it. (Participant 3)

The wide range of patient management tools, often used inconsistently, led to fragmentation and invisibility and many participants spoke about staff members' lack of awareness of the capabilities of what was available. Participants spoke about the lack of knowledge, education and training for new and existing staff in the use of patient flow tools, and this was regarded as a major barrier in managing patient flow. Another barrier identified by many participants was accessibility, which related to the limited number of software licenses available to access the tools.

Parallel systems used by authorised person, are not available by all. (Participant 5)

Not having access to the software often led to frustration, shared by many of the participants. Participants spoke about enablers that could lead to better patient flow and this involved removing the restrictions so more staff members would have an overview of the patients' journey. A 'wish list' was mentioned, and for many participants, at the top of this was a single tool incorporating all information required to make the best decision possible, making the use of the multiple existing tools redundant. The need for a predictive tool was expressed by many participants and related to how many admissions the hospital can expect daily, based on historical data and statistics.

We are expecting 20 discharges. We've only got four that are confirmed. So, until they're confirmed, we can't do anything about anything. So, we've got four confirmed. We've had two that are gone. We've got all of these patients coming in. So, in your head, you're going, okay. Right. So, I can allocate those ones, but I can't allocate those, and all that might happen. (Participant 11)

Theme 4: Increasing Complexity

The global theme of increasing complexity relates to a range of activities and decisions that contribute to ineffective and inefficient patient management in the ED. This includes, among other factors, a high demand for the hospital system due to an increase in patients presenting to the ED and clinically inappropriate patient stays.

We had patients stay over 12 months in a hospital bed because they can't get National Disability Insurance Scheme funding, and there's nowhere for them to live. (Participant 12)

The other issue raised related to inappropriate allocations, whereby patients presenting with medical issues were allocated to surgical beds, potentially leading to the cancellation of elective surgical procedures.

They have got 20-something patients from Medicine in their beds today, so they can't operate on someone if there's no bed to put them in at the end of the day. (Participant 2)

At times patients were placed in beds not suitable for their medical condition, creating a need for them to be relocated to a more appropriate bed in a different clinical area. Participants reported that this often leads to frustration, as an optimal decision is not made.

It has been quite often we're put in a position that we don't get to make the ideal decision because those beds aren't available. (Participant 13)

Participants spoke about the nursing workforce becoming specialised and that nurses working in one specialty did not have the skillset to care for a patient who did not have a condition falling under that specialty. This issue contributed to patients not being able to be transferred from the ED to certain clinical areas. Patient complexity was identified as a contributing factor to patient flow issues. For example,

patients who required telemetry often waited longer to be transferred, as beds equipped with telemetry were scarce. High acuity patients could interfere with patient flow, as at times the most appropriate ward had many high acuity patients, creating barriers for staff to provide safe care. Patient preferences also played a role, as at times same-gender rooms were requested.

DISCUSSION

This study aimed to explore and understand the factors that influence patient flow management at a referring hospital in Tasmania, Australia. It has become clear that these factors are complex in nature, and that patient flow management appears to be a major problem contributing to poor patient and staff experience. As seen in this study and consistent with the observations of He et al., the complexities in inpatient bed management are caused by multiple factors such as "the uncertainty of patient arrivals, length of stay (LOS), limitations in staff and resources, lack of communication, cooperation, and transparency between different units and facilities, and timely information sharing" (p451) [9]. Patient flow as a complex phenomenon requires system-level change, requiring the full attention of executive healthcare managers in order to develop and execute plans addressing the issue in a holistic way However, a systems level change might not always be achievable and therefore initially focusing on tools supporting decision making could be a good first step in improving patient flow in a complex world.

In this study two themes, Managing Patient Flow and Tools as Enablers and Barriers, highlighted that current methods used to provide patients with the best journey possible are hindered by the wide variety of tools available and their inconsistent use. This can be seen as overprocessing and not adding value to the process [22]. An overarching tool (software) which incorporates all information required to aid patient flow decisions would hypothetically be useful. However, it may not be feasible to develop such a tool that is readily accepted by all user groups. An alternative may be to develop a predictive tool that could accurately forecast patient arrivals by the hour of the day, enabling planners to match staff to meet anticipated patients, reconfigure units, and redeploy staff [23]. The development of a predictive tool could lead to more sophisticated resource management, creating a more 'Lean' flow by reducing waste. Linking forecasts of arrivals with upstream (ambulance callouts) and downstream (e.g. LOS) analytics could also lead to more holistic decision-making.

The issue of staff not being qualified to care for certain patient cohorts, as found in this study, calls for strategies of flexibility in allocating experienced staff to areas in need. It is known that the provision of optimal care relies on integrative activities such as mobilisation of appropriate people and resources [29]. Enhancing human capital or the skills, experience, and knowledge gained by an employee to perform the job well can be key in the organisation's ability to allocate patients to appropriate beds [30]. An organisational unit dedicated to continuous learning, supported by a university should be part of the strategy within healthcare organisations, to meet training and education needs [30] and support health service improvement research and projects. The other strategy to consider is targeted education by rotating staff through different clinical areas, facilitating the transfer of clinical knowledge, as this knowledge grounded in the evidence is a priority characteristic for providing the best care possible [29].

In this study several waste activities were identified such as *overproduction*, *waiting,* and *transportation* [15] Overproduction evidenced by the number of physical examinations patients received can be seen as repeated work [31]. Streamlining admissions by reducing the number of patient assessments and by allocating the responsibility for admission to ED physicians could streamline the process of allocating beds and moving patients to ward areas. This strategy has been employed in other jurisdictions whereby patients were examined by a senior physician in a fast-track model, demonstrating positive effects on wait time and LOS [32]. The implementation of a standardized multi-disciplinary consultation or team-based care model, whereby senior doctors, junior doctors, and nurses working together can contribute to better patient flow [29]. Changing models of care has implications for clinical governance, and building frontline capacity, engagement, and developing communication plans with executive sponsorship are essential to ensure successful implementation [33]). Other strategies could involve the employment of nurse practitioners helping to fast-track patient examination. Well-designed ED models of care involving nurse practitioners can lead to improvements in flow and elimination of waste [34]. These strategies can decrease ED boarding time (the duration between ED admit decision and ED departure time) contributing to improvements in patient flow [35])

What has become clear, from an operational point of view, is how the daily bed allocation decisions were made. Allocating patients in the most appropriate bed surfaced strongly among the participants of this study as an important part of their role. It was evident that a number of patients were placed on clinically inappropriate wards, which may have affected patient experience, patient safety, and the quality of care [36]. Therefore, it is crucial that patients are allocated the most appropriate bed, and this might be through developing an event simulation model representing emergency and elective admissions into inpatient wards mimicking allocation decisions, providing the best way to allocate the available beds among hospital wards [37].

LIMITATIONS

The findings of this study are constrained by some limitations. The study cohort consisted of clinicians who were directly involved in patient flow, but no patients with lived experience were interviewed, which may have led to a limited range of perspectives. The interviews were conducted in one organisation within one Australian state and therefore the results may not be fully representative of those in other jurisdictions. However, further replication of the research approach may be useful to help inform patient flow issues for healthcare organisations in similar contexts.

CONCLUSIONS

This research has demonstrated that obtaining the perspectives of patient flow experts is vital in understanding the issues surrounding patient flow. It has become clear what these issues entail and that they relate to unknown demands, ineffective and inefficient communication, patients placed in beds not suitable for their medical condition, and sub-optimal decisions. Moreover, the inconsistent use of a wide range of patient management tools contributes to fragmentation and lack of visibility. It is important to understand the contextual differences to develop and implement suitable and sustainable solutions, which may be in the form of an overarching prediction and decision support tool and streamlined processes for patient assessment.

AUTHOR CONTRIBUTIONS:

For research articles with several authors, a short paragraph specifying their individual contributions must be provided. The following statements should be used "Conceptualization, PVD, MD MO, RT and JM;. methodology, PVD, MD, MO and RT; formal analysis, PVD, MD; investigation, PVD, MD and MO.; writing—original draft preparation, PVD, MD and SP.; writing—review and editing PVD, MD, SP, MO, RT and JM.; project administration, PVD, MD.; funding acquisition' PVD, MO, RT and JM All authors have read and agreed to the published version of the manuscript.

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CONFLICTS OF INTEREST:

The authors declare no conflict of interest.

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RESEARCH ARTICLE

IMPROVING ACCURACY OF DISCHARGE SUMMARY MEDICATION LISTS – A COMPREHENSIVE ELECTRONIC MEDICAL RECORD QUALITY IMPROVEMENT PROJECT

Winnie Tao[1], Hamish Rodda[2,3], Nick Monypenny[2], Paul Wembridge[1,4]*

1. Pharmacy Department, Eastern Health, 8 Arnold Street, Box Hill, Victoria, 3128, Australia
2. eHealth Department, Eastern Health, 8 Arnold Street, Box Hill, Victoria, 3128, Australia
3. Emergency Department, 8 Arnold Street, Box Hill, Victoria, 3128, Australia
4. Department of Quality, Planning and Innovation, Eastern Health, 5 Arnold Street, Box Hill, Victoria, 3128, Australia

Correspondence: pwembridge@swh.net.au

ABSTRACT

BACKGROUND:

Discharge summaries (DSs) are an important communication tool between hospital and community clinicians however errors in these documents are common. To improve the accuracy of DS information, our health network implemented a suite of quality improvement projects that promoted "More Efficient Documentation (of patient information) for Improved Care" (MEDIC).

OBJECTIVE:

The aim of this study was to determine if DSs post-implementation of the MEDIC program of work were associated with lower rates of medication errors.

DESIGN:

A retrospective pre- (March 2021) post- (March 2022) medical record audit was conducted at five public hospitals. Patients were included chronologically based on discharge date until the target sample size was reached (100 per group). For each patient, the DS medication list was compared to the pharmacy generated patient friendly medication list or interim medication administration chart and any discrepancies were considered errors. Utilisation of electronic Clinical Decision Support (CDS) was evaluated via review of the EMR.

MAIN OUTCOME MEASURE:

Medication errors.

RESULTS:

The mean number of DS medication errors was lower in the post-intervention group (3.0 vs 1.4, p<0.01). Fewer patients in the post-intervention group had one or more DS medication errors (59% vs 39%, p<0.01). Patients in the post-intervention group were less likely to have one or more high-risk medication errors (20% vs 10% p=0.048). There were 437 individual errors (pre=298, post=139). Omitted medications were less common in the post-intervention group (127 vs 11). Utilisation of EMR home medication CDS was higher in the post-intervention group (54% vs 69%, p=0.005). Pooled data from both groups showed completion of discharge medication reconciliation CDS was associated with a lower number of errors on DSs (mean: 3.7 vs 1.4, p<0.001, DS with one or more errors: 68% vs 39%, p<0.001).

CONCLUSION:
The MEDIC program of work was associated with improved DS medication list accuracy.

KEYWORD
medical errors, medication reconciliation, communication, patient discharge, electronic health records, decision support systems,

INTRODUCTION

Discharge summaries (DSs) are an important communication tool between hospital and community clinicians. [1] DSs usually contain a list of medications the patient is taking at the point of discharge however medication discrepancies or errors in these lists are common. [2-8] Errors on DSs have the potential to cause harm to patients. [9]

The Australian National Safety and Quality Health Service (NSQHS) Standards require the distribution of a current medication list with reasons for any changes to the receiving clinicians at transfer of care. [10] Our health service meets this requirement by including a list of medications in the medical DS, however, internal auditing has identified that errors are common. To improve the accuracy of DS information, our health network implemented a suite of quality improvement projects that promoted "More Efficient Documentation (of patient information) for Improved Care" (MEDIC).

The MEDIC program of work was designed to optimise the use of the Electronic Medical Record (EMR) and ensure compliance with the NSQHS Standards. [11] Interventions completed through the MEDIC program included:

- Tailoring EMR medical user interfaces and workflows to the needs of specific specialties. These interfaces provided more emphasis on the medication list and reconciliation status.
- Introduced the ability to save the progress of medication reconciliation to return to at a later point in time. Prior to the MEDIC program, clinicians would need to exit the medication reconciliation page to view other parts of the medical record (such as pathology or observations) which resulted in the need to restart the process from the beginning.
- Updated training materials, education, communication and individualised performance feedback (clinical unit) aimed at improving adoption of the full medication reconciliation lifecycle during an inpatient stay (home medication documentation, admission medication reconciliation and discharge reconciliation)
- Improvements to the outbound interfacing capabilities of the EMR for DSs and Adverse Drug Reaction (ADR)/allergies
- Transition to EMR generated Patient Friendly Medication Lists (PFML) and Interim Medication Administration Charts (IMAC)
- Workflow improvements to the ordering and administration of blood products

The MEDIC program of work was implemented in two stages across our health network between September 2021 and January 2022. Elements of the MEDIC program of work have been associated with increased provision of PFML/IMAC, decreased medication-related data entry requirements, decreased risk of transcription errors and improved compliance with the Australian National Guidelines for the On-Screen Display of Discharge Summaries. [1,12,13] To date, the effect of the MEDIC program of work on DS medication errors has yet to evaluated.

The aim of the current study was to determine if DSs post-implementation of the MEDIC program of work were associated with lower rates of medication errors.

METHODS

This pre- (March 2021) post- (March 2022) retrospective medical audit was conducted at five metropolitan public hospitals from the same healthcare network. This time period was chosen to allow sufficient time for staff familiarisation with the new processes and avoided periods of significant service disruption related to the COVID-19 pandemic. Specifically, there were no COVID-19 related "lockdowns" in metropolitan Melbourne and the overall number of cases remained low compared to other potential audit periods. [14] Four hospitals used EMR for charting inpatient medications, whilst the fifth (Hospital C)

used standardised paper medication charts. [15] All hospitals utilised EMR for discharge prescribing and DS generation.

Patients were reviewed chronologically based on discharge date until the target sample size was reached (100 per cohort). Sample size was selected to maximise the number of patients reviewed given available resources. Patients with a length of stay less than 24 hours, those without a PFML/IMAC or DS, ambulatory encounters (for example, Hospital in the Home) and emergency department presentations were excluded.

For each patient, the DS medication list was compared to the pharmacist generated PFML or IMAC, which was considered the "source of truth". Any discrepancies were considered errors. This method was adapted from that used in other studies evaluating DS medication list accuracy. [3,5-8] The study did not consider discrepancies involving time of administration (for example, 'take one tablet in the morning' written as 'take one tablet daily') as errors unless they related to "time-critical" medications as defined by the Society of Hospital Pharmacist of Australia.16 Combination medications documented in separate elements (for example, Caduet® 5/10mg documented as amlodipine 5mg and atorvastatin 10mg) and omission of medication intended for administration on the day of discharge only (for example, ferric carboxymaltose) were not considered errors.

Error types were classified using categories adapted from the Australian Commission on Safety and Quality in Health Care Medicine Incident Classification Tool. [17] A modified APINCH (A: Antimicrobials, P: Potassium and other electrolytes, I: Insulin, N: Narcotics and other sedatives, C: Chemotherapeutic agents, H: Heparin and other anticoagulants) classification which excluded antimicrobials was utilised to identify high-risk medications. [18] Polypharmacy was defined as five or more medications being taken on discharge (based on the PFML or IMAC).

Only medication related information on the DS medication list was reviewed. Medication related information elsewhere on the DS and details of ADRs were not reviewed.

Statistical significance was evaluated using chi-square test or two-tailed t-test with a p value of <0.05 considered significant. All data was recorded in a spread sheet with analysis being completed in R® or Microsoft Excel®.

The project was registered as a quality improvement activity with the health network human research and ethics committee.

RESULTS

A total of 200 patients were included in the analysis. There were significant differences in the LOS and number of medications between the groups (table 1). The rate of home medication documentation in EMR was higher in the post-intervention group (54% vs 69%, p=0.04). When compared to the pre-intervention group, the post-intervention group had fewer DS medication errors (mean: 3.0 vs 1.4, p<0.01). Patients in the post-intervention group were less likely to have one or more medication errors on their DS (59% vs 39% p<0.01).

Lower DS medication error rates were observed across all post-intervention clinical specialty subgroups with the exception of aged care although not all reached statistical significance (table 2). The post-intervention result for aged care was influenced by a single patient from Hospital E who had 32 DS medication errors. Exclusion of this patient resulted in a statistically non-significant reduction in mean DS medication errors in the aged care post-intervention subgroup (3.7 vs 1.0, p>0.05).

TABLE 1: PATIENT DEMOGRAPHICS AND CLINICAL CHARACTERISTICS

	Pre-Intervention (n=100)	Post-Intervention (n=100)	P Value
Age (mean years)	69 (21)	72 (17)	ns
Length of Stay (mean days, standard deviation (SD))	13 (14)	8 (7.3)	**<0.01**
Female (%)	48	50	ns
Discharge Medications (mean number, SD) [A]	10 (5.5)	12 (5.6)	**0.02**
Discharge High-Risk Medications (mean number, SD)[A]	0.93 (1.1)	0.94 (1.1)	ns

Site			
Hospital A (155 beds) (%)	17	16	
Hospital B (621 beds) (%)	31	55	
Hospital C (326 beds) (%) [B]	30	23	
Hospital D (158 beds) (%)	14	4	
Hospital E (64 beds) (%)	8	2	
Clinical specialty			
Aged Medicine (%)	27	11	
General Medicine (%)	23	39	
Mental Health (%)	11	7	
Specialty Medicine (%)	37	34	
Surgery (%)	2	9	
Utilisation of EMR CDS			
Home Medications (%)	54	69	**0.04**
Admission Medication Reconciliation (%)	7	10	ns
Discharge Medication Reconciliation (%)	66	66	ns

A: Based on the PFML/IMAC

B: Paper inpatient medication management

TABLE 2: DISCHARGE SUMMARY MEDICATION ERRORS (MEAN, SD)

	Pre-Intervention	Post-Intervention	Difference	p
All patients included in study	3.0 (4.4)	1.4 (3.7)	-1.6	**<0.01**
Inpatient Medication Management Process				
Electronic	3.4 (4.8)	1.5 (4.1)	-1.9	**0.01**
Paper	2.1 (3.2)	0.87 (1.7)	-1.2	ns
Site				
Hospital A	3.3 (6.0)	0.88 (2.0)	-2.4	ns
Hospital B	2.6 (3.2)	1.3 (2.3)	-1.3	**0.02**
Hospital C	2.1 (3.2)	0.87 (1.7)	-1.2	ns
Hospital D	4.5 (5.5)	0 (0)	-4.5	ns
Hospital E	4.3 (5.2)	18 (20)	+13.7	ns
Clinical specialty				
Aged Medicine	3.7 (5.5)	3.8 (9.6)	+0.1	ns
General Medicine	4.2 (5.6)	1.2 (2.5)	-3	**<0.01**
Mental Health	2.5 (2.9)	0.86 (2.3)	-1.6	ns
Specialty Medicine	1.6 (2.2)	0.88 (1.2)	-0.72	ns
Surgery	7.5 (0.71)	1.7 (2.6)	-5.8	**0.01**

There was a trend towards a lower rate of high-risk medication DS errors in the post-intervention group (mean: 0.28 vs 0.16, p>0.05). Patients in the post-intervention group were less likely to have one or more high-risk medication errors on their DS (20% vs 10% p=0.048).

The hospital which utilised paper inpatient medication management (Hospital C) had a lower rate of DS medications errors in both pre- and post- cohorts compared to pooled results of hospitals utilising electronic inpatient medication management (table 2).

When pooling results from pre- and post- intervention cohorts, utilisation of electronic discharge medication reconciliation CDS was associated with fewer DS medication errors (mean: 3.7 vs 1.4, p<0.01; DS with ≥1 medication errors: 68% vs 39% p<0.01).

A total of 437 individual errors were identified (pre: 298, post: 139) of which 42 (9.6%) involved high-risk medications. The most common medications implicated in DS errors were paracetamol, colecalciferol and macrogol (table 3). The majority (67%) of high-risk medication DS errors involved opioids or other sedatives with the most common individual medications being and oxycodone (n=11) and warfarin (n=4) (table 3). The most common errors were unintentionally omitted medication and documentation of a medication the patient was not taking prior to admission (table 4). There was a 92% decrease in the number of omitted medications in the post-intervention group (129 vs 11).

TABLE 3: MOST COMMON MEDICATIONS INVOLVED IN A DS MEDICATION ERRORS

Medications with ≥5 DS errors	Number	Percentage [A]
Paracetamol	26	5.9%
Colecalciferol	14	3.2%
Macrogol	13	3.0%
Docusate-Senna	11	2.5%
Oxycodone [B]	11	2.5%
Pantoprazole	11	2.5%
Aspirin	10	2.3%
Furosemide	10	2.3%
Pregabalin	10	2.3%
Magnesium	9	2.1%
Metoprolol	8	1.8%
Quetiapine	6	1.4%
High-Risk Medication Errors by Class	Number	Percentage [C]
Narcotics and other sedatives	28	67%
Heparin and other anticoagulants	8	19%
Insulin	5	12%
Potassium and other electrolytes	1	2.4%
Chemotherapeutic agents	0	0%

A: Denominator = all DS medication errors
B: Including combination products with naloxone
C: Denominator = high-risk DS medication errors

TABLE 4: NUMBER OF DS MEDICATION ERRORS BY ERROR CLASSIFICATION

Error classification	PRE-INTERVENTION (n=298)	POST-INTERVENTION (n=139)
Unintentionally omitted medication	129	11
Patient not taking documented medication	89	46
Duplication	34	53
Wrong dose, volume or concentration	29	17
Wrong strength	8	2
Wrong time	4	2
Incomplete or unclear documentation	4	1
Wrong rate or frequency	0	4
Wrong medication	1	1
Wrong duration	0	1
Wrong formulation	0	1

DISCUSSIONS

STATEMENT OF PRINCIPAL FINDINGS

This study has demonstrated that the MEDIC program of work was associated with a lower rate of DS medication errors. The greatest improvements in DS accuracy were observed in hospitals with inpatient electronic medication management, although the absolute DS error rate remained lower at the paper site (table 2). Furthermore, the intervention was associated with significantly higher rates of home medication documentation using the EMR, which is itself a requirement of the NSQHS Standards.[11]

The improvement observed in the post-intervention cohort of this study was driven largely by a reduction in unintentional omissions. This was likely due to the higher rates of home medication documentation in the EMR. Our EMR has built in CDS allowing the prescriber to pre-populate the discharge prescription and DS utilising information which has been documented on admission, such as the home medications.

The finding that DS medication errors are less common at sites with paper inpatient medication management may seem counter-intuitive however, one in three DSs included in this study were generated with incomplete use of the discharge medication reconciliation CDS. This CDS completion rate remained consistent in pre- and post-intervention cohorts and we theorise that this may be a possible reason for the higher overall DS medication error rates in sites using inpatient medication management. When utilising electronic inpatient medication management, inpatient orders will pre-populate the DS and when discharge medication reconciliation is not completed, this can result in duplications and unnecessary medications appearing on the DS. These types of errors were common in our study (table 4).

The case of a specialty medicine DS containing 32 errors which was described above highlights the risks associated with incomplete or inappropriate use of CDS. In this instance, none of the three stages of medication management CDS were completed resulting in a large number of duplicates and errors due to pre-populated medications from historic admissions at the health network.

In response to concerns with incomplete use of medication-related CDS, our health network has implemented a warning which is automatically added to the discharge summary when the full medication lifecycle, including discharge medication CDS has not been completed. Our EMR contains multiple reconciliation steps designed to transition medications between different contexts (historic discharge prescriptions, documented preadmission medications, current inpatient prescriptions and discharge prescriptions) minimising the need for manual data re-entry. The full medication lifecycle is considered incomplete until each reconciliation step has been completed. This warning appears with a red or orange background and details the missing reconciliation step(s). Furthermore, in instances where discharge CDS has not been started, filtering has been implemented so that only discharge prescriptions (not home and inpatient medications) pre-populate the DS.

Informal feedback from medical staff has been mostly positive and anecdotally, clinicians trust in the accuracy and validity of DSs has improved. This additional trust is likely due to the introduction of the processing logic that inserts a warning in the DS if the full medication lifecycle is incomplete which was described previously. The absence of the DS warning implies medication related information is more likely to be accurate and this assumption is supported by our finding that completion of discharge medication reconciliation was associated with a lower error rate.

STRENGTHS AND LIMITATIONS

Limitations of this study include a retrospective design, differing characteristics in pre- and post- cohorts (LOS and number of medications on discharge) and a small sample size. Retrospective audits are a common, practical method of evaluating DS medication errors and are used extensively in literature. [3, 5, 7, 8, 19] A previous study investigating DS medication errors in 515 hospital inpatients found no correlation between LOS and DS medication error rate.19 For this reason, the different LOS between cohorts was unlikely to influence the findings of our study. The post-intervention cohort in our study was taking more medicines. Despite polypharmacy being a known risk factor for DS medication errors, we still found a significantly lower DS medication error rate in the post-intervention cohort. [2, 8] When generalising the results of this study it must be noted that it was conducted at a single hospital network in metropolitan Melbourne utilising one type of EMR (Oracle Health - Cerner Millennium®). Further, to be included in our study, patients required a pharmacist generated PFML or IMAC. At our healthcare network, these tasks are prioritised towards complex patients and further research would be needed to determine if similar benefits would be observed

in less complex patient groups (89% were taking five or more medications on discharge, a known risk factor for DS medication errors). [2, 8, 20] For the same reason, our study likely overestimates the number of DS medication errors in the inpatient hospital population as a whole.

Although we did not assess the accuracy of the IMAC or PFML that was considered the "source of truth" for discharge medications, these are created through a collaborative process involving the pharmacist and physician. These collaborative processes have high levels of accuracy and have been used in previous research evaluating DS medication errors. [7, 8]

IMPLICATIONS FOR POLICY, PRACTICE AND RESEARCH

The EMR in use at our health network (Oracle Health - Cerner Millennium®) is in common use worldwide and given the widespread issue of DS medication errors, elements of the MEDIC program of work may be suitable for implementation at other health services.

Adoption of an EMR generated PFML/IMAC has enabled integration of these documents with My Health Record.21 My Health Record is a secure, consumer-controlled online service operated by the Australian Government that supports better patient and consumer outcomes through better access to information. [21] Our health network is now automatically uploading PFML/IMAC to the Pharmacist Share Medication List section of My Health Record for patients that have not withdrawn their consent. [22]

CONCLUSIONS

DS medication errors remain common and the EMR quality improvement activities (the MEDIC program of work) described in this study were associated with significantly lower DS medication error rates.

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RESEARCH ARTICLE

CARBON EMISSION REDUCTION ASSOCIATED WITH UTILISATION OF TELEHEALTH IN OUTPATIENT CLINICS IN AN AUSTRALIAN QUATERNARY HEALTH SERVICE

*Jessica Redmond, Timothy Fazio, Phoebe R Darlison, Barbara Ioppi, Monika Page, Katherine A Barraclough, Kudzai Kanhutu, Ben Dunne**

Royal Melbourne Hospital, VIC, Australia

Correspondence: ben.dunne@mh.org.au

ABSTRACT

OBJECTIVE:

To assess the impact of implementing telehealth in outpatient clinics on the carbon emissions associated with the delivery of health care.

DESIGN & SETTING:

Retrospective cohort study in large metropolitan quaternary referral health service from January 2021 - December 2022. Participants: All patients who attended an outpatient clinic appointment during the study period, either in-person, via telehealth or via telephone.

MAIN OUTCOME MEASURES:

The estimation of carbon emissions in tonnes (t) of CO2-equivalent (CO2-e) associated with in-person and telehealth appointments based on emissions associated with travel, telehealth platform usage and N95 mask usage.

RESULTS:

There were 571,121 outpatient clinic appointments during the study period. Of the appointments, 251,458 (44%) were conducted remotely, resulting in an estimated reduction in 3,629t of CO2-e emissions in the two-year period. Telehealth consultations in this time contributed 4.5t of CO2-equivalent emissions. The total emission usage of telehealth clinic was only 0.12% of emissions generated from face-to-face clinic appointments.

CONCLUSION:

Telehealth offers the opportunity of substantial carbon emissions reduction within the healthcare sector, while also providing cost and time-saving benefits for healthcare services and patients. Limitations include generalisation of transportation modes and the retrospective nature of the data collection.

KEYWORDS

telehealth, healthcare, carbon emissions, outpatient clinics

INTRODUCTION

According to the World Health Organisation, climate change is the most significant threat to global health [1] and addressing this challenge has also been described as the greatest global health opportunity [1-3]. Climate change impacts the environmental determinants of health; through extreme weather patterns, declining biodiversity, the spread of vector-borne disease, and reduced food and water security [1, 2, 4].

The Australian healthcare sector contributed 7% of Australia's total carbon dioxide emissions in 2014-15, producing 35,772 kilotonnes of carbon dioxide equivalent emissions (CO2-e) [5]. We are one of the most carbon-intense healthcare sectors in the world [6] and the bulk of these emissions arise from clinical care delivery rather than building energy use [7]. There are no direct data on the proportion of the Australian health system's carbon footprint that can be attributed to patient travel, however in the UK, patient travel makes up 5% of the of the National Health Service's carbon footprint [8]. Given the larger land mass of Australia compared with the UK, it is safe to estimate that patient travel contributes at least 5%, if not more, to our health system's carbon footprint.

There is an urgent need for the healthcare sector to take action to reduce its environmental impact. In response to this, prominent health bodies, the Australian Medical Association (AMA) and Doctors for the Environment Australia (DEA), have called on the Australian healthcare sector to reduce its carbon emissions to net zero by 2040, with an interim emission reduction target of 80% by 2030 [9]. Guidelines published by the World Health Organisation for healthcare organisations to improve environmental sustainability and climate resilience include recommendations for the use of new technology, including telehealth, to provide sustainable healthcare and reduce the environmental impact of the healthcare sector [10].

Almost one third of Australia's population live in regional or remote areas [11]. The tertiary and quaternary healthcare centres in metropolitan cities service a significant geographical area, including regional and remote communities. Attending appointments from regional or remote areas has significant environmental impact due to the carbon emissions associated with the long travel; and is often expensive. As a result, regional and rural communities experience health inequity and difficulties with accessing timely specialist healthcare [12-14]. Telehealth is a viable means to reduce barriers to accessing specialist care for regional and remote communities and negates the need for patient travel, with an associated reduction in carbon emissions [4].

With the advent of the global COVID-19 pandemic, there has been rapid growth in the use of telehealth as a key strategy to enable healthcare delivery while limiting face-to-face contact between healthcare providers and clients [12]. The existing literature suggests that for appropriately selected patients, telehealth as modality can lead to comparable clinical outcomes, high satisfaction and improved attendance [12-18].

The existing body of literature on the benefits of telehealth in reducing carbon emissions in the provision of healthcare is promising. However, most prior reports involve individual departments and clinics rather than whole organisations. In this retrospective cohort study, we explore the impact on carbon emissions of implementing telehealth across a large quaternary health care service in Melbourne, Australia.

METHODS

STUDY SITE

The Royal Melbourne Hospital is a major metropolitan, quaternary referral and teaching hospital, operating approximately 800 beds, and over 47 different specialist clinics. It is one of two major trauma referral centres in Victoria and one of Australia's leading public hospitals. Patients are referred to the Royal Melbourne Hospital from across southern New South Wales, Victoria, and Tasmania. The telehealth platform used by the health service is Healthdirect Video Call service.

During the period of study, individual clinics determined whether patients would be seen via telehealth, telephone or face-to-face.

STUDY POPULATION AND DATA COLLECTION

This study was approved as a quality assurance project by the Melbourne Health Ethics Committee (QA2022144). Data were extracted from the hospital's data warehouse using structured query language (SQL). This included administrative information such as date of appointment, appointment delivery modality (telehealth, telephone, face-to-face), clinic and speciality, patient's post code, and Australian Statistical Geography Standard (ASGS)

Remoteness Structure's Remoteness Areas according to postcode [19]. All outpatient clinic appointments at the Royal Melbourne Hospital from January 1st 2021 until December 31st 2022 were included. Appointments that were scheduled but the patient failed to attend (either in-person or remotely) were excluded.

ENVIRONMENTAL OUTCOME ANALYSIS

The distance between the patient's home and the Royal Melbourne Hospital site was calculated using geographic coordinates obtained from the patient's residential post code and the hospital.

Based on the Australian National Transport Commission 2021 data of vehicle emissions intensity for light vehicles, which accounted for 91% of cars sold in 2021, the average CO2 emission rate was determined to be 146.5g/km travelled [20]. The distance of a round trip between the patient's coordinates was utilised to calculate the CO2 equivalent emissions (CO2e) per visit if the patient had attended the appointment in person instead of via telehealth or telephone.

Previous studies have calculated the energy consumed in the use of telehealth platform patient and clinician electronic devices as well as backend cloud hosting infrastructure for a video call consult [17, 18, 21]. Based on the calculations and work from Blenkinsop et al [17] and Aslan et al [22], we calculated the total electricity usage (including the upload and download requirements for a 1080p HD video for the consultation) for two users was 3.67 gigabytes (GB) per consultation. The energy intensity was 6.7 GB x 0.015 kWh/GB = 0.05508kWh [22]. Utilising the Australian Government's National Greenhouse Account Factor of 0.68kg CO2-e/kWh [23], one 36-minute telehealth consultation was responsible for 37.25g CO2-e.

During the period of this study, which in part coincided with the COVID-19 pandemic, it was hospital policy for all patients, visitors and staff members to wear N95 masks in clinical areas including outpatient clinics. The range of published life cycle inventory (LCI) results in recent literature demonstrates a median representative value of 65g CO2-e for each single N95 respirator mask consumed [24-26]. One mask per visit was assumed in the calculation in case the clinician was conducting the telehealth clinic from within the healthcare service and thus wearing a mask. As a secondary assessment, the possible cost reduction from reduced mask usage associated with telehealth was also considered. Procurement services identified that the cost of 100,000 N95 masks was $149,000 or $1.49 per mask.

RESULTS

During the period of the study, 571,124 outpatient clinic consultations were attended, of which 319,666 (56%) were conducted face-to-face, 120,333 (21%) were conducted via telehealth, and 131,125 (23%) were conducted via telephone, as demonstrated in Figure 1. The majority of patients who attended an outpatient clinic (either face-to-face, via telehealth or via telephone) were from metropolitan areas and lived within 25km from the hospital, as outlined in Tables 1 and 2.

FIGURE 1: PERCENTAGE OF CLINIC CONSULTATIONS CONDUCTED FACE-TO-FACE, VIA TELEHEALTH OR VIA TELEPHONE DURING THE JANUARY 2021-DECEMBER 2022 PERIOD.

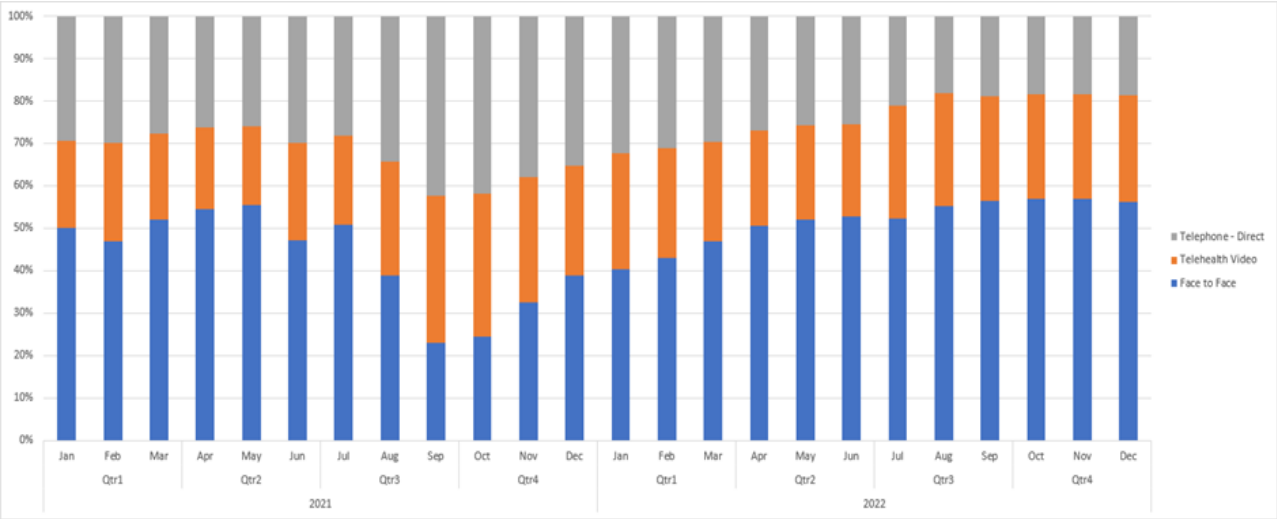

TABLE 1: PERCENTAGE OF ATTENDEES OF CLINIC CONSULTATIONS CONDUCTED FACE-TO-FACE, VIA TELEHEALTH OR VIA TELEPHONE DURING THE JANUARY 2021-DECEMBER 2022 PERIOD CLASSIFIED BY DISTANCE OF PATIENT'S ADDRESS TO THE HOSPITAL.

Distance of residential address from the Hospital (km)	Number of patients	Percentage (%)
0-25	411272	73.45
25-50	68660	12.26
50-100	27022	4.83
100-200	29230	5.22
>200	23780	4.25

TABLE 2: PERCENTAGE OF ATTENDEES OF CLINIC CONSULTATIONS CONDUCTED FACE-TO-FACE, VIA TELEHEALTH OR VIA TELEPHONE DURING THE JANUARY 2021-DECEMBER 2022 PERIOD CLASSIFIED BY PATIENT'S REMOTENESS AREA.

Remoteness Area (RA)	Number of patients	Percentage (%)
Major Cities of Australia (RA0)	484180	84.78
Inner Regional and Outer Regional Australia (RA1 and RA2)	75486	13.21
Remote and Very Remote Australia (RA3 and RA4)	298	0.05

SAVED EMISSIONS ASSOCIATED WITH AVOIDED TRAVEL TO CLINICS

The average return distance between patient homes and the hospital was 76.84km (1.67km-6,588.83km). The total travel distance averted through use of telehealth and telephone was 24,769,006km, which equates to 3,629 tonnes CO2-e saved.

CARBON EMISSIONS ASSOCIATED WITH TELEHEALTH CONSULTATION

The average length of a call on the telehealth platform was 36.6 minutes across 120,333 telehealth consultations, equating to 78,123 hours of telehealth consultations. This equates to 4,482,404g or 4.5 tonnes CO2-e.

Due to a lack of data of telephone consultation length, the CO2e of telephone consultations could not be calculated.

REDUCTION IN EMISSIONS RELATED TO N95 USAGE.

Given that 251,458 appointments occurred remotely, this avoided requirements for patient usage of N95 masks and thus reduced emissions associated with mask usage by 16.3 tonnes CO2-e. Additionally, the reduction in the usage of N95 masks during the period of the study led to a saving of at least $311,811 for the health service.

DISCUSSION

We have demonstrated that the utilisation of telehealth has significant net carbon emission savings. Based on our findings, we estimate the carbon emissions associated with telehealth clinics is 0.12% of the emissions of face-to-face clinics. The total travel distance averted through the use of telehealth and telephone is equivalent to 517 times the circumference of the equator.

Several previous studies have also demonstrated that the use of telehealth services leads to substantial carbon emission reductions associated with healthcare, largely due to avoidance of patient travel to and from outpatient appointments [4, 15-18]. However, these primarily involved individual departments or clinics rather than across an entire health service. Additionally, the majority of these studies were conducted in the UK, which has comparatively less geographical dispersion than Australia, where nearly one-third of the population live in remote or rural areas [11] and thus might face more significant challenges regarding travel-related carbon emissions.

The time frame of this study in a pandemic era allowed for a unique additional area of carbon emission reduction assessment in that the use of telehealth reduced usage of

N95 masks. The assumption of one mask per clinic visit likely under-represents the carbon emissions reduction from avoidance of mask usage as it doesn't account for the patient having a support person attending the clinic with them (our local patient survey data has shown that 25% of patients brought a support person with them to clinic in 2021/2022), nor clinicians working remotely not wearing masks. Even in early 2024, face-to-face clinic appointments at the Royal Melbourne Hospital still required patients and support persons (as well as clinicians) to wear a standard surgical mask, so this carbon saving remains relevant in the current early post-pandemic setting.

There are additional benefits that have occurred due to the utilisation of telehealth. Literature published by Dao et al [27] reviewed survey data captured in 2020 from patients in the same health service as this study who utilised the telehealth platform. The average patient living in a metropolitan area saved $76.60, and in regional areas $229.82 for attending their clinic appointment via telehealth instead of face-to-face; while the median total cost was AU$153.20 saved for each patient [27].

There are limitations of our study, namely the generalisation of the mode of transportation to calculate the emissions. Given the retrospective nature of the data collection, assumptions were made to facilitate the analysis, considering car only travel and average journey times under normal driving conditions. Factors such as road type, route taken, time of travel, weather conditions, specific vehicle types and means of transport (such as via car, train, taxi, plane, bicycle or walking) were not included in the analysis. Our carbon emission calculation is an estimation based on the average passenger vehicle emissions data in Australia. Additionally, telephone consultation length was not available for our patients, which prevented the calculation of associated CO2e, thus impacting the overall net emission estimation results as 20% of clinic consultations occurred via telephone. This is also seen in previous similar studies [4].

The timeframe of this study was intentionally extended beyond the period of COVID-19 related lockdowns and travel restrictions that occurred in 2020-2021 in Victoria, Australia. Whilst it is possibly a limitation of the study that it was conducted during a pandemic leading to an increase in the utilisation of telehealth, it is unlikely that we overestimated the opportunity for carbon emission reductions given there has been consistent demonstration that telehealth is a viable option for providing outpatient medical care in both primary and secondary care settings, especially in the management of chronic diseases [4].

CONCLUSION

Taking into consideration the significant impact of climate change on health outcomes at an individual and global level, as well as the significant contribution of the healthcare industry to carbon emissions, it is imperative for health services to take action to reduce carbon emissions. We have demonstrated that at an institutional level, the scale of emission reduction using telehealth for outpatient clinics is significant and should be considered a mainstay of clinical operation in a post-pandemic era in the appropriate clinical setting.

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RESEARCH ARTICLE

INVESTIGATING LEADERSHIP: REFLECTIONS ON THE METHODOLOGICAL CHOICES USED TO RESEARCH HOW ALLIED HEALTH CLINICIANS ARE ENABLED TO STEP INTO HEALTH SYSTEMS LEADERSHIP ROLES

Rebecca K. George[*1], *Karen Webster*[2], *Nicola M. Kayes*[3]

1. Canterbury District Health Board, Health Informatics New Zealand, Australasian Institute of Digital Health, New Zealand
2. Paramedicine Department, School of Clinical Sciences, Auckland University of Technology, Auckland, New Zealand
3. Centre for Person Centred Research, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand

Correspondence: Becky.george@hotmail.co.nz

ABSTRACT

This article examines the methodological choices made for a research study into Health Systems Leadership. Reflections on key learnings are provided as a way of offering insight for researchers navigating these decisions for the first time. Embarking on qualitative research to effect change is purposeful but challenging; choosing the most appropriate methodology and methods can often be confounding and stressful for new researchers. This article explores the decision to use Interpretive Descriptive methodology with an Appreciative Inquiry lens and makes visible decision junctures in the development of this research. Literature provides a wealth of expert guidance and excellent insights into research methodology and methods. However, very little expounds on the learnings of those who have gone before and what their insights and learnings may be. Research into allied health clinicians and their journey into health systems leadership roles provides an opportunity to reflect on an applied research journey.

KEYWORDS

Qualitative research, health, methodology, appreciative inquiry, interpretive description, leadership

INTRODUCTION

Good quality health research is needed to address a range of challenges within the health sector and perpetuate improvements in clinical practice, alongside effective policy change. Qualitative research has a long and rich history of researchers seeking to understand perspectives, experiences, and behaviour relevant to a particular phenomenon of interest. It allows in-depth analysis and interpretation, using theoretical foundations and methodologies to explain why the researcher claims what they claim [1]. However, the full value and significance of qualitative research as an evidence-based source for informing effective health system development waits to be fully realised.

Understanding the complexity, decision-making, and balance of organisational system tensions depends on the knowledge generated through small, in-depth qualitative studies and large-scale clinical trials [1]. Health and disability systems around the globe are inherently complex. Greenhalgh and Papoutsi [2] assert where complexity is

often discussed, it is also 'sub-optimally' studied. Greenhalgh and Papoutsi [2,p.1] recommend 'new standards of research quality, namely (for example) rich theorising, generative learning and pragmatic adaptation to changing contexts'. Using qualitative research is critical to illuminating and investigating contemporary health issues amidst the complexity [5].

Findings revealed by qualitative research can impact and influence how health and disability services are led and delivered, changing the course of investment and system design. Using qualitative research creates a space for subjective focus, embracing different methods of inquiry and epistemological frameworks. The diversity of choice compels the researcher to justify and clarify their philosophy and aligned practical approach. This leads to robust study design and findings founded on integrity [6]. The breadth of methodological choice, however, can elicit discomfort in the researcher when faced with an expansive range of options. Therefore, it is essential to support health researchers in their methodological decisions as they seek to understand systems and influence change.

This paper explicates key methodological decisions, and the outworking of those decisions, in a research study exploring how allied health clinicians are enabled to step into health system leadership roles. The research was prompted by the lack of diversity of clinicians within health systems leadership roles and, in particular, a paucity of allied health clinicians in those roles [3,4]. Research was needed to understand why there is a lack of diversity of clinicians in leadership roles to guide future allied health and health systems leadership development. The overarching objective of this research was to enable a greater diversity of clinicians to inform future health system design, development and delivery.

Giving visibility to the reasoning behind methodological selections and how they are applied supports emergent and developing researchers and optimises the contribution of qualitative health research to service and system design [7]. There is an absence of digestible work that provides detailed accounts of methodological decisions for the novice health researcher. This article seeks to narrow this gap. It will outline and explore the methodological decisions and challenges encountered during the use of specific methodology applied to a health research question. Given the focus of this paper is to reflect on the methodological choices made and learnings garnered from that, the 'methods' and 'results' sections do not follow usual conventions. Rather, the 'Methods' section focuses on introducing the methodological decisions and rationale. Whereas the 'Results' section includes a reflection on the outcomes of that methodological decision making and the outworking of those in the research process. These insights and experiences are candidly provided to help others feel less daunted by the qualitative research approach.

METHOD

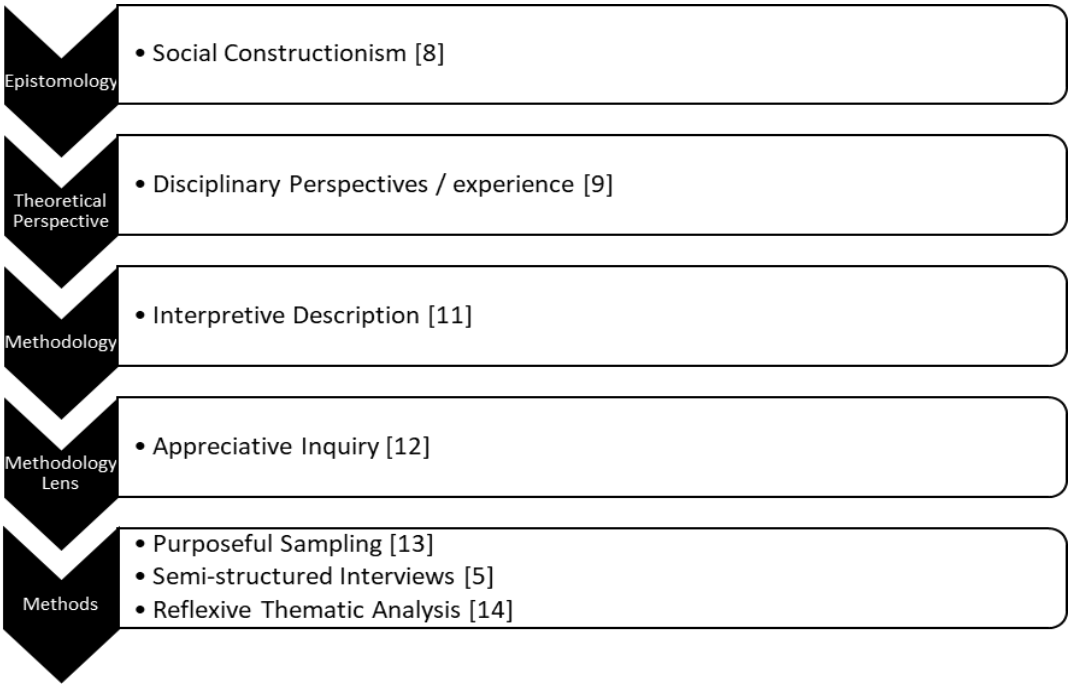
Ethical approval #21/353 for the associated doctoral research undertaken was granted by the Auckland University of Technology Ethics Committee in October 2021, and all participants gave informed written consent.

POSITIONING THE RESEARCH

How a research study is approached amidst the interplay of external influences will impact the researcher's thoughts and actions and influence their findings. Determining the positioning of a research study within its field and the researcher's own position within the research topic is essential. Crotty [8] suggests that researchers use four key elements when determining and describing their research approach: epistemology, theoretical perspective, methodology, and methods. He argues for congruence across these four elements to ensure coherence. While many novice researchers find determining these elements challenging, achieving coherence supports the theoretical logic, rigour and credibility of their research findings. The use of these four elements to inform the development of the methodological framework underpins this research study.

Figure 1 provides an overview of the four key elements relevant to the research study, and a further detailed discussion of each element follows.

FIGURE 1: STUDY DESIGN OVERVIEW, BASED ON THE WORK OF CROTTY [8]



WHY SOCIAL CONSTRUCTIONISM?

Social Constructionism contends that reality is constructed, and meaning is attributed to that reality. 'All reality, as meaningful reality, is socially constructed' and includes the likelihood that people can generate a collective meaning from 'interactive human community' [8]. Given the multiple and varied experiences of the allied health workforce progressing into leadership roles, social constructionism frames and facilitates the exploration of participants' social, interpersonal, and contextual constructs. Social Constructionism stems from the work of Karl Mannheim and the 'sociology of knowledge', which Crotty evolved to recognise that the individual's social reality is absolute and relative to them [8, 15].

A health systems leader experiences constant change, competing demands and dynamic social interactions that require flexible collaboration, consultation, and the management of diverse teams [16]. Their social reality is rapid decision-making, strategic planning, and interpersonal dynamics, which rely on their values, experience, and leadership skills. People step into leadership roles for different reasons, motivated by a variety of factors, both internal and external. Since there is no specific pathway in New Zealand Aotearoa for allied health clinicians to progress into leadership roles, they typically experience different realities. Given this, each participant's perspective provides rich insight and contributes to a broader view of the phenomenon of interest.

WHY INTERPRETIVE DESCRIPTIVE METHODOLOGY?

Interpretive Description is an approach to qualitative research that can address complex questions. Consistent with social constructionism, it assumes that 'realities are local in nature, socially and experientially based, and contingent in form and content on the persons who hold them' [16]. Rooted in the social sciences, Interpretive Description provides a way to conduct applied qualitative research that produces valuable insights into 'complex experiential phenomena', applicable and useful for health professionals [17]. Interpretive Description was designed to 'explore and understand how individuals and groups make meaning and act in real-world situations' to build knowledge that will inform clinical practice [9, 10]. While it originated in nursing, Interpretive Description has since been used to inform practice-based research in various other disciplines [18, 7].

Thorne [17] upheld the value of motivated health professionals asking pertinent clinical questions in methodological development. Interpretive Description methodology was developed to provide rigour and credibility for clinical research so that research findings could be applied to address real-world practice challenges. According to Thorne [20], using the researcher's perspectives and experience can enrich the discovery and understanding of the data. However, using

a single theoretical perspective can influence the interpretation of data and obscure insights likely to be gained. The interaction between participant and researcher will also provide an encounter with multiple realities [19]. Therefore, it is essential to employ reflexive practice to prevent these pre-existing perspectives from limiting analysis or influencing interpretation.

Bias typically exists in objectivism, where external influences are identified and their scope of influence over the research is controlled for. In contrast, in qualitative research, the subjectivity of the approach allows for influences to have an effect, and therefore this effect needs to be analysed as part of the methodology. When using Interpretive Description, bias does not exist as an external entity but as multiple factors that interplay as part of the subjective perspective, explained and interwoven into analysis and discussion. A researcher must retain humility to appreciate their impact and balance it appropriately with their curiosity about the topic [20].

Strategies to retain humility throughout a qualitative study are essential to developing the findings. Where there is value in discovering multiple realities, it is essential to explore those realities with a robust 'theoretical scaffold' [21]. According to Thorne, there are two key elements to theoretical scaffolding: the literature review [22] and understanding the researcher's position within the study, which Thorne refers to as 'theoretical baggage' [17]. The exploration of the researcher's theoretical baggage, in balance with the curiosity for the topic, will guide and shape the theoretical fore-structure of the research. Although it can be a challenging process, the practice of reflexive thinking to understand this theoretical baggage is very productive. It reveals insights that add depth and colour to the contextual nature of the research. It allows the researcher to expand their thought connections and better understand their practice. Most notably, reflexive practice provides the scope and space to explore a deeper understanding of the data and its interpretation. The theoretical baggage brought into this particular research study includes professional practice and relational and developmental experiences. This includes suppositions of bias towards and inequities for allied health clinicians' leadership development, recruitment into health system leadership roles and inclusion within strategic health system design. As Thorne argues, detailing these reflections enables the researcher to 'convey an integrity of purpose that will not be confused with misuse of methods or erroneous claims' [17]. Working within the same landscape as the participants, the theoretical forestructure supports and provides rigour to explore a complex phenomenon while acknowledging the experience and learnings brought into the study.

Interpretive Description is consistent with the intent and purpose of this research, which seeks to provide applicable findings based on new knowledge about the experiences of allied health clinicians stepping into leadership roles. Interpretive Description aligns with a constructivist and naturalistic orientation to inquiry, affirming the qualitative approach, the engagement with a specific population, and investigating meaning as applied to a particular phenomenon [7, 9]. As such, the research findings need to be tangible, applicable, and able to be used to help change the current approach to health leadership development. To uncover applicable findings and inform the leadership development of allied health clinicians, the study sought to explore experiences, events and memories allied health leaders attribute meaning to as being formative to their progress into leadership roles.

WHY AN APPRECIATIVE INQUIRY LENS?

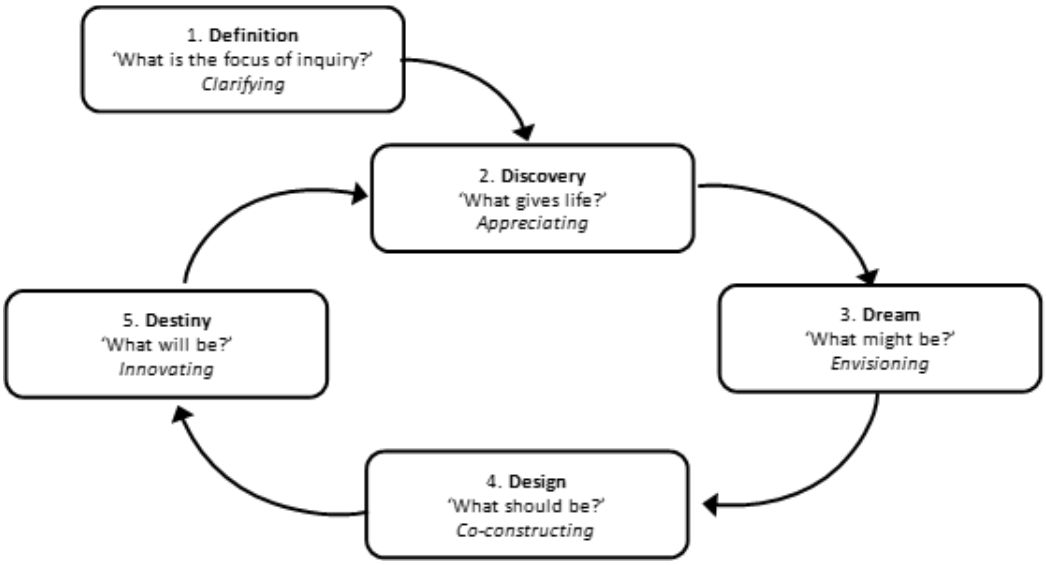
Appreciative Inquiry provides the opportunity to apply a positive lens and assumes that the system in focus has 'rich and untapped' descriptions of its strengths, possibilities and successes [12, 23]. Tapping into these descriptions can facilitate positive growth for both individuals and organisations. Cooperrider and Whitney (12, p. 9) assert that when the means and ends of a change inquiry are positively correlated, the outcome is more robust and sustainable. Drawing on an Appreciative Inquiry lens in the study design of this research underpins the intent to elicit positively constructive findings.

Appreciative Inquiry is identified as a social constructionist approach to change, supporting inclusion, magnifying the voices of recognised experts, and engaging with a whole system perspective [24]. This approach aligned closely with the experience intended for participants, empowering them through their valued perceptions and shared experiences. Therefore, the Interpretive Description methodology was chosen to support and underpin the study rigour for clinically applicable research and an Appreciative Inquiry lens to shape the methods.

Appreciative Inquiry methodology draws on the 5-D cycle (Figure 2). Using an Appreciative Inquiry lens facilitated the application of the general tenets of these 5-D stages within the interviews. Beginning with 'define,' participants were

invited to articulate an understanding of the topic and identify their positioning. The remaining stages helped to frame subsequent questions.

FIGURE 2: THE 5-D CYCLE OF APPRECIATIVE INQUIRY



Reproduced from The David L. Cooperrider Center for Appreciative Inquiry [25]

Using a problem-solving approach to answer questions focusing on the potential for change is more common. However, this approach can focus heavily and unhelpfully on the problem, a deficit approach to finding solutions [26]. Unfortunately, the societal culture in which health and disability exist nurtures this focus, and the health and disability system regularly endures critique and unfavourable commentary from various stakeholders [27, 9]. This commentary impacts the health workforce but is not the only negative cultural influence.

Considering the contextual positioning of many allied health professions, a deficit-focused approach to interviewing can undermine the aim to effect positive change. To question the participants on barriers may result in a negative focus on the problems, and deficit-focused discussion is known to have demoralising effects [29]. The aim was to empower participants during the interview and focus on enablers. Therefore, it was important to lean on the principles of Appreciative Inquiry as a strength-based approach to guide and give positive focus to the conversational framework.

The five Principles of Appreciative Inquiry also informed the theoretical rigour and evidence base for pursuing the positive experiences identified within the participants' narratives. Table 1 provides an overview of the five principles.

TABLE 1: THE FIVE PRINCIPLES OF APPRECIATIVE INQUIRY [12]

	Constructionist	We are constantly involved in understanding and making sense of people and the world around us.	The experience and perspectives of allied health clinicians are all valid and hold value in making sense of the leadership journey.
	Simultaneity	Inquiry and change are simultaneous.	The sharing of insights promotes awareness and understanding of positive outcomes.
	Poetic	Pasts, presents, and futures are endless sources of learning, inspiration and interpretation.	The diversity and rich breadth of experiences shared will be empowering and informative.
	Anticipatory	Our positive images of the future lead to positive actions.	Future casting questions will encourage positive ideas and promote change.
	Positive	Building and sustaining momentum for change requires large amounts of positive affect.	Validating the allied health practitioners provides positive affirmation, and disseminating the research findings creates momentum.

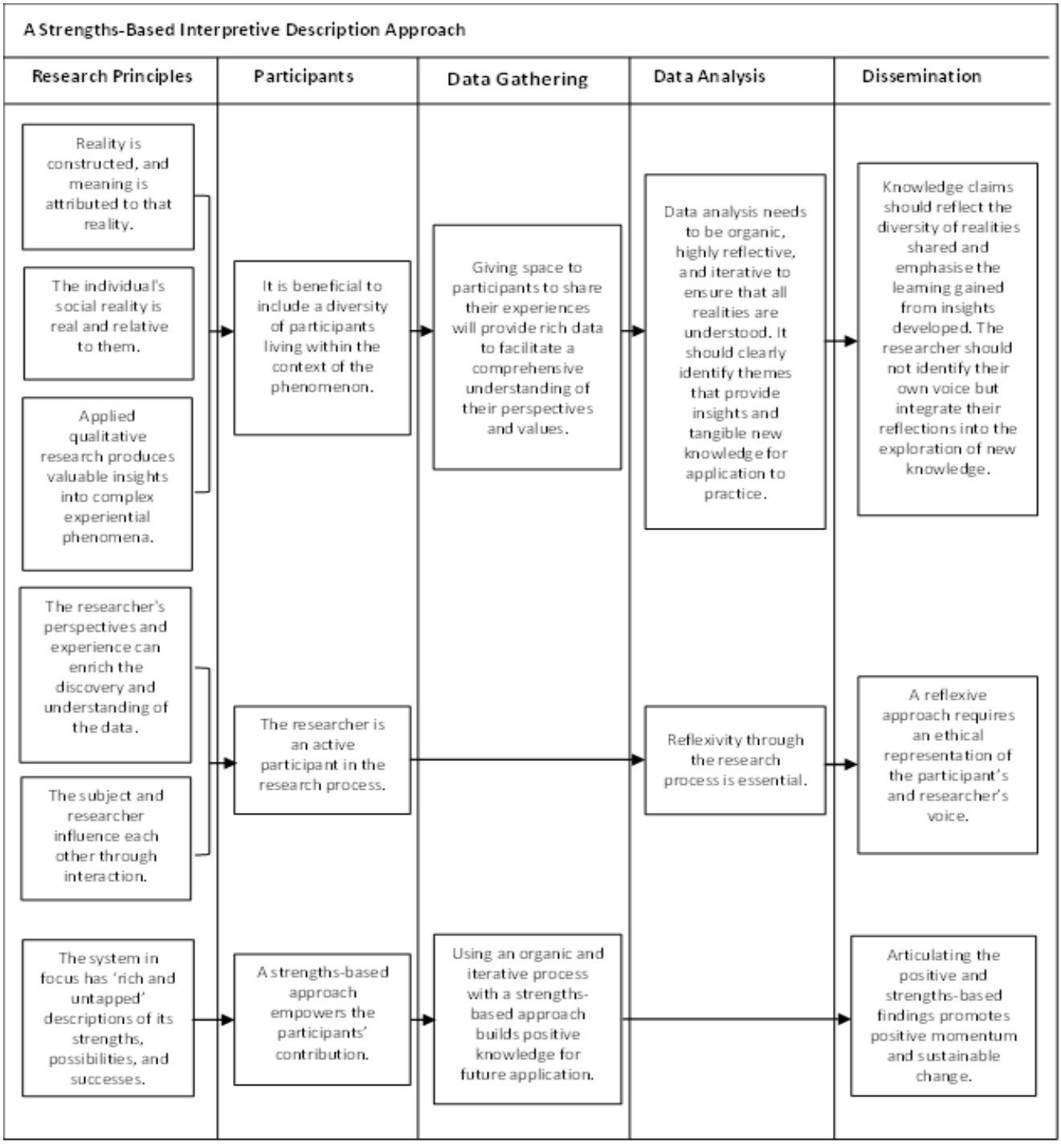
Each of these principles contributed to establishing the authenticity of the study findings and their subsequent interpretation. Williams and Haizlip (2013) endorsed using Appreciative Inquiry for positive culture change, an aim consistent with this research's goals: to elicit findings for application across the health and disability system and create positive change. Appreciative Inquiry allows for an organic and iterative process using a strengths-based approach to build positive knowledge for future applications [30]. In a societal context where the health and disability system faces a persistent deficit focus, creating change using an alternate lens provided a new and refreshed perspective from which participants could contribute.

Results

A SYNTHESIS OF THE METHODOLOGY

Understanding how the theoretical aspects align and enable the practical logistics of the study to sequence logically is essential. Figure 3 demonstrates the coherent alignment and helps to articulate and identify how the methodology supports and underpins each practical step of the study. Figure 1: **DUMMY TEXT**

FIGURE 3: SYNTHESIS OF METHODOLOGY AND STUDY PROCESS



Demonstrating theoretical and methodological coherence adds credibility and articulates the reasoning and evidence employed. Sharing this overview supports and guides emergent researchers to appreciate the 'big picture' perspective and avoid getting overwhelmed.

CHOOSING THE METHODS

THE IMPORTANCE OF CONTEXT

This research process commenced during the early stages of the COVID-19 global pandemic. Therefore, as well as being informed by the epistemological and methodological influences described above, the decision-making for methods was guided by the social context in which this research was undertaken. Key characteristics of this context included: a) potential participants were busy responding to the demand of health care needs within a pandemic situation; and b) the New Zealand Government had introduced restrictions on the movement of, contact with and interaction between people due to the rise in COVID-19 case numbers. In alignment with these conditions, in-person interviews were unable to be conducted. Therefore, in response, the methods required needed to be flexible to work around participants' schedules, minimise their burden, enable allied health leaders to take part in the context of other competing demands, and be managed remotely to mitigate the impact of government restrictions. For these reasons, participant interviews were conducted remotely using the institute's Microsoft Teams programme, which provided recording functionality and delivered the additional benefit of the institute's information security and protection protocols.

PARTICIPANT RECRUITMENT

Purposive sampling was used to recruit a suitable pool of Allied Health clinicians, chosen to provide rich detail relevant to the research objectives [13]. This sampling method provided the opportunity to engage with specific participants living the experience under focus. It ensured that the data was relevant and contemporary to the applicable contexts for new knowledge. As such, purposive sampling is congruent with Social Constructionism and Interpretive Description; it focuses on potential participants within the environment and context that the research applies to and creates the opportunity to explore meanings provided by the sample specifically identified.

Eligibility criteria ensured that the appropriate participants could share current and contemporary experiences. Allied health clinicians were eligible to take part if they:

1. Identified with one of the Allied Health professions listed by the Ministry of Health [31].
2. Worked in a position of authority that aligned with the Edmonstone definition of 'health systems leadership': 'Leadership within and across organisational and geopolitical boundaries, beyond individual professional disciplines, involving a range of organisational and stakeholder cultures, often without direct managerial control of resources and working on issues of mutual concern that cannot be addressed by any one person or agency.' [32]

People were excluded if they were concurrently accredited with a medical or nursing professional qualification. This exclusion criterion was critical to understanding the perception of participants who only had the experience of the 'allied health' collective and did not have insights blurred by the experience of other professional training and practice.

Initially, expert sources were identified from their public profile using available information to characterise them as health systems leaders with an allied health background. These expert sources were approached to participate and also asked to nominate and facilitate introductions to eligible Allied Health clinicians, drawing on their knowledge of eligible potential participants from across New Zealand's health and disability system. A number of strategies were used to mitigate the risk of coercion as part of the recruitment process due to the likelihood that they would be known to the researcher. Additional recruitment methods included advertising through established forums such as the National Allied Health, Scientific and Technical Directors Forum and Ngā Pou Mana, the New Zealand Māori Allied Health forum [33]. Access to publicly available information was also valuable and enabled through online search engines such as Google and LinkedIn. Finally, snowballing was used to identify additional eligible allied health clinicians to optimise sample diversity and address sampling gaps where alternate methods did not work sufficiently to identify eligible participants. Snowballing involved asking known allied health connections to forward the research information to a colleague they considered would be an eligible candidate. This multi-pronged approach to recruitment was necessary because allied

health systems leaders can be hard to find [33]. An Allied Health clinician in a health systems leadership role can typically take on a role and title that does not readily identify their professional or clinical background. Therefore, recruitment strategies aimed to capitalise on the collective allied health community network knowledge and broad connections to identify potential participants.

Decisions about sample size and when to stop data collection in qualitative research are subjective. While it was anticipated that a sample size of n=15-20 would be sufficient, the final sample size was n=19. All participants provided informed written consent, completing an electronic consent form. Interpretive judgment was applied to decide when to stop data collection based on the need to consider time, resources available, volume, and richness of data accrued. Thompson Burdine et al. (2021) affirm that where a relatively small sample size is available, it can provide sufficient in-depth data to achieve information power and answer the research question [35]. Another key factor contributing to decisions regarding sample sufficiency was the extent to which there was diversity in key characteristics, such as ethnicity, gender, and profession. In particular, given this research was undertaken in New Zealand, it was important to ensure that the research was purposefully inclusive and actively sought Māori (the indigenous population) participation. This inclusive approach reflected the commitment to Te Tiriti ō Waitangi obligations [36, 37]. These bi-cultural obligations are upheld through the researcher's professional code of conduct, by their employer and by the academic institution. Recognising the Western perspective brought into the research study as a non-Māori, it was essential to explore any culturally specific 'enablers' experienced by allied health clinicians.

DATA GATHERING

Qualitative interviews are an effective tool and can elicit rich data from those who have experienced the phenomenon of interest [5]. Individual interviews, rather than group interviews, were completed with each allied health clinician for two reasons. First, to give space to their unique experiences and depth of insight, consistent with social constructionism and Interpretive Description. Second, to enable flexible scheduling due to their increased workloads, responding to health service demand, and shifting priorities in response to case numbers and movement restrictions. Evidence demonstrates that applying an Appreciative Inquiry lens during one-to-one interviews has successfully elicited 'detailed and often intimate information from busy heads' [38].

Using interviews for the accrual of a richly layered data pool, they facilitated an immersive opportunity to explore and develop an intimate understanding of the phenomena and emergent themes. Advice and guidance were sought from the Mātauranga Māori Committee, an advisory forum at the researcher's academic institution, to review design and research plans and ensure cultural alignment and safety. It was agreed that a Māori advisory group to guide, support and ensure bi-cultural interpretation of the findings would also support transferability across the health and disability workforce. The importance given to this bi-cultural application is aligned in the interim to the Whakamaua: Māori Health Action Plan [39] while Te Aka Whai Ora (Māori Health Authority) develops the Hauora Māori Strategy [40]. The plan includes 'Māori leadership' as one of its priorities in achieving Pae ora (healthy families). It seeks 'to increase and support Māori participation in governance, leadership and management decision making at all levels of the health and disability system' [39].

The Individual interviews were used to obtain rich, layered and detailed experiences and support the transferability of findings by allowing others to identify with those experiences and relate the findings to other settings [41]. Online interaction was a necessary method and could have affected the engagement and connection between the interviewer and interviewee. However, many participants had become accustomed to communicating online due to the social conditions, and despite some initial hesitation, participants willingly shared their experiences.

The Appreciative Inquiry lens facilitated a strengths-based perspective and a positive style of questioning. Table 2 lists the questions used during the interviews to collect data. These questions evolved during the data collection phase to capture the information required and extract positive and empowering thoughts and perspectives.

TABLE 2: INTERVIEW QUESTIONS

	Question	Phase of Appreciative Inquiry
1	a. What does Health Systems Leadership in NZ mean to you? b. What makes a good health systems leader?	Definition
2	Tell me about the experiences or events that inspired you to consider leadership.	Discovery
3	Can you describe an event or experience that encouraged you in your leadership journey?	Discovery
4	What factors supported you in achieving your leadership role/s?	Discovery
5	Tell me about when you overcame a challenge or limitation stepping into leadership.	Discovery
6	a. What possibilities do you see for future allied health clinicians leading health systems? b. Are there any roles or conceptual roles you would suggest?	Dream
7	a. What would it look like if you could design a system that was inherently enabling AH clinicians? b. Where/when would this enabling process start?	Design
8	What advice would you give to a colleague on a leadership journey?	Destiny / Delivery

APPROACHING ANALYSIS WITH ATTITUDE

Choosing to use thematic analysis as the preferred approach, in conjunction with a strengths-based perspective, helped define the whole study design. Deciding which thematic analysis method required consideration of the study aim, context, and personal strengths. There was expectation that the participant's stories and experiences would overlap and intermingle, building upon each other to construct themes. Therefore, it was intended that the methods would weave together an analytic framework from which the findings would be produced.

To reflect the perspective of data interweaving with each other, the iterative method of Reflexive Thematic Analysis (Reflexive TA) was deemed the most appropriate [14]. This choice linked the interview method, interview questions and method of analysis in congruence to support and underpin the development of themes [5]. Clarke and Braun (2018) assert that 'reflexive' TA is just one of several TA approaches. It embraces qualitative research values, providing an open and organic process for 'iterative thematic development' [14]. It enables the researcher to have an immersive experience with the data, identifying repeated patterns of meaning [43]. Exploring those patterns, interpreting their meaning and identifying emergent themes provide space and scope to produce robust outcomes for developing guidance and recommendations for policy development. Making it appropriate for use with Interpretive Description [9].

Reflexive TA draws on six analysis phases to uphold the rigour required for credibility;

- Familiarising yourself with the data,
- Generating initial codes,
- Searching for themes,
- Reviewing themes,
- Defining and naming themes
- Producing the report [43].

However, reflexive TA is not a linear process where the researcher moves sequentially from one phase to the next; instead, it requires shifting back and forth throughout the analysis phases to elicit the required refinement [43].

Following the interviews, all the audio recordings were transcribed professionally, reviewed for accuracy and read as part of familiarisation. Tools such as visual mapping and reflexive journaling were used to support data immersion, clarify emerging insights, and continually identify

theoretical baggage. The immersion process was valuable; it allowed for the exploration of coding across the whole data set, consider emergent themes, and use an iterative approach to categorising and grouping the codes differently [44].

While developing codes and analysing the data, the lens of Appreciative Inquiry was applied to sustain a strength-based perspective for balanced interpretation. The software programme NVivo 14 was used to support the analytical process and provide organisational clarity for the codes. Positive language was applied when coding, such as 'being equipped' and 'self-investment', and the aligned references were contextual and meaningful. This does not mean information shared about barriers or disabling factors was ignored or marginalised. The strengths-based approach emphasised negative examples or experiences because they were contextually different from the interviews' positive focus. As such, the analysis provided rich and detailed information on the full spectrum of participants' social, emotional and interactive experiences.

ACKNOWLEDGING ASSUMPTIONS

Researcher reflexivity was a key strategy used to identify any assumptions about the participants, their context and the research approach. For example, it was assumed that health systems leaders would have experienced an active transitional process when stepping into leadership roles. It was assumed recruitment would be hard because potential participants may not include their professional background as part of their publicly available information. It was also assumed that pre-existing connections might exist between the researcher and participants. The potential for positional power to influence the participants was recognised and strategically mitigated. Employing reflexive practice with techniques such as journaling helped clarify assumptions, evaluate the research process and design the study accordingly. Employing a reflexive journey is as important as the outcome.

ESTABLISHING RIGOUR

To attain rigour in qualitative research, there is a need to achieve and maintain consistency in the approach, analysis, and reporting of outcomes [45, 46, 47]. Establishing rigour in qualitative research is often challenging, and Thorne [21] recommends using evaluation criteria to underpin the research and demonstrate transparency in the process.

Thorne [21] identifies four criteria. The first, 'Epistemological Integrity', refers to evidence of congruity between epistemology, theoretical perspective, methodology and methods. Figure 3 (see above) makes explicit the methodological alignment. Second, 'Representative Credibility' was established through the sampling process and how individual interviews enabled rich and in-depth data collection. The third is the use of 'Analytic Logic' to detail and demonstrate a coherent progression of analysis from data collection to outcomes. Evidence of audit trails, graphics, and records of progressive thematic development to illustrate this researcher's refinement logic. The final criterion is 'Interpretive Authority', which ensures that the researcher takes responsibility for the significance of data immersion. Techniques to facilitate this included, reading, familiarisation doodling (representative pictures and text of the researcher's thinking), NVivo analysis software, audio playback, visual mapping and reflexive journaling. These techniques integrated the critical questions of, 'What is happening here? [and] Why am I seeing this?' as part of the analytic process [21].

In addition, Thorne [10] urges the researcher to consider a further set of criteria for critiquing qualitative research as part of their accountability and quality assurance. These five criteria include moral defensibility, disciplinary relevance, pragmatic obligation, contextual awareness and probable truth. These criteria underpin the pragmatic approach of Interpretive Description, and each strategy identified achieved the rigour required and endorsed the transferability of findings into practice.

DISCUSSION

As health systems continue to evolve, appropriate research tools are required to provide research rigour to study the adaptive health landscape [48]. This article has detailed insights into the approach taken at key decision junctures of the research journey. In addition to the above, several key learnings emerged; they include the use and application of Appreciative Inquiry, the approach to engaging with Māori values and principles, creating the right interview environment, the study's impact on organisational change and how to approach the power differential between researcher and participants.

Appreciative Inquiry allows for discussing numerous factors, dependencies and influences without constraint. Healthcare researchers have used it as a powerful tool to study and facilitate change [49]. The lens of Appreciative

Inquiry was chosen as a proven perspective through which to engage credibly with participants amidst their complex and ever-changing context. Using the 5-D Cycle (Figure 2) provided a framework to lead the participants through sharing their experiences. Asking for contextual insights at the start (Define) critically helped with providing immediate feedback to inform the interview's progress.

Engaging in a culturally appropriate and inclusive research design is critical. In New Zealand, whether a study is explicitly engaging with Kaupapa Māori research [50] or undertaking research involving Māori, the design and methodology should be culturally responsive to support Māori engagement in the research and to optimise the likelihood that the research findings can contribute to Māori aspirations. This researcher's associated academic institution offered access to the Mātauranga Māori Committee. With their support, additional evidence was identified supporting the use of Appreciative Inquiry by Te Tangata Whenua Community and Voluntary Sector Research Centre [51]. The Research Centre endorses Appreciative Inquiry as 'compatible to Kaupapa Māori approaches' and aligned with the research principles within their Code of Practice [52]. Using Māori advisory forums was essential for supporting and underpinning the methodology with rigour and epistemological integrity [17]. Maintaining momentum and energy during data collection helps to facilitate participants' contribution and engagement. Finding a methodology that enabled momentum and energy during the interviews was essential to create an unrestrictive context for data collection. Using an alternate pathway to discussing phenomena challenged the well-known default problem-solving approach for creating change. When a group or individual uses deficit-based discussion, it can bring a negative emotional response that limits vision and creativity of thought. When an individual or group wants to create change, an Appreciative Inquiry approach can elevate their morale, commitment and ongoing discovery of innovative ideas [53]. Appreciative Inquiry was chosen because it helped to frame the interview questions and support the development of a positive tone of engagement for obtaining the data required.

It was evident that despite a strength-based approach to questioning, the participants' experiences were not all positive. Avoiding a discussion of barriers might create a misperception that barriers do not exist, and assumptions could have been made that the allied health collective workforce is successfully enabled and empowered into health systems leadership roles. Ignoring or restricting the exploration of barriers could have impacted the data extracted, the themes generated and the study's final findings. During the interviews, participants did share experiences that had been challenging and hard for them, often identifying them as limiting factors. These experiences were used to inform the findings and identify limitations that further the understanding of what positively enables allied health clinicians.

This study did not anticipate being able to effect organisational change across each participant's employing agencies [53]. Health and disability systems are complex, multifaceted and constantly changing. Notwithstanding the diversity of research participants, who came from public and private health agencies, ministry, and national and regional leadership situations, the study sought to understand the experiences of a group of individuals whose insights would give rise to common themes or patterns in meaning. These themes, once interpreted and discussed, could be applied across the broad health and disability system to impact those types of individuals who align themselves with the participants.

This research is ongoing at a time when the most extensive national health system reforms New Zealand has experienced in twenty years are underway [54]. As operational clarity emerges, it is an excellent time to explore and share new evidence for the development of future health system leaders. The potential for positive change within the leadership context remains; it will continue beyond the life of this research and is part of a much broader health system agenda [55].

Participation in this research was limited to a small group of eligible people, excluding a large proportion of the broader system's employees. The limitations on the scope of this study potentially reduced the impact for change. Broad socialisation could increase visibility and influence positive change. This socialisation could support uptake and engagement with the findings, enabling individuals to find alignment and influence emergent and developing allied health clinicians.

The influence of a possible power differential between researcher and participant required practical consideration. The Community and Voluntary Sector Research Centre [56] also identified this as a potential issue for individuals participating in Appreciative Inquiry. Differences in perception of power may occur between the concurrent involvement of leaders and staff in group

situations or because of who the employing organisations are for the researcher and participant. While this study did not use groups of participants, the power balance issue between researcher and participant required sensitivity. It was essential to be transparent about employment details, university support and positioning alignment within the information provided to participants. All interviews were conducted outside of the time of paid employment, all communications went through a non-work-related email address, and the demeanour and dress code did not reflect a typical work context. It was apparent that the practical and administrative aspects mattered, along with how this sensitivity influenced the approach and mindset going into the interviews. Overt recognition was given to the value and importance of asking participants to share their treasured experiences. They were handled as precious taonga (sacred), as a gift of memories, received with care and honour.

CONCLUSION

This article has examined the choice to use combined methodologies to deliver new and credible knowledge to guide future allied health and health systems leadership development. Completing an applied health research study with the intention to effect change requires robust methodology and rigour. Sharing these learnings and insights with the research community and identifying how and why those choices were made has the potential to inform how research can be approached, now and into the future. Reflecting on the congruency of a methodological approach and how an additional methodological lens positively influenced the study design identifies opportunities for consideration. Using Interpretive Description with an Appreciative Inquiry lens has demonstrated an effective pathway to engage with research and deliver findings intended to affect positive change across the health system. These shared learnings provide further understanding of an applied qualitative health research process.

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RESEARCH ARTICLE

THE IMPACT OF JOB CRAFTING DIMENSIONS ON WORK ENGAGEMENT AMONG NURSES: THE MEDIATING ROLE OF PSYCHOLOGICAL CAPITAL

Mohammed Yousef Alkhraishi, Mehmet Yesiltas*

Faculty of Economics and Administrative Sciences, Business Administration Department, Cyprus International University, Nicosia, Cyprus

Correspondence: mohammedalkhraishi@yahoo.com

ABSTRACT

Work significantly influences individual well-being and human growth. Jobs are not solely formulated by companies based on their needs but are also actively modified by the individuals who hold those positions. High-stress professions, such as nursing, highlight how stress levels are influenced by factors like resource availability, patient demands, colleague interactions, and workplace cultural dynamics. Hence, this study investigates the effect of job crafting dimensions on work engagement and examines psychological capital's mediating role in this relationship. It aims to reveal how job crafting can improve both personal and organizational well-being.

This study is a descriptive cross-sectional study. The study was conducted with 348 nurses at Al Dhafra Hospitals in Abu Dhabi, UAE. The analysis utilized in this study was conducted using Structural Equation Modeling (SEM) through SmartPLS 4 and SPSS version 27 for descriptive and correlation analysis.

The findings demonstrate that the impacts of job crafting dimensions—task crafting, cognitive crafting, and relational crafting—on work engagement and psychological capital are statistically significant. Additionally, the influence of psychological capital on work engagement is statistically significant. Path analysis revealed that psychological capital mediates the interaction between job crafting dimensions and work engagement. These relationships were shown to be statistically significant.

This study reinforces the significance of psychological capital and job crafting dimensions as crucial attributes in the workplace. Hence, it advocates for the healthcare industry to consider the implementation of targeted programs aimed at fostering these attributes within nursing teams. Such strategic initiatives are poised to improve individual well-being among nurses, which is expected to result in enhanced organizational efficiency and a notable decrease in turnover rates over time.

KEYWORDS

cognitive crafting, job crafting dimensions, psychological capital, relational crafting, task crafting, work engagement

INTRODUCTION

Work is a significant component of most individuals' lives, contributing to their overall well-being and vitality. The job experiences and knowledge we acquire have the potential to influence our overall well-being, as well as enhance human growth. They can improve our impression of our own effectiveness, value, social support, competence, and self-assurance [1]. Hence, identifying and promoting methods by which individuals can effectively better their job experience can also contribute to the enhancement of their well-being [2]. Jobs are not solely formulated by companies based on their needs but are also actively modified by the individuals who hold those positions. However, the stress levels experienced by nurses are impacted by multiple aspects, including the accessibility of resources for task completion, the demands of patients and their families, interactions with colleagues, and the ever-changing workplace culture [3].

Job crafting is a notion that enables individuals to actively shape their job obligations to align more effectively with their skills, interests, and values. It has gained significance in today's dynamic and always-changing workplace. While job crafting is not a recent occurrence, its importance has been widely acknowledged in recent years as organizations aim to improve employee engagement, work satisfaction, and general well-being.

Applying the concept of job crafting can bring significant advantages to the nursing profession. This notion includes three essential aspects: Task Crafting (TC), Cognitive Crafting (CC), and Relational Crafting (RC) [4]. Task Crafting (TC) refers to the practice of nurses modifying the scope and techniques of their work to adapt to the evolving healthcare needs effectively. Nurses may modify their methodologies in reaction to emerging healthcare technologies, evolving patient care protocols, or shifts in the healthcare industry. In addition, this enables people to improve task performance and efficiency by creatively utilizing their knowledge and experience. These modifications enhance both organizational and team performance in achieving healthcare goals while also maintaining an exciting and challenging nursing job that promotes ongoing learning and development. Cognitive Crafting (CC) refers to the process of deliberately and strategically shaping one's cognitive abilities and skills. This dimension pertains to the nurses' perception of their jobs. Instead of focusing simply on the routine parts of patient care, nurses can reframe their work by highlighting the wider influence they have, such as their contribution to patient recovery and their role in spreading health education. By adopting a more comprehensive perspective, nurses might discover greater significance and satisfaction in their profession, recognizing themselves as essential contributors to patient health and welfare rather than mere executors of tasks. Relational Crafting (RC) emphasizes the importance of interpersonal relationships in the field of nursing. Nurses have the option to work together with colleagues who enhance their abilities, provide distinct viewpoints, or fulfill social requirements in the professional environment. Nurses improve the quality of patient care and create a happier work environment by developing collaborative and supportive relationships, which allow for the sharing of expertise and creativity [5].

Work engagement (WE) is defined as a 'motivational process influenced by resource availability,' where both workplace and personal resources can motivate employees, leading them to 'work hard (vigor), be involved (commitment), and feel happily absorbed (absorption) in their work' [6].

Psychological capital (PsyCap), defined as the combination of an individual's mental capabilities, such as self-efficacy, resilience, optimism, and hope, can be nurtured and developed [7]. In addition, Organizational development is the process of fostering constructive behaviors in individuals within a company to enhance overall organizational effectiveness. This idea highlights the significance of positive psychological characteristics in shaping organizational behavior and is thought to have a greater impact on productivity compared to traditional types of capital [8].

This research enhances the theories of job crafting and job demand-resources (JD-R). Job Crafting Theory and Job Demand-Resources Theory provide insightful frameworks for understanding employee engagement and well-being; within these models, Job crafting is a well-researched personal resource that has gained significance in studying employee well-being [9]. It is closely linked to other essential factors in the work setting, such as dedication and job happiness inside the business [10].

The Job Demands-Resources (JD-R) hypothesis suggests that job crafting is associated with a conducive and innovative work environment. It also indicates that job

crafting can act as a personal resource that modifies job demands, augments existing job resources, and improves work engagement [9]. Currently, nurses face many challenges as frontline providers, which can increase internal stress and impact their psychological well-being, job happiness, and engagement. The psychological toll of witnessing numerous patient deaths can deteriorate one's mental health, underscoring the need to look at the undefined effect of job crafting on nurses' work engagement. In the UAE, resources discussing this issue are limited. Therefore, this study addresses the need for additional psychological support to improve job happiness and aims to alleviate work stress and the mental status of nurses [9].

This study aims to analyze the effects of job crafting dimensions, including task crafting (TC), cognitive crafting (CC), and relational crafting (RC) on work engagement (WE) among nurses in hospitals in the Al Dhafra region of Abu Dhabi, UAE. Given the remoteness and rural characteristics of Al Dhafra, healthcare delivery faces unique challenges, underscoring the importance of exploring how nurses adjust their roles to enhance engagement and job satisfaction in such a demanding environment. In addition, the study investigates the role of psychological capital (PsyCap) in mediating the connection between job crafting dimensions and work engagement (WE).

HYPOTHESIS

Contemporary research finds a minimum of three main factors that prompt individuals to participate in job crafting. Initially, individuals strive to exert authority over their work or specific elements of their occupations in order to prevent feelings of isolation. Additionally, they actively participate in job crafting as a means to uphold a favorable perception of themselves. Furthermore, it satisfies fundamental human necessities [11].

In recent years, several review articles have examined the various elements that contribute to job crafting. One of the most extensive studies on meta-analysis revealed that job crafting, along with various other workplace-related characteristics, is connected with improved engagement [11].

A correlation has been shown between work engagement and job crafting in a cross-sectional study involving workers from various industries, excluding healthcare. Job crafting has been connected to work engagement, work performance, job satisfaction, organizational commitment, and quality of care [12]. Additionally, a prior cross-sectional study established a correlation between work crafting and job engagement among nurses [13]. In addition, the study discovered that enhancing the structural work resources components of individual job crafting exhibited a moderate correlation with work engagement, while enhancing the social work resources components exhibited a weak correlation [13].

Two prior investigations were conducted specifically for nurses. A cross-sectional study discovered a favorable correlation between job crafting and work engagement among healthcare workers in a Chinese public hospital [14]. A different study found that the initial job crafting of a team was linked with the amount of work engagement among clinicians, such as doctors and nurses, in Vietnam. This relationship was observed one month after the study began [15]. Thus, the practice of collaborative job building may potentially be linked to enhanced work engagement among nurses.

H1: Task crafting is positively related to work engagement.
H2: Cognitive crafting is positively related to work engagement.
H3: Relational crafting is positively related to work engagement.

Psychological Capital (PsyCap) is an acknowledged psychological asset that has a favorable influence on persons by bolstering their resilience, optimism, hope, and self-efficacy [16]. However, PsyCap influences overall organizational outcomes and significantly affects well-being, health, and behavior in the workplace [17]. PsyCap serves as a bridge between an employee's attitude and behavior towards work and their psychological condition. Prior research has found strong negative correlations between job crafting and psychological discomfort and propensity to leave [18], However, employees who possess the ability to actively shape their job roles are more adept at managing job requirements and are capable of fulfilling both their work and family obligations [19].

Research has shown that individuals that are engaged demonstrate higher levels of innovation, productivity, and initiative in the workplace. In addition, they implement proactive modifications in their work environment to remain engaged. Engaging in job crafting behaviors can

enhance the cultivation of psychological capital [20], which subsequently fosters the attainment of satisfactory employment conditions and heightened job satisfaction among employees [21], while also bolstering their level of work engagement. Additionally, Prior studies have demonstrated a correlation between job crafting and psychological capital [22,20]. The successful execution of job crafting relies heavily on the individual's psychological capital, which comprises their personal resources [23].

In order to develop PsyCap, which includes resilience, hope, and self-confidence, it is essential to have a sound psychological condition. In contrast, adverse mental states can give rise to mental diseases, exhaust psychological resources, and ultimately lead to job discontent, impeding the cultivation of PsyCap [24]. Psychological capital (PsyCap) is a significant construct in the field of Positive Organizational Behavior [25].

H4: Task crafting is positively related to psychological capital.
H5: Cognitive crafting is positively related to psychological capital.
H6: Relational crafting is positively related to psychological capital.

In previous research, psychological capital (PsyCap) has a significant association with work engagement in the nursing profession, which means that nurses with elevated of PsyCap typically demonstrate higher work engagement [26]. Based on performed research, it was revealed that work creating has the potential to enhance an individual's psychological capital [22]. another study also found PsyCap to be an important factor in predicting work engagement [27].In additional, PsyCap is viewed as a resource and protective factor in elevating levels of job satisfaction and work engagement [24].

H7: Psychological capital is positively related to work engagement
Work engagement positively influences a diversity of job-related outcomes; higher work engagement among nurses leads to better job satisfaction, organizational commitment, lower turnover rates, reduced error rates, and an overall improvement in the quality of work life [26]. These findings emphasize the significance of promoting work engagement in the field of nursing, given its association with positive outcomes not only for the individual nurses but also for the healthcare organizations they work for and the patients they care for.

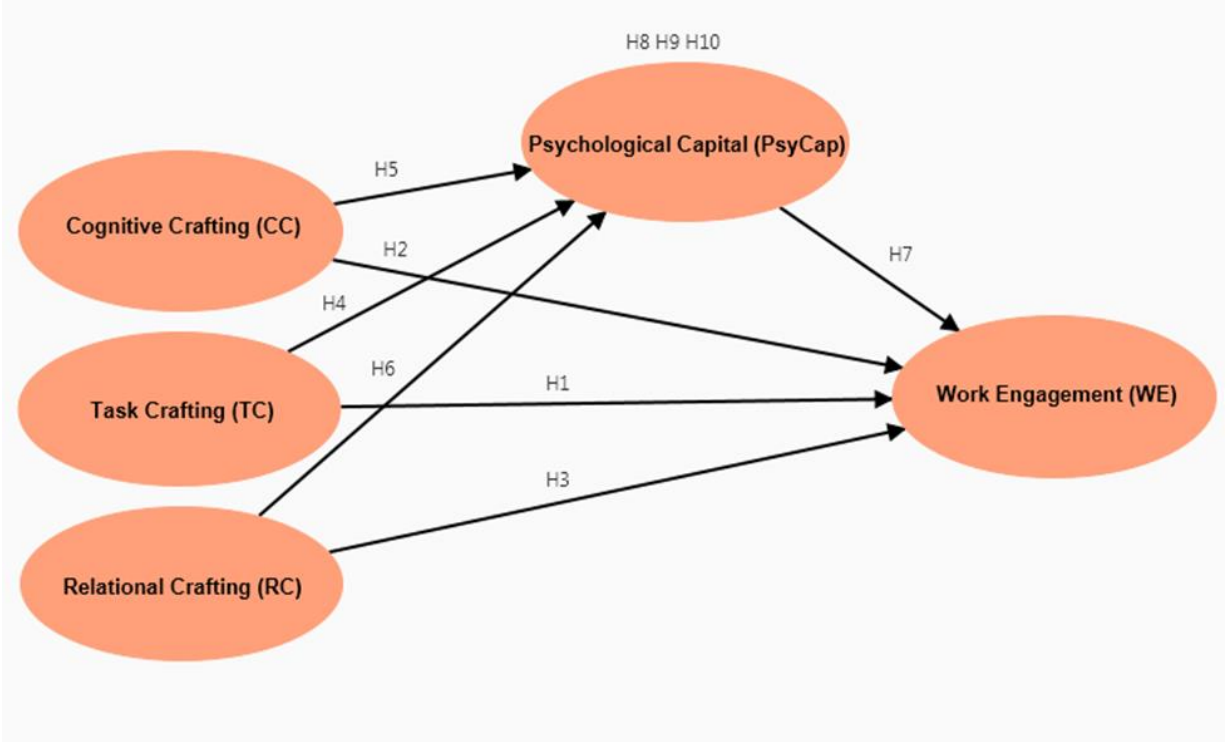
A separate study discovered that job crafting significantly influences the job engagement and service recovery of flight attendants [28]. Furthermore, another study has provided evidence of the established correlation within educational institutions. There is currently a lack of extensive research on the mediating effect of psychological capital in the relationship between task crafting and work engagement in the setting of healthcare [29].

Scientific research has established work crafting as a mediator in the relationship between work engagement and job performance [30]. It also acts as a mediator between psychological capital and job happiness [22]. Nevertheless, there is a lack of research that investigate the role of psychological capital in mediating the connection between job crafting and work engagement. Initial research suggests that psychological capital may serve as a mediator between job autonomy and work engagement [31], however the evidence is still limited.

H8: There is a mediating role of psychological capital in the relationship between task crafting and work engagement
H9: There is a mediating role of psychological capital in the relationship between cognitive crafting and work engagement
H10: There is a mediating role of psychological capital in the relationship between relational crafting and work engagement

Figure 1 illustrates the conceptual framework of this research, which was constructed using the connections between different variables revealed in the literature review.

FIGURE 1. CONCEPTUAL FRAMEWORK



METHODS

SAMPLING AND DATA COLLECTION

The research will employ a descriptive cross-sectional design. The research was carried out with a sample size of 348 nurses employed in Al Dhafra hospitals located in Abu Dhabi, UAE. The analysis utilized in this study was conducted using Structural Equation Modeling (SEM) through SmartPLS 4 and SPSS version 27 for descriptive and correlation analysis.

The study focuses on nursing in the UAE, and voluntary nurses from Al Dhafra Hospitals will participate in the research to gather the essential data. Participants were chosen using questionnaires that will be sent to the Al Dhafra hospitals via online survey questionnaires.

All information will be kept confidential on the principal investigator's laptop, which is secured with a password. After the cleaning of the data, all information will be entered into Smartpls and SPSS software.

MEASUREMENTS

As previously stated, this study uses five latent variables (independent variables - Task crafting, Cognitive crafting, and Relational crafting; dependent variable work engagement; and mediation variable - PsyCap), and a 5-point Likert scale was used (see Table 1).

TABLE 1. INSTRUMENTATION

Variables	Sources	Items
Task crafting (TC)	[32]	5
Cognitive crafting (CC)	[32]	5
Relational crafting (RC)	[32]	5
work engagement (WE)	[33]	17
Psychological Capital (PsyCap)	[16]	22

ETHICAL CONSIDERATIONS

The Ethical Committee of Al Dhafra Hospitals in the UAE gave ethical clearance for this research (ADH-IREC-365).

STATISTICAL ANALYSES

VALIDITY AND RELIABILITY ANALYSIS

From the Tasking crafting scale, one item was removed; from the Work engagement scale, four items were removed; and from the Psychological capital scale, one item was removed. These items were excluded because their factor loadings were less than the minimum criterion of 0.50. The remaining items demonstrate strong scale reliability, as shown in Table 2.

The constructs of Task crafting, Cognitive crafting, Relational crafting, Work engagement, and Psychological capital showed factor loading ranges (>0.50), These intervals underscore a substantial and consistent measurement of the constructs by the scale items. Moreover, The Average Variance Extracted (AVE) values for these constructs are above the minimum criterion of 0.50, provide additional evidence supporting the convergent validity of the measures. These values indicate a reasonable degree of variance that is accounted for by each construct.

The constructs also demonstrate strong internal consistency, as indicated by Cronbach's alpha values significantly exceeding the accepted reliability threshold of 0.70. Additionally, the composite reliability (CR) scores, surpassing the 0.60 benchmark, confirm the composite reliability of the constructs, provide strong evidence of the reliability of the measures utilized in this study.

DISTRIBUTION OF VARIOUS DEMOGRAPHIC FACTORS

The majority of the participants in the sample are female (75.9%), while the male participants make up a smaller percentage (24.1%). The age distribution shows that the majority of participants are concentrated in the age bracket of 30-39 years (43.1%), with a relatively balanced distribution across the other age groups, while a smaller percentage work morning shifts of 8 hours (29.3%). The participants' demographic data is displayed in Table 3.

TABLE 2. RESULTS OF VALIDITY AND RELIABILITY ANALYSES

Factor	Num. of items	Factor loading intervals	Cronbach's alpha (α)	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Task Crafting (TC)	4	0.671-0.801	0.751	0.755	0.843	0.574
Cognitive Crafting (CC)	5	0.716-0.898	0.900	0.911	0.926	0.717
Relational Crafting (RC)	5	0.689-0.776	0.797	0.798	0.860	0.552
Work Engagement (WE)	12	0.630-0.815	0.920	0.924	0.932	0.533
Psychological Capital (PsyCap)	21	0.594-0.865	0.962	0.967	0.965	0.573

TABLE 3. DEMOGRAPHIC FACTORS RESULTS

Control Variable	Demographic Factors	Frequency	Percentage
Gender	Male	84	24.1
	Female	264	75.9
Age	20-29 years	24	6.9
	30-39 years	150	43.1
	40-49 years	126	36.2
	50 years and above	48	13.8
Marital status	Single	45	12.9
	Married	300	86.2
	Divorce	3	0.9

Qualification	Diploma	36	10.3
	Bachelors	243	69.8
	Master	66	19.0
	Doctorate	3	0.9
Experience	1-5 years	27	7.8
	6-10 years	78	22.4
	11-15 years	93	26.7
	16 years and above	150	43.1
Nursing specialist	Practical Nurse (PN)	12	3.4
	Registered Nurse (RN)	267	76.7
	Charge Nurse (CN)	42	12.1
	Others	27	7.8
Workplace	Out-Patient (OPD)	33	9.5
	Intensive Care Unit (ICU)	48	13.8
	Emergency Department (ED)	51	14.7
	In-Patient (Ward)	171	49.1
	Others	45	12.9
Duty shift	Day/Night shift (12 hours)	246	70.7
	Morning shift (8 hours)	102	29.3
	Total	**348**	**100**

DATA ANALYSIS

DESCRIPTIVE STATISTICS

The sample size for each variable is 348 respondents, as shown in Table 4. Job crafting dimensions have a mean score of 4.05, 4.09, and 4.165, respectively. Indicates that participants generally engage actively in shaping their tasks, cognitive perception, and strong tendency at work. Meanwhile, work engagement is reported with a mean of 4.035, suggesting a high level of engagement among the participants. Finally, psychological capital, with an average score of 4.00, indicates a significant presence of good psychological qualities such as resilience, optimism, and self-efficacy among the participants.

These statistics collectively suggest that the participants in this study exhibit moderately high levels of job crafting dimensions, work engagement, and psychological capital, with some individual differences in each of these areas.

TABLE 4. DESCRIPTIVE STATISTICS OF THE SCORES OF PARTICIPANTS ON THE STUDY VARIABLES

Variable	N	Minimum	Maximum	Mean	Standard Deviation	Variance
Task Crafting (TC)	348	1	5	4.050	1.010	1.030
Cognitive Crafting (CC)	348	1	5	4.090	0.760	0.580
Relational Crafting (RC)	348	1	5	4.165	0.805	0.655
Work Engagement (WE)	348	1	5	4.035	0.850	0.725
Psychological Capital (PsyCap)	348	1	5	4.000	0.845	0.715

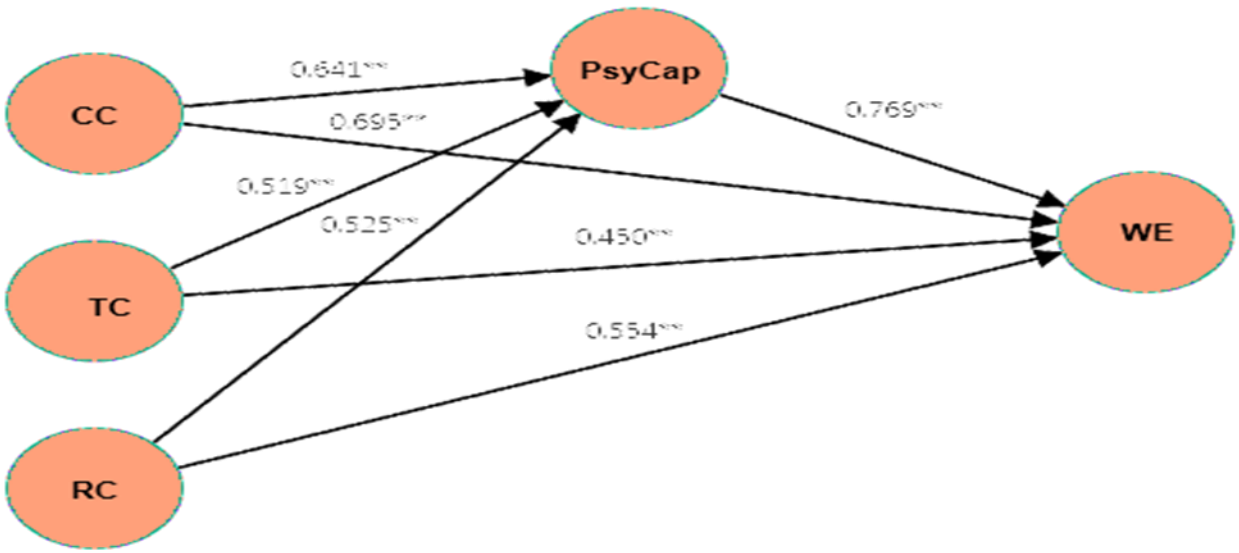
CORRELATIONAL ANALYSIS OF VARIABLES

The study's correlation analysis illuminates the relationships between job crafting dimensions, work engagement, and psychological capital. Upon reviewing Table 5, it is positively correlated with work engagement (r = .450**, p < .01), suggesting a substantial and meaningful relationship between the two variables. The data shows that cognitive crafting has a significant and positive correlation with work engagement (r = .695**, p < .01). This underscores the importance of mental processes in employee engagement. The statistical analysis reveals that relational crafting exhibits a positive association with work engagement (r = .554**, p < .01). This suggests that the caliber of interpersonal connections in the professional environment significantly influences the extent of employee involvement. The psychological capital variable is positively correlated with task crafting (r = .519**, p < .01), cognitive crafting (r = .641**, p < .01), and relational crafting (r = .525**, p < .01). Additionally, it exhibits the strongest correlation with work engagement (r = .769**, p < .01). This pattern indicates that psychological capital is an essential element that is intrinsically linked to all forms of job making and serves as a strong indicator of work engagement.

TABLE 5. CORRELATIONS RESULT

Variable		Mean	SD	1	2	3	4
1	Task crafting (TC)	4.050	1.010	1			
2	Cognitive crafting (CC)	4.090	0.760	0.449**	1		
3	Relational crafting (RC)	4.165	0.805	0.628**	0.610**	1	
4	Work engagement (WE)	4.035	0.850	0.450**	0.695**	0.554**	1
5	Psychological capital (PsyCap)	4.000	0.845	0.519**	0.641**	0.525**	0.769**

FIGURE 2. CORRELATION RESULT IN THE MODEL



HYPOTHESIS TESTING

The outcomes of evaluating the impacts in a Path model (H1-H7) in the absence of a mediator are presented in Table 6.

H1: Task crafting is positively related to work engagement.

The correlation between task crafting (TC) and work engagement (WE) is fairly positive, with a β coefficient of 0.45. These findings indicate that persons who proactively alter elements of their job duties are likely to observe a significant enhancement in their level of work engagement. The statistical significance of this discovery is supported by

a p-value of 0.00 and a t-value of 9.157, both of which surpass the conventional limits for significance.

H2: Cognitive crafting is positively related to work engagement.

The correlation between cognitive crafting (CC) and work engagement (WE) is significantly strong, as indicated by a β coefficient of 0.716. It is suggested that when employees alter their cognitive perspectives of their work, it has a substantial and beneficial impact on their levels of engagement. This relationship is highly significant statistically, with a t-value of 18.856, p-value = 0.00, and suggests a potent area for interventions aimed at increasing work engagement.

H3: Relational crafting is positively related to work engagement.

The positive relationship between relational crafting (RC) and work engagement (WE) is moderately strong, with a β coefficient of 0.563. It signifies that building better work relationships can lead to a substantial increase in work engagement. This finding is statistically robust (t-value = 12.72, p-value = 0.00).

H4: Task crafting is positively related to psychological capital.

The β coefficient of 0.522 suggests that task crafting (TC) not only affects work engagement (WE) but also has a moderately strong positive impact on the psychological resources that contribute to an individual's positive psychological state and also suggests that modifying job tasks can have a meaningful positive effect on employees' optimism, hope, resilience, and confidence. This relationship is statistically significant, with a high t-value of 11.298 and a P-value of 0.00, indicating that task crafting is a solid predictor of psychological capital.

H5: Cognitive crafting is positively related to psychological capital.

There is a strong positive relationship between cognitive crafting (CC) and psychological capital (PsyCap), as shown by a β coefficient of 0.666. Changing how employees view their work appears to boost their psychological resources significantly. The statistical strength of this relationship is very high (t-value of 15.598 and p-value of 0.00), which underscores the importance of cognitive aspects of job crafting in enhancing psychological capital.

H6: Relational crafting is positively related to psychological capital.

Relational crafting (RC) has a moderate to strong positive impact on psychological capital (PsyCap), with a β coefficient of 0.537. It indicates that fostering better interpersonal connections at work is likely to contribute positively to employees' psychological capital. The relationship is statistically significant (t-value of 10.779 and p-value of 0.00) and suggests relational crafting is an important factor in building psychological strength.

H7: Psychological capital is positively related to work engagement.

The correlation between psychological capital (PsyCap) and work engagement (WE) is markedly positive, as demonstrated by the highest β coefficient of 0.769. It suggests that individuals possessing high levels of psychological capital are significantly more likely to be actively engaged and committed in their work. The exceptionally high t-value of 22.349, coupled with a p-value of 0.00, provides robust evidence supporting this relationship.

TABLE 6. PATH MODEL

Path	β	SE	t-Value	p- Value	LLCI	ULCI
TC →WE	0.450**	0.049	9.157	.000	0.340	0.538
CC →WE	0.716**	0.038	18.856	.000	0.637	0.786
RC →WE	0.563**	0.044	12.720	.000	0.467	0.642
TC →PsyCap	0.522**	0.046	11.298	.000	0.427	0.610
CC →PsyCap	0.666**	0.043	15.598	.000	0.568	0.736

RC →PsyCap	0.537**	0.050	10.779	.000	0.427	0.624
PsyCap →WE	0.769**	0.018	22.349	.000	0.795	0.949

Note: β = path coefficient; Bootstrap sample size=5000 ; LL lower limit, CI confidence interval, UL upper limit ;N=348 ; (** p < .05).

MEDIATING ROLE OF PSYCHOLOGICAL CAPITAL (H8-H10)

H8: There is a mediating role of psychological capital in the relationship between task crafting and work engagement.

The overall impact of task crafting (TC) on work engagement (WE) is statistically significant, with a beta coefficient of 0.45, which suggests a considerable beneficial influence without considering any mediators. Nevertheless, upon examining the specific impact of task crafting on work engagement while accounting for psychological capital (PsyCap), the beta coefficient decreases to 0.058, rendering this association statistically insignificant with a p-value of 0.105. These findings indicate that the impact of task designing on work engagement is mainly mediated via its effects on psychological capital rather than having a direct effect. Conversely, the indirect impact is particularly robust, with a beta coefficient of 0.393 and a statistically significant p-value of 0.00. This suggests that psychological capital plays a considerable role in mediating the connection between task crafting and work engagement. The robustness of the indirect effect, as evidenced by the substantial t-value of 10.472, suggests that the alterations in PsyCap resulting from task crafting exert a significant impact on enhancing work engagement. In other words, task crafting enhances psychological capital, which in turn significantly increases work engagement.

In summary, the evidence confirms that psychological capital plays a significant role as a partial mediator in the connection between task crafting and work engagement. It has a substantial indirect impact; while its direct effect is not statistically significant when accounting for psychological capital, it highlights the significance of cultivating psychological capital in employees as a means via which task crafting can boost work engagement. Table 7. Presents the results of PsyCap mediating the impact of TC on WE.

TABLE 7. THE RESULTS OF PSYCAP MEDIATING THE IMPACT OF TC ON WE

Path	β	SE	t-Value	p- Value	LLCI	ULCI
TC □WE	0.450	0.049	9.157	0.000	0.340	0.538
Direct effect (TC □ PsyCap □ WE)	0.058	0.035	1.622	0.105	-0.012	0.126
Indirect effect (TC □ PsyCap □ WE)	0.393	0.037	10.472	0.000	0.310	0.459

Note: β = path coefficient; Bootstrap sample size=5000 ; LL lower limit, CI confidence interval, UL upper limit ;N=348 ; (** p < .05).

H9: There is a mediating role of psychological capital in the relationship between cognitive crafting and work engagement.

The statistical study reveals that cognitive crafting (CC) significantly and positively affects work engagement (WE), as evidenced by a notable overall effect with a beta coefficient of 0.716. This significant effect persists even when accounting for psychological capital (PsyCap) as a mediator, demonstrated by a substantial direct effect of 0.348 and an indirect effect of 0.368. Both effects are statistically significant, with p-values of 0.00; this indicates that cognitive crafting directly contributes to enhancing work engagement. Furthermore, it significantly boosts psychological capital, which in turn has a positive influence on work engagement. The considerable t-values for the direct (7.217) and indirect (14.306) effects suggest that psychological capital acts as a partial mediator in this relationship. Both pathways independently contribute to the outcome of work engagement. Table 8. Illustrates the results of the impact of CC on WE, mediated via PsyCap.

TABLE 8. THE RESULTS OF THE IMPACT OF CC ON WE, MEDIATED VIA PSYCAP

Path	β	SE	t-Value	p- Value	LLCI	ULCI
CC □ WE	0.716	0.038	18.856	.000	0.637	0.786
Direct effect (CC □ PsyCap □ WE)	0.348	0.048	7.217	0.000	0.257	0.448
Indirect effect (CC □ PsyCap □ WE)	0.368	0.026	14.306	0.000	0.318	0.418

Note: β = path coefficient; Bootstrap sample size=5000 ; LL lower limit, CI confidence interval, UL upper limit ;N=348 ; (** p < .05).

H10: There is a mediating role of psychological capital in the relationship between relational crafting and work engagement.

The data demonstrates that relational crafting (RC), which involves altering the quality and amount of interpersonal interactions within the workplace, has a significant total effect on work engagement with a beta of 0.563. This strong relationship is supported by a substantial t-value of 12.72 and a p-value of 0, indicating that changes in work relationships can greatly enhance work engagement. When taking psychological capital (PsyCap) into account, the direct impact of relational craftsmanship on work engagement remains considerable but less strong, with a beta coefficient of 0.201; this is further corroborated by a substantial t-value of 5.233 and a p-value of 0, indicating that the act of creating and nurturing relationships directly enhances work engagement, regardless of one's psychological capital. On the other hand, the influence of relational crafting on work engagement is also remarkable when considering its indirect effect through psychological capital. A beta coefficient of 0.362 indicates that a considerable portion of relational crafting's impact on work engagement is mediated by psychological capital. The t-value of 10.644 and a p-value of 0 for this indirect effect underscore the significance of this mediation.

In summary, the analysis supports and suggests partial mediation, where relational crafting boosts work engagement on its own and also by enhancing psychological capital, which in turn positively impacts work engagement. Table 9. Presents the results of PsyCap mediating the impact of RC on WE.

Following the explanation of the analyses, the summary of the results for the hypotheses can be found in Table 10.

TABLE 9. THE RESULTS OF PSYCAP MEDIATING THE IMPACT OF RC ON WE

Path	β	SE	t-Value	p- Value	LLCI	ULCI
RC □ WE	0.563	0.044	12.720	0.000	0.467	0.642
Direct effect (RC □ PsyCap □ WE)	0.201	0.038	5.233	0.000	0.123	0.274
Indirect effect (RC □ PsyCap □ WE)	0.362	0.034	10.644	0.000	0.290	0.424

Note: β = path coefficient; Bootstrap sample size=5000 ; LL lower limit, CI confidence interval, UL upper limit ;N=348 ; (** p < .05).

TABLE 10. SUMMARY OF HYPOTHESES

Hypotheses	Summary	Results
H1	Task crafting is positively related to work engagement	Supported
H2	Cognitive crafting is positively related to work engagement	Supported
H3	Relational crafting is positively related to work engagement	Supported
H4	Task crafting is positively related to psychological capital	Supported
H5	Cognitive crafting is positively related to psychological capital	Supported
H6	Relational crafting is positively related to psychological capital	Supported
H7	Psychological capital is positively related to work engagement	Supported

H8	There is a mediating role of psychological capital in the relationship between task crafting and work engagement	Supported
H9	There is a mediating role of psychological capital in the relationship between cognitive crafting and work engagement	Supported
H10	There is a mediating role of psychological capital in the relationship between relational crafting and work engagement	Supported

DISCUSSION

This study investigated the correlation between job crafting dimensions and work engagement among nurses. Additionally, the study explored the mediation effect of psychological capital in this relationship. According to the study results, the levels of work engagement among nurses also rise in correlation with an increase in job crafting dimensions, which includes task crafting, cognitive crafting, and relational crafting. Consequently, they demonstrate a greater inclination towards taking initiative and are able to align their employment with their personal preferences and principles. Additionally, job crafting might be seen as a proactive approach used by nurses to enhance the demands and resources of their profession, with the aim of making it more meaningful, fulfilling, and conducive to increased productivity.

This finding aligns with the theoretical predictions of [12,13,14,15] which suggest there is correlation between job crafting dimensions and work engagement . This setting instills nurses with confidence since they believe they will not face humiliation or punishment, even if their actions lead to unfavorable outcomes. These papers in the literature corroborate our research findings.

Upon reviewing the literature, it is commonly observed that psychological capital serves as a mediator between job crafting dimensions and work engagement [22,26,29,31]. These studies corroborate our research findings. Furthermore, there needs to be more research investigating the impact of inter-job crafting on work engagement and also to investigate the mediating role of psychological capital in this relation within the health sector.

The study revealed a noteworthy correlation between job crafting dimensions and work engagement. Consequently, nurses who experience psychological comfort and security demonstrate greater engagement in proactive actions. They can effectively guide their job by implementing steps that will imbue it with personal significance. When conducting a literature review, it is imperative to include more studies that investigate the correlation between job crafting and psychological capital. A study conducted in Taiwan examined 163 individuals from 45 teams in 12 firms. The study discovered that introducing the notion of job crafting promotes employees to demonstrate good psychological capital behaviors [20]. A study involving employees in the health sector indicated that job crafting is a significant element in enhancing psychological safety and is positively associated with the occurrence of impediment circumstances in job crafting [34]. These studies corroborate our research findings.

The present findings showed that there was a significant correlation between psychological capital and work engagement. This means that the nurses who have an elevated of psychological capital will report an elevated of work engagement. This result was supported in literature review [28,29]

This study examined the function of psychological capital in mediating the relationship between job crafting and work engagement. The results indicate that psychological capital serves as a mediator in this relationship. This study is the first known investigation to examine the influence of psychological capital on the connection between job crafting and work engagement among nurses. The presence of psychological capital as a mediating factor in this connection highlights its significant relevance as an explanatory mechanism.

Significant effects of job crafting aspects on nurses' work engagement, with psychological capital playing an important mediating role. These findings not only fill a gap in the existing literature but also provide practical implications for enhancing nurse engagement through strategic work. By advancing our understanding of these dynamics, healthcare organizations can better support their nursing workforce, foster an environment that fosters intellectual capital and enhances overall job satisfaction and productivity.

RECOMMENDATIONS

Hospital work is becoming more complex and inherently stressful. Nurses often find themselves in challenging and stressful practice environments, which can adversely affect their work engagement.

The study's findings and consequences lead to the following proposed recommendations:

1. Develop and implement structured job crafting programs that encourage employees to personalize their work experiences and tasks in a way that leverages their strengths and interests.
2. Foster an organizational culture that values and promotes psychological capital by providing training and resources aimed at enhancing employees' resilience, optimism, hope, and self-efficacy.
3. Integrate psychological capital development into leadership training modules, ensuring that managers are equipped to support and facilitate job crafting efforts among their teams.
4. Conduct regular assessments of work engagement and psychological capital to identify areas for intervention and measure the effectiveness of job crafting initiatives.
5. These recommendations aim to harness the power of job crafting and psychological capital to create a more engaged and productive workforce.

THEORETICAL IMPLICATIONS

Job crafting dimensions have been found to impact work engagement at different levels and in diverse manners. Nevertheless, there is a need for more studies investigating the correlation between these variables in the health domain. Hence, this research on nurses serves to enhance the existing body of knowledge on job crafting dimensions, as well as work engagement. Although the effect of job designing and work engagement is recognized, there is a need for additional elucidation of this association. The overall environment and social situations influence the link between these variables. In this study, the researchers examined the mediating influence of the psychological capital notion, which contributes to employees' sense of safety and comfort, for the first time. The study found a positive and substantial relationship between job crafting dimensions and work engagement. This relationship was mediated by psychological capital. This finding offers a fresh outlook on job crafting dimensions and work engagement, especially in hospitals where there is a high level of interpersonal interaction.

PRACTICAL AND MANAGERIAL IMPLICATIONS

The majority of healthcare professionals encounter numerous adverse circumstances, including burnout, job dissatisfaction, and diminished motivation. These adverse circumstances predominantly arise within the nursing profession, and This is due to the fact that nurses constitute the biggest number of healthcare workers and are primarily responsible for providing healthcare services. Research has demonstrated that nurses experience physical, cognitive, and perceptual burdens in their profession. Hence, it is imperative to eradicate these issues pertaining to working circumstances in order to ensure the safety of both nurses and patients [35]. Furthermore, the health industry is a highly specialized domain characterized by numerous unpredictable factors. Any unforeseen catastrophe, such as a crisis like the COVID-19 pandemic, conflicts, or earthquakes, necessitates crucial decision-making.

Furthermore, the workloads of all employees have escalated, and the working conditions have become more arduous. Nurses must demonstrate proactive behaviors in this setting. Thus, creating a conducive climate for work crafting within hospitals might mitigate the adverse circumstances encountered by nurses and empower them to demonstrate proactive actions. The study findings suggest that leaders/directors should create a conducive climate for work crafting by implementing rules and behaviors that promote psychological comfort and safety among nurses.

Furthermore, managers in healthcare settings must prioritize the improvement of job crafting chances and psychological capital among nurses; this has the potential to enhance work engagement, which leads to enhanced job performance and patient care. Within this particular framework, the findings of the present investigation indicate that businesses could gain advantages by promoting employees' involvement in task, cognitive, and relational crafting, as these activities are linked to increased levels of work engagement and psychological capital. Furthermore, considering the robust correlation between psychological capital and work engagement, it is advisable to propose that organizations allocate resources towards enhancing the psychological capital of their employees through training initiatives, supportive managerial strategies, and the cultivation of a positive work environment.

LIMITATION AND SUGGESTIONS FOR FUTURE RESEARCH

We recognize certain constraints in this study, as the cross-sectional design of the research only provides insights into the situation during a specific time frame. Consequently, conducting tests on this model using a longitudinal design will be advantageous in terms of corroborating the research findings. The research was carried out in public healthcare facilities. Alternatively, the situation at private hospitals might also be depicted. Public and private hospitals are similar in quality and services.

Conversely, the study's sample consisted of nurses. An analysis of other professional groups in future studies will help to generalize the findings obtained for health professionals. Ultimately, the outcomes of this study may be influenced by confounding variables that were not taken into account, such as additional forms of job pressures and external factors that affect the environment beyond the workplace.

This study indicates that job crafting is indeed present, and certain elements of job crafting are enhanced as a consequence of prior elevated levels of psychological capital and work engagement. Standardization of work activities in the public healthcare sector for quality control and productivity enhancement may restrict employees' ability to customize their employment overall, including their specific job duties.

The variability of cognitive and relational job crafting in response to changes in psychological capital or work engagement may be attributed to the work context, while task-related job crafting remains unaffected. However, given that certain parts of job crafting are influenced by psychological capital or work engagement, it becomes intriguing to go deeper into the mechanisms, motivations, and circumstances surrounding job crafting. Senior employees who possess higher levels of formal autonomy and power are more likely to view job crafting as a challenge within their expectations of work conduct. Furthermore, our findings indicate that psychological capital positively influences certain elements of work crafting. The availability of these knowledge sources suggests that the relationship between psychological capital and job crafting may be mutually influential. Ultimately, the robust correlation between psychological capital and work engagement may give rise to further inquiries in the study. Which specific elements of psychological capital exert the greatest influence on engagement, and how does psychological capital interact with other organizational aspects to shape work engagement? Given the findings of this study, we believe that the interrelationships among psychological capital, job crafting, and work-related well-being should be further investigated as an interactive system.

CONCLUSION

The study highlights the significance of job crafting and psychological capital in improving work engagement among nurses. This study offers significant insights that contribute to both the theoretical comprehension and practical implementation of healthcare administration. By presenting compelling evidence of a predictive influence on both work engagement and job crafting dimensions, the mediating role of psychological capital emphasizes the importance of individual resources in amplifying the beneficial impacts of job crafting dimensions on work engagement. The results indicate that promoting psychological capital can enhance employee engagement, especially when people actively adapt their tasks, cognition, and work relationships. This study reinforces the significance of psychological capital and job crafting dimensions as crucial attributes in the workplace. Hence, it would be advantageous for the healthcare industry to contemplate establishing institutions to foster psychological capital and job crafting dimensions among work groups. Individual employees would experience improved well-being, leading to increased organizational efficiency and reduced turnover rates in the long run.

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RESEARCH ARTICLE

TRANSFERABLE SKILLS AND GRADUATE ATTRIBUTES: ANALYSIS OF HEALTH SERVICES MANAGEMENT STUDENTS' REFLECTIONS ON AN INDUSTRY-BASED PLACEMENT

Sheree Lloyd[1], Minalli Vasandani*[2], Joel Salvacion[2]

1. University of Tasmania, Australia
2. Griffith University, Queensland, Australia

Correspondence: Sheree.lloyd@utas.edu.au

ABSTRACT

PURPOSE

Work Integrated Learning (WIL) supports learners to acquire transferable skills and graduate attributes for employability through placements in settings aligned with their future profession. The purpose of this paper is to explore, student reflections on the attainment of transferable skills and university graduate attributes on health service management (HSM) work integrated learning placements in one Australian University.

DESIGN/METHODOLOGY/APPROACH

The study used data collected from e-portfolios from two cohorts of students who completed placements in the health industry. Structured e-portfolios recorded student reflections, these were analysed both quantitatively and qualitatively. To analyse the reflections, content analysis and mapping of narratives to transferable skills and University graduate attributes was used to evidence their attainment by learners on placement.

FINDINGS

The data demonstrated that students attained transferable skills and university attributes and reflected upon them in their e-portfolios. However, not all transferable skills and attributes were evidenced in student portfolios. Ethical thoughts and actions, respect and capability with First Peoples, citizenship and social responsibility, negotiation and conflict resolution, research and organizational membership were not comprehensively demonstrated. Reflective skills and learning how to reflect could be further emphasised and practiced within the curricula.

The outcomes of the study can be used to strengthen the focus of reflective e-portfolios, inform the development of HSM curricula and support academics teaching in WIL programs to further clarify expectations on reflection.

ORIGINALITY

This paper is of interest to universities aiming to equip graduates with transferable skills and the attributes to thrive in complex and rapidly changing work environments. The study identified further research opportunities that could inform the design and content of e-portfolios to demonstrate the skills attained on placement.

KEYWORDS

Reflective practice, transferable skills, graduate attributes

INTRODUCTION

Employment after attaining university qualifications is the aspiration of every graduate. In Australia, the government funders of higher education institutions expect universities to produce work-ready graduates that satisfy the demands of employers and the expectations of the graduates themselves [1]. Graduates must be able to evidence the attainment of transferable skills and attributes acquired throughout their learning to be successful in gaining employment. Work Integrated Learning (WIL) aims to prepare graduates who are work-ready and equipped with transferable skills and graduate attributes by combining theoretical knowledge with the practice of professional work [2].

Many education providers now recognise the importance of WIL courses to support student employability and a university on the east coast of Australia (hereafter called 'the university') has offered courses to health service management (HSM) students since 2009 [3]. HSM students have completed placements in a broad range of settings and worked on diverse projects including workforce planning, strategy and policy development, consumer engagement, governance, electronic patient records, informatics and health service accreditation [3 ,4].

According to Cordier et al [5]. and Stoten [6], an e-portfolio can be used by educational institutions to assess students' reflections on their learning and experiences on placement. Using an e-portfolio to record reflections, thoughts and experiences enables students to more accurately document their employability and transferable skills [7]. An e-portfolio supports learners to record their professional and personal progress [6] and to provide an opportunity to highlight their transferable skills to prospective employers [8,9]. In the university studied, HSM students are assessed using a structured e-portfolio, deployed as a PebblePad™ Workbook. Pebblepad™ is a tool that can be used to document and substantiate skills, new knowledge and behaviours, personal reflections on competencies or capabilities relevant to the students' profession and achievement whilst on placement [10].

Employers are increasingly attracted to graduates with both technical as well as transferable skills [11,12]. Transferable skills are skills, values and characteristics that can be used beyond the context of academic study and include critical thinking, leadership, communication, and cultural awareness [13].

CONTEXT

At the university studied, graduate attributes form a foundation intended to produce 'remarkable graduates of influence' [14]. The graduate attributes that the University aims its graduates to attain are that they are knowledgeable and skilled with critical judgement, effective communicators and collaborators, innovative, creative and entrepreneurial, socially responsible and engaged in their communities, culturally capable when working with First Australians and effective in culturally diverse and international environments [15]. The graduate attributes at the university are underpinned by transferable skills and can be developed through assessment, extra-curricular activities and learning experiences including WIL [14]. The university defined transferable skills are : 1. Applied literacies, data literacy, digital and information literacy, 2. Career and self-management, 3. Communication and interpersonal skills, 4. Citizenship and social responsibility, 5. Ethical thought and actions, 6. Global and cross-cultural perspectives, 7. Leadership, continuous learning, and problem solving, 8. Negotiation and conflict resolution, 9. Organizational membership, 10. Research, 11. Respect and capability with First peoples and 12. Teamwork and collaboration [15]

The HSM program at this university, embeds transferrable skills acquisition into courses throughout the curriculum. One of the channels to further develop student employability skills is the WIL course where students can learn by completing projects of value for health industry partner organizations. Students complete a WIL to become more relevant in their chosen industries [16] and the placement assists students to reduce the differences encountered between educational and work settings [17]. Further WIL provides the opportunity to apply the theoretical knowledge learned at university in the workplace [18]. WIL is intended to provide students with an opportunity to foster mastery and employability and active engagement with industry [19]. The HSM WIL is a capstone course or courses, and students can complete one or two substantial industry-based WIL placements of 4 days a week for 13 weeks with attendance at a weekly academic workshop [3,4,20]. The WIL is compulsory in the Advanced Master's degree program and can be taken as an elective in the Master's degree program.

The Pebblepad ™ workbook is introduced to students during orientation and a specific workshop is held on reflection, how to reflect and its importance. In the workshop learners are introduced to Rolfe's Reflective Model, characterised by its simplicity and focus on three key questions The What, So What and Now What of experiences [21]. The model was developed specifically for health professionals and is used while on placement to learn from positive and negative experiences during the WIL [21]. Workbooks are a multi-page electronic resource, designed by the academic and can incorporate skills templates, evidence professional competencies, reflections and activity logs [10]. The student workbooks form part of the assessment in the HSM WIL course. Students document reflections on their experiences as well as situations where they have exhibited, improved upon, or learned a skill on placement. In reflecting, students make sense of their chosen profession and can showcase their personal and professional development during WIL [22]. The e-portfolio includes evidence such as a resume, LinkedIn profile and reflections on the acquisition of skills attained, graduate attributes and student growth during WIL. The intention of the e-portfolio is that it is a tool that can be carried forward after graduation and inform graduate preparation for employability, plan future learning needs and allow potential employers and professional organizations to see the skills and competencies obtained [7, 23].

We found limited research in the literature that described the application of e-portfolios to document graduate attributes and transferable skills in the discipline of HSM. The aim of this study was to analyse the reflections documented in the student e-portfolio during their health industry placements to understand the acquisition of transferable skills and graduate attributes.

RESEARCH QUESTIONS

1. What are the university defined transferable skills acquired by HSM students as a result of their WIL experience?
2. How do the reflections of the HSM students on work integrated learning portray the acquisition of the University graduate attributes?

ETHICS

Ethical approval was obtained for the study from The University Human Research Ethics Committee (GU Ref No: 2018/931). Participation was voluntary, participant information provided, and consent obtained from all respondents. Students could withdraw their consent to participate in the study at any time.

RESEARCH DESIGN AND METHODOLOGY

A structured workbook was designed by the WIL academic convenor and each student given access to their own e-portfolio. The e-portfolio workbook included instructions relating to the completion of questions and expectations for recording their reflections. Students were tasked to record their experiences whilst on placement, reflect on their acquisition of skills, personal growth and to submit the e-portfolio for assessment.

Students who had completed a WIL placement from the Trimesters 1 and 2 2019 were invited to join the study. Participants were informed about the study aims and objectives. A participant information sheet was provided, where the study methodology was clearly explained. We advised participants that the data collected would be de-identified prior to analysis. Further, analysis would not be commenced until after students had completed the course and grades finalised.

DATA ANALYSIS

Each PebblePad™ e-portfolio workbook was downloaded in PDF format. The PDF files were given a unique identifier and names removed. To assist the analysis a database was created using a Microsoft Excel spreadsheet and included demographic details, placement locations and narratives from the PDF files. Each student portfolio was read in detail. The items in the portfolio were discussed by the research team. Coding was approached using the following steps:

1. Questions from the workbook were mapped to the Griffith graduate attributes that the research team identified the questions aligned with and identified in the spreadsheet. See Table 1.

2. Codes applied to narrative data in the spreadsheet were derived from the list of transferable skills that the University aligned to each graduate attribute. See Table 2.

TABLE 1: WORKBOOK STRUCTURE, CODING OF ITEMS TO GRADUATE ATTRIBUTES FOR ANALYSIS

Workbook section	University Graduate Attribute			Questions in the Workbook
Section 1. Instructions				
Section 2. My Placement	Socially responsible and engaged in their communities	Culturally capable when working with First Australians	Effective in culturally diverse and international environments	• Name of workplace, supervisor name, key facts or points of interest, title of project • Dates student read Code of Conduct and completed orientation • Overall summary of WIL placement
Section 3. Navigating the world of work	Knowledgeable and skilled with critical judgement	Socially responsible and engaged in their communities		• Personal SWOT analysis for placement • Plan for addressing weaknesses during placement • Explain your understanding of ethical conduct in the workplace • Professional competencies to be focussed on during placement • Reflections on the challenges in managing yourself on placement.
Section 4. Interacting with people in the work workplace	Effective communicators and collaborators	Culturally capable when working with First Australians	Effective in culturally diverse and international environments	• Reflections on your interactions with people on your WIL placement • Describe an instance where you communicated well to get the work done. • Thinking about your WIL - what are some of the ways you can improve communication to get the job done? • Describe the team you have worked in. Explain your role in the team. • Explain from what you have learnt in your degree how diversity is important in the workplace. Reflect on your placement experience.
Section 5. Getting the work done on placement	Innovative, creative, and entrepreneurial			• Explain how you have used course work, skills, knowledge, or theories gained during your HSM studies. • Initiative and enterprise that contributes to innovative outcomes. • List the technologies used and explain how on placement you learned about new technologies during your placement.

Workbook section	University Graduate Attribute		Questions in the Workbook
Section 6. Career and work development	Knowledgeable and skilled with critical judgement	Innovative, creative and entrepreneurial	• Describe your professional development during WIL • Reflect on your experience during your WIL and explain what future professional development is needed as an emerging health service manager. • Load a new version of your resume based on WIL. • Include a link to your LinkedIn profile in the workbook • Make a list of the transferable skills gained on placement

TABLE 2: CODES APPLIED TO WORKBOOK NARRATIVES

University Graduate Attribute	University Aligned Transferable Skills Codes applied to workbook narratives
Knowledgeable and skilled with critical judgement	Applied Literacies (data literacy, digital literacy, and information literacy) Leadership, continuous learning, and problem solving
Effective communicators and collaborators	Communication and interpersonal skills Teamwork and Collaboration
Effective in culturally diverse and international environments	Global and cross-cultural perspectives
Socially responsible and engaged in their communities	Ethical thought and action
Innovative creative and entrepreneurial	Innovative, creative, and entrepreneurial

RESULTS

Our results are divided into three sections: 1. participant demographics, 2. the university defined transferable skills documented during WIL placement and 3. the acquisition of the university graduate attributes.

Nineteen of twenty-six HSM students (7 males, 12 females) consented to participate in the study. Table 3 shows the breakdown of participant placement locations.

TRANSFERABLE SKILLS OBTAINED ON PLACEMENT

Students were asked to record in the e-portfolio the "transferable skills you have obtained or strengthened during your WIL and an example of how you obtained or strengthened this skill," the most recorded skills were communication, collaboration and teamwork, and career and self-management skills. Table 4 presents the top 5 transferable skills obtained on placement.

TABLE3: PARTICIPANT DEMOGRAPHICS

Placement location	No. participants
Government (e.g. health department)	3
Primary care setting (e.g. general or allied health practice)	4
Private Hospital	3
Public Hospital	7
Not for profit	2
Grand Total	**19**

TABLE 4: TOP 5 UNIVERSITY DEFINED TRANSFERABLE SKILLS OBTAINED DURING WIL.

Transferable Skills	Number of students who reflected on the attainment of the transferable skills during WIL
Communication and interpersonal skills	15
Career and self-management	10
Leadership, continuous learning, and problem solving	8
Teamwork and collaboration	8
Applied literacies: data literacy, digital and information literacy	6

Rarely mentioned as a transferable skill obtained during the WIL placement were ethical thoughts and actions, global and cultural perspectives, respect and capability with First Peoples, citizenship and social responsibility, negotiation and conflict resolution, research, and organizational membership. While these skills were not directly recognized as being obtained by the students in response to the explicit question, their PebblePad™ reflections showed that global and cultural perspectives as well as citizenship and social responsibility, were discussed and reflected upon by the students with statements such as "diversity is the most important part of any workplace. Diversity exists in all forms; Respect everyone irrespective of any diversity" (student 11) and "I see ethical conduct as guiding the performance of my team to provide and improve upon safe and quality healthcare whilst guarding the wellbeing of my peers" (student 7).

Negotiation and conflict resolution skills were demonstrated in the student reflections however perceived as a communication skill. Student 8 stated "Two members of the project team came to me to seek assistance in regards to a team member who they believed was not pulling their weight appropriately; I employed Active Listening Skills and enabled the two members to express their concerns; I communicated to both members the importance of team work, pros and cons of different members and it was up to them to help include all members and be open to strengths and weaknesses of each member".

UNIVERSITY GRADUATE ATTRIBUTES

Reflections from workbooks demonstrating the acquisition of graduate attributes were also analysed as we examined the narratives to identify the transferable skills that underpin them. Exemplar quotations from the reflections are shown in Table 5.

TABLE 5 UNIVERSITY GRADUATE ATTRIBUTES AND TRANSFERABLE SKILLS

Column 1 University Graduate Attribute	Column 2 Transferable Skills	Student reflections – exemplar quotations
Knowledgeable and skilled with critical judgement	Applied Literacies data literacy, digital literacy, and information literacy	I always tried utilizing the creative templates and designs for making reports, posters and documents that attract attention of readers. I always tried proposing more than one options for my supervisor so that she could select the most appropriate one. (Student 3) All the strategies proposed were formulated by me- based on literary evidence, my understanding of the Genomics project and regular inputs on Queensland Genomics' requirements. (student 15)
	Leadership, continuous learning, and problem solving	Working individually on the project and being given an opportunity in making important decisions and suggestions for the project. (student 2) I helped one of the new employees understanding the basic use of Nookal as I saw him struggling with the process. (student 5) As a leader I ensure my team know that our team make up a larger team that are all parts of driving towards a common goal. (student 8)
Effective communicators and collaborators	Communication and interpersonal skills	I discussed with my supervisor about the core needs of this task, what was he actually looking for and what should be done. (Student 4) When I did not understand something, I emailed supervisor and asked for an appointment. The supervisor talked with me and gave me some points. If I didn't understand, she gave me an example until I understood it. I have learned from this: ask questions; be more active. (student 6) Proper communication needs to be done before getting the help of others. If dealt with courtesy and with good oral communication, a lot can be accomplished. (Student 9)
	Teamwork and Collaboration	I believe I work quite effectively in a team - I respectively listen to what others have to say, notice how they contribute and offer my contributions and ideas in a positive and considerate manner. (student 7)

Column 1 University Graduate Attribute	Column 2 Transferable Skills	Student reflections – exemplar quotations
		I worked in a team of quite a few people. Everyone helped me with my project. I asked for help whenever, I needed. And I am happy to say that I received help, whenever I asked for it. (Student 11) My team was very supportive and the understanding between us was good, regularly we communicated through emails, message, or call. I used to discuss my ideas and take feedback on it. (student 14)
Effective in culturally diverse and international environments	Global and cross-cultural perspectives	Diversity in the workplace gives an opportunity to learn and understand different cultures and taught me how to deal with people from diverse groups. (student 2) Working in a group or team where there are people who belong to different cultures, backgrounds, and ethnicity, is a completely different and pleasant experience that help you learn about different cultures. Gaining new knowledge and interesting histories of different cultures. I have learned that respecting every person regardless of their background and culture is important. (student 4)
Socially responsible and engaged in their communities	Ethical thought and action	Before starting surveys in Metro North area, my supervisor and I checked the Code of Ethics to make sure that the vulnerable population groups are approached appropriately, and their rights and dignity are maintained during survey activities. (student 14) As maintaining confidentiality, I did not leave any information on the computer that I have been using at the library. I have always checked and deleted every information I have downloaded and used from the computer at the end of each day. (student 16)
Innovative creative and entrepreneurial	Innovative, creative, and entrepreneurial	I always tried utilizing the creative templates and designs for making reports, posters and documents that attract attention of readers. I always tried proposing more than one options for my supervisor so that she could select the most appropriate one. (Student 3) One of an amazing opportunity was encountered by me. After I completed my portal design, I needed someone to test it. During that period two new recruits were being hired so I took permission from my workplace supervisor to take their help to test my portal. (student 5)

TRANSFERABLE SKILLS DEMONSTRATED IN STUDENT REFLECTIONS

Students reflected that communication and interpersonal skills; career and self-management; leadership, continuous learning, and problem solving; teamwork and collaboration and applied literacies: data literacy, digital and information literacy were acquired on placement.

Some transferable skills were not widely recorded in student reflections. These were ethical thoughts and actions, respect and capability with First Peoples, citizenship and social responsibility, negotiation and conflict resolution, research and organizational membership.

COMMUNICATION

Most students (15/19) talked about the benefits of acquiring both written and oral communication skills and becoming comfortable raising issues and ideas with their supervisor and communicating with colleagues to achieve outcomes. These future health service managers noted their weaknesses in communicating as part of their personality such as being reserved or shy with one student stating "Having an introvert (ed) personality makes me feel shy sometimes. I just want a quiet and safe corner where nobody could see me while working" (student 3). This can lead to "difficulty in asking questions" (student 17), "lack of confidence in presentation and public speaking" (student 16) and "difficulty in initiating conversations" (student 15). By attaining, practicing, and improving their communication skills through their WIL placements and being placed in certain situations improvement in communication skills was noted. Students stated that their WIL experience "helped in overcoming the fear of the audience" (student 2) and to "overcome weaknesses by stepping out of my comfort-zone" (student 10). Others expressed how their communication skills helped overcome weaknesses in other areas, "being an international student, there is an increased level of difficulty and effort to adapt to a new country and work culture. I was able to overcome this by displaying my interest in understanding and adapting to a new culture and striking (up) conversations with people to understand their likes and dislikes." (student 1).

TEAMWORK AND COLLABORATION

The WIL placement further enhanced student understanding of teamwork and collaboration and how it can build new skills and impact outcomes. With students stating that during their WIL placement they experienced the "most inspiring thing of teamwork that I have witnessed" (student 3) and that "teamwork promotes ideas of shared vision and leadership attributes in all team members which I have actually (now) experienced" (student 4).

While most of the students (18/19) reflected upon teamwork and collaboration during WIL positively, one reflection stated, "I didn't consider myself as a team member during my WIL" and that "working together or in close proximity with others does not necessarily mean that you are in a team" (student 9).

LEADERSHIP, CONTINUOUS LEARNING, AND PROBLEM SOLVING

Working in project management roles, students could demonstrate or develop their leadership and problem-solving skills and reflected that the placement had "changed my perception on preparation" (student 1). Others stated, "learning that I needed to be flexible and adaptable" and that "being over-prepared to take advantage of opportunities, these problems were (able to be) overcome".

CAREER AND SELF-MANAGEMENT

The students who reflected on this skill in their e-portfolios focused primarily on project and time management. Punctuality was a common theme with multiple students considering it a challenge to overcome and a personal point for improvement. Exemplified in this quote

"I was always punctual if due to some reason I was late I would always inform my supervisor. (and) being dependable I was asked to open the clinic" (student 5).

GLOBAL AND CROSS-CULTURAL PERSPECTIVES

Many of the students (15/19) described their experience of diversity in the workplace as "working with people from different cultures" (student 3), "working with people from different countries" (student 6) or "interacting with people from different backgrounds" (student 12). Student 19 explains how his experience during WIL placement gave him a better appreciation of diversity "One scenario happened when I was practicing at the hospital is about language. There are many patients from many countries coming to the hospital. One patient who can only speak Spanish (was) admitted to the hospital, but there is no Spanish translator available at the hospital. Therefore, the administration manager sent emails to all staff to ask for help if anyone can speak Spanish. Luckily, one staff can speak Spanish and was able to help for translation. This shows that the diversity can help the hospital to increase the quality of care."

CULTURALLY CAPABLE WHEN WORKING WITH FIRST AUSTRALIANS

This university attribute and associated skill of 'respect and capability with First People,' was a clear deficiency in student reflections. We observed that unless the student had direct engagement or attended a placement for an organization that worked with the Indigenous community, the PebblePad™ workbook reflections in this sample rarely mentioned how they embodied respect and capability for

First People during their placements. Despite the availability of a specific learning module available to students to prepare them and improve cultural competency students did not evidence this achievement in their reflections. The workbook asked students to reflect on diversity and cultural competence but did not contain a specific question regarding Indigenous people and this is a learning for future versions.

ETHICAL THOUGHT AND ACTION

Students were asked in their Pebblepad™ Workbooks to explain their understanding of ethical conduct in the workplace and evidence their workplace Code of Conduct. Student reflections on ethics were generalised with reflections such as "it is important to be respectful" (student 1), "doing what is morally right" (student 8) or "adhering to professional standards and the code of conduct" (student 12). Most students (13/19) used confidentiality as an example to explain ethical conduct in the workplace but rarely explained how they have applied or practiced this or the complex issues that may arise in relation to confidentiality. Reflections painted the concept of confidentiality with descriptions such as the "ethical obligation to protect all private and confidential information of patients and staff and refrain from any data or information breach issues" (student 4) or related them to the legal implications of confidentiality "patients medical information should be kept confidential, disclosing the information without their permission is not only unethical but also a crime." (student 5) or "violating a patient's confidentiality can hurt the patient and have legal an ethical consequence" (student 6).

Some student reflections gave deeper understanding of ethical behaviour in the workplace by sharing individual experiences. Student 9 shares "my personal experience of an ethical issue carried out a study on the completion of orientation modules by locums. Apart from at work I met some of the locums at social occasions or at the student accommodation center. As a part of the study, I had to check whether they had undergone the orientation modules, as necessary. When I met some of the locums, I knew that they have not completed their orientation. But during interviews they were quite confident that they had completed their modules. In these instances, I often wondered should I tell them about it or not? If I tell them, they might go back and do some of the modules. But on the other hand, it can jeopardize my personal relationship with them. If I do not tell them, I would be risking the lives of patients. This always led to an ethical dilemma."

When reflecting on diversity and ethics, the experience of the students was generally positive and they explained how they adapted to the cultural and other differences in the Australian workplace and students described the practical methods they used for example, "being an international student, there is an increased level of difficulty and effort to adapt to a new country and work culture. I was able to overcome this by displaying my interest in understanding and adapting to the new culture and striking conversations to understand their likes and dislikes" (student 1).

DISCUSSION

We applied a novel approach to utilize reflections collected in an e-portfolio to understand the transferable skills and university graduate attributes acquired by HSM students on WIL placements.

LINKING GRADUATE ATTRIBUTES AND TRANSFERABLE SKILLS

The university aspires to produce graduates of influence with demonstrable attributes equipped with transferable skills for the 21st century [15]. We also know that graduates will have multiple careers and opportunities in the future and professionals will be lifelong learners, developing new skills and attributes in line with changing requirements in the labour market.

Transferable skills serve as the foundation for graduate attributes and orienting students to reflection, clearly representing its' benefits and explaining how skills and attributes are linked will enable the student to demonstrate their ability in the corresponding graduate attribute. Students' own self and professional management will lead to further growth and development.

THE REFLECTIVE E-PORTFOLIO

Transformative learning on placement can occur when opportunities to learn, to apply learning to solve problems, authentic assessment and reflection, projects that develop student capabilities, supervisor and team support and an enabling environment are provided [24]. The benefits of WIL and experiences obtained during placement can depend on the ability and degree to which students reflect on them [25]. Reflection also takes 'time, effort and discipline' [26] .In our study there were two factors observed that constrained the quality and comprehensiveness of student reflections. Firstly, that the e-portfolio is used as a piece of assessment. The focus of students may not be on

reflection per se and learning from that reflective process but the application of their known techniques to obtain the highest grade possible [27]. This leads students to answer the question as opposed to reflecting on the question and restricts the student from obtaining the full benefits of the reflective process through the process of deeper insights and understanding [26]. The second limitation lies in the skills and understanding of the role of reflection as emerging health service management professionals. Despite, the e-portfolio being significantly weighted to encourage student effort and enthusiasm towards this assessment item, reflective practice can appear irrelevant to students when contrasted with other more typical academic items and consequently, not taken seriously [28]. This can lead to students treating the reflection as a "tick-box" exercise [29,30]. This "tick-box" approach was seen in at least one section of the workbooks studied, where students provided closed responses or objective answers to questions as opposed to personalized reflections.

Reflection is also an important skill for emerging professionals. The professional college for health service managers, the Australasian College of Health Service Managers articulates that its members demonstrate a 'commitment to self-development including continuing education, networking, reflection and personal improvement' as a core competency [31]. We have identified that the quality and depth of reflections limited our analysis.

THE NON-LINEAR CURRICULUM

The 'University' as part of the Learning and Teaching Framework, organizes programs to optimize student access, flexibility, and choice [19]. For the students of HSM degrees this means that there is not a linear sequence of typical courses studied and no one graduate will follow the same structure or combination of courses. Core courses are specified, there are few courses with pre-requisites so that students can study courses in ways that reflect their interests, work, and other commitments. This flexible approach has many advantages however complicates the challenge of integrating and developing reflection skills. Spiral and traditional curriculums can support reflective skills development in a program [32,33]. We have learned from analysing reflections that building reflective skills and assessing these across the whole of curriculum is important. In the University's HSM non-linear curriculum innovative approaches to ensure that we can develop these skills is imperative, so when students reach the capstone WIL course, they have the requisite skills in, and value reflection. Reflective skills can be developed by incorporating further structured reflective activities and assessments throughout the curriculum to embed continuous reflection in the learning process. Refinement of the wording for some questions and explanations in the Pebblepad™ workbook may also capture and promote deeper student reflections. Embedding in assessment an expectation that students attain and evidence a smaller prioritised set of skills and reflecting this in the marking criteria may drive greater compliance and focus [34].

CONCLUSION

Our study has demonstrated an e-portfolio tool such as a structured Pebblepad™ workbook, can evidence the attainment of graduate attributes and transferable skills. While on placement HSM students demonstrated in their reflections that they have acquired or strengthened important transferable skills. This study also revealed that there were some key attributes and skills that were not documented in student workbooks. Some student reflections were incomplete and that they may have undervalued the importance of reflection and its role in learning, informing personal development and developing resilience. Understanding student reflective abilities can help to guide the further development of the curriculum and to reinforce the value of reflection and its application for future growth, personal and professional development [34].

LIMITATIONS OF RESEARCH

The research is limited by factors such as the depth of student reflections, that reflection was linked to assessment, individual differences and the student learning experiences on placement. Closed responses to questions, rather than a more detailed account limited student reflections on key skills they attained. While we consider that the number of participants in this study allowed us to understand the skills acquisition for health service management students in the 2019 cohort, the experiences and reflections of students could be influenced by the project's students completed, opportunities provided to students by their supervisors and other factors.

FURTHER RESEARCH

We have analysed student reflections focussing on transferable skills. Further research on the use of reflective e-portfolios to understand how student learning aligns to achievement of transferable skills is needed. Research that further informs the design and content of e-portfolios to

demonstrate the skills attained during placement will contribute to the body of knowledge and further substantiate the impact of WIL.

CONFLICTS OF INTEREST

There are no known conflicts of interest associated with this publication. In conducting this study, we have not received any significant financial support that could have influenced the outcomes.

AUTHORS CONTRIBUTION

SL was the Chief Investigator for the study. SL designed the study. Literature searches were conducted by SL, MV and JS. Analysis was conducted by JS, MV and SL. JS, SL and MV completed the first draft, edited by all. All authors contributed to the intellectual input and edited emerging drafts. All authors agree on the final version of the article.

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RESEARCH ARTICLE

'LEARNING THE ROPES' IN A PSYCHOLOGICALLY SAFE HEALTHCARE ENVIRONMENT

Lishin Moothery Joshy

SCMS Cochin School of Business, Kerala, India.

Correspondence: lishinjoshy@gmail.com

ABSTRACT

OBJECTIVES

The main objective of the study is to examine the associations between organizational socialization, psychological safety and job involvement of newly hired nursing professionals in India through the lens of 'Conservation of resources theory'. The study also explored psychological safety as a mechanism linking organizational socialization and job involvement.

DESIGN/METHODOLOGY

Data was collected from 286 Indian nursing professionals who recently joined their respective organizations. The cross-sectional data was analyzed using IBM SPSS and POCESS macro model 4.

OUTCOMES

The results reveal that organizational socialization is positively associated with nursing professionals' job involvement, and that this relationship is mediated by feelings of psychological safety.

CONCLUSIONS

Healthcare organizations can translate the findings into organizational advantages by institutionalizing organizational socialization and thereby increasing job involvement. It was identified that nursing professionals who have undergone organizational socialization processes experience psychological safety, and that it is the latter that is the link between organizational socialization and job-involvement.

KEYWORDS

organizational socialization, psychological safety, job involvement, cor theory, newly hired nurses

INTRODUCTION

India is a country in which great prestige is attached to the profession of doctors; however, nurses are taken for granted, and there is a stigma attached to the profession itself. Such prejudices from the general public and from within the healthcare profession trigger the migration of nurses to foreign countries, and consequently India is facing a dearth of competent nurses [1]. Against the WHO prescribed ratio of 44.5 skilled health professionals per 10,000, there are only 8.3 and 17.4 doctors and nurse/midwives respectively per 10,000 persons in India [2]. The turnover rate in the health care sector in India is high [2]. Indian nurses, it is believed, work more enthusiastically in other countries than they do in India [1]. Thus, it is imperative that steps are taken to improve the job

involvement of nurses in the country. Through this paper, the researcher aims to test whether organizational socialization plays a role in deciding the level of job involvement of nurses, which if confirmed, will have several practical implications for the nursing profession.

Organizational socialization (OS) is the process through which newcomers learn how to function effectively in the workplace following their entry into the organization [3, 4]. OS speeds up the transition of the newcomer from an outsider to an insider [5]. Socialization of nurses in the new organization is more important than prior work experiences [6]. Organizational socialization pertains to the ways in which the experiences of individuals in transition from one role to another are structured for them by others in the organization [4].

Newcomers adapt easily in the early days of their socialization, and early adjustment leads to lasting influences and quantifiable outcomes [7]. An organization's reluctance in intervening in the newcomer OS process has severe negative consequences such as job dissatisfaction, disengagement [8], prohibitive voice-behaviour and turnover [9]. In the healthcare sector, the expectation from graduates is that they should "hit the ground running" and perform at peak levels from the beginning of their careers [6], and that they should evaluate and handle situations which they are not prepared for [10]. If they fall short, it can lead to several consequences for hospitals. These may include increased workload for existing staff as they may need to provide additional support and training, decreased efficiency and productivity [9], potential patient care errors or lapses in quality, and heightened levels of stress and burnout among both new and existing staff. Additionally, it may impact patient satisfaction and overall organizational performance [6]. Therefore, addressing the challenges faced by new nurses in acclimating to their roles is crucial for maintaining operational effectiveness and ensuring high-quality care delivery within hospitals.

The transition from college to a workplace, and from one workplace to another is not a seamless process, and it takes time and effort to blend-in and to rise to expectations [11]. This is truer in the case of nurses, because theirs is essentially a team job, and hence, along with individual brilliance they need to have desirable personality traits and should be able to adjust to the established formal and informal practices of the hospital [12]. Their perceptions about their own job role, shaped by what they learned from academic institutions [10], and for experienced nurses, by their experiences at their former workplaces, may or may not be accurate, given that expectations from employers, supervisors and colleagues are likely to vary from hospital to hospital [9].

Social systems that are consistent and predictable offer higher levels of psychological safety [10], but many healthcare settings are hardly consistent or predictable. Psychological safety (PS) was defined by Kahn as "feeling able to show and employ one's self without fear of negative consequences to self-image, status or career" [13]. There are several studies that looked at the effect of effective socialization on social integration [7], newcomers' adjustment [4], person-job fit [8], learning–feedback seeking behaviors [14], work engagement [13], work satisfaction, patient's wellbeing [15], high morale, self-authorship [16], feeling of being valued [10], and turnover [9]. This research is one of the first that investigates the effect of socialization on job involvement among nursing staff. Job involvement (JI) is the extent to which employees psychologically identify with their work. Further, previous researchers have not used the concept of psychological safety to link organizational socialization with the above-mentioned employee outcomes. Nor have they used the Conservation of Resources theory (COR theory) to provide theoretical support to the arguments. COR theory is a motivational theory that tries to explain human behavior based on a primitive need to acquire and conserve resources for survival. Hobfoll [17] defined resources as 'those objects, personal characteristics, conditions or energies that are valued by the individual'.

Based on the above premises this paper aims to answer these research questions:
RQ1: How does organizational socialization affect the job involvement of newly hired Indian nursing professionals?
RQ2: What is the role of psychological safety in explaining the relationship between organizational socialization (OS) and job involvement (JI)?

Answers to the above research questions have the potential to provide valuable insights for healthcare organizations which are trying to enhance nurses' retention. Also, considering the high levels of stress reported among Indian nurses [1], identifying factors that contribute to their job involvement can help in promoting a supportive work environment and in ensuring delivery of high-quality patient care. Given the hierarchical culture prevalent in India's healthcare system [1,2], there is a need for studies that

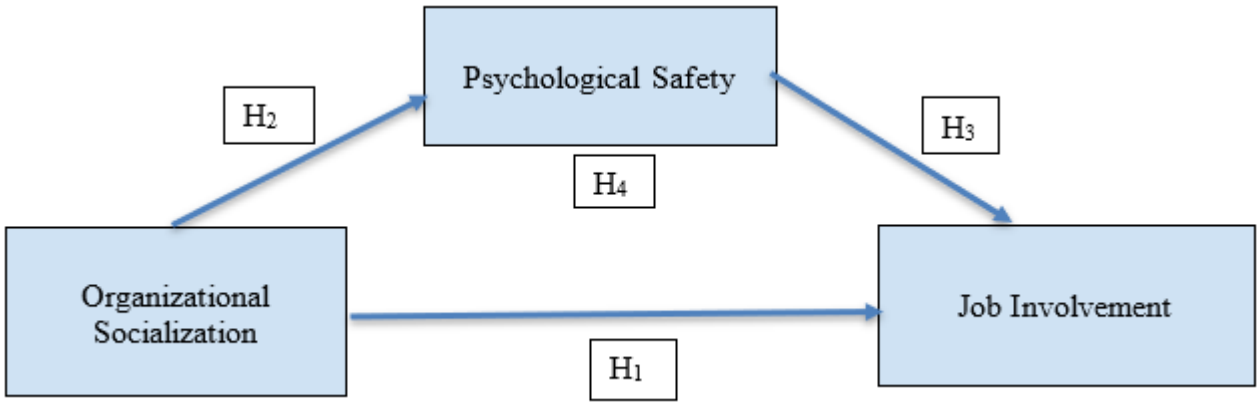
explore the mediating role of psychological safety in this relationship within the Indian nursing context. Finally, the researcher aims to contribute to the broader literature on organizational behavior and human resource management in healthcare settings, thereby enriching theoretical frameworks and informing practical interventions.

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

There exists a status hierarchy within hospitals which is an impediment to free interactions between members of different cadres, and the new recruits in 'low status' jobs (for example nurses or para-medical staff, when compared to physicians or surgeons) are likely to be affected more [9]. Organizational socialization alone cannot make the barriers disappear, but it is likely to help newly hired nurses to start functioning efficiently [14].

According to Hobfoll [17], psychological strain, typically, is not a result of demands outstripping resources at the disposal of an individual, although that too is a possibility. But more frequently, it is experienced when there is a threat of depletion of resources, since according to COR theory, individuals have a fundamental inclination to obtain, retain and protect that which they value, which are nothing but what we call 'resources' [17]. The resources can be objects like a laptop, conditions like job security, personal aspects like self-esteem, or energies like credit, money, favors etc. [18]. Even when a new nursing recruit has the necessary skills related to the healthcare domain in general, it is almost impossible to translate them immediately into the required output from the first day at the new workplace [9]. It is essential for the nurses to align themselves to the ways of working in the organization [12] and to embed themselves into the organizational culture [6], which is no easy task except perhaps when viewed using hindsight. Till this time-consuming process is completed, the employee is under threat of a damaging loss of their existing resources like self-esteem and respectability and more tangible ones like job-security [18].

FIGURE 1 CONCEPTUAL MODEL



ORGANIZATIONAL SOCIALIZATION AND JOB INVOLVEMENT

Organizational socialization has been found to be related to outcomes like citizenship behaviors [14], work engagement [13], job satisfaction, organizational commitment, job performance and turnover [6]. Those who undergo a successful socialization process during their early days in an organization are likely to gain enhanced skills for adjustment in the long term as well [3]. Moreover, when socialization is undertaken through a well-structured process [9], organizations are able to easily transfer information from existing employees to the new ones, so as to preserve the goals, values, norms, and principles of the organization [15, 20]. The resultant increase in intrinsic/extrinsic motivation has the potential to improve job satisfaction [21]. Previous research has shown that higher levels of social contact at the workplace leads to higher involvement, although they stopped short of proposing an explanatory mechanism [13]. Socialization activities will certainly open avenues for social contacts [15], and this too suggests that organizational socialization can lead to higher job involvement.

***H1**: Organizational socialization will be positively related to newcomers' job involvement.*

ORGANIZATIONAL SOCIALIZATION AND PSYCHOLOGICAL SAFETY

Interpersonal risk is certain to be a concern wherever there is uncertainty and change, and psychological safety is mainly related to eliminating or reducing such risks [22, 23]. The researcher proposes that socialization, by means of helping in acquiring an in-depth awareness about the organization in general, and about the job role in particular [9], will improve the psychological safety levels of nurses. The quantity and quality of entry training have been found to be related to lower anxiety [22]. A good socialization process is likely to have similar effects [3].

***H2**: Organizational socialization will be positively related to newcomers' psychological safety.*

PSYCHOLOGICAL SAFETY AND JOB INVOLVEMENT

Psychological safety is particularly important within complex and high stakes work environments like hospitals [24]. When an individual perceives that he or she is psychologically safe, he or she is more likely to exhibit positive behaviors like innovative behavior [19], job crafting [25], and risk-taking behavior [21]. Job involvement which is a type of attitude towards work [25] too is hence likely to be affected by psychological safety levels. Based on these premises, the researcher hypothesizes that

***H3**: Psychological safety is positively associated with newcomers' job involvement.*

MEDIATING ROLE OF PSYCHOLOGICAL SAFETY IN THE RELATIONSHIP BETWEEN ORGANIZATIONAL SOCIALIZATION AND JOB INVOLVEMENT

Psychological safety refers to how individuals perceive the potential outcomes of taking interpersonal risks within their work environment [23]. This definition focuses on perception, rather than on an objective reality, and emphasizes the significance of recognizing the lowering of interpersonal risk level [23, 24]. It is a major explanation mechanism for how positive contextual resources influence different outcomes at the workplace [24]. Based on the integrated model of job involvement [26], the researcher believes that psychological safety might be the social-psychological link variable that operates between organizational socialization and job involvement. In line with COR theory, organizational socialization can enhance the resources at the disposal of employees [18] and provide a safe environment that nudges them to express themselves quite freely [22] and thus is likely to have a positive effect on their job involvement.

***H4:** The relationship between organizational socialization and job involvement is mediated by newcomers' feeling of psychological safety.*

METHODOLOGY

ETHICAL CONSIDERATIONS

This study was approved by the Ethics Committee of the institution the author is affiliated to (Protocol number of the ethical approval - SCMS/65/23/0094 dated 01/07/2023 issued at Cochin, Kerala).

The objectives of the study were explained to all participants by the researcher, and assurance was provided that all information provided by them would be treated confidentially. Cross-sectional design was used for this study.

India's health-care system consists of public and private health-care service providers, with the former focusing mostly on rural areas and the latter on urban India. The sample for this study consisted of staff-nurses employed with five hospitals located in two South Indian cities, Kochi and Chennai. They had less than 6 months of service with their present organizations. The researcher contacted the nursing superintendents of the respective hospitals, sought support for distributing the questionnaires, and had face to face interactions with potential participants to explain the purpose of the study and to obtain informed consent. 500 questionnaires (sample questions of which have been mentioned below against each construct) were distributed between July 2023 and October 2023, from which 286 fully filled up and usable responses were received back. The researcher used quantitative methods on the data collected. In this study, both descriptive (mean, standard deviation, frequency analysis) and inferential (factor analysis, mediation analysis) statistics have been utilized. Factor analysis was used to draw inferences about the underlying structure of the dataset. IBM SPSS PROCESS Macro model 4 was used to undertake mediation analysis to understand the underlying mechanism by which the independent variable i.e. organizational socialization influences the dependent variable, job involvement through the proposed mediator variable, psychological safety, thus providing insights into the underlying causal mechanisms.

ORGANIZATIONAL SOCIALIZATION

Organizational socialization was measured using an 18-item scale of demonstrated validity and reliability developed by Chao et.al. (1994) [27]. Six dimensions of socialization - performance proficiency, language, organizational goals/values, politics, people, and history [27] were used to ascertain socialization levels of the healthcare professionals. Items included "I know the organization's long-held traditions" and "I have learned how things really work on the inside of this organization". The respondents were requested to evaluate the items on a five-point Likert scale. Cronbach **α** was .89 for organizational socialization.

PSYCHOLOGICAL SAFETY

An adapted version of Edmondson's [24] Psychological Safety Scale (2018) has been used in this study. Examples for the items were "It is safe to take a risk in this organization" and "No one in this organization would deliberately act in a way that undermines my efforts". Cronbach **α** was .72 for psychological safety.

JOB INVOLVEMENT

An adapted version of the Lodahl and Kejnar [26] Job Involvement scale was used in this study. Some of the items were "I'll stay overtime to finish a job, even if I'm not paid for it" and "The major satisfaction in my life comes from my job". Cronbach **α** was .83 for job involvement.

RESULTS

Table 1 contains the demographic details of the respondents. Respondents had the following characteristics: - gender: female (72.4%) and male (27.6%); age: below 25 years (64.3%), between 25 and 35 years (27.6%), between 35 and 45 years (7.7%) and above 45 years (0.4%).

Results of the measurement model are depicted in Table 2. Composite reliability (CR) and the variance extracted were used to assess convergent validity [29]. In this study, the CR, which ranges from 0.71 to 0.89, exceeded the recommended minimum level of 0.7 [30]. Since Cronbach's alpha coefficient is above 0.70, the reliability of the scales was established. The Average Variance Extracted (AVE) was in the range of 0.55 to 0.65, meeting the recommended minimum level of 0.5 [31].

TABLE 1: DEMOGRAPHIC VARIABLES

S.No.	Variable	Characteristics	Frequency	Percent
1	Sex	Male	79	27.6 %
		Female	207	72.4%
2	Age	Below 25	184	64.3%
		25-35	79	27.6%
		35-45	22	7.7%
		45 and above	1	0.4%

TABLE 2: MEASUREMENT QUALITY INDICATORS

Latent constructs	No. of items	Average variance extracted	Composite reliability	Cronbach's a
Organizational Socialization	18	0.55	.89	.89
Psychological Safety	3	0.63	.71	.72
Job Involvement	5	0.64	.84	.83

CONVERGENT VALIDITY AND DISCRIMINANT VALIDITY

Exploratory Factor Analysis (EFA) was utilized to condense data by identifying common underlying factors or dimensions, as well as to evaluate discriminant validity. Principal Component Analysis (PCA) with varimax rotation was employed for this purpose. All items loaded significantly on their respective factors, indicating distinct and interpretable factors for organizational socialization, psychological safety, and job involvement. Factor loadings, presented in Table 3, demonstrated standardized

values exceeding 0.5, signifying convergent validity. Moreover, the square root of the average variance extracted (AVE) surpassed correlation estimates for all components, affirming discriminant validity. Consequently, the validity findings (as depicted in Table 4) were found to be satisfactory.

The model's goodness-of-fit was assessed through both absolute and relative indices. Absolute indices, including the goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and comparative fit index (CFI), were all greater than 0.90. Additionally, the root mean square error of approximation (RMSEA) value was below 0.08, indicating an acceptable fit. NFI exceeded 0.90, implying a good fit as per conventional standards. It can be seen from Table 5 that the model fit, as per the computed fit indices, is excellent for the dataset. The array of indices regarding overall model goodness-of-fit lends ample support for accepting the hypothesized research model [31].

TABLE 3: RESULTS OF FACTOR ANALYSIS

Constructs	Items	Factors							
		1	2	3	4	5	5	6	7
OS- Performance proficiency					.			.	
	OS1	**.568**	.286	.233	.403	.286	.164	065	.267
	OS2	**.612**	.188	.464	.358	.168	.145	-.110	.216
	OS3	**.724**	.358	.508	.258	.328	.015	-.003	.233
OS-Language	OS4	.321	**.538**	.469	-.129	.138	.095	.163	.092
	OS5	.143	**.515**	.389	.084	.015	.041	.378	.107
	OS6	.079	**.506**	.485	.232	.206	.014	.086	.127
OS-Organizational Values	OS7	.152	.010	**.702**	.045	.010	.196	.171	.136
	OS8	.058	.165	**.582**	.313	.165	.017	.195	.047
	OS9	**.**123	-.015	**.696**	.191	-.015	.220	.009	.154
OS- Politics	OS10	.321	.124	.321	**.530**	.124	.195	.146	.123
	OS11	.198	.193	.198	**.635**	.193	.219	.120	.143
	OS12	.144	.156	.144	**.775**	.156	.123	.180	.079
OS- People	OS13	.109	.325	.109	.149	**.583**	.092	.262	.152
	OS14	.015	.108	.015	.164	**.608**	.316	-.030	.058
	OS15	.308	.252	-.023	.308	**.652**	.215	.017	.143
OS-History	OS16	.108	.273	.213	.128	.273	**.690**	.151	.093
	OS17	.191	.221	.090	.191	.221	**.723**	.128	.117
	OS18	.178	.066	.193	.188	.026	**.737**	.144	.201
PS-Psychological Safety	PS1	.227	.105	.028	.217	.125	.030	**.666**	.226
	PS2	.079	.113	.042	.179	.114	.163	**.803**	.092
	PS3	.083	.080	.231	.053	.086	.183	**.698**	.224
JI-Job Involvement	JI1	.180	.136	.038	.180	.136	.135	.240	**.617**
	JI2	.121	.197	.117	.121	.197	-.038	.101	**.783**
	JI3	.268	.130	.113	.208	.130	.061	.110	**.765**
	JI4	-.111	.044	.211	-.111	.044	.194	.040	**.764**
	JI5	.133	.016	.141	.133	.016	.151	.185	**.737**

The bold values indicate the factor loadings.

TABLE 4: DISCRIMINANT VALIDITY

Construct	M	SD	Organizational Socialisation	Psychological Safety	Job Involvement
Age	26.12	11.3			
Gender	0.56	0.42			
Organizational Socialisation	3.23	0.81	**0.751**		
Psychological Safety	2.84	0.48	0.32**	**0.862**	
Job involvement	3.31	0.38	0.33**	0.19**	**0.821**

The bold values represent the square root of AVE value, while other values represent the correlation between items.

TABLE 5: FIT INDICES

CMIN/DF	χ2	SRMR	GFI	AGFI	RMSEA	NFI	IFI	TLI	CFI
1.762	118.253	0.042	0.92	.90	0.06	.927	.965	.946	.926

As illustrated in Table 6, the mediation analysis results showed a significant direct and indirect effect of newly joined nurses' organizational socialization (OS) on the outcome variable, job involvement (JI) through psychological safety (PS). Specifically, organizational socialization was positively associated with psychological safety (β=0.48, SE=0.05, p < 0.001), and with job involvement (β = 0.40, SE = 0.03, p < 0.001) and psychological safety was significantly related to job involvement (β=0.24, SE=0.07, p < 0.001). So, hypotheses one, two and three are supported.

The association between organizational socialization and the outcome variable remained significant after controlling for psychological safety, indicating that psychological safety only partially mediated the effect of organizational socialization on job involvement (β = 0.18, p < 0.01, CI [0.05 - 0.20]). So, hypothesis four was also supported.

TABLE 6: ILLUSTRATES THAT THE FINDINGS SUBSTANTIATE ALL THE HYPOTHESES

	Relationship (Structural Path)	Standardized path coefficient (Standardized Regression Weight)	Comments
H1	OS ⟹ JI **(Standardized Direct Effect)**	(β = 0.40, SE = 0.03, *p* < 0.001)	Supported
H2	OS ⟹ PS	(β =0.48, SE=0.05, *p* < 0.001)	Supported
H3	PS ⟹ JI	(β =0.24, SE=0.07, *p* < 0.001)	Supported
H4	OS ⟹ PS ⟹ JI **(Standardized Indirect Effect)**	(β = 0.18, p < 0.01, CI [0.05 - 0.20])	Supported

DISCUSSION

Various researchers have identified that indicators of organizational socialization (OS) correlate positively with desirable outcomes and negatively with undesirable outcomes for both the new employee and the organization. For instance, [3,6,7,8] have demonstrated these relationships through their research. The results of the current study show that organizational socialization is positively related to job involvement, and that this relationship is mediated by psychological safety. Prior research has identified that interventions can improve psychological safety [22, 23]. When healthcare organizations have a climate of continuous improvement, it supports the development of psychological safety and

encourages staff to become more involved in their job [22, 23, 24]. Implementing a stable organizational socialization process aids in fostering interpersonal relationships and psychological safety in health care teams. Organizational socialization process provides trust and emotional support for nurses [33] and provides the much-needed psychological safety which helps them to engage in open and effective communication with co-workers and to overcome work-related problems [34], thus enhancing job involvement. Thus, organizational socialization motivates new hires to work effectively. Prevalence of feelings of psychological safety among nurses may help them to feel a sense of belonging and attachment to the new workplace.

THEORETICAL AND PRACTICAL IMPLICATIONS

Utilizing the COR theory, the researcher introduced a novel model that examines the joint effect of organizational socialization and psychological safety on job involvement, thus providing a coherent theoretical model. This extends the theory by demonstrating that contextual resources such as organizational socialization play a role in work outcomes like job involvement through its positive influence on personal resources like psychological safety. Prior researchers had examined the effects of psychological safety in contexts where employees were firmly established within their organizations [33], whereas this research focuses on new hires in an eastern cultural context. Similar research can be conducted among new employees in other sectors as well, to see whether the relationships hold across the board. It would be interesting to explore whether Conservation of Resources Theory can be used to explain, at least partially, other similar results from Organizational Behaviour research as well.

There is so much at risk in the healthcare industry if new recruits fail to learn. It is literally a matter of life and death for the most important stakeholders concerned, i.e., patients [24]. The teams that deliver healthcare are cross-functional in nature, which pushes collaborative spirit and teamwork into the forefront of desirable attributes [15]. Inter-dependence is very prominent among workers in this field. According to previous research, more than 70% of errors are connected with interactions within the health care delivery team [34].

It is only when the employees' gel together as a team that synergies begin to evolve [33]. When they succeed as a team, the individual members benefit too, by way of improved job involvement among other desirable employee outcomes. It is in the interest of the employer to effectively facilitate the socialization process, thereby empowering the new recruits to perform effectively both at an individual level, and as part of a team [15]. The consequent increase in job involvement will further push the employee from within to perform even better and the resultant virtuous cycle becomes beneficial for all stakeholders concerned.

Healthcare organizations can use this result as a lever for increasing job involvement by formalizing a structure for organizational socialization. Towards this end, they can try the following steps:

Hospitals can develop and document a structured onboarding program tailored to nursing staff. Orientation sessions could cover hospital policies, procedures, safety protocols, and the nursing department's specific roles and responsibilities. Each newly hired nurse can be paired with an experienced mentor who can provide guidance, support, and hands-on training during the initial period of employment. It would be worthwhile to provide clear expectations and goals by openly communicating performance expectations, goals, and milestones for the new nurse's probationary period. Social integration can be facilitated by organizing social activities and events to help newly hired nurses integrate into the hospital's culture and build relationships with colleagues. This could include welcome lunches, team-building exercises, or networking events that encourage interaction and camaraderie among staff members. Most importantly, channels should be established for new nurses to provide feedback on their onboarding experience and identify any areas for improvement. This would help in evaluating the effectiveness of the onboarding process periodically to identify areas for refinement and improvement, and in promptly acting on the findings.

CONCLUSION

Healthcare organizations can translate the findings into organizational advantages by institutionalizing organizational socialization and thereby increasing job involvement. It was also identified that nursing professionals who have undergone organizational socialization processes experience psychological safety, and that it is the latter that is the link between organizational socialization and job-involvement. Integrating newly hired nurses into the organizational fabric through socialization,

especially during induction, not only fosters their feeling of psychological safety but also improves the efficiency of HR management processes, consequently influencing the involvement of nursing professionals in their roles.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The fact that the measures were self-reported opens the possibility of response biases. The collection of data from a single source i.e. nursing professionals, has the potential to result in common method bias. However, Harman's single factor test revealed that only 36.65% of variance was attributable to a single factor. Values less than 40% are considered acceptable [35]. In future, researchers can collect information about job involvement from supervisors, to further reduce the possibility of common method bias. Future researchers can collect information about national cultural dimension of uncertainty avoidance, and can try to use the same as a moderating variable in the proposed relationship. Future studies can validate the results in different cultural and industrial contexts and use experimental and longitudinal designs to explore the causality of the relationship. Various mechanisms (like goal orientation) through which OS impacts other outcomes of socialization (like performance) also has the potential to be the subject of future research.

ABBREVIATIONS:

Organizational Socialization (OS),
Psychological Safety (PS),
Job Involvement (JI),
Conservation of Resources Theory - COR theory

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RESEARCH ARTICLE

DEVELOPMENT OF A RESOURCE MANAGEMENT CURRICULUM FOR INTERMEDIATE CARE IN A COMMUNITY IN HEALTH REGION 1 (THAILAND)

Chollada Sorasak[1], Worayuth Nak-Ai[2]*

1. Intercountry Centre for Oral Health, Chiang Mai, 50000, Thailand
2. Sirindhorn College of Public Health, Chonburi, 20000, Thailand

Correspondence: duichol@gmail.com

ABSTRACT

OBJECTIVE:

This action research aimed to develop a resource management curriculum for intermediate care in a community in Health Region 1 in Thailand.

MATERIAL AND METHODS RESEARCH:

The study involved 80 intermediate care (IMC) administrators, 13 experts, 260 IMC nurses, and 155 individuals who completed the training. Data were collected using various methods, including surveys, interviews, and questionnaires. Quantitative data were analyzed using descriptive statistics, while qualitative data were analyzed using content analysis.

RESULTS:

The findings revealed several key points. First, the IMC management model was primarily based on local administrative organization guidelines, with issues identified in personnel knowledge, human resources, budget, and equipment. Second, the curriculum, consisting of 27 lessons and 35 hours, was developed and validated by experts and the Thailand Nursing and Midwifery Council. Third, participants showed a significant improvement in test scores after training, with a mean score increase from 23.12% to 40.75%, and expressed high satisfaction with the training ($\bar{x}$ = 4.42, SD = .447). Finally, clinical data from the National Health Security Office indicated that 50.24% of IMC patients experienced improved ADL after the training, reflecting the curriculum's effectiveness.

CONCLUSION:

The study suggests that policies should be formulated to make the curriculum a key task for local administrative organizations. The curriculum should be used as an indicator for personnel management at all levels, with continuous monitoring and evaluation to ensure its effectiveness. The findings underscore the importance of comprehensive training that covers all areas and personnel levels, with regular reviews and updates to maintain high standards of care.

KEYWORDS

curriculum, intermediate care, intermediate care in community, management, action research

INTRODUCTION

Thailand's long-term care landscape is facing significant challenges, as evidenced by data from the Department of Health indicating that 446,903 individuals require rehabilitation and dependent care. This surge has led to an increase in patients with physical disabilities, creating difficulties for those seeking rehabilitation services post-hospitalization due to overcrowded facilities [1]. In response, the Ministry of Public Health has implemented policies aimed at enhancing the health service system, with a particular focus on medical services to address these issues and improve the quality of community hospitals. Recognizing the importance of intermediate care in the community, the Department of Health has prioritized the development of a system for patients who have stabilized but still face limitations in their daily activities. This approach emphasizes medical rehabilitation services and strengthens the connection between hospitals and communities, aiming to enhance physical and mental performance, reduce disability, improve social reintegration, and alleviate the burden on families and society [2].

The demand for patient care in healthcare facilities arises in accordance with the increasing prevalence of diseases, leading to a continuous increase in the number of patients with physical and mobility impairments. As a result, more patients are seeking services at tertiary hospitals, causing overcrowding and long waiting times for treatment. This congestion is evident in regional hospitals (RPH), general hospitals (GH), and community hospitals (CH). The referral system for other groups of patients is inadequate and complicated, leading to various complications in managing these patients [2].

Access to acute stroke rehabilitation services for inpatients at regional hospitals shows that only 18% of stroke patients receive rehabilitation. Most patients are discharged immediately after the critical phase, in line with the Diagnosis Related Group (DRG) policy aimed at reducing hospital stay duration. Additionally, doctors often assume that patients can receive rehabilitation at nearby community hospitals, but there is no clear referral system. Moreover, patients and their families do not understand or recognize the importance of rehabilitation. Once home, families often find that they are unprepared to provide care, lack the skills for complex tasks, such as physical therapy, and need assistance with basic daily activities. They also lack the necessary equipment for patient care [2].

The concept of intermediate care has been increasingly studied to fill gaps in the healthcare system. Intermediate care refers to the rehabilitation of patients whose clinical symptoms have stabilized but still have some physical abnormalities and limitations in performing daily activities. These patients require ongoing medical rehabilitation services provided by a multidisciplinary team, connecting care from the hospital to the community and family. This approach aims to enhance physical and mental abilities for daily activities, reduce disability, and facilitate patients' reintegration into society at full potential. Intermediate care involves developing services and promoting a better quality of life for patients, reducing the number of bedridden patients, and alleviating the healthcare burden on families and societies. It ensures that patients and their relatives receive timely and continuous rehabilitation in areas where such services are regularly provided without needing to travel to a hospital for rehabilitation [2].

Health Region 1 in Thailand encompasses eight provinces located in the upper north of the country: Chiang Rai, Chiang Mai, Nan, Phayao, Phrae, Mae Hong Son, Lampang, and Lamphun. In 2023, there were 210,820 intermediate care (IMC) patients nationwide, with Health Region 1 accounting for 19,147 cases, ranking third highest in the country. The primary challenge faced is the insufficient number of IMC beds. Health Region 1 has a total of 163 IMC beds, resulting in a high patient-to-bed ratio of 117 patients per bed. This situation leads to hospital overcrowding and inadequate services to meet patient needs.

The development of community-based IMC services has been proposed as a potential solution to this problem. However, the government has yet to establish clear policies to support the development of this system. The focus on Health Region 1 is driven by the identified need for improved IMC services and its potential to serve as a model for other regions in Thailand [3].

The successful implementation of IMC in the community relies on the effective management of key resources: human resources, finances, materials, and overall management strategies. However, the varying approaches to IMC management across different community organizations have resulted in inconsistent

patient service standards. To address this issue, a curriculum based on the 4M management framework (Man, Money, Material, and Management) has been developed to standardize community-based rehabilitation and optimize patient care efficiency [4].

OBJECTIVE

This study aims to develop a resource management curriculum for IMC in Health Region 1 of Thailand. The research seeks to address gaps identified in previous studies, such as the lack of standardized management approaches and the need for improved rehabilitation services. Additionally, the study will explore potential quality indicators (QIs) for IMC to assess the curriculum's effectiveness.

MATERIALS AND METHODS

STUDY DESIGN

This study employed an action research and explanatory sequential design based on the PAOR (Plan, Act, Observe, Reflect) model of Kemmis & McTaggart [4]. The research methods were classified according to specific objectives consistent with the PAOR model. The study was conducted in Health Region 1, which includes eight provinces: Chiang Rai, Chiang Mai, Nan, Phayao, Phrae, Mae Hong Son, Lampang, and Lamphun.

STUDY PROCESS

The study followed the PAOR model, a cyclical process involving planning, acting, observing, and reflecting. By following this structured approach, the study aimed to develop a standardized and effective resource management curriculum for IMC in the community, ensuring better patient outcomes and more efficient use of resources. This model ensures continuous improvement and adaptation based on feedback and results at each stage, which are presented in each phase below.

Planning Phase: Identifying and analyzing the current issues in IMC management.

- Objective: To analyze the current situation and problems in the IMC in Health Region 1.
- Population and Sampling: The population consisted of 99 IMC administrators. Using Krejcie and Morgan's table, 80 administrators were selected through one-step cluster sampling.
- Data Collection: Data were collected using a single cross-sectional method. A questionnaire was used to gather information on IMC management, divided into three parts: general information, opinions on IMC management, and satisfaction of service recipients.
- Instruments: The instruments included a questionnaire and a structured interview form.
- Data Analysis: Quantitative data were analyzed using mean, standard deviation, percentages, and frequency distributions. Qualitative data were analyzed using descriptive summaries.

Acting Phase: Developing and implementing the curriculum based on expert input.

- Objective: To develop a resource management curriculum for IMC in the community.
- Population and Sampling: The population consisted of 13 experts. Brainstorming meetings were held to gather expert opinions and recommendations.
- Data Collection: Data were collected from meeting minutes and expert opinions.
- Instruments: The instruments included meeting minutes and questionnaires on curriculum guidelines.
- Data Analysis: Qualitative data were analyzed using content analysis. Reliability was determined by 13 experts using Cronbach's alpha, with an IOC = 0.92.

Observing Phase: Monitoring and evaluating the curriculum's effectiveness through pre- and post-training assessments.

- Objective: To evaluate the application and improvement of IMC in the community.
- Population and Sampling: The population consisted of 260 IMC nurses selected using convenient or volunteer sampling from 769 subdistricts in Health Region 1.
- Data Collection: Data were collected using pre- and post-training tests and satisfaction assessments.
- Instruments: The instruments included a learning achievement test with 50 questions and a satisfaction assessment using a Likert scale.
- Data Analysis: Quantitative data were analyzed using a paired-samples t-test to compare pre- and post-training scores. Satisfaction was measured using the mean and standard deviation.

Reflecting Phase: Analyzing the outcomes and making recommendations for future improvements.

- Objective: To analyze the summary of results and recommendations after using the IMC curriculum.
- Population and Sampling: The population consisted of 155 individuals who completed the training. The individuals were selected through convenience sampling.

- Data Collection: Data were collected using evaluation forms on behavioral results and opinions, and an improved ADL Intermediate Care Report Form.
- Instruments: The instruments included evaluation forms and clinical data from the National Health Service Organization (NHSO).
- Data Analysis: Quantitative data were analyzed using percentages, means, and standard deviations. Qualitative data were analyzed using content analysis.

ETHICS CONSIDERATIONS

The research emphasizes ethics and sample protection. Ethics approval was obtained from the Human Research Committee from Sirindhorn College of Public Health, Chon Buri, COA.NO 2021/T14, COA.NO 2023 T09 on 27 May 2022.

RESULTS

The results of this study are presented according to the PAOR model, providing a clear and systematic overview of the findings from each phase.

PLAN PHASE

Objective: To analyze the current situation and problems in the IMC in Health Region 1.

Findings:

- The survey revealed two types of management structures: single organization and joint organization. Local Administrative Organizations (LAOs) were the lone primary organizations in every province except Lampang, where joint management included network partners, subdistrict health promotion hospitals, temples, and the local community.
- IMC personnel were divided into full-time and rotating staff from community agencies. Registered nurses played a crucial role in management, and village health volunteers (VHVs) provided 82.8% of services. The primary source of funding for management came from LAOs.

ACT PHASE

Objective: To develop a resource management curriculum for IMC in the community.

Findings:

- The curriculum was developed through brainstorming meetings with 13 experts, resulting in 27 lessons and 35 hours of content. The curriculum was validated by the Thailand Nursing and Midwifery Council, with an IOC of 0.92.
- The curriculum covered four key areas: personnel development (24 lessons), management, money, and materials (one lesson each).

OBSERVE PHASE

Objective: To evaluate the application and improvement of intermediate care in the community.

Findings:

- Pre- and post-training tests showed a significant improvement in participants' knowledge, with mean scores increasing from 23.12% to 40.75% ($p < 0.05$).

TABLE 1. PRE- AND POSTLEARNING ACHIEVEMENT OF THE TRAINING

Score	Amount	Mean	S.D.	t	p-value
Before	260	23.12	5.037	-44.216	.000
After	260	40.75	4.431		

Participants expressed high satisfaction with the training, with a mean satisfaction score of 4.42 (SD = 0.447).

The curriculum was reported to the Nursing and Midwifery Council and approved for continuing education in nursing.

REFLECT PHASE

Objective: To analyze the summary of results and recommendations after using the IMC curriculum.

Findings:

- Participants who completed the training reported that they could apply the knowledge and skills effectively to themselves and their organizations, with a mean score of 4.40 (SD = 0.58).
- Clinical data from the National Health Security Office (NHSO) showed that 50.24% of IMC patients experienced improved ADL after training in 2022-2023.
- Participants suggested expanding the training to cover all areas and personnel levels, including reviewing

knowledge after training and incorporating additional practical training and mental health content.

SUMMARY OF KEY FINDINGS

1. Current IMC Management Issues: The IMC management model was primarily based on local administrative organization guidelines, with significant issues identified in personnel knowledge, human resources, budget, materials, and equipment.
2. Curriculum Development: A curriculum consisting of 27 lessons and 35 hours was developed and validated by experts and the Thailand Nursing and Midwifery Council.
3. Training Outcomes: Participants showed a significant improvement in test scores after training, with a mean score increase from 23.12% to 40.75%, and expressed high satisfaction with the training (mean satisfaction score of 4.42, SD = 0.447).
4. Patient Outcomes: The curriculum was practical, leading to improved Activities of Daily Living (ADL) for patients, with 50.24% of IMC patients showing improvement in ADL after training in 2022-2023.

TABLE 2. CLINICAL DATA ON IMC SERVICES FROM THE NHSO FROM 2022 TO 2023

Province	2022			2023		
	Number of IMC patients (people)	Increased ADL (people)	Percentage	Number of IMC patients (people)	Increased ADL (people)	Percentage
Mae Hong Son	67	46	68.7	129	92	71.3
Phrae	183	91	49.7	459	212	46.2
Chiang Mai	462	252	54.6	1,154	580	50.3
Lampang	444	132	29.7	799	331	41.4
Chiang Rai	894	390	43.6	1,637	926	56.6
Phayao	308	136	44.2	542	278	51.3
Nan	100	37	37.0	330	109	33.0
Lamphun	229	133	58.1	567	294	51.9
Total	2,687	1,217	48.2	5,617	2,822	50.2
Two-year Total						49.2

Source: NHSO November 15, 2023

RESULTS CONCLUSION

The study successfully developed and implemented a resource management curriculum for IMC in a community in Health Region 1. The curriculum addressed key issues in IMC management and significantly improved participants' knowledge and patient outcomes. Continuous monitoring and evaluation are recommended to ensure the curriculum's effectiveness and sustainability.

DISCUSSION

1. Integrated IMC operations can achieve success through collaboration with network partners from both the public and private sectors, as well as multidisciplinary professionals. Services are provided through rotating systems, with nurses leading management and Village Health Volunteers (VHVs) participating. The Local Administrative Organization (LAO) plays a key role in management to meet local needs, aligning with Somkid Lertpaitoon's concept that LAOs are responsible for providing local public services [6]. This approach is supported by the Community Health System Research and Development Institute, which emphasizes community involvement and collaboration with local agencies for successful local health fund development [7]. Additionally, the Department of Health Service Support advocates for the development of public health volunteers as "community health managers" to enhance rehabilitation services [8].

However, several challenges hinder the achievement of IMC goals, including personnel lacking knowledge in rehabilitation and management, as well as shortages

in human resources, budget, and equipment. These issues necessitate developing personnel potential and reviewing their knowledge, along with creating an operating manual. This aligns with Tshering et al.'s findings that organizational financial factors are often critical [9]. Khomkrib Longlaleng's study also notes that a lack of knowledge and budget shortages impede community care for individuals with movement disabilities [10]. Preeda Srisang emphasizes that developing personnel potential is crucial for organizational success [11].

Key factors contributing to successful IMC management include LAO executives' support, a variety of services, and the participation of network partners and multidisciplinary teams in managing human resources and developing adequate capacity, funding, materials, and equipment. Peeranithi Aksorn's study identifies that success in project management is influenced by action plans, cooperation, network development, funding, public sector procurement, and administration and management tools [12].

2. The ICM curriculum for the community was developed using a systematic training curriculum development process based on the concepts of Saylor, Alexander, and Lewis [13]. This process includes four steps: 1) setting goals, objectives, and the desired scope for development; 2) designing and developing the curriculum; 3) implementing the curriculum; and 4) evaluating the effectiveness of the curriculum. Key components to address IMC management problems include decision making for employees, setting objectives, creating training content, scheduling training duration, and incorporating training processes. The curriculum received standard certification from the Nursing and Midwifery Council Committee on June 15, 2020, for addressing four management problems: personnel, money, materials, and management, and meeting the Council's standards for online teaching. This aligns with Eisner's theory [14] of critical performance evaluation, which focuses on expert knowledge and experience, and Beauchamp's [15] curriculum component theory, which involves defining content scope, targeting, planning, and judgment. It also aligns with Kiattiphong Udomthanathira's [16] idea that innovation begins with organizational problems and leads to expert-verified solutions, and Wiput Laosuksri's [17] study on basic life support training certified by the Thai Resuscitation Council.

3. Scores for management knowledge in the IMC curriculum for online communities were higher after training. This aligns with Duanpen Bunmachu's research [18], which found that e-learning improved students' mean learning achievement scores. Similarly, Wanthakarn Simarorit's study [19] showed that a developed curriculum enhanced professional competencies for tourism business personnel, with increased post-training scores. Dusita Langdee's research [20] also indicated higher scores and high satisfaction levels among participants after training. Jaruwan Manomaikit's study [21] confirmed that experiential learning concepts significantly increased high school English teachers' competencies and satisfaction. Siriporn Lamno's research [22] demonstrated that directors, special education teachers, and supplementary teachers were highly satisfied with the curriculum and manual post-training.

4. The research objectives for the analysis were to evaluate the impact of the IMC curriculum on community participants, focusing on knowledge application and organizational management development. The summary of the results indicated that participants found the training beneficial and expressed a desire for expanded and practical training sessions. This aligns with Kirkpatrick's theory [23], which evaluates training effectiveness in terms of satisfaction, learning, behavior change, and organizational impact. These findings are consistent with Thanongsak Chanthaburi's study on enhancing teaching efficiency and academic cooperation [24], Phasakon Suanruang's research on the importance of continuous knowledge development [25], Pairin Parsut's recommendation for comprehensive emergency training [26], and Nudee Nupairoj's study on the value of experiential workshops [27].

LIMITATIONS

The study faced limitations, such as IMC system changes, service cancelations, management shifts, and COVID-19 impacts, which led to inaccurate data and delayed research timelines.

CONCLUSION

This study found that IMC is divided into full-time and rotating types, with labor shortages being a key challenge. To address this, training programs should be developed to enhance knowledge of IMC management and

rehabilitation across all levels of the medical service network. Furthermore, the developed curriculum was well accepted by experts and approved by the Nursing and Midwifery Council for continuing nursing education. Successful IMC implementation relies on policy support and top management's commitment to creating patient-centric services. IMC should be a priority policy for local organizations and a key measure for managing healthcare personnel.

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RESEARCH ARTICLE

UNVEILING THE NEXUS: ELEVATING MARKETING STRATEGIES FOR ENHANCING SATISFACTION AND LOYALTY IN ELDERLY HEALTH CARE SERVICES

Bishal Bhuyan

Faculty of Commerce and Management, Assam Downtown University, Assam

Correspondence: kinnorikashyap2012@gmail.com

ABSTRACT

The study aimed to examine whether there is an association of marketing mix, and perception with customer's satisfaction, and loyalty among elderly people. A total of 400 participants were included in the study. The study population comprised individuals aged 65 years and above from Assam, India including both males and females. Participants were primarily selected from residential homes, old age homes, and various common gathering places such as parks, shops, Namghar (a holy place), and community halls.

The study indicated a significant correlation between the dimensions of the marketing mix, perception, satisfaction, and loyalty. Moreover, the findings from the linear regression analysis, revealed customer satisfaction towards the marketing of healthcare services can be attributed to product, price, place, process, and physical evidence (7 P's) and customer perception (R2=.54; .53 respectively). Additionally, customer loyalty towards the marketing of healthcare services is influenced by product and price (7P's), and customer perception (R2=.54; .2 respectively).

This study contributes to understanding the overlooked aspect of marketing to the elderly population, providing valuable insights for healthcare companies to develop improved marketing strategies. Hence, irrespective of the organization's size, type, or location, whether it's a startup or an established entity, privately owned or government-operated, local or global, the role of business managers is vital in making informed decisions and establishing strategic priorities to allocate resources efficiently in order to meet evolving customer demands and achieve business success. As a result, commercial enterprises need to develop tools, concepts, and strategies to effectively navigate the dynamic and unpredictable marketing landscape.

KEYWORDS

marketing mix, customer perception, customer satisfaction, customer loyalty and elderlies

BACKGROUND

According to the "American Marketing Association," marketing is both a function of an organization and a set of procedures aimed at developing, communicating, and delivering value to customers, while also managing beneficial client relationships for the business and its stakeholders [1].

Given the diverse preferences and tastes of customers, it is challenging for marketers to uniformly serve the needs and wants of all individuals. As a result, marketers divide the

heterogeneous market into homogenous groups in order to achieve the dual goals of attracting potential customers through superior value and retaining and growing existing customers by providing satisfaction. While the fundamental function of marketing is to acquire and retain customers for profit generation, it encompasses more than just this objective. Another crucial marketing function is creating awareness of the company among its target audience, often achieved through branding or establishing a visible presence. Therefore, marketing is not a solitary effort but requires collaboration across the entire organization to achieve customer satisfaction [1,2,3,4].

THE MARKETING MIX STRATEGY

The concept of marketing strategy involves developing a long-term and future-oriented approach that encompasses the overall plan of an organization or business to achieve its fundamental objectives. This strategy aims to provide the organization with a sustainable competitive advantage by understanding and meeting the needs and desires of its customers [5]. McCarthy and Perreault [6] defined the marketing mix as "the controllable variables that an organization can coordinate to meet the needs of its target market." This definition, with slight modifications, gained widespread acceptance.

Nevertheless, a highly influential alternative framework that gained widespread acceptance was introduced by Broom and Bitner [7], known as the 7 Ps of Marketing. This concept expanded upon the traditional 4 Ps of the Marketing Mix (product, price, place, and promotion) by incorporating three additional elements: people, process, and physical evidence. The framework is further elaborated below:

TABLE 1. THE MARKETING MIX

Product	Price	Place	Promotion	People	Physical Evidence	Process
Traditional Quality		Distribution	Advertising			
Features and options	Discounts and allowances	Channels of Distribution	Personal selling			
			Sales promotion			
Style Brand name Packaging Product line Warranty and Service level	Payment terms	Coverage Outlet Locations Sales Territories Inventory levels and locations	Publicity			
		Transport carriers				
Modified and expanded for services						
Quality level		Location	Advertising	Personnel	Environment	Policies
Brand name	Discounts	Accessibility	Personal selling	Training	Furnishings	Procedures
Service line	Allowances	Distribution	Sales promotion	Discretion	Color	Mechanization
Warranty	Payment terms	Distribution channel	Publicity	Commitment	Layout	Employee discretion

			Incentives	Noise level	
Quality/price Price differentiation	Coverage		Appearance Interpersonal behaviour Attitudes Other customers' Behaviour Degree of involvement, Customer/ customer Contact	Facilitating goods Tangible clues	Customer involvement Customer direction Flow of activities

Source: Booms & Bitner [7]

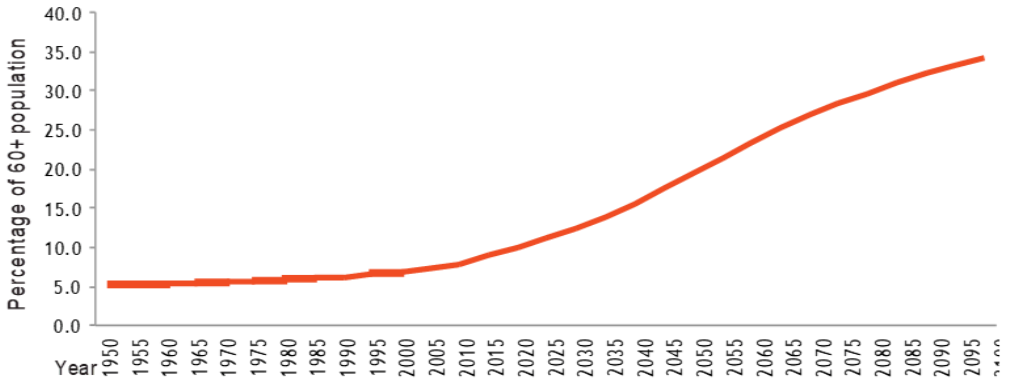
UNDERSTANDING THE ELDERLY MARKET FROM THE MARKETING PERSPECTIVE

It is evident that nations with a significant aging population are witnessing notable trends and shifts in human civilization [8,9]. In the past, there was a prevailing notion that growth and development in the modern era should primarily focus on the younger population, neglecting the elderly segment. This perspective has limited our understanding of the economic consequences affecting both the younger and older populations [10]. It is apparent that the elderly population has distinct needs, wants, and desires compared to other age groups. They often face various chronic diseases, physical disabilities, mental illnesses, and psychosocial issues, which cannot be viewed in isolation. Additionally, several factors, such as social concerns (e.g., separation from children), occupational challenges, mistreatment, lack of knowledge and awareness about risk factors, dietary and nutritional requirements, and psycho-emotional concerns (e.g., mental stress, difficulty staying occupied), along with financial constraints and inadequate access to healthcare, contribute to the deterioration of their mental and physical health. Consequently, these factors have a detrimental impact on their quality of life [11]. Therefore, it is crucial to handle the elderly population with utmost care and affection [12-19, 22, 53].

ELDERLY POPULATION OVERVIEW- THE INDIAN PERSPECTIVE

Due to advancements in life expectancy, the aging population in India is experiencing significant growth at an exponential rate. This trend has led to an increased demand for comprehensive care for the elderly [12]. According to the United Nations' 2015 census report, the percentage of individuals over the age of 60 is projected to rise from 8 percent in 2015 to 19 percent in 2050 (graph 1). Furthermore, reports suggest that by the end of the century, the elderly population will comprise approximately 34 percent of the total population in India [13].

GRAPH 1: PERCENTAGE OF THE 60-PLUS PERSONS IN TOTAL POPULATION, INDIA, 1950-2100



Source: United Nations (2015), World Population Prospects, 2015 Revision, Department of Economic and Social Affairs, United Nations.

The objective of this study is to examine the marketing of healthcare products and services targeted at elderly individuals, utilizing the marketing mix framework. When introducing a product to the market, companies develop new marketing strategies and plans. These plans encompass situational analysis, objectives, goals, tactics, cost considerations, and profit estimations [14]. Prior to formulating any strategy, marketers must gather information about the specific target audience, which could be possible through research work. Therefore, this study aims to shed light on the strategies implemented by healthcare companies, emphasizing the positive impact of effective marketing mix strategies. It also seeks to identify any shortcomings and provide valuable insights, recommendations, and suggestions that can contribute to the development of effective marketing strategies for the elderly population.

HYPOTHESES

1. Dimensions of 7P's Marketing Mix, would significantly correlate with Perception, Satisfaction, and Loyalty among elderly customers.
2. 7P's Marketing Mix would significantly impact Satisfaction among elderly customers.
3. Customer perception would significantly impact Satisfaction among elderly customers.
4. 7P's Marketing Mix would significantly impact Loyalty among elderly customers.
5. Customer perception would significantly impact Loyalty among elderly customers.

SAMPLE AND PROCEDURE

The study population comprised individuals aged 65 years and above from Assam, India including both males and females. Participants were primarily selected from residential homes, old age homes, and various common gathering places such as parks, shops, Namghar (a holy place), and community halls.

The respondents for this study were primarily selected from four districts in Assam, namely Sonitpur, Kamrup-metro, Nagaon, and Lakhimpur. According to the 2011 census report, the total population of elderly individuals in Assam was 20,78,544. To determine the appropriate sample size, the formula for minimum samples required for a standard normal distribution with a 95% confidence level and a 5% margin of error was used:

$$n = \frac{z^2 \times p(1-p)}{e^2}$$

Where:

- z is the z score (at a 95% confidence level, the Z score is 1.96)
- e is the margin of error (5% = 0.05)
- n is the sample size
- p is the population proportion (number of interested population/total population)

Using the above equation, the calculated sample size was determined to be 384 samples, considering a population proportion of 0.5, a Z score of 1.96, and a 5% margin of error. However, the questionnaire was distributed to a sample size of 406 elderly individuals, and 400 filled-in questionnaires were received. The purposive sampling method was employed to select the sample group of elderly population. Subsequently, data cleaning was performed to identify any missing values, ensure data accuracy, and identify outliers. After cleaning the data, a total of 400 valid responses were used for analysis.

The data collection process for this study involved using a structured questionnaire. Older individuals who were employed, unemployed, or retired were selected to participate. They were informed in advance about the study's objective, and fortunately, none of them declined to take part, although some requested additional time due to their discomfort at that specific moment.

Data was collected through offline methods. For the offline mode, the researcher visited participants at their preferred locations and times. Before collecting data, the purpose of the study was reiterated and participants were informed of their right to stop the procedure or refuse to answer any questions they were uncomfortable with. Verbal informed consent was obtained, and the information was recorded while ensuring strict confidentiality and anonymity. Interactions were conducted in the local language, Assamese, and participants were debriefed and thanked for their participation.

The Ethical Clearance was taken from the Ethical Committee in 2019 with number: NO.GMC/CH/39/2017/PT-II/52.

MEASURES

The variable Marketing mix has 7 constructs:

1. Product: It has 5 items in total. The items were adopted from a study conducted [15]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (indifferent), 2 (disagree) and 1 (strongly disagree) was used for the statements.
2. Price: It has 3 items in total. The items were adopted from a study [15]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (indifferent), 2 (disagree) and 1 (strongly disagree) was used for the statements.
3. Place: It has 4 items in total. The items were adopted from a study [15]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (indifferent), 2 (disagree) and 1 (strongly disagree) was used for the statements.
4. Promotion: It has 3 items in total. The items were adopted from a study [15]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (indifferent), 2 (disagree) and 1 (strongly disagree) was used for the statements.
5. People: It has 6 items in total. The items were adopted from a study [16]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree) and 1 (strongly disagree) was used for the statements.
6. Process: It has 4 items in total. The items were adopted from a study [17]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree) and 1 (strongly disagree) was used for the statements.
7. Physical evidence: It has 2 items in total. The items were adopted from a study [17]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (indifferent), 2 (disagree) and 1 (strongly disagree) was used for the statements.
8. Customer satisfaction: It has 4 items in total. The items were adopted from a study [18]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree) and 1 (strongly disagree) was used for the statements.
9. Customer loyalty: It has 5 items in total. The items were adopted from a study [19]. A five-point Likert scale ranging from 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree) and 1 (strongly disagree) was used for the statements.
10. Customer perception: It has 1 item in total. The item was adopted from a study [20]. A six-point Rating scale ranging from 6 (strongly agree) to 1 (strongly disagree) was used for the statements.
11. Customer motivation: It has 1 item in total. The item was adopted from a study [20]. Multiple choice questions were used for the statements.

TABLE 2: CONSTRUCT RELIABILITY, VALIDITY AND CRONBACH ALPHA VALUE

Construct/Dimension	No. of Items	Validity	Cronbach's Alpha Value
Product	Item 1	0.84	0.838
	Item 2	0.89	
	Item 3	0.88	
	Item 4	0.76	
	Item 5	0.82	
Price	Item 1	0.79	0.75
	Item 2	0.73	
	Item 3	0.84	
Place	Item 1	0.86	0.881
	Item 2	0.89	
	Item 3	0.81	
	Item 4	0.83	

Promotion	Item 1	0.72	0.728
	Item 2	0.77	
	Item 3	0.77	
People	Item 1	0.84	0.927
	Item 2	0.87	
	Item 3	0.83	
	Item 4	0.84	
	Item 5	0.84	
	Item 6	0.42	
Process	Item 1	0.83	0.855
	Item 2	.075	
	Item 3	0.82	
	Item 4	0.68	
Physical evidence	Item 1	0.77	0.834
	Item 2	0.81	
Customer satisfaction	item 1	0.69	0.785
	Item 2	0.79	
	Item 3	0.71	
	Item 4	0.70	
Customer loyalty	Item 1	0.74	0.792
	Item 2	0.77	
	Item 3	0.67	
	Item 4	0.73	
	Item 5	0.79	

Source: Compiled by the researcher

NORMALITY OF THE DATA

Before proceeding with the data analysis, the extreme outliers and missing values were removed from the datasheet. Additionally, to check the normality of the data, measures of central tendency (mean), measures of variability (standard deviation) and measures of shape (skewness and kurtosis) were calculated. The mean scores of the statements are between 2.27 to 4.55 and standard deviations of the mean scores stretched from .70 to 1.53. Lower standard deviation is considered to be closer to the mean score [45]. From Table 3 it can also be observed that skewness is ranged from - 1.75 to .70 and kurtosis is ranged from .16 to 2.77. All the values of skewness for the statements are found within the acceptable ranges from -2 to +2 [45]. Similarly, for kurtosis all the statements are found in acceptable ranges from -7 to +7 [45].

TABLE 3: SKEWNESS AND KURTOSIS

Construct	Mean		SD		Skewness		Kurtosis	
	Min	Max	Min	Max	Min	Max	Min	Max
Product	4.29	4.54	.85	1.15	-1.30	-.70	.44	1.12
Price	2.64	3.14	1.06	1.20	.06	.48	.16	.71
Place	4.35	4.55	.92	1.19	-1.14	-.66	.26	1.41
Promotion	2.79	3.52	1.16	1.53	.09	.37	.27	1.01
People	4.00	4.37	.79	1.19	-1.08	-1.58	.19	2.10
Process	2.27	2.49	1.37	1.48	.47	.70	.96	1.18
Physical Evidence	4.32	4.34	.70	.86	-1.75	-1.30	1.10	2.75
Loyalty	2.88	3.80	1.15	1.23	-.06	.27	.79	1.27
Satisfaction	2.68	3.95	.82	1.13	-1.50	.39	.41	2.77

Abbreviations: SD- standard deviation, Min- minimum, Max- maximum.

Source: Data analysis done by the researcher based on primary data collected

RESULTS

The demographic characteristics, as presented in Table 4, provide an overview of the 400 total respondents.

TABLE 4: DEMOGRAPHIC PROFILE OF THE RESPONDENCE

Sample Characteristics	Frequency (n=400)	Percent %
Gender		
Male	167	41.8
Female	233	58.3
Marital status		
Married	256	64.0
Unmarried	4	1
Divorced	2	0.5
Widow	138	34.5
Residential Location		
Rural	165	41.3
Urban	235	58.8
Educational qualification		
Illiterate	66	16.5
Primary school	85	21.3
Middle school	73	18.3
Secondary school	85	21.3
Higher Secondary	56	14.0
Graduate	25	6.3
Post graduate	3	.8
Others	7	1.8

Employment status		
Employed	22	5.5
Unemployed	238	59.5
Not working	140	35.0
Source of earning		
Pension		
Yes	128	32.0
No	272	68.0
Business		
Yes	5	1.3
No	395	98.8
Rent		
Yes	32	8.0
No	368	92.0
Children		
Yes	391	97.8
No	9	2.3
Grand-children		
Yes	376	94.0
No	24	6.0
Others		
Yes	2	.5
No	398	99.5
Mode of stay		
Family	320	80.0
Old age home	100	13.8
Single	25	6.3

Source: Data analysis done by the researcher based on primary data collected

TABLE 5: CORRELATION COEFFICIENTS AMONG DIFFERENT DIMENSIONS OF 7P'S MARKETING MIX, PERCEPTION, SATISFACTION, AND LOYALTY (N=400)

Dimensions	Product	Price	Place	Promotion	People	Process	Physical Evidence	Perception	Satisfaction	Loyalty
Product	1	.549**	.924**	.454**	.469**	.170**	.187**	.534**	.698**	184**
Price		1	.537**	.825**	.261**	.108	.142*	-.293**	.270**	-.543**
Place			1	.452**	.523**	.106	.151*	.439**	.691**	159*
Promotion				1	.157*	.115	.135*	.307**	.250**	.609
People					1	.157*	.152*	.069	.553**	.027
Process						1	.052	.107	.138*	.025
Physical evidence							1	.177**	.301**	.039

Perception								1	.334**	.185**
Satisfaction									1	.034
Loyalty										1

*p<.05; **p<.01

**Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

The results presented in Table 5 indicate a significant correlation between the dimensions of the marketing mix, perception, satisfaction, and loyalty (P<0.05; P<0.01 respectively). The correlations demonstrate significant relationships between various dimensions, such as product, price, place, promotion, people, process, physical evidence, and perception, with loyalty and satisfaction.

TABLE 6: MARKETING MIX WITH SATISFACTION (N=400)

	Satisfaction (Criterion)		
Marketing Mix Variables (Predictors)	**β**	**t**	**Sig.**
Product	.546	3.37**	.001
Price	.319	2.96**	.003
Place	.182	1.90*	.05
Promotion	.062	.61	.541
People	.366	1.08	.282
Process	.06	5.18***	.000
Physical Evidence	.162	2.31*	.022
R	**.783**		
R^2	**.545**		
Adjusted R^2	**.524**		
F	**26.830*** **		

*p<.05; **p<.01; ***p<.001 Dependent variable: Customer satisfaction

Independent variables: Marketing Mix

The findings from the linear regression analysis, as presented in table 6, reveal that the R2 value is .545, indicating that 54% of the variation in customer satisfaction towards the marketing of healthcare services can be attributed to product, price, place, process, and physical evidence. Among the 7Ps, product (β= .546, p<0.01), price (β= .319, p<0.01), place (β= .182, p<0.05), process (β= .06, p<0.001), and physical evidence (β= 162, p<0.05) show statistically significant relationships, whereas promotion and people do not significantly predict the outcome. The largest beta coefficient is observed for the product dimension, indicating a strong and unique contribution to explaining customer satisfaction. The adjusted coefficient of determination (R^2) suggests that .545 percent of the variation in customer satisfaction can be explained by the variations in the independent variables. This implies that these dimensions have the ability to account for changes in customer satisfaction. Therefore, the overall model is deemed significant at the .001 level (F= 26.830).

TABLE 7: CUSTOMER PERCEPTION WITH SATISFACTION (N=400)

	Satisfaction (Criterion)		
(Predictor)	**β**	**t**	**Sig.**
Customer perception	.821	3.40**	.003
R	**.231**		
R2	**.053**		
Adjusted R2	**.048**		
F	**9.28****		

**p<.01 Dependent variable: Customer satisfaction
Independent variables: Customer perception

The findings from the linear regression analysis, as presented in Table 4.4, reveal that the R2 value is .053, indicating that 53% of the variation in customer satisfaction towards the marketing of healthcare services is influenced by customer perception. The results show that customer perception (β= .821, p<0.01) significantly predicts the outcome, making a strong and unique contribution to explaining the dependent variable, which is customer satisfaction. The adjusted coefficient of determination (R^2) suggests that .053 percent of the variation in the dependent variable can be explained by variations in the independent variable, customer perception. This implies that customer perception plays a substantial role in understanding customer satisfaction. Therefore, the overall model is considered significant at the .01 level (F= 9.28).

TABLE 8: MARKETING MIX WITH LOYALTY (N=400)

	Loyalty (Criterion)		
Marketing Mix Variables (Predictors)	**β**	**t**	**Sig.**
Product	.229	2.02*	.045
Price	.355	3.35**	.001
Place	.143	1.61	.541
Promotion	.063	1.08	.282
People	.028	.403	.688
Process	.014	.257	.797
Physical Evidence	.033	.596	.552
R	**.741**		
R^2	**.549**		
Adjusted R^2	**.529**		
F	**27.68*****		

*p<.05; **p<.01; ***p<.001 Dependent variable: Customer Loyalty
Independent variables: Marketing Mix

The findings from the linear regression analysis, as presented in Table 4.5, reveal that the R2 value is .549, indicating that 54% of the variation in customer loyalty towards the marketing of healthcare services is influenced by product and price. The results show that product (β= .229, p<0.05) and price (β= .355, p<.01) are statistically significant predictors, while place, promotion, people, process, and physical evidence do not significantly predict the outcome. Among the seven Ps, the largest beta coefficient is β= .355, which corresponds to price. This suggests that price makes a strong and unique contribution to explaining the dependent variable, which is customer loyalty. The adjusted coefficient of determination (R^2) indicates that .549 percent of the variation in the dependent variable can be explained by variations in the independent variables. This implies that the marketing mix strategy, specifically product and price, explains a significant portion of the variance in

customer loyalty. Therefore, the overall model is considered significant at the .001 level (F= 27.68).

TABLE 9: CUSTOMER PERCEPTION WITH LOYALTY (N=400).

	Customer loyalty (Criterion)		
(Predictor)	**β**	**t**	**Sig.**
Customer perception	.039	.754	.451
R	**.039**		
R2	**.002**		
Adjusted R2	**.004**		
F	**.568**		

**p<.01 Dependent variable: Customer loyalty
Independent variables: Customer perception

The findings from the linear regression analysis, as presented in Table 4.6, reveal that the R2 value is .002, indicating that only .2% of the variation in customer perception towards the marketing of healthcare services is influenced by customer loyalty. The results show that customer perception (β= .0391, p>0.01) is not a significant predictor and does not contribute to explaining the dependent variable, which is customer loyalty. The adjusted coefficient of determination (R^2) indicates that .004 percent of the variation in the dependent variable can be explained by variations in the independent variables. Therefore, the results of the linear regression model suggest that customer perception does not have a significant correlation with customer loyalty.

DISCUSSION

The main aim of the current study was to gain insights into the specific needs and demands of healthcare products and services among the elderly population provided by companies.

The result displays the regression analysis, illustrating the impact of the marketing mix components i.e. Product, price, place, process and physical evidence have a positive impact on consumer satisfaction. These results are consistent with previous studies [32,33,34,35,36], which also highlighted the influence of these factors on customer satisfaction. Nuseir and Madanat [24] emphasized in their study that higher product and service quality leads to increased customer satisfaction. The satisfaction of elderly customers is driven by the attainment of expected outcomes from the products or services they use. It is important to note that the quality of a product or service is evaluated from the customer's perspective rather than the company's viewpoint. Additionally, customer perception is a strong predictor of customer satisfaction. The quality of a product leaves a lasting impression on customers' psychology, regardless of their age, and its acceptance generates a high level of satisfaction and loyalty [38].

In the context of the place element, certain factors such as order process, storage location, goods distribution, and handling can positively or negatively impact customer satisfaction [37]. The distribution channel, comprising service providers and market intermediaries, is integral to the place element. Companies can choose between direct and indirect marketing channels to provide products and services. Direct channels involve selling products directly from manufacturers to end consumers, while indirect channels involve intermediaries like brokers, wholesalers, and retailers. Indirect channels increase product costs due to profit distribution among agents. Choosing the right medium for selling products and services is crucial to ensure effectiveness and accessibility for all stakeholders. Customer satisfaction is negatively affected when the site or distribution channel inconveniences them, highlighting the importance of customer service and an efficient distribution network [35]. The people element in the service delivery process plays a crucial role as they interact with customers.

Staff members are key contributors to delivering high-quality service and overall satisfaction. However, in the case of elderly customers, the people element may not have a significant impact, either due to a sense of detachment or the inability of staff members to establish a connection or meet the expectations of elderly.
Providing elderly customers with prior information about products or services is beneficial as the pricing factor

influences both parties. Companies aim to secure profits while retaining customers, and higher pricing policies can lead to customer loss. High-quality products have a strong impact on customer psychology, regardless of age, and generate satisfaction and loyalty [38]. Customer value derived from using a product is a crucial factor as customers may be attracted to competitors offering similar products with lower prices. Saving even a small amount becomes a priority if alternative products offer similar quality. Customers with high expectations require higher quality, and failing to understand their quality requirements puts customer loyalty at risk. The marketing mix concept aims to deliver the right value to the right customer for optimal results [39]. The Customer satisfaction is achieved when customers receive the expected benefits and quality from a product or service, aligning with their needs and preferences. Therefore, when elderly customers purchase a product or service that meets their expectations and perceived quality, they are likely to be satisfied. Customer satisfaction is important for increasing market share and maximizing profits [21]. Studies [22,23] noted that satisfied customers contribute to a company's success by spreading positive word-of-mouth and helping the company achieve its goals.

Improving the supply chain organization, involving suppliers, manufacturers, wholesalers, retailers, and customers, can give an organization a competitive advantage over its competitors. This leads to better customer satisfaction by enabling faster delivery of products and services, thus meeting the needs of the elderly population effectively [24]. Location also plays a crucial role in customer satisfaction among the elderly population and affects an organization's productivity [25]. In service marketing, offering easily accessible products and services under one roof attracts a significant number of elderly customers in Assam. This convenience reduces their effort in searching for desired brands and products, ultimately influencing their satisfaction levels [26]. Price as a flexible element of the marketing mix, can be adjusted quickly based on product and service characteristics. It is most effective when harmonized with other elements of the marketing mix. Earlier studies [27] emphasized the significant relationship between price and customer loyalty. This study also found that elderly customers are sensitive to price, and reducing prices can lead to increased customer loyalty. While a high price does not guarantee brand loyalty, it does indicate perceived excellence in brand quality. However, other study [28] reveals that price does not significantly influence the purchase decisions of loyal or non-loyal customers. These customers will purchase the product regardless of the price. Customer perception, a topic extensively studied by researchers, has been found to have a direct link with the marketing mix and customer satisfaction [29,30]. perception of service quality, influenced by elderly customers' expectations, is an important factor affecting customer satisfaction. Marketers can modify their distribution channels to align with the needs and preferences of the target customers, including the elderly, thereby cultivating a positive perception of their products and services in the long run. Understanding customer perception regarding a product or service allows marketers to better comprehend consumer behavior [31]. This understanding enables organizations to influence customer perceptions through advertising, public relations, loyalty programs, and discounts, ultimately enhancing customer satisfaction.

Customer loyalty is established when the perceived quality of a product creates a strong impression on customers, leading to a heightened sense of satisfaction and loyalty. However, the concept of quality can be subjective, as each product is perceived differently based on individual preferences [40]. This variation in perception affects the level of satisfaction and ultimately influences loyalty. For a product to generate loyalty, it should meet certain requirements, such as superiority over competitors, uniqueness, non-substitutability, and appropriability. These qualities build trust and foster customer loyalty to the brand [46]. Nevertheless, it is understandable that marketers cannot expect people of all ages to have the same desires, as these needs change as age habits evolve [41]. The needs of elderly customers differ from those of the general population. Therefore, it is recommended that marketers take this into consideration when considering commercial business strategies. The findings of this study provide valuable insights for practical implementation by marketers. Although elderly customers may not be given high priority by marketers, the study reveals that addressing the demand and issues related to marketing elderly healthcare products and services can inspire innovative and creative approaches that cater to all generations in a harmonious manner.

FURTHER RESEARCH AND LIMITATIONS

The current research assesses the significance of healthcare product and service-related satisfaction. Loyalty and Perception levels among elderly individuals in a specific district of Assam, India. Nevertheless, the study is

constrained by certain limitations. The results obtained through purposive sampling may not be applicable to the entire population, emphasizing the need for a more representative sampling technique in future research to generalize the study findings. The current study is primarily non-longitudinal due to time and cost constraints, with a suggestion for future research to adopt a longitudinal approach to track the evolving behavior of elderly customers over time.

It is crucial to acknowledge that the study is restricted to a sample size of 400 elderly Indian customers, and future researchers may consider larger sample sizes from diverse states. The study's scope is also confined to only a few districts in Assam, India.

Despite these limitations, the paper contributes to the existing literature. Future researchers are encouraged to explore the impact of different elements of the marketing mix (Product, Price, Place, Promotion, People, Process, and Physical Evidence) in-depth among the elderly population. Additionally, technology upgradation should be there for more product development and documentation is required for fulfilling the demands of the customers.

CONCLUSION

Older individuals are increasingly prioritizing a healthy lifestyle, leading them to seek out organic and nutritious food options. They are well aware of the negative effects of popular junk food available in the market, resulting in a growing demand for healthier products that promote overall well-being [42]. However, taste remains a concern for consumers, emphasizing the need for innovative and delicious food offerings. Consequently, it is important to consider the demands for healthier and tastier food products.

The study indicates that elderly customers have had negative experiences with current marketing strategies, necessitating the analysis of strategies for promoting well-being among them in retail stores [43]. Possible solutions involve restructuring the store, such as resizing shelves and providing seating facilities to accommodate limited mobility, as well as categorizing products based on similarity and offering service facilities and equipment.

Therefore, regardless of the nature or scale of the organization, be it new or existing, private or government-run, local or international, business managers play a crucial role in making appropriate choices and setting strategic priorities to allocate resources effectively in response to changing customer expectations, ensuring efficient business success. Consequently, commercial businesses must develop tools, concepts, and strategies to navigate the turbulent and ever-changing marketing environment [44].

CONFLICT OF INTEREST

The author declares no conflict of interest

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RESEARCH ARTICLE

JUST GIVE ME A REASON: HOW GOAL SETTING INCREASES THE NUMBER OF BLOOD DONATIONS

Judith Schloffer[1], Thomas Foscht[1], Lan Wu[2], Cesar M. Maloles III[2]*

1. Department of Marketing, School of Business, Economics and Social Sciences, University of Graz, Austria
2. Department of Marketing, College of Business and Economics, California State University, East Bay, United States of America

Correspondence: judith.schloffer@uni-graz.at

ABSTRACT

In general, there is a positive attitude towards blood donation but only a very small percentage of the population that are eligible to donate blood actually does. Based on ability-opportunity-motivation theory and goal-setting theory, we espouse that asking potential donors to commit to a donation goal in the form of a specific reason for donating blood increases donation frequency.

In an online experiment with a sample of 168 respondents conducted in Austria, different donation goals were developed based on medical data and tested. As a result, we were able to show that asking people to "just" donate, which is currently the standard communication approach of many blood donation organizations, if applied to 100 potential donors would result in 98 blood donations. However, motivating blood donors to reach a goal that requires multiple blood donations more than doubles the number of blood donations over the course of a year. If we think one step further and have potential blood donors select the most appropriate donation goal for them based on the effectiveness, this will triple the amount of blood donated compared to "just donate blood again".

The goal of blood donor organizations should therefore be to use appropriate communication measures to encourage potential blood donors to commit to a blood donation goal that suits them best. This could then motivate them to donate blood more frequently, which would increase the amount of blood donated and secure a continuous supply of much-needed blood.

KEYWORDS

blood donation, goal setting, donor retention, commitment, motivation, communication

INTRODUCTION & BACKGROUND

Demand for blood donations is constant and many countries face an ongoing challenge of collecting enough blood from safe donors to cover national demand [1]. In particular, due to the COVID-19 pandemic, the worst blood shortage in more than a decade has emerged across the globe [2]. Motivating potential blood donors is thus essential for ensuring a steady blood supply [3]. In many countries, voluntary and unpaid blood donors are critical to the proper functioning of health systems [4]. Although generally, people have a positive attitude toward donating blood [5], figures worldwide show only a very small percentage (about 3 to 4%) of eligible blood donors actually donate [6, 7]. The pool of people willing to donate

blood is already small (e.g., 37% in the US); and if people then donate only once or are no longer eligible or willing to donate regularly, there may be shortages in the blood supply. Although first-time donors are important to replace donors who leave the system either voluntarily or who maybe forced to [8], they often donate only once and not regularly [9–12]. Assuming that people who have donated blood before generally have a positive attitude towards blood donation, further encouragement (e.g. communication measures) can enhance their motivation to donate blood again given that they are still eligible to donate. Therefore, blood donor organizations are constantly striving to implement measures to attract new donors or to encourage existing blood donors to donate again.

Above all, communication strategy plays a decisive role in increasing blood donation [13]. Blood donor organizations should use appropriate communication strategies at an early stage to (re)motivate potential donors to give blood and thus ensure a sustainable supply of blood.[11]. In their communications, blood donation organizations often use the generic slogan "save lives" to encourage people to donate blood, despite experimental findings questioning the effectiveness of communication campaigns that rely on this message [14]. Consequently, questions regarding alternative communication approaches and messages to motive blood donors arise. Hence, we propose that setting a specific donation goal, such as donating enough blood needed for a specific medical treatment, would motivate blood donors to donate more frequently and therefore increase the amount of blood donations within a given period of time. Based on ability-opportunity-motivation theory and goal-setting theory, we show how asking former blood donors to commit to a specific donation goal increases donor performance in the form of donation frequency, thus potentially increasing the volume of blood donations per donor.

The ability-opportunity-motivation (AOM) theory is an established conceptualization for classifying the determinants of individual performance [15]. AOM states that a combination of an individual's ability, motivation, and their opportunities can give a measure of an individual's performance, with all three factors needing to be present for performance to occur [16, 17]. Ability is the amount of cognitive, emotional, financial, physical, or social resources that a person can use to perform a particular behavior including variables such as age, health, knowledge, educational level, and energy level [16]. Opportunity refers to relevant constraints that enable a behavior and is the factor that describes the environment in which individuals use their motivation. Motivation describes the process of activating individuals to achieve a goal [18]. Motivation includes variables such as attitude, personality, values, involvement, engagement, and expectations.

In the context of blood donation, performance can be defined as the number of donations in a given period of time. Volunteers' physiological abilities are variables such as ageand health status. The requirements for donating blood are not the same throughout the world. In Austria, people between 18 and 70 who meet certain health and legal criteria may donate blood. First-time donors must not have reached the age of 60 at the time of their first donation. Body weight must be at least 50 kg. However, these variables cannot be influenced either by the volunteer or the blood donation organization. Knowledge (e.g., about the benefits of donating blood or the blood donation process) can be actively obtained by the potential blood donor. Blood donor organizations can support this knowledge acquisition by providing comprehensive information.

The opportunity to donate refers to all environmental factors that affect the individual donor. Blood donor organizations can influence these factors. For instance, blood donation organizations need to create donation-environments that allow volunteers to donate blood without much effort. This includes offering blood donation appointments at locations and times that are convenient for volunteers and providing information about these appointments as part of communication efforts. The on-site collection environment must also be designed so that volunteers feel comfortable during donating blood and leave being satisfied with the experience. Satisfaction with the process of blood donation is essential for blood donors to come back to donate again [10].

Finally, volunteers must be willing and motivated to participate. There are a large number of studies in the literature that look at the different forms of motivation for donating blood (e.g. altruism, reciprocity, social closeness, fairness, donor identity) [19–21]. In this paper we focus on how communication efforts by blood donation organizations, such as in asking the potential donor to set a specific donation goal, can increase motivation to donate blood. For this purpose, we draw on goal-setting theory. Goal-setting is essentially related to task performance [22].

A specific goal, along with appropriate feedback, indicates what needs to be done and how much effort needs to be put in, contributes to higher motivation and ultimately better task performance. Since conscious human behavior is purposeful and is regulated by the individual's goals [23], setting a goal gives individuals a broader vision behind what they are doing. As people better understand the big picture and the result they are trying to achieve, they will be more motivated to work towards the goal. Against this background we claim that asking potential donors to set a specific donation goal, rather than simply asking them to donate (again), increases motivation to donate and thus also leads to better performance in terms of a higher number of blood donations.

METHODS

STUDY DESIGN

A scenario analysis was carried out based on the theoretical findings of the AOM theory and the goal-setting theory. As the study is exploratory and not structure-testing, it aims to analyze possible future developments and present them coherently. Alternative future situations are described. As a first step, we developed various donation goals. We then collected data and finally developed scenarios to predict blood donation volumes based on this data. To obtain realistic blood donation goals, we designed donation goals based on a literature review and discussed in a second step with a group of experts consisting of employees of the Austrian Red Cross and physicians. After these consultations, we developed three treatments that differ in relation to the reason to donate and the frequency of donation. The donation goals to be achieved within a time frame of one year were: donating blood once again, donating two times for cancer treatment, and donating four times for heart surgery (see Table 1).

TABLE 1. OVERVIEW ON TREATMENTS

	Donation Goals		
	Goal 1: **Donating once again**	Goal 2: **Donating two times for cancer treatment**	Goal 3: **Donating four times for heart surgery**
Basic information for participants	Every 80 seconds, a unit of blood is needed in Austria—that's up to 400,000 units per year. Whether in accidents, operations, serious illnesses such as cancer, or even during births, human blood is one of the most important "medicines" in an emergency and cannot be replaced by anything else. The need for blood reserves during operations depends, of course, on the "severity" of an intervention. On average, however, heart operations, for example, require the processed blood of four blood donations to supply the patient. Organ transplants or the treatment of accident victims with severe injuries may require 20 or more blood donations. The Austrian Red Cross is faced with the task of ensuring an ongoing supply of blood. Please indicate to what extend you can contribute to the following donation goal.		
Treatment (Donation Goal)	I am willing to donate blood again to support the blood supply in Austria in general.*	I am willing to donate blood 2 times within a year, thereby enabling the treatment of a cancer patient. As a service, the Austrian Red Cross would then take the liberty of reminding you of the appointments offered in your area. If you donated	I am willing to donate blood 4 times within a year to make one heart surgery possible. As a service, the Austrian Red Cross would then take the liberty of reminding you of the appointments offered in your area. If you donated blood 4 times within a

	*Assumption: donation will be in a timely manner (within a year)	blood 2 times within a year, you would receive a small thank you gift from the Austrian Red Cross.	year, you would receive a small thank you gift from the Austrian Red Cross.
Willingness to donate	Measured as single item on a 5-point-Likert Scale 1 =strongly agree to 5 = strongly disagree		

SAMPLE

The research team has been working closely with the Red Cross in Austria for some time with the aim of finding out more about the behavior of blood donors. In the past, the focus has been on studies of both current blood donors and potential blood donors. In addition to attracting new blood donors, the Austrian Red Cross aims to reach out to people who have already donated and encourage them to donate again. It can be assumed that this group of people has a positive attitude towards donating blood and a certain willingness to donate blood. Therefore, this study is aimed at blood donors who have already donated, i.e. for whom contact details are already available. In order to find out more about their behavior and to analyze potential reasons for not donating and subsequently to jointly develop future measures to increase the volume of blood donations, in cooperation with the Austrian Red Cross, those people were selected from the blood donation database who live in a certain area, have donated blood at least once but have not donated blood in the last three years, and who could be reached via e-mail. 4,000 former blood donors received an invitation from the Austrian Red Cross to participate in an online survey. It was ensured that the data could not be traced back to individual donors.

This approach is also in line with the Ethics Commission of the University of Graz. According to its guidelines, research projects involving human subjects that may impair the physical or psychological integrity of the subject or the right to privacy or other important rights and interests of the subject or their relatives must be examined for their ethical justifiability. The survey in connection with this study did not require separate approval.

MEASUREMENT

The questionnaire was developed on the basis of previous studies using validated scales. The questionnaire included questions about satisfaction with previous blood donations, intention to donate blood again and attitude towards donating blood. Satisfaction was measured with one item on a five-point scale from 1 = very satisfied to 5 = not satisfied. Intention to donate again within the next six month was measured by asking "That I donate blood in the next 6 months is ..." with answers using a 5-point scale with 1 = certain to 5 = out of the question [24]. Attitudes towards donating blood were assessed by the average of six semantic differentials; "Donating blood is … not challenging–challenging, pleasant–not pleasant, useful–useless, worthwhile–not worthwhile, not extraordinary–extraordinary, desirable–not desirable." [25] The items were scored between 1 and 5. The questionnaire was pre-tested with a sample of students – all previous donors.

Since each of the blood donors was randomly assigned to one of the three treatments, these constructs were used alongside demographic variables for checking if the treatments differ from one another. After reading the treatments the respondents answered on a five-point Likert scale their willingness to donate for the specific donation goal (see Table 1). After a two-week data collection period in spring 2018, the final sample for the three treatments included 168 respondents—56 to donate blood again, 57 to donate twice to treat a cancer patient, and 55 to donate four times for heart surgery.

To see if the groups that resulted from random assignment of donation goals differed on demographic variables such as age, number of previous donations, satisfaction with previous donations, attitude towards donating blood, and intention to donate again an ANOVA was conducted that revealed no differences (see Table 2). About 60 % of the respondents were female. The average age of the sample was 39 years. The average number of blood donations before subjects discontinued donating was 12.4.

TABLE 2. DESCRIPTION OF THE SAMPLE

	Mean Values				
	Overall sample (n = 168)	Goal 1: Donating once again (n = 56)	Goal 2: Donating two times for cancer treatment (n = 57)	Goal 3: Donating four times for heart surgery (n = 55)	Sig.
Age	38.9	39.7	35.4	39.5	n.s.
Number of donations before discontinuation of donation	12.4	13.4	11.7	11.4	n.s.
General satisfaction with blood donation [a]	1.29	1.21	1.35	1.27	n.s.
Attitude towards blood donation [b]	1.82	1.70	1.83	1.94	n.s.
General intention to donate blood again in the near future [c]	2.21	2.23	2.16	2.07	n.s.

Note: n.s. p < .10; *p < .05; **p < .01; ***p < .001.
a: Item measured on a 5-point Likert-Scale: 1 = "very satisfied" to 5 = "not satisfied"
b: Items measured on a 5-point Likert-Scale: 1 = "strongly agree" 5 = "strongly disagree"
c: Item measured on a 5-point Likert-Scale: 1 = "certain" to 5 = "out of question"

RESULTS

Firstly, we analyzed the differences in the frequencies of willingness to donate for the three donation goals. Aggregating the first two categories (strongly agree and agree) of the five-point Likert scale measuring "willingness to donate", we find that 98.2% of respondents who read the "donate again" treatment are willing to donate. When considering the group of respondents who read the donation goal "donate twice for heart surgery", 73.3% of respondents are willing to donate. In the case of the third group who have read the treatment "donate four times for heart surgery", 58.2% are willing to donate. (see Table 3).
The results of an ANOVA statistical test show, that there are significant differences ($p<0.001$) in the willingness to donate for each of the three donation goals. The mean value of the willingness to donate measured on a 5-point scale from 1 = strongly agree to 5 = strongly disagree for Goal 1 ("donating once again") is 1.21, the mean value for Goal 2 ("donating two times for cancer treatment") is 1.86, and the mean value for Goal 3 ("donating four times for heart surgery") is 2.24. This indicates the lower the effort required, the higher the willingness to donate.

More importantly, our study shows that setting specific donation goals that motivate blood donors could increase the frequency of blood donations and thus the amount of blood donated within a given period of time. If we assume that, for the three donation goals, the willingness to donate can be equated with the probability of donating blood, then this can lead to the following number of blood donations in the course of a year—based on 100 potential donors—(Figure 1): In the case of the donation goal "donate blood one more time," 98 people would donate blood once within a year and 2 would not, resulting in a total of 98 blood donations. In the case of the donation goal "two donations for the treatment of a cancer patient," 73 people would donate blood; but, more importantly, they would donate blood two times a year. This would result in 146 blood donations. And finally, in the case of "four donations for a heart operation," 58 people would donate blood, but in this case, they would donate blood four times a year. Consequently, this would lead to 232 blood donations per year.

In essence the result of this analysis is that it makes sense for an organization not only to ask potential donors to donate, but to ask them to set a donation goal. The more ambitious the goal is, the lower is the willingness to choose the goal. However, since the more ambitious goals result in a higher number of donations, this makes up for the lower willingness to choose them. So, finally, although the probability for the goal "four donations for a heart operation" is the lowest, Goal 3 turns out as the most effective option for the organization.

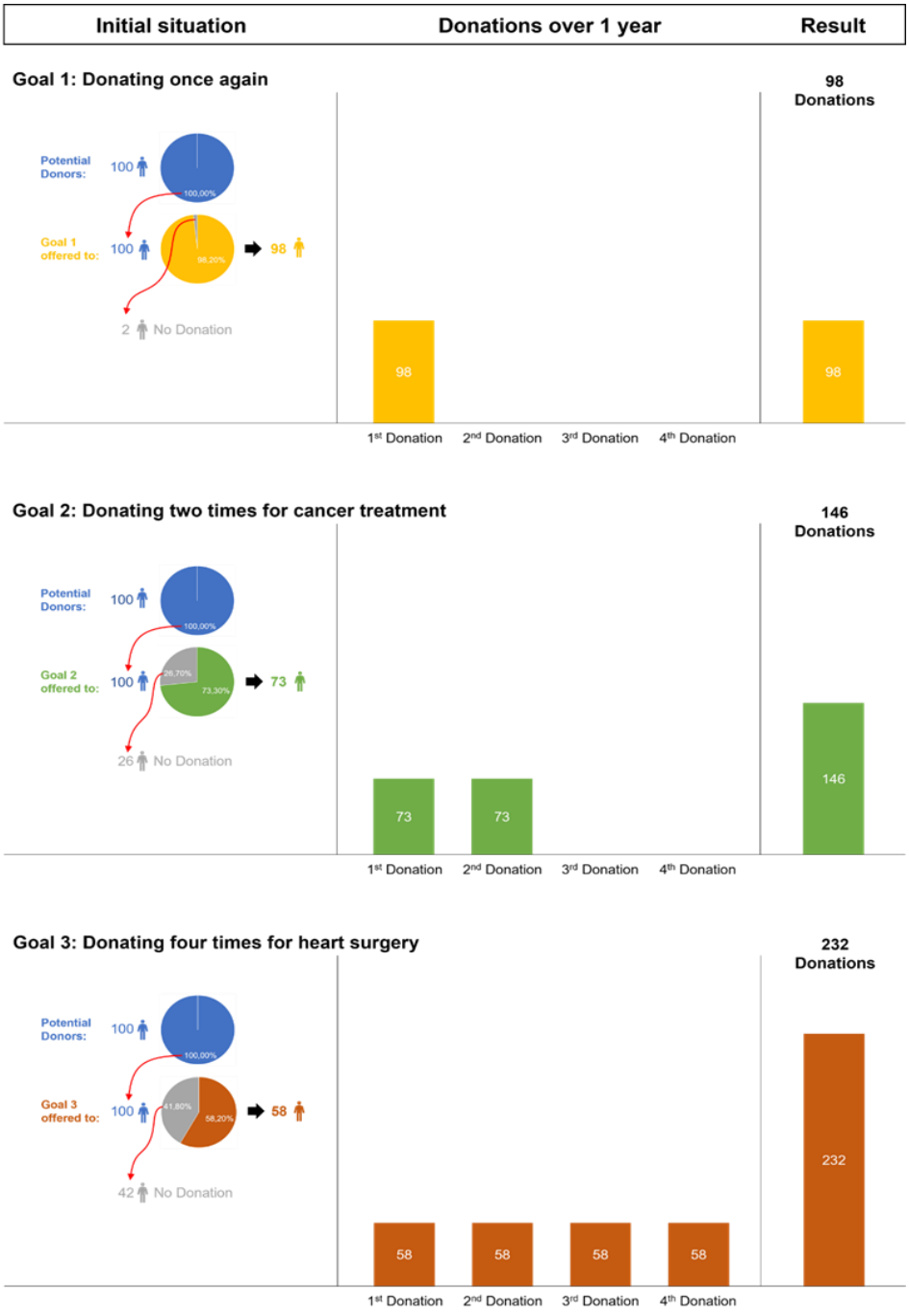
TABLE 3. RESULTS OF THE DONATION GOALS REGARDING WILLINGNESS TO DONATE AND EFFECTIVENESS

	Goal 1: Donating once again	Goal 2: Donating two times for cancer treatment	Goal 3: Donating four times for heart surgery
Aggregated* frequency of willingness to donate[a]	98.2	73.3	58.2
Mean value of willingness to donate [a]	1.21	1.86	2.24
Effectiveness	3	2	1

[a]: Item measured on a 5-point Likert-Scale: 1 = "strongly agree" 5 = "strongly disagree"

*Note: Responses to "1 = strongly agree" and responses to "2 = agree" on the 5-point Likert-Scale were aggregated.

FIGURE 1. NUMBER OF POSSIBLE DONATIONS DEPENDING ON THE DONATION GOAL

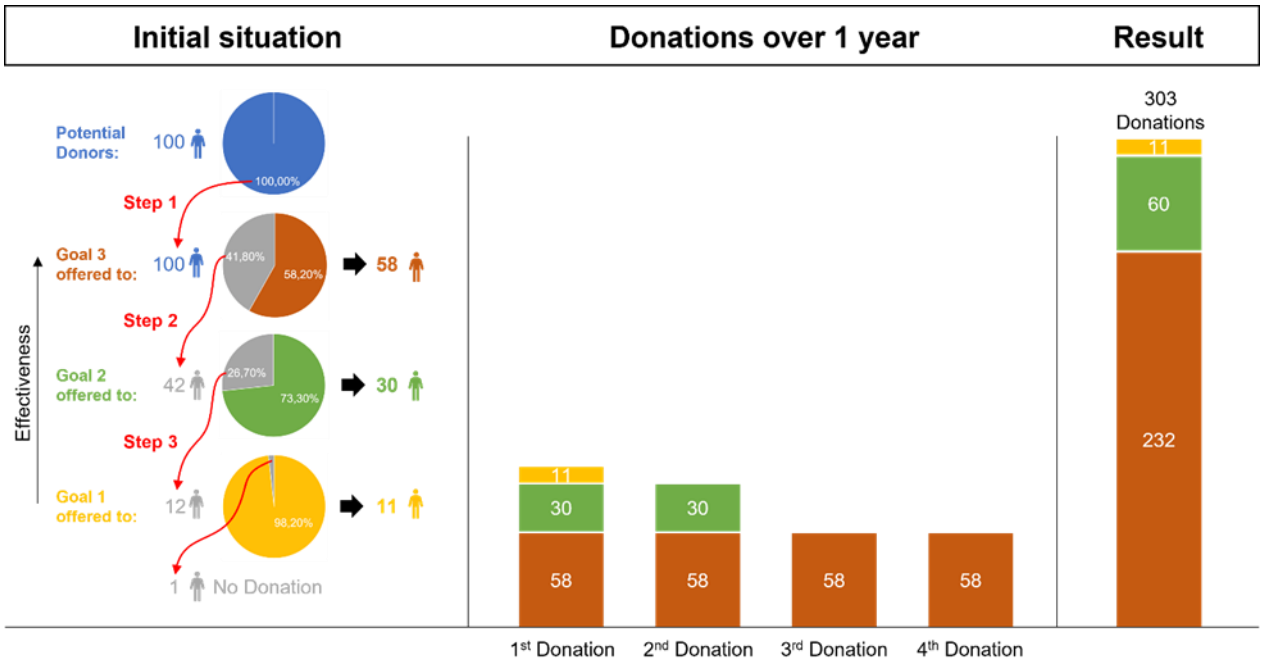


DISCUSSION

The results from our study show that setting a donation goal can increase the potential number of blood donations. For blood donor organizations, this is significant in that by optimizing their communication strategy and asking the potential donors to set a donation goal instead of asking them to donate "once again," they can generate more blood donations in a given time period and better secure the blood supply. As a result, we were able to show that asking people to "just" donate, which is currently the standard communication approach of many blood donation organizations, applied to 100 potential donors would result in 98 blood donations. However, motivating blood donors to reach a goal that requires multiple blood donations more than doubles the number of blood donations over the course of a year compared to the "just donate once again"-goal.

The analysis also shows that there is a difference in willingness to donate depending on the donation goal. For the most ambitious goal ("four donations for a heart operation") the willingness is the lowest; but it turns out to be the most effective goal since the total number of donations over one year is the highest. In particular, 58% of potential donors would be willing to follow this goal, which means that 42% would not donate at all. Why should these potential donors not be addressed with the second effective goal for the organization? Or in other words, it seems to be goal-oriented to offer potential donors the goal with the highest effectiveness; if they are not willing to accept, the goal with the second-best effectiveness would be offered and so on. By applying this idea, which follows the principle of skimming the different levels of willingness to donate and is ultimately an optimization idea, the following result could be achieved (Figure 2): Assuming the starting point is 100 potential donors, in a first step they would be addressed with the donation goal with the highest effectiveness, donation Goal 3 ("four donations for a heart operation"). As it was shown in the analysis, this would lead to 232 donations per year. Since in this case 42 people did not agree to accept the goal, they could now in a second step be addressed with the second-best goal in terms of effectiveness, Goal 2 ("two donations for the treatment of a cancer patient"). The probability to accept Goal 2 is 73.3 percent, which would lead to 30 people who are willing to donate two times a year. This would add another 60 donations to the 232 gained with Goal 3. At the end of the second step, there would still be 12 people left, who could not accept Goal 2. So in step 3, the third-best Goal 3 ("donating once again") could be offered to them. The probability of accepting Goal 3 is 98.2 percent, which would lead to 11 donors. Since these people are willing to donate once in a year, this offer would add another 11 donations. One person who does not want to donate would remain. Consequently, finally by offering the goals in a sequence according to their effectiveness, a total number of 303 donations could be achieved, if all the donors would fulfill their donation goal.

FIGURE 2. MAXIMIZING NUMBER OF DONATIONS BY OFFERING GOALS IN A SEQUENCE ACCORDING TO THEIR EFFECTIVENESS



The goal of blood donor organizations should therefore be to use appropriate communication measures to encourage potential blood donors to commit to a blood donation goal that suits them best. This could then motivate them to donate blood more frequently, which would increase the amount of blood donated. For the blood donation organization, however, this then also means that communication measures must be precisely tailored to the individual blood donor and also reward the achievement of the goal. Furthermore, once the goal has been reached, the communication must be adapted in such a way that the blood donor continues to be motivated to donate. In addition to the managerial implication for blood donor organizations, our contribution to the blood donation literature is that this study, to our best knowledge, is the first to apply AOM theory and goals setting theory in the context of blood donation, explaining another possible motivation to donate.

CONCLUSION

The assumption of this study was that goal setting increases the number of blood donations by giving individuals a specific goal to work towards, which increases their motivation and commitment to donate. Setting a donation goal, namely to donate blood for a specific medical treatment, is intended to increase donor performance in terms of donation frequency. This approach is in line with the concept of goal-setting theory, according to which setting specific goals leads to higher motivation and performance. The use of specific donation targets proved to be more effective in motivating blood donors than general appeals to "just donate again". Selecting donation goals that align with individual motivation can maximize donation volume. The results of the study demonstrate the importance of implementing goal-setting strategies to increase the number of blood donations and ensure a continuous supply of blood. The results of the study underline the importance of communication strategies that focus on donation targets in order to increase the number of blood donations. In order to apply these findings more broadly, blood donation organizations need to adapt their communication approaches and incorporate goal-oriented elements into their donation campaigns. Putting these research findings into practice would mean tailoring communication messages to encourage donors to commit to specific donation goals that match their ability and motivation. By scaling up this approach and integrating it into donation campaigns, organizations can potentially increase donor numbers and ensure a sustainable supply of blood. Although the study was conducted in Austria, the principles of goal setting and motivation in blood donation can be applied worldwide. The Austrian Red Cross or any other blood donation organization could potentially benefit from using similar goal setting strategies to increase blood donations. The Austrian Red Cross has already made initial attempts on social media to implement the idea of donation goals through stories about the personal fate of blood donation recipients. In the future, concrete measures will be considered as part of the communication strategy, taking into account the results of this study.

LIMITATIONS AND FUTURE RESEARCH

This study is intended to be exploratory and therefore has some limitations. In the context of the AOM theory, setting a goal was assumed to be the motivation for donating blood. Other motivations for blood donation, such as a generally existing intrinsic motivation, altruism, or hedonism as motivation or social pressure or closeness, fairness or donor identity were not considered in this study. The sample size per treatment is small, between 55 and 57 respondents. Each respondent also evaluated only one randomly assigned donation goal and could not choose the donation goal that was most attractive to them. Therefore, a competitive setting could lead to different results. We also assumed that the blood donors would like to complete the goal that they are willing to achieve and did not examine the actual behavior of the participants. It was also assumed that the blood donation organization supports the blood donors in achieving the donation goal by regularly reminding them about blood donation events. In order to inform the blood donor about the achievement of the set goal, it would be ideal if the donor received the information for which specific medical case the blood was used. In Austria, however, this is not possible due to legal regulations. In addition, it is not possible to ensure that the donated blood is used at all for the intended donation goal. Furthermore, for the formulation of donation goals, only average values can be given for the amount of blood that is actually needed for medical treatment.

In a further study the intention to donate blood and achieving a set donation goal and then the actual blood donation behavior should be investigated. For this purpose, however, the donation goal should not be selected

randomly, but selected in such a way that blood donors can freely choose a donation goal or possibly rank their preferences.

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RESEARCH ARTICLE

ARTIFICIAL INTELLIGENCE AND SERVICE FLEXIBILITY IN HEALTHCARE: EXPLORING THE NEXUS

Pradeep Kumar

Birla Institute of Management Technology (BIMTECH), Greater Noida - Delhi NCR, India

Correspondence: pradeep.kumar14fpm@iimranchi.ac.in

ABSTRACT

Artificial Intelligence (AI) has the potential to revolutionize healthcare by enabling the development of more personalized, efficient, and effective medical services. One aspect of AI competence in healthcare that has received significant attention is the ability to respond rapidly to the patients' dynamic needs while injecting more flexibility into the system.

This research explores the nexus between AI and service flexibility in healthcare. The qualitative study was carried out to examine the flexibility perspectives of AI-enabled service deliveries in healthcare. The findings contribute to a nuanced understanding of the facets of service flexibility in healthcare that AI could enable. The results would guide better coordination and management of care and the ability to make more informed decisions about treatment options.

The nexus between AI and service flexibility in healthcare would sketch the new paradigms of patient value creation and evidence-based practices, which is an immediate need of healthcare organizations across the globe.

KEYWORDS

Artificial intelligence (AI), healthcare, uncertainty, service flexibility, value creation.

INTRODUCTION & BACKGROUND

In healthcare, Artificial Intelligence (AI) is increasingly being used to enhance the delivery of patient care and improve outcomes [1]. AI tools and technologies have gained momentum in the past few years and populated the healthcare literature [2,3]. It is being used for various medical applications and procedures, such as blood pressure monitoring, heart rate tracking, and prediction of diseases, to name a few [4]. The recent report of Deloite [5] indicates that AI has significantly affected the healthcare industry across the globe. A substantial portion of clinical and administrative service automation will result from the application of AI technologies, which might lead traditional healthcare organizations to shift their operations to more focused on patients [6,7]. However, healthcare deliveries are faced with a high degree of uncertainties that emanate from the changing needs of the patients, and it remains crucial to cope with the technological turbulence while maintaining quality services. Researchers argue that flexibility is a competitive weapon to deal with uncertainties and deliver customized services to patients [8,9]. Flexibility provides a mechanism to adjust the medical infrastructure and deliver personalized services to the patients [10]. Pervious theories on service dominant logic and customer dominant logic indicate patients (customers) not only demand flexibility but also value them [11,12]. Moreover, resource-based theory (RBV) argues that organization mechanize their value resources and infrastructure to generate flexible mechanisms [13,14]. Despite the

tremendous potential of AI to create systems that can perform clinical as well as administrative tasks in healthcare, it remains crucial to understand how AI exhibits service flexibility.

AI is the simulation of human intelligence in machines designed to think and act like humans [15,16]. AI is defined as computational agents that act intelligently to perceive, learn, memorize, reason and problem-solve toward goal-directed behavior [17]. With AI algorithms and machine learning models, healthcare providers can analyze vast amounts of patient data to gain insights into their health conditions and treatment options and even predict future health risks [18,19]. This allows for personalized and proactive patient care, improving outcomes and patient satisfaction. Many authors suggest that technology infusion in service delivery is the primary enabler of flexibility [20,21]. Particularly in the healthcare industry, AI-enabled customer services—such as call analytics, in-app monitoring of health, chat bot-driven customer services, managing high volume patient inquiries, and using patient feedback analysis—are anticipated to generate capabilities for enhanced efficiency [22]. Yet the nexus between AI-enabled deliveries and service flexibility in healthcare remains largely unexplored.

Service flexibility allows healthcare organizations to respond quickly to patient needs and market dynamics changes, leading to increased efficiency and productivity [23]. Previous researchers have emphasized that organizations utilize resources to deal with uncertainties and generate flexibility [24,25]. Researchers posit that flexibility is a competitive weapon to deal with uncertainties and deliver customized services. Many authors have explored measurement issues, financial and non-financial outcomes of flexibility, and the enablers of flexibility [20,25,26]. A significant number of studies established the linkages between manufacturing and healthcare flexibility while simultaneously indicate the utilization of recent forms of technology like AI to achieve flexibility at various levels [10,21]. However, the Technology Adoption Model (TAM) and theory on customer engagement indicate that service providers exhibit flexibility by utilizing several forms of technology [27,28]. Extant literature indicates that technology enables flexibility at various service delivery levels and creates value propositions [9,29]. It is widely accepted by scholars that three major elements characterize flexibility in a particular region: range, mobility, and uniformity [25]. In the context of healthcare, authors argue that customers (patients) experience value in use e.g., use of services and care through numerous customizations that are possible through flexible capabilities [29], [30]. Therefore, AI in healthcare must be addressed to ensure responsiveness and exhibit flexibility. However, there is a paucity of information on the role of AI in generating several types of flexibility. Accordingly, this study examines the nexus between AI and service flexibility in healthcare and, hence, value creation perspectives.

This research attempts to answer the research question:
RQ: How does the integration of AI in healthcare exhibit service flexibility?

STUDY CONTEXT:

AI-enabled technology is no longer regarded an emerging technology in India. Chat Bots driven customer service, media delivery, e-commerce, tourism, agriculture, and healthcare are just a few industries where it is being used more frequently. To increase adaptability in the healthcare market, many Indian organizations have been employing AI even for contextual understanding (such as by insurance service providers to give discounts for safe driving or real-time feedback) [31]. AI-enabled services are predicted to completely reshape the Indian health care sector [4]. In describing the future of the Indian healthcare business, it is predicted that patients' acceptance of AI-driven solutions will expand exponentially in the coming years [32]. The paradigm shifts in healthcare following COVID-19 will create new opportunities for AI-enabled devices and solutions. Given this background and context, it is justified to explore the AI-enabled service flexibility in the Indian healthcare sector. 0

RESEARCH DESIGN

The study investigated AI-enabled service flexibility in healthcare through the development of a case study. Researchers argue that a case study provides an in-depth understanding of the study phenomena [33]. The study primarily aimed to determine how AI in healthcare organizations creates patient-oriented responsiveness by adapting to their dynamic needs. The sample organization has significantly adopted AI-based tools and technologies for patient-related services in the past two years [20]. Semi-structured interviews (n=35) of healthcare professionals were conducted to collect the data. The study participants (Table 1) were recruited based on their background, knowledge of the topic being studied, and the nature of their current organizational roles. The snowball sampling was utilized to approach and invite the study participants.

The author approached the medical institute (Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India) on 2nd and 3rd of September 2023 for a permission and ethical approval. By acknowledging the academic importance, the ethical committee clearance was given to the author on 13th December 2023 and the author was awarded a research travel grant by the parent institute (Birla Institute of Management Technology, Greater Noida, India) to facilitate and support their scholarly pursuits.

DATA COLLECTION

The questions for the semi-structured interviews were created using the critical literature on the studied topics (such as AI, responsiveness, flexibility, and customization). The semi-structured interview questions were shown to a small group of healthcare professionals and their feedback was taken into consideration to improve the list of questions. The interviews took place in July and August of 2023. Most discussions took 45 to 50 minutes on average, and only a small number were repeated for data reliability and clarity. Three phases (Table 1) were included in the data collection process.

TABLE 1: PHASES OF DATA COLLECTION IN THIS STUDY

Phase	Organizational position	Working experience	Interviewees	Interviews	Focus of interview questions
Field sensitization	Senior	>10 Years	5	6	
	Middle	05-10 years	5	5	AI usage in healthcare organizations
	Lower	0-05 years	3	5	
Data gathering	Senior	>10 years	6	7	Role of AI in coping uncertainties and flexible response
	Middle	05-10 Years	7	7	
	Lower	0-05 Years	4	6	
Validation	Senior	>10 Years	3	3	Validation of findings
	Middle	05-10 Years	2	3	
	TOTAL		**35**	**42**	

DATA ANALYSIS

The data analysis was focused on exploring the nexus between AI and facets of service flexibility. The study examined the various dimensions of service flexibility that AI could enable. The basis of exploration were the three elements (range, mobility, and uniformity) of flexibility [25] that AI could generate. The qualitative data were transcribed and imported into the database. The analysis of qualitative data was performed through NVivo (v10) software. Because NVivo is so user-friendly and allows for document extraction directly from word processing software, it was selected over other products for data analysis [35].

Further, a thematic analysis was employed to identify meaningful patterns from the qualitative data. The recommendations of Braun and Clark [36] were followed to identify the patterns, and themes (Table 2) were identified based on those authors recommendations of using a six-step process of looking at the meaning of patterns. Three coders (one professor and two research scholars) were involved in the coding process. In order to improve clarity and reliability, interviews were carried out repeatedly [37]. We collected information from multiple sources in order to undertake data triangulation [38]. Data was gathered from the medical records and other documents. In regard to clinical procedures and treatment modalities, relevant information has been gathered via websites, a medical education unit, telemedicine, and other nursing units. When relatively few new insights were obtained—that is, when the researchers could predict the informant's response before they stated it (data saturation)—the data collecting process was stopped [33]. To ensure validity and reliability, we adhered to recommendations of

Denzin (1998) [39]. Finally, the Kappa score was ascertained to establish inter-coder reliability.

TABLE 2: INTERVIEW RESPONSES AND CODING OF DATA IN THIS STUDY

Example quotes	2nd order coding	Coding Categories
"AI-powered capabilities are revolutionizing the healthcare industry. It enables us to optimize our operations by dynamically adjusting resources and services to meet patient needs. AI, for example, can assist us in allocating people and resources more effectively amid an unexpected patient spike, ensuring that everyone receives the treatment they require". *"Artificial Intelligence has improved our capacity to manage higher patient numbers in the radiology department. AI systems can help us satisfy demand without sacrificing diagnostic quality by helping us prioritize and interpret imaging tests more efficiently".*	AI and Operational efficiency, AI for staff optimizations, AI for better resource allocation, AI for quick adjustments on multiple fronts, AI for shorter waiting time	AI-enabled Volume flexibility
"AI plays a crucial role in clinical requirements. It allows us to customize treatment regimens for each patient, resulting in better care. Additionally, it simplifies administrative work and enhances inter-departmental responsiveness while providing patient care". *"Increased responsiveness made possible by AI directly impacts patient treatment. It enables us to customize therapy regimens to meet the particular requirements of every patient, increasing treatment efficacy and lowering adverse event rates. Better patient outcomes and general satisfaction follow from this".*	Clinical workflow optimization, AI-driven clinical decision making, better treatment outcomes.	AI-enabled Clinical flexibility
"AI-enabled recovery processes significantly impact patient care. It guarantees that treatment programs are customized to each patient's needs, leading to more successful and efficient rehabilitation. Consequently, this leads to enhanced patient results and general contentment". *"AI in nursing aids in creating rehabilitation plans tailored to each patient's needs and evolving with them. Better patient outcomes result from this, as it promotes more effective recoveries and better treatment".*	AI for improved recovery, tracking of patient complaints, quick attention for recovery, AI-driven interventions	AI-enabled Patient recovery flexibility

CASE STUDY FINDINGS AND DISCUSSION

The study focused on a healthcare organization aligned with the Ministry of Health, Medical Education and Research, Government of India's index. The case organization has emerged as one of the leading institutions based on parameters such as patient registrations, bed capacity, and an extensive range of clinical, para-clinical, and auxiliary services. Notably, substantial investments have been directed towards the integration of Artificial Intelligence (AI) within the organization, reflecting a strategic commitment to advancements in healthcare technology. Healthcare professionals within this organization have acknowledged the implementation of flexible practices that align with patient preferences, and there is a growing recognition of the potential for AI to enhance and enable such flexibility. The extant literature underscores the multi-dimensionality of service flexibility, yet this study contributes by elucidating the specific dimensions of service flexibility that can be effectively harnessed through the adoption of AI-enabled tools and technologies. The findings shed light on the nuanced ways in which AI applications can foster adaptability in healthcare services, thereby contributing to a more comprehensive understanding of the intersection between AI adoption and service flexibility in the healthcare sector.

AI-ENABLED VOLUME FLEXIBILITY

The use of AI to optimize and modify the distribution of resources and services in healthcare settings in response to shifting demands and needs is known as "AI-enabled volume flexibility in healthcare."[21, 40]. In healthcare,

where resource allocation and service delivery can be intricate and dynamic, this idea is especially pertinent. AI can forecast patient loads, disease outbreaks, and other healthcare demands by analyzing historical and current data. Healthcare systems can better meet shifting needs by using this information to allocate resources, such as staff, equipment, and beds. Appointment slots and rescheduling can be optimized using AI-driven scheduling systems to account for fluctuations in patient loads. This adaptability guarantees that patients receive care when needed and cuts down on waiting periods.

AI-ENABLED CLINICAL FLEXIBILITY

By evaluating patient data, including test results, patient histories, and medical imaging (such as X-rays, MRIs, and CT scans), AI algorithms can help medical personnel diagnose medical disorders. Healthcare professionals can diagnose patients more quickly and accurately with this support, giving them more freedom to make decisions. AI can analyze large datasets to forecast patient outcomes and the course of a disease. Artificial intelligence (AI) makes more proactive and adaptable treatment planning possible by giving medical professionals these predictions. AI can analyze patient data and recommend treatments in real-time to enhance clinical decision-making. This support aids medical practitioners' decision-making process, particularly in intricate or quickly changing clinical situations. Thus, AI-enabled clinical flexibility allows a rapid response to the patient's clinical conditions and provides a range of clinical services effectively and efficiently [10].

AI-ENABLED PATIENT RECOVERY FLEXIBILITY

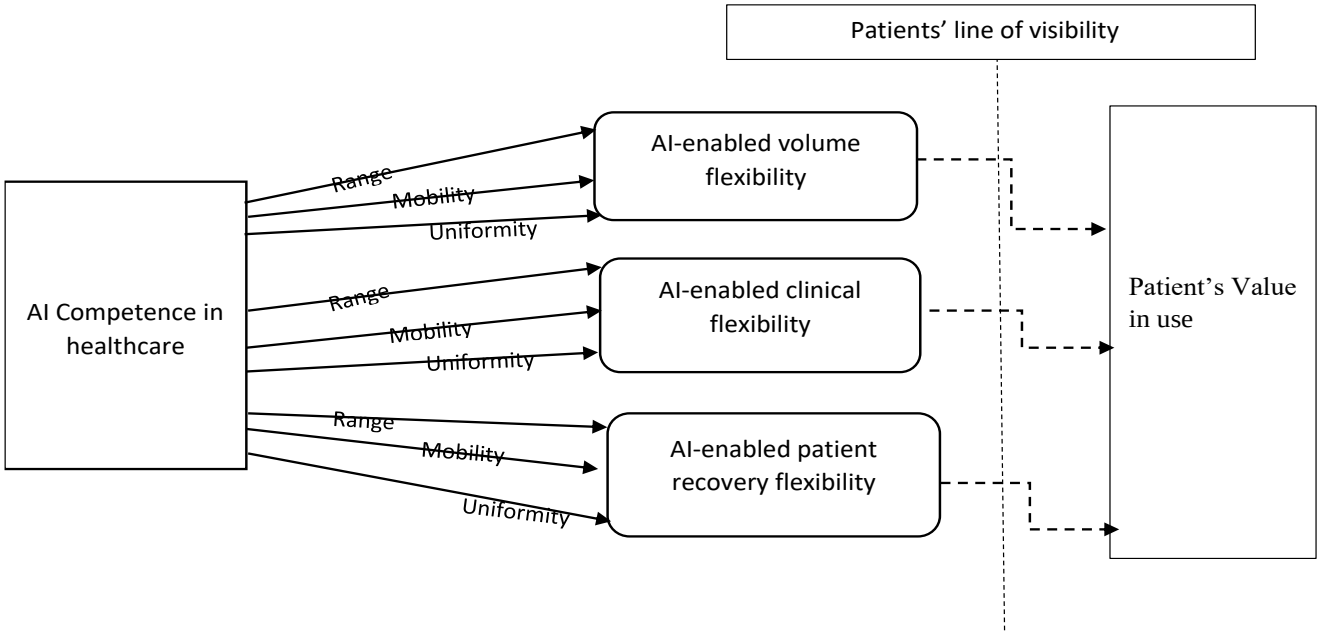
The recovery of patients when something goes wrong has happened remains crucial in healthcare [41]. Therefore, a different level of flexibility is required to cope with uncertainties like re-admittance, patient complaints, or other post-discharge issues. AI technologies make it possible to deal with such uncertain conditions. AI offers tools and methods that enhance the overall recovery process; it can have a substantial impact on the flexibility of patient rehabilitation in the healthcare industry. This eliminates the need for frequent in-person visits by enabling medical professionals to monitor patients' progress toward recovery and make any required modifications to the treatment plan. AI-powered rehabilitation programs can track patients' progress and offer personalized workout plans. The AI's ability to modify the workouts as patients heal to fit their evolving requirements and capacities promotes an adaptable and patient-centric approach to rehabilitation.

AI is becoming increasingly integrated into the present healthcare ecosystem, as demonstrated by a number of studies [42,43]. Several studies in the field of healthcare have shown that the broad implementation of artificial intelligence (AI) leads to enhancements throughout the entire care spectrum, including robotic surgery, clinical trials, rare illness therapy, medication development, and customer services ([18,44]). AI-enabled devices and technology have improved the healthcare supply chain, automated treatment processes, and provided individualized care [45]. AI-based tools and technologies increase the range, mobility, and uniformity in the following three facets and hence, create flexible mechanisms (Table 3).

TABLE 3: GENESIS OF AI-ENABLED SERVICE FLEXIBILITY IN HEALTHCARE

AI-enabled service flexibility	Range	Mobility	Uniformity
Volume flexibility	Number of patients admitted, rate of discharge from medical units	reduced waiting time, short queue,	Quality of treatment, lower mortality rates
Clinical flexibility	The number of clinical services.	Inter-departmental responsiveness,	Improved efficiency of clinical services
Patient recovery flexibility	Variety of support channels for patients, rate of re-admissions.	Quick support to patient complaints, attentiveness, and AI-based assistance	Effective management of patient's complaint, effective recovery

FIGURE 1: AI COMPETENCE AND SERVICE FLEXIBILITY IN HEALTHCARE



THEORETICAL IMPLICATIONS

This study provides several implications for theory. First, the study responds to recent calls from researchers regarding the dynamics of flexibility in healthcare [31]. The study's findings reveal three unique facets of patient-oriented service flexibilities in terms of volume flexibility, clinical flexibility, and patient recovery flexibility. Thus, the results contribute to the healthcare literature by clarifying the genesis of patient-oriented flexibilities at various levels. Second, previous studies argue that AI provides a response mechanism to several uncertainties in the care processes while simultaneously increasing the effectiveness and efficiency of medical resources [17]. The current study's findings extend this conceptualization and establish the relationships between AI and service flexibility by justifying the distinctive dimensions of service flexibility. Recent studies on AI in healthcare calls an exploration into healthcare providers service flexibility, that AI could enable [28,31]. The findings explain the three facets of healthcare flexibility. Further, the results established the elements of AI-enabled volume flexibility, AI-enabled clinical flexibility, and AI-enabled patient recovery flexibility [10,21,41]. Third, previous studies merely mention that flexible capabilities provide numerous customizations in response to changing demand patterns [8,29]. This study goes beyond that and establishes how AI plays a significant role in addressing the changing demand patterns in a healthcare context and exhibits a multitude of flexibilities as a response.

PRACTICAL IMPLICATIONS

An integrative model of service flexibility and artificial intelligence in healthcare would encompass the utilization of AI technologies and flexible service offerings to enhance the delivery of healthcare services. The model would aim to strike a balance between the benefits of AI, such as improved efficiency and accuracy, and the need for personalized, flexible healthcare services that cater to the unique needs of patients. For example, AI algorithms can automate repetitive tasks such as data entry, freeing healthcare providers to focus on more critical tasks such as patient diagnosis and treatment, thus allowing them to develop volume-flexible capabilities [28]. Additionally, this results in better patient outcomes, reduced costs, utilization of medical resources more effectively, and thus responding more flexibly. In addition, AI-enabled clinical flexibility is essential to respond to various clinical conditions of the patients. The study's findings clarify how AI injects more flexibility into the system to recover patients quickly if something wrong happens. For example, AI-powered telemedicine services can provide remote patient consultations, reducing the need for in-person visits and making healthcare more accessible.

CONCLUSIONS

This study provides a 'flexibility' perspective of AI in healthcare. The semi-structured interviews of healthcare professionals were conducted to explore how AI could enable different types of flexibility in healthcare deliveries.

The findings suggest three crucial dimensions of flexibility that AI could enable in a healthcare setting. However, future studies should explore other facets of AI-enabled service flexibilities and assess the strength of the relationships through quantitative techniques. The qualitative data was gathered from healthcare professionals, and patient's perspectives were not included. Therefore, it is urged to build a holistic view of AI-enabled service flexibility by compiling patients' data in the study.

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RESEARCH ARTICLE

THE IMPACT OF JOB STRESS ON JOB SATISFACTION AMONG NURSES DURING COVID-19 PANDEMIC: THE MODERATING ROLE OF PSYCHOLOGICAL CAPITAL

Mohammed Yousef Alkhraishi[*1], *Maysoon Fayiz Almashayekh*[2], *Mehmet Yesiltas*[3]

1. Abu Dhabi Health Services Company (SEHA), Al Dhafra Hospitals, Nursing Midwifery Clinical Education and Research Department, Abu Dhabi, United Arab Emirates.
2. Ambulatory Healthcare Services (AHS), School Health Services, Abu Dhabi, United Arab Emirates
3. Faculty of Economics and Administrative Sciences, Business Administration Department, Cyprus International University, Cyprus.

Correspondence: mohammedalkhraishi@yahoo.com

ABSTRACT

The mental well-being of nurses has been severely impacted by COVID-19, and safety measures are required for both their physical and mental well-being. Effective treatment of their psychological trauma requires a thorough understanding of their experiences. Ensuring public safety requires dedicated nursing staff participation in the management of plague clinics. Supporting nurses' psychological and physical well-being through adequate compensation, mental health counselling and job satisfaction is critical to addressing this crisis and future challenges.

This study is proposed to provide baseline information on the impact of job stress on Al Dhafra hospitals nurses' job satisfaction during the COVID-19 pandemic and the effect of psychological capital as a moderator. Furthermore, the study will open a new aspect for further research to improve and reduce its adverse effects. Besides, the study will highlight the importance of exploring coping strategies and perceived influential supporting factors to address stressors of nurses in the UAE and mounting concerns about job satisfaction during Covid-19. In addition, it can be used as a reference to create, improve, or modify guidelines and existing protocols. As well as serve as a reasonable contribution study for further nursing management in future crises.

The study employed a quantitative correlation research design, and an online survey was conducted and participated in by 255 nurses who are in direct contact with and managing patients with COVID-19 in Al Dhafra hospitals in the UAE.

The present study's findings indicate that there is a negative relationship between job stress and job satisfaction; on the other hand, the findings also revealed a positive moderating effect of psychological capital on the relationship between job stress and job satisfaction.

The current study has important implications for hospitals in developing managerial, training, and strategic policies. According to the findings of this study, job stress has a significant impact on nursing satisfaction. Furthermore, hospitals can improve their job satisfaction as well as can be applied to other cultural and demographic contexts to reduce employee stress.

KEYWORDS

Al Dhafra Hospitals, COVID-19 Pandemic, Job Satisfaction, Job Stress, Psychological Capital.

INTRODUCTION

The psychological damage from COVID-19 affected the overall population, predominantly the nurses. They are the health workers who are most often on the front lines, and as a response to the rampant global pestilence, nursing's role has expanded to deal with patients stricken by COVID-19.

Nurses are facing many challenges as frontline providers. The mission of preventing the spread of infection or managing patients with COVID-19 infections puts further stress on the shoulders of the healthcare team. These challenges may increase their internal pressure and affect their psychological well-being and job satisfaction. Patient's psychological health may worsen due to observing many of them die. It requires immediate attention to the coronavirus pandemic's undetermined effect on healthcare providers' mental hygiene. In the UAE, more resources are needed to discuss this problem. Al-Dhafra hospitals are located in a relatively isolated region of the UAE, making them an ideal location to examine the impact of work stress in areas of geographical isolation, limited resources and diverse patient populations The choice of Al Dhafra hospitals is an option that is appropriate for this methodology. By examining these specific factors that are overlooked in health research, the study seeks to fill an important gap in our understanding of job stress, job satisfaction, and psychological capital about addressing less complex areas of health care. The purpose of this study is not only to elucidate the impact of job stress on nurse satisfaction, but also to investigate the possible influence of psychological capital on this ability. The insights gained are expected to inform the design of, and ultimately helpful, targeted interventions and programs to support the well-being and retention of health care workers in remote areas sustain high quality patient care.

Stress combines psychological, passionate, mental, and physical responses to job-related factors such as work materials, work environment, and working conditions [1].

Nurses are exposed to many stressors that influence them toward psychological illness. Nurses who work closely with and handle COVID-19 patients are expected to experience more depression and anxiety than ordinary people or administrative personnel [2]. It was discovered during the COVID-19 pandemic that there was a high level of stress, fear, and depression among nurses. In comparison, other studies distinguish between the short-term and long-term impacts of the infection on human bodies [3,4,5].

JOB SATISFACTION

Job satisfaction is often characterized as a good and pleasurable emotional response triggered by an individual's overall evaluation [6]. Furthermore, job satisfaction, as an individual's subjective emotional state, provides a positive emotional reaction due to the person's perception of the worth of their work. That person might get more actively involved in the position [7].

Job dissatisfaction and job stress have mutual connections. An emotion of displeasure or the staff feels unstable between what he attains and performs [8]. During the COVID-19 pandemic, it is critical for nurses to feel satisfied with their work. Various studies worldwide recorded shallow job satisfaction among nurses, including Israeli nurses, with mean job satisfaction of 3.6 (score range, 5-point Likert) [9]. While in Italy, a large-scale study among healthcare professionals was recorded with a mean score of 2.8 on a 4-point Likert scale [10].

Job satisfaction has also been shown to be negatively related to job stress [11]. Another research [12] found a link between work satisfaction and job stress, with job stress lowering dignity during sad moods and contributing to physician turnover. A substantial connection exists between perceived stress and work satisfaction [13].

JOB STRESS

The concept of job stress has been studied extensively especially in the nursing profession due to its profound impact on individual health workers and on health care as a whole the relationship between job stress and job satisfaction is complex, with elevated stress levels often leading to diminished satisfaction and, consequently, higher turnover rates among nursing staff [14,15]. The pandemic has increased the number of stressors, making it important to examine their effects on nurses' job satisfaction in this unique context. Furthermore, nurses have a reason to choose to step down from their work due to the devastating effect on mental health, danger to safety, and inadequate protection for their loved ones. Recognizing the psychological problems surrounding poor job satisfaction among nurses is vital to achieving more precise solutions [16]. According to research, there is no correlation between work stress and job satisfaction [17]. Another study [18] found a link between work satisfaction and job stress,

with job stress lowering dignity during sad moods and contributing to physician turnover.

PSYCHOLOGICAL CAPITAL

Psychological capital is considered the second request build that incorporates people's mental limits like self-viability, trust, strength, and confidence, which can be coordinated or created [19]. Psychological capital acts as a defensive cradle against the abysmal mental impacts of the coronavirus. Psychological capital is considered the second request build that incorporates people's mental limits like self-viability, trust, strength, and confidence, which can be coordinated or created [19].

With its dimensions of hope, effort, resilience, and hope, psychological capital provides a promising framework for understanding how nurses can effectively manage the COVID-19 pandemic. This psychological positivity has been shown to play an important role in improving individuals' ability to cope with job stress, and may offset the negative effects on job satisfaction [20,21].The psychological capital of nursing staff in the high-stress environment of the pandemic may be an important factor in maintaining or improving job satisfaction despite many challenges If the role of psychological capital in nursing job stress is examined and job satisfaction in Al Dhafra hospitals provides valuable insights.

Psychological capital acts as a defensive cradle against the abysmal mental impacts of the coronavirus. Psychological capital likewise intervenes in the positive connection between self-administration and well-being and defensive behavior during the pandemic [22]. Furthermore, evidence proves that psychological capital decreases the feelings of trepidation in nurses' entourage despite hardship [23]. In addition, previous research has shown that nurses' psychological capital is negatively linked with occupation burnout [24] and aids in reducing nurses' perceptions of mental distress, increasing work satisfaction, and improving patient safety [25].

The COVID-19 pandemic has placed unprecedented stress on healthcare systems around the world, significantly affecting the well-being and job satisfaction of nursing staff. Al Dhafra Hospitals, which serves a remote and diverse population in the UAE, provides a unique context for examining these developments. The aim of this study is to examine the impact of job stress on nurses' job satisfaction in this critical context with a focus on the moderating role of psychological capital.

This study mainly proposes to provide baseline information on the impact of job stress on Al Dhafra Hospital nurses' job satisfaction during the COVID-19 pandemic and the effect of psychological capital as a moderator. Furthermore, the study will open a new avenue for further research to improve and reduce its adverse effects. The study will highlight the importance of exploring coping strategies and perceived influential supporting factors to address stressors for nurses in the UAE and mounting concerns about nurses' level of satisfaction. It is hopeful that the findings of this study would produce positive affirmation for the staff engaged in the workplace, thus building a good relationship with the leader that is encouraging and courageous while at the same time being counseled flexibly. In addition, it can be used as a reference to create, improve, and modify the guidelines and existing protocols. It can also serve as a reasonable contribution study for further nursing management in future crises.

METHODS

DATA COLLECTION AND PROCEDURE

This study population was extracted and gathered from within Al Dhafra Hospitals in UAE, and the participants are the nurses who work there. Participants were chosen using questionnaires sent to the Al Dhafra hospitals using online survey questionnaires.

The survey was drawn from nurses in Al Dhafra hospitals in the UAE, with a focus on those treating patients with COVID-19. Selection was made through an online survey, in which only nurses involved in COVID-19 care were included.

To examine nurses' job stress, job satisfaction, and psychological capital during the COVID-19 pandemic, the researcher used valid and reliable questionnaires, including socio-demographic characteristics, job stress , job satisfaction , and psychological capital scales.

All information was kept confidential on the principal investigator's laptop, secured with a password. After cleaning the data, all information was entered into the Statistical Package for Social Science (SPSS) version 26.

The study employed a quantitative correlation research design. Descriptive statistics (frequency, means, percentages, and standard deviations) were employed to characterize the demographic characteristics. The

inferential statistics used correlation and regression analysis of variance to test job stress, job satisfaction, and psychological capital scores among participants' demographic features. The questionnaire was examined after the survey was finished to make sure it adhered to the rules. To guarantee accurate data input, the questionnaires were double-entered and consistently numbered. The hospital nurses provided 255 survey respondents out of a total of 420 possible participants, and they completed the surveys with a recovery rate of 60.7%. The analysis showed that at least 201 responses were required to reach a confidence level of 95% with a margin of error of ±5%, ensuring the study's findings are statistically reliable and reflective of the nurses' experiences during the pandemic.

CONFIDENTIALITY AND ETHICAL ISSUES

The Medical Research and Development (Department of Health) Ethical Committee in Abu Dhabi, UAE, granted ethical approval for this study (DOH/CVDC/2022/1711).

DEMOGRAPHIC INFORMATION FORM

The demographic information questions contained seven items, including age, gender, marital status, educational level, years of experience, types of nursing specialties, and the workplace/unit in the hospital.

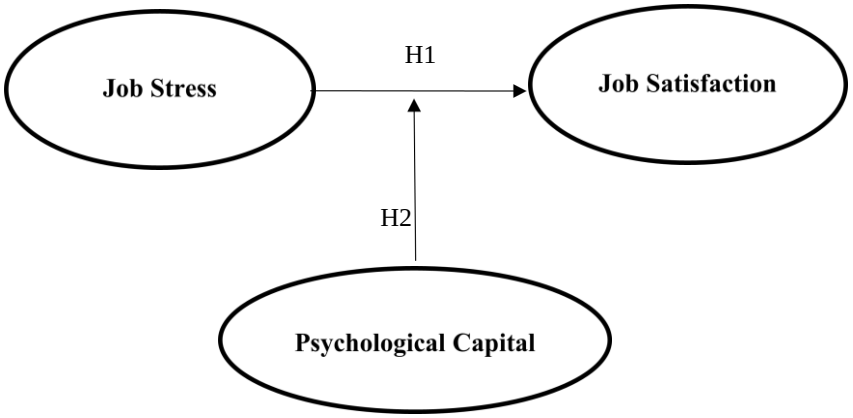
JOB STRESS, JOB SATISFACTION, AND PSYCHOLOGICAL CAPITAL SCALE

This study examined 13 items from the organizational determinants of job stress [26] that were used to measure stress at work. The generic job satisfaction scale (GJSS) [27] was used in this research to evaluate job satisfaction. It consists of 10 items that assessed the psychological capital at work using the short version of the questionnaire [28] with 22 items. Participants picked a number between 1 and 5 on a 5-point Likert scale to represent their Level of each variable.

CONCEPTUAL FRAMEWORK

The conceptual framework of this study, created based on the connections between the numerous factors found in the literature review, is shown in Figure 1. To examine the relationship between job stress and job satisfaction, we developed a conceptual framework for this study. During the COVID-19 pandemic, we needed to also consider how psychological capital moderates the link between job stress and job satisfaction.

FIGURE 1: CONCEPTUAL FRAMEWORK



HYPOTHESES

Numerous hypotheses are developed using the conceptual Framework shown in Figure 1 following the literature search conducted at the start of this study.

H1: Job stress is negatively related to job satisfaction among nurses during COVID-19 pandemic.

H2: Psychological capital will moderate the relation between job stress and job satisfaction among nurses during COVID-19 pandemic so that when psychological capital is low, the influence of job stress on job satisfaction is high, and when psychological capital is high, the effect of job stress on job satisfaction is low.

RESULTS

DESCRIPTIVE STATISTICS

Utilizing SPSS 26.0, statistical analyses were carried out. Descriptive statistics like frequency and component ratio were used to examine the data. The descriptive statistics of the 255 study participants reveals a predominance of nurses aged 30-39 years (60%), with the majority being female (76.5%) and married (76.5%); Educational level is surprisingly high, with 78.8% holding a bachelor's degree. In terms of work experience, there is an equal distribution among those aged 6-10 years (30.6%), 11-15 years (31.8%), and over 16 years (32.9%), indicating independent workers skilled in most are registered nurses (88). is 2%), reflecting the focus on this group in the study. Workplaces are diverse, with the largest group working in intensive care units (42.4%), emphasizing the importance of critical care This population gives the number of nurses available Details of Al Dhafra Hospitals offering different types of acute care. Identify well-educated, skilled, and predominantly female nurses working in the setting. Table 1 lists the characteristics of the final 255 participants.

TABLE 1: DESCRIPTIVE STATISTICS OF THE PARTICIPANTS (N = 255)

		Frequency	Percent	Valid Percent	Cumulative Percent
Age					
Valid	20-29 years	18	7.1	7.1	7.1
	30-39 years	153	60.0	60.0	67.1
	40-49 years	54	21.2	21.2	88.2
	50 years and above	30	11.8	11.8	100.0
	Total	255	100.0	100.0	
Gender					
Valid	Male	60	23.5	23.5	23.5
	Female	195	76.5	76.5	100.0
	Total	255	100.0	100.0	
Marital Status					
Valid	Single	54	21.2	21.2	21.2
	Married	195	76.5	76.5	97.6
	Divorce	6	2.4	2.4	100.0
	Total	255	100.0	100.0	
Educational Level					
Valid	Diploma	30	11.8	11.8	11.8
	Bachelor	201	78.8	78.8	90.6
	Master	18	7.1	7.1	97.6
	Doctorate	6	2.4	2.4	100.0
	Total	255	100.0	100.0	
Years of Experience					
Valid	1-5 years	12	4.7	4.7	4.7
	6-10 years	78	30.6	30.6	35.3
	11-15 years	81	31.8	31.8	67.1
	16 years and above	84	32.9	32.9	100.0
	Total	255	100.0	100.0	

Nursing Specialties					
Valid	Practical Nurse	3	1.2	1.2	1.2
	Registered Nurse	225	88.2	88.2	89.4
	Charge Nurse	21	8.2	8.2	97.6
	Senior Charge Nurse	6	2.4	2.4	100.0
	Total	255	100.0	100.0	
Workplace		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Out-Patient	45	17.6	17.6	17.6
	Intensive Care Unit	108	42.4	42.4	60.0
	Emergency Department	42	16.5	16.5	76.5
	In-Patient	60	23.5	23.5	100.0
	Total	255	100.0	100.0	

MEASURES

The reliability of the questionnaire was assessed using its internal consistency (Cronbach's *a* coefficient) and composite reliability. At the same time, content validity and aggregation validity were used to evaluate the questionnaire's overall validity. The questionnaire included demographic information as well as job stress , job satisfaction , and psychological capital measures. The result is summarized in Table 2 for the reliability test.

TABLE 2: RELIABILITY TEST

Variables	Cronbach's Alpha	Items
Job Stress	91.2%	13
Job Satisfaction	88.7%	10
Psychological Capital	94.6%	22

HYPOTHESIS ANALYSIS

Relationship between job stress and job satisfaction

Hypothesis one:

H1: Job stress is negatively related to job satisfaction among nurses during COVID-19 pandemic.

The link between the independent and dependent variables was examined using Pearson's product correlation coefficient and regression analysis.

The results of the correlation and regression between job stress and job satisfaction obtained from SPSS Tables 3 and 4 show the results as follows:

Table 3 is a correlation analysis between job stress and respondents' job satisfaction. The correlation coefficient is r = -.341**, a negative correlation. Also, it is significant as its p-value is 0.000, which is less than the significance level (a = 5%), and from regression analysis as per Table (4), the R square (R2) value is 0.117, which means the job stress explained by job satisfaction represents 12%. It can be concluded that the fitted model is significant (F = 33.392, p-value.000 less than the significance level (5%), and the regression coefficient of job stress on job satisfaction is found to be -.303, which implies that any increase in job stress led to a decrease in job satisfaction by 303. Also, the regression coefficient is significant as the p-value p.000 is less than the many Level of 5%. So, we accepted hypothesis H1. That result indicates that if nurses stress is high, nurse satisfaction will be low among nurses in the Al Dhafra Hospitals during the COVID-19 pandemic.

TABLE 3: CORRELATION RESULTS

		Job Stress	Job satisfaction
Job Stress	Pearson Correlation	1	-.341**
	Sig. (2-tailed)		.000
	N	255	255
Job Satisfaction	Pearson Correlation	-.341**	1
	Sig. (2-tailed)	.000	
	N	255	255

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 4: HYPOTHESIS (1) REGRESSION RESULTS

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.496	.168		26.786	.000
	Job Stress	-.303	.052	-.341	-5.779	.000

a. Dependent Variable: Job Satisfaction,R2=0.117, F = 33.392,p=.000 > 0.05

The Moderation Effect of psychological capital on the Relationship between Job Stress and Job Satisfaction

Hypothesis Two:

H2: Psychological capital will moderate the relation between job stress and job satisfaction among nurses during Covid-19 pandemic so that when psychological capital is low, the influence of job stress on job satisfaction is high, and when psychological capital is high, the effect of job stress on job satisfaction is low.

The relationship between the independent, dependent, and moderating factors was examined using linear regression analysis.

As shown in Table (5), regression analysis was performed to examine the effects of psychological capital on the direction and degree of the link between job stress and job satisfaction. According to the results, the link between job stress and job satisfaction was somewhat influenced by psychological capital (=.738, Beta =.610, p 0.000). the relationship between psychological capital and job stress (=-.071, beta=.018, p 0.000).

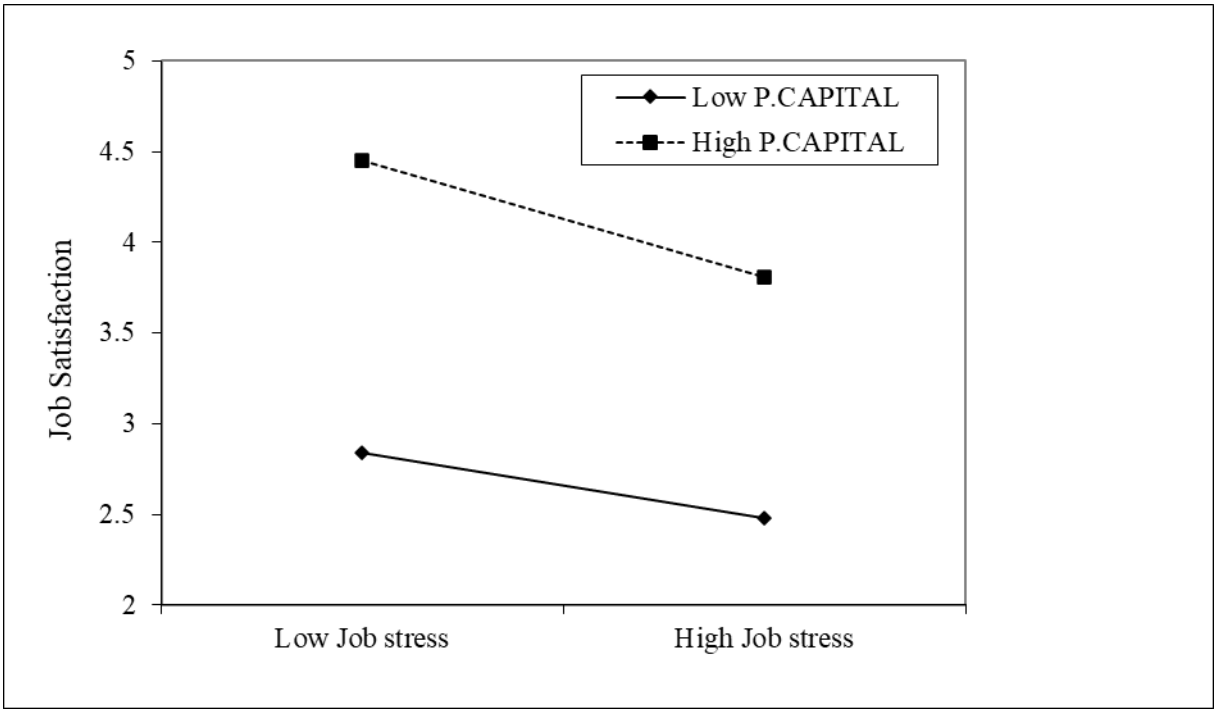
Results indicates that psychological capital is a positive moderator effect on the relationship between job stress and job satisfaction, which means that the hypothesis is accepted. In addition, as indicated by the graph in Figure 2, job satisfaction decreased as job stress increased, regardless of the Level of psychological capital; However, the detrimental impact of job stress on job satisfaction was more pronounced when psychological capital was low.

TABLE 5: RESULT OF MODERATED VARIABLE REGRESSION ANALYSIS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.300	.230		5.648	.000
	Job Stress	-.234	.037	-.264	-6.323	.000
	P.CAPITAL	.817	.051	.675	16.171	.000
2	(Constant)	1.632	.238		6.857	.000
	Job Stress	-.251	.036	-.283	-6.929	.000
	P.CAPITAL	.738	.053	.610	13.979	.000
	INTERACT	-.071	.018	-.176	-4.048	.000

a. Dependent Variable: Job Satisfaction

FIGURE 2: MODERATING EFFECT OF PSYCHOLOGICAL CAPITAL IN THE RELATION BETWEEN JOB STRESS AND JOB SATISFACTION.



DISCUSSION AND CONCLUSIONS

This research aimed to determine the effect of job stress on job satisfaction among nurses during the pandemic. Work-related stress is a growing problem worldwide, and healthcare workers responding to pandemic outbreaks as front-liners are more susceptible to stress and anxiety. By doing regular mental health assessments, providing support services, and therapeutic therapy, supplying adequate protective supplies, recommending treatment options, and submitting full organizational support to the staff working during the crisis, we can minimize the negative effect of mental health on healthcare workers during pandemics.

The outcome of the latest research empirically detected that psychological capital moderates the connection between job satisfaction and job stress. The results of the current study enlighten the point that nurses are individuals too, and the latest condition of the pandemic has also infected their mental hygiene. Nurses are the rescuers of the country, and their mental hygiene and psychological capital are fundamental to the UAE Government's battle against this infectious virus. These results imply that healthcare companies should consider nurses' psychological capital as a critical strategy for improving their competitive advantage. It may increase the quality of

medical services and achieve high performance by efficiently building and managing nurses' psychological capital. Furthermore, healthcare institutions must acknowledge the need to provide enough employment resources for nurses.

Throughout the pandemic, nurse stress and stigma are top priorities among hospital nurses; anxiety and individual demands, more significant workload, and vulnerability to infection are the utmost priorities in facing death. Job stress can be due to job satisfaction. Job stress due to job tiredness will have an impact on the psychological nurse so that it causes work satisfaction to lessen. The results of this research support those of other studies that followed parallel lines of inquiry [28,11,12,13]. In addition, psychological capital is effective in the relationship between job stress and job satisfaction; this result is supported by the previous research mentioned earlier [23,24]. Our findings confirmed a previous study's finding that a low job satisfaction rate also results from an overall rise in job stress. According to most study results, happy nurses work for organizations more often.

The medical institution needs to pay more attention to the psychological state of nurses. It needs to provide nurses with leadership training and job stress evaluation to manage and improve work satisfaction. The nursing vocation has taken up a priceless position in medical care organizations. An unavoidable part of all healthcare settings is the need for the nursing profession. The improvement of job satisfaction among nurses is required to confirm the quality of the career. To enhance the working situation of nurses, the hospital must tackle numerous measures. The institution's administration must deliver a good payment package, other organizations for nurses, and promotional opportunities. Provision of promotion opportunities for immediate enhancement of the quality of work, and the right salary package will inspire the nurses to do their utmost.

Nurse leaders and managers are highly skilled nursing professionals who function to produce top-quality healthcare. Leaders should look after employees and facilitate them with a voice in the organization by persuading nurses to join a coalition board so as to increase decision latitude and self-efficacy.

Managers should regularly assess nurses' accomplishments to lessen job stress, increase self-perception, and increase job satisfaction. Nurse job satisfaction and motivation depend on nursing management, considering the area or unit where a nurse wishes to work. Nurse leaders can make work significant by allowing staff to challenge themselves and grow in clinical nursing roles. They also help other nurses see their job as valuable and essential in achieving their goals. These measures are crucial during a nationwide pandemic like the COVID-19 pandemic when routines are halted, the environment is tense, and change makes workers feel more uneasy.

THEORETICAL AND PRACTICAL IMPLICATIONS

Our research provides information on nurses at the Al Dhafra Hospitals in the UAE. It has implications for the pandemic response, especially regarding how work stress affects job satisfaction, performance, retention, absenteeism, commitment, and turnover rates. Given the evidence that these variables influence nurses' work satisfaction, addressing nurses' concerns about readiness, social support, and mental health is crucial. Workplace mindfulness training, stress management strategies, and social support may lessen stress.

Nurses' capability, confidence, and morale may be strengthened, for instance, through effective communication between the government and hospital administration, training, higher and prompt compensation, incentives, and workforce growth.

Concerning the practical indications that may be obtained from this research, the outcome proposes that, in a pandemic state, including for healthcare professionals, the impact of psychological capital could lessen the psychological stress from job-state experiences, meaning that work satisfaction is not decreased. Psychological capital is an essential personal resource that can be developed through coaching and training programs. This is supported by another study, which validated the role of psychological capital in a similar context and setting [16].

It is necessary to cultivate psychological management skills that aid medical practitioners in getting essential resources like optimism, self-efficacy, and resilience that are effective for handling times such as the pandemic. In summary, we assumed that our study has added to the latest attempt to show the moderating role of psychological capital in the connection between job satisfaction and psychological stress among nurses since the beginning of the worldwide pandemic. These results also inspire the development of individual resource management actions, such as plans, to

maximize the health and performance of nurses' psychological capital.

Management in the hospital should give proper safety procedures in the latest situation and deal with the physical requirements of the nurses, as all of the government hospital facilities in the UAE do not have essentials like private rooms to rest and bathrooms for nurses.

LIMITATIONS AND FUTURE RESEARCH

The initial limitations are that this study is a correlation study design, and other elements that may impact job stress, job satisfaction, and psychological capital are not managed. The data was taken from a single hospital in Al Dhafra. Nurses employed in remote areas were not selected, so the overall ability of the result is restricted. Additionally, the study's findings during the COVID-19 pandemic only apply to the job satisfaction and stress levels of nurses working at Al Dhafra Hospitals in the UAE. Future studies may include other factors, such as job engagement, fatigue, and service performance, to address the effects of the perceived COVID-19 threat.

Future research may examine the impact of the integrity of the information source on people's worries, which was not discussed in this study. The psychological effects of COVID-19 misinformation and false news have been the focus of prior studies.

RESEARCH STUDY INSTRUMENT

A copy of the data collection instrument used in this research is available by requesting it from the contact author.

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ANALYSIS OF MANAGEMENT PRACTICE

SAFEGUARDING PATIENT INFORMATION AS AN ISSUE FACED BY NURSES: A POLICY BRIEF

Alireza Nikbakht Nasrabadi[1], Narges Norouzkhani[2], Arpi Manookian[1], Mohammad Ali Cheraghi[3], Mohsen Mohammadi[4], Zohreh Izadidastenaei[5], Amir Hossein Goudarzian[*5]*

1. Department of Medical-Surgical Nursing and Basic Sciences, School of Nursing & Midwifery, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Medical Informatics, faculty of medicine, Mashhad University of Medical Sciences, Mashhad, Iran
3. Department of Nursing Management, School of Nursing & Midwifery, Tehran University of Medical Sciences, Tehran, Iran
4. Department of Medical Surgical Nursing, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran
5. PhD Candidate of Nursing, School of Nursing & Midwifery, Tehran University of Medical Sciences, Tehran, Iran

Correspondence: amir_sari@yahoo.com

ABSTRACT

In an era of advancing technology, nurses find themselves at the forefront of protecting patient information. Safeguarding patient information is a critical concern in healthcare settings due to the potential adverse effects that can result from breaches or mishandling of this data. This invasion of privacy can have profound emotional, social, and financial repercussions for patients. In this article, possible and effective approaches were provided under evolving cybersecurity threats, balancing access and privacy, human error and insider threats, education and training, interoperability and data sharing headings. Patient information security is a complex and ever-evolving challenge for nursing professionals. Nurses must remain vigilant, well-informed, and proactive in implementing cybersecurity best practices.

KEYWORDS

patient, information, nurse, policy brief

INTRODUCTION

The problem of safeguarding patient information in healthcare refers to the challenge of ensuring the confidentiality, integrity, and availability of sensitive patient data. This data encompasses personal information, medical records, treatment plans, and diagnostic results [1]. Safeguarding patient information is a critical concern in healthcare settings due to the potential adverse effects that can result from breaches or mishandling of this data [2]. Insufficient protection of patient data can lead to privacy violations, where personal and medical details become exposed without authorization. This invasion of privacy can have profound emotional, social, and financial repercussions for patients. Identity theft is another consequence [2].

Patient information often includes personal identifiers like social security numbers and addresses. When this data is inadequately safeguarded, malicious actors can use it for fraudulent activities, resulting in financial losses and personal distress for patients [3]. Legal repercussions can follow data breaches. Healthcare organizations and responsible individuals may face fines, lawsuits, and damage to their reputations [3]. These legal consequences

can be costly and damaging to the healthcare industry. Financial losses are a direct result of data breaches, as organizations must invest in investigating, mitigating, and legally defending against breaches [4].

Additionally, a loss of patient trust can impact an organization's revenue. Reputation damage is a significant concern. Healthcare providers and organizations may suffer reputational harm in the event of data breaches. This can result in a loss of patient trust and negatively affect public perceptions of the organization's commitment to patient care and data security [2]. Patients can experience emotional distress when they discover their sensitive medical information has been mishandled. This distress can manifest as anxiety, mistrust in healthcare providers, and reluctance to seek medical care [4].

Nurses play a crucial role in safeguarding patient information to ensure patient privacy and confidentiality [5]. Protecting patient information is not only a legal and ethical responsibility but also essential for maintaining trust between healthcare providers and patients [6]. But nurses face specific challenges when it comes to safeguarding patient information. With these concerns, this policy brief addresses these challenges and provide recommendations for increasing the potential of saving patient information.

CURRENT POLICIES

Current policies for safeguarding patient information may vary by region and healthcare organization, nevertheless there are numerous common approaches followed in many healthcare settings. Here are key aspects of current policies for safeguarding patient information:

1. Health Insurance Portability and Accountability Act (HIPAA) privacy rule: Adherence to the principles of the United States Federal Health Insurance Portability and Accountability Act (HIPAA) is fundamental. Policies should outline the specific measures nurses must take to ensure compliance with HIPAA regulations regarding the privacy and security of patient information [7].
2. Implementing security policies which restrict users from software installation: Disabling unnecessary services on servers and enhancing control over incoming and outgoing traffic for essential services [8].
3. Healthcare professionals specially nurses, should practice proper data and cyber security instructions; this involves maintaining strong and regularly updated passwords and staying alert to potential cyber threats like email phishing attempts. Many institutions prioritize frequent software updates as a crucial security measure [9].
4. Access to patient data is typically limited to authorized personnel, with role-based access controls in place. This means individuals can only access information relevant to their specific job responsibilities [1].
5. Patient Consent and Authorization: Policies may outline the process for obtaining patient consent for sharing information and the instances where authorization is required. This ensures that nurses are aware of the legal requirements for disclosing patient data [8].

It's important to note that data security and privacy regulations can vary by country, and healthcare organizations are often required to comply with local laws and regulations in addition to specific standards. Compliance with these policies is crucial to protect patient information and maintain trust in healthcare systems.

POLICY IMPLICATIONS AND RECOMMENDATIONS

EVOLVING CYBERSECURITY THREATS

Nurses operate in an ever-evolving landscape of cybersecurity threats. They should understand the signs of a potential ransomware attack and be prepared to respond quickly to mitigate the damage. By constantly updating their knowledge of cybersecurity best practices, nurses can play an active role in protecting patient information [6]. Phishing is a common technique used by cybercriminals to trick individuals into revealing sensitive information, such as login credentials or personal data. Phishing attempts can occur via email, text messages, or phone calls, and attackers often pose as trusted entities [10] (please see appendix).

Reporting phishing attempts promptly and following organizational protocols is crucial in preventing data breaches. While nurses are trusted professionals, the risk of insider threats (individuals within an organization) exists in any workplace. Organizations should implement stringent access controls and monitoring mechanisms to identify unusual behavior that may indicate insider threats [10]. Nurses should also be aware of the importance of reporting

any suspicious activities they observe. The proliferation of Internet of Things (IoT) devices in healthcare, such as wearable devices and remote monitoring systems, introduces new cybersecurity risks [11]. These devices are connected to networks and may transmit sensitive patient data.

However, they can also be potential entry points for attackers if not properly secured. Nurses should be aware of the security risks associated with IoT devices and ensure they follow protocols for secure connectivity and usage. Social engineering attacks target human vulnerabilities rather than technological weaknesses. These attacks exploit psychological manipulation to deceive individuals into divulging confidential information or granting unauthorized access [12]. Nurses may be targeted through tactics such as pretexting (creating false scenarios) or baiting (enticing individuals to take specific actions) [12]. Education and training on social engineering techniques can help nurses recognize and resist these tactics.

BALANCING ACCESS AND PRIVACY

Nurses face the delicate task of balancing timely access to patient information with maintaining strict privacy measures. While nurses require quick access to patient data to provide efficient care, they must also adhere to stringent access controls and confidentiality protocols. Striking the right balance involves implementing robust authentication processes and role-based access controls [13]. Nurses should have access only to the information necessary for their specific roles and responsibilities [13].

By limiting access to a need-to-know basis, healthcare organizations can reduce the risk of unauthorized access or accidental disclosure of sensitive data. Robust authentication mechanisms, such as strong passwords, two-factor authentication, or biometric authentication, can help ensure that only authorized individuals can access patient information [14]. Nurses should follow best practices for password hygiene, avoiding common pitfalls like sharing passwords or using weak and easily guessable credentials. Regularly updating passwords and promptly reporting any suspected unauthorized access can help safeguard patient data.

Education and training play a crucial role in promoting a culture of privacy and security among nurses [15]. Nurses often communicate patient information electronically through various channels, such as email, messaging platforms, or telehealth applications. It is essential to use secure and encrypted communication methods to protect patient privacy. Nurses should be trained on secure communication practices, such as avoiding transmitting patient information through unsecured channels or using encryption tools when necessary [16].

Monitoring systems can detect anomalies in data access patterns, alerting IT departments or security teams to potential breaches. Nurses should actively participate in these monitoring efforts and report any observed irregularities. Healthcare organizations should adopt a privacy-by-design approach when developing or implementing new technologies and systems [17]. This approach involves integrating privacy and security measures from the early stages of system design. Nurses can engage in conversations with patients about the use and disclosure of their information, ensuring that patients understand their rights and have control over how their data is shared [18]. This collaborative approach promotes patient autonomy and strengthens trust between patients and healthcare providers [17].

HUMAN ERROR AND INSIDER THREATS

Human error remains a significant challenge in patient information security. Nurses, like any other healthcare professionals, may inadvertently cause data breaches through accidental disclosure or mishandling of sensitive information. Comprehensive training on data protection protocols, privacy policies, and ethical use of patient information is crucial for minimizing human error and mitigating insider threats [19].

Healthcare organizations should prioritize comprehensive training programs that address data protection protocols, privacy policies, and the ethical use of patient information. By providing nurses with the necessary knowledge and skills, organizations can reduce the likelihood of human error and ensure that nurses understand the importance of safeguarding patient data [19, 20]. Encouraging a culture of incident reporting is essential in addressing human errors and identifying potential insider threats. Nurses need to be aware of the reporting mechanisms for any data breaches, privacy incidents, or suspicious activities they come across. Prompt reporting allows for timely investigation and appropriate response to mitigate the impact of incidents [12, 16]. Monitoring systems can detect anomalies in data access patterns, triggering alerts for further investigation. Creating an environment where employees are actively engaged and aware of the importance of patient information security is key to mitigating insider threats.

Regular communication and reminders about the organization's security policies, ethical guidelines, and the potential consequences of data breaches can help foster a sense of responsibility and vigilance among nurses [16]. Nursing organizations and regulatory bodies can play a role in reinforcing ethical and professional standards related to patient information security [16].

EDUCATION AND TRAINING

The rapidly evolving nature of cybersecurity threats necessitates ongoing education and training for nurses. However, nursing education programs often offer limited formal training on cybersecurity [21]. To address this challenge, healthcare organizations should prioritize comprehensive training programs for nurses. These programs should cover a range of topics, including recognizing phishing attempts, secure communication practices, password hygiene, and incident reporting. Continuous education empowers nurses with the knowledge and skills necessary to protect patient information effectively.

Nursing programs should include dedicated courses or modules that cover essential concepts, such as data protection, privacy laws, security protocols, and ethical considerations [22]. By incorporating these topics into the curriculum, nurses can develop a solid foundation in patient information security from the outset of their careers. Collaboration with industry experts, cybersecurity professionals, and information technology specialists can help ensure that the educational content remains current and aligned with the latest trends and challenges [23]. Given the rapidly evolving nature of cybersecurity threats, continuous professional development is crucial for nurses to stay informed and maintain their skills.

Healthcare organizations should support and encourage nurses to pursue additional training, attend relevant conferences or webinars, and participate in professional associations dedicated to patient information security [23, 24]. These opportunities enable nurses to expand their knowledge, network with peers, and stay updated on the latest advancements in the field. Interdisciplinary training programs that bring together different stakeholders can enhance understanding, foster effective communication, and promote teamwork in safeguarding patient data [25]. Training programs should emphasize the importance of patient privacy, ethical responsibilities, and the potential impact of data breaches on individuals and healthcare organizations [26].

INTEROPERABILITY AND DATA SHARING

Interoperability, the seamless exchange of patient information between different healthcare systems, is vital for delivering high-quality care. However, it presents challenges in terms of patient information security [27]. Nurses must ensure that data transfers occur securely, maintaining the integrity and confidentiality of patient information across various platforms and systems. Robust encryption methods, data access controls, and secure data exchange protocols are essential in overcoming these challenges [23].

The establishment and adoption of common standards and interoperability frameworks are fundamental to ensuring seamless data exchange. Standards such as Health Level Seven (HL7) and Fast Healthcare Interoperability Resources (FHIR) provide a common language for healthcare systems to communicate and exchange data [28, 29]. Nurses should be familiar with these standards and the interoperability frameworks used in their practice settings to effectively navigate data sharing processes. Adherence to data sharing policies, privacy regulations (such as HIPAA in the United States), and organizational protocols is needed.

Understanding the principles of data classification, access controls, and encryption can help nurses maintain the confidentiality and integrity of shared information [30]. Respecting patient privacy and obtaining informed consent for data sharing are critical ethical considerations, which ensure patients have control over how their information is used and shared [31]. Interoperability and data sharing facilitate access to comprehensive patient information, empowering nurses to make informed clinical decisions and collaborate with multidisciplinary care teams. Integrated electronic health record (EHR) systems enable nurses to access up-to-date patient data, including medications, allergies, and diagnostic results, supporting more efficient and coordinated care delivery [1].

Data sharing across healthcare organizations and research institutions enables advancements in medical research, population health management, and public health initiatives. Nurses may contribute to research studies or participate in data collection efforts that require the sharing of de-identified patient data. Variations in data formats, data quality, and system compatibility can hinder seamless exchange. Nurses should be prepared to address these challenges by advocating for standardized data capture, participating in data quality improvement

initiatives, and collaborating with healthcare IT professionals to enhance system interoperability [32].

CONCLUSION

Patient information security is a complex and ever-evolving challenge for nursing professionals. Nurses must remain vigilant, well-informed, and proactive in implementing cybersecurity best practices. By addressing the evolving cybersecurity threats, balancing access and privacy, mitigating human error and insider threats, and investing in education and training, nurses can contribute significantly to safeguarding patient data. By prioritizing patient information security, nurses play a crucial role in ensuring the privacy, confidentiality, and integrity of healthcare systems in the digital age.

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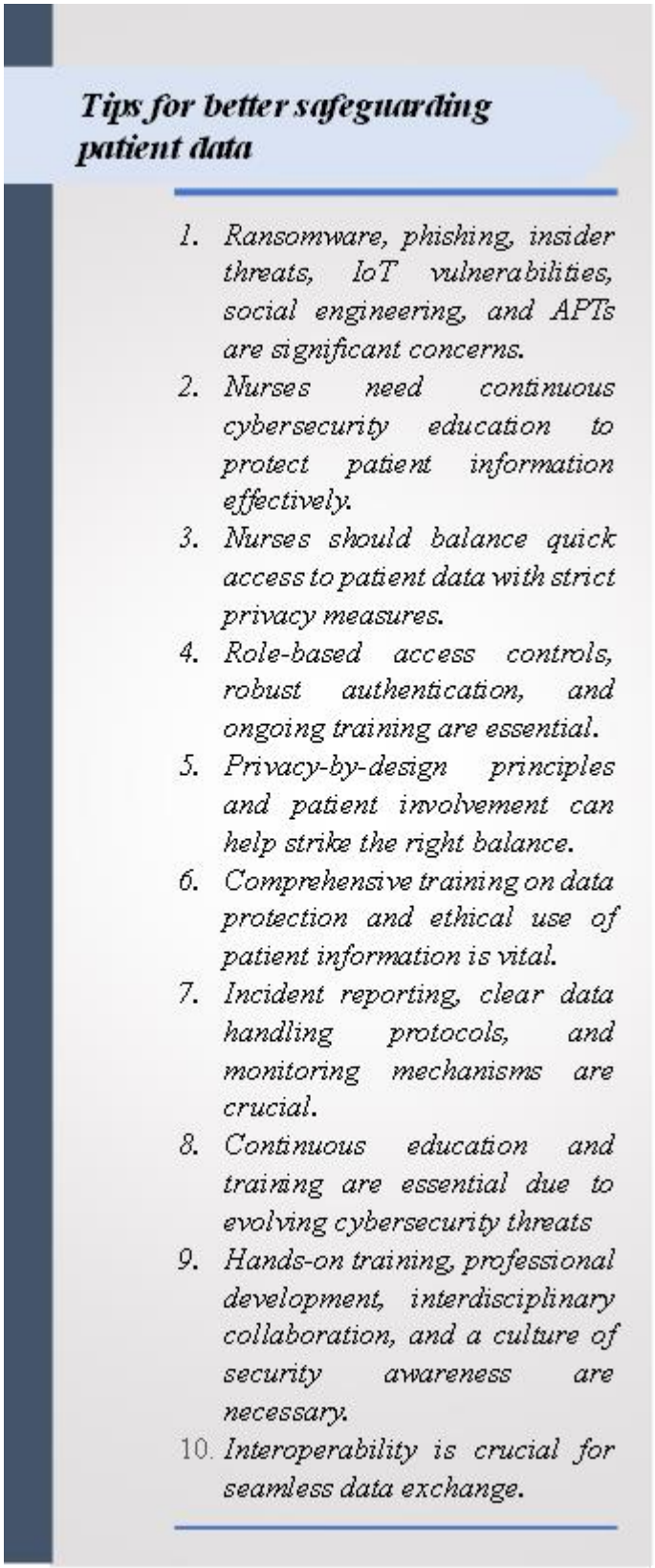
APPENDIX



Source: Developed by authors.

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REVIEW ARTICLE

EFFORTS IMPLEMENTED FOR DEVELOPING HEALTH MANAGEMENT WORKFORCE IN THE ASIA PACIFIC: A SCOPING REVIEW

Priyanka Pokhrel[*1], Zhanming Liang[1], Judy Taylor[2]*

1. College of Public Health, Medical and Veterinary Science, James Cook University, Douglas, Townsville, QLD, Australia
2. College of Medicine and Dentistry, James Cook University, Townsville, QLD, Australia

Correspondence: priyanka.pokhrel@my.jcu.edu.au

ABSTRACT

BACKGROUND AND OBJECTIVE:

A strong and effective health management workforce (HMW) is essential to underpin the comprehensive health care services provided by health care organizations. The fast-growing nature of healthcare systems suggests the required competencies for HMW continue to evolve. Hence, an up to date understanding of management competency requirements is important to the productivity and sustainability of the healthcare system. Before any investment in management competency development, understanding the current health service management workforce development strategies is one of the key steps. There has been no integrated review on the development efforts for HMW in the Asia Pacific region. The objective of this scoping review is to identify and confirm the key strategies that have been used in developing the health management workforce in the Asia Pacific region.

MATERIALS AND METHODS:

A scoping review of the literature was conducted between May and August 2022 using the following databases: Medline, Ovid Emcare, CINAHL, Scopus, and Web of Science, to retrieve original research articles demonstrating development efforts for HMW in the Asia Pacific regions. The review was guided by the PRISMA-ScR (2018) checklist [23].

RESULTS:

The scoping review identified four different development strategies for HMW in Asia Pacific region: i) Organisational informal professional development programs, ii) Competency assessment and identification of gaps in knowledge and skills of HMW, iii) Confirming competencies and developing competency framework and iv) Formal education and training. Among these four development strategies, organisational informal professional development programs and competency assessment and the identification of gaps in knowledge and skills of HMW were the main strategies implemented for HMW in the Asia Pacific region. The review also highlighted a relatively low level of government or system level development strategies for HMW in the Asia Pacific region.

CONCLUSION:

The review concluded that the existing development strategies and efforts for HMW are not evenly implemented within the Asia Pacific region. Political will and policy direction are important and plays a vital role in the competency development of HMW. It is also critical to provide multilevel commitment from system and organisational level together with identifying and addressing the bottlenecks in the development strategies by considering organisation types, management levels and positions, practical training methods, motivation of participants, and other contextual factors.

KEYWORDS:
Health management workforce, Management development, Asia Pacific region

INTRODUCTION

A competent health management workforce (HMW) is important for the effective functioning of the health care system and improved healthcare outcomes of the population by emphasizing safe, high quality, and compassionate care as a top priority [1,2,3]. Developmental activities need to be planned and implemented to build the competency and capability of HMW. It is crucial to develop an understanding of the current strategies and actions prior to investing in new activities. An initial search of literature did not identify review articles that present evidence of the collective efforts implemented to develop health service managers (HSM)/HMW in the Asia Pacific region. According to the World Health Organisation (WHO), the Asia Pacific region includes 37 countries which are divided into two subregions: the Western Pacific consisting of 27 countries such as China, Japan, and Australia and the South- East Asia consisting of 10 countries such as India, Nepal, and Thailand [4].

While the development of HSMs' competencies and capabilities are crucial for achieving better management outcomes and ultimately positive health results, various challenges need to be addressed [1]. Using Nepal as an example, management positions are generally occupied by senior doctors with extensive clinical experience without formal management education [5, 6]. There is no documented evidence of competency-based development strategies being implemented for hospital managers. Only one study conducted in 2012 was identified which confirmed the need for in-service management training for HMW [6] to develop managerial competencies in Nepal. This lack of development of managerial competencies was one of the factors thought to limit effective and efficient hospital service provision in Nepal [5, 6].

Challenges faced in developing a health management workforce that can meet the needs of the health system.

The literature provides discussion on the various challenges facing the development of a competent health management workforce that contribute to meeting the growing and changing healthcare needs of the population. Evidence has been reported on the lack of understanding on competency requirements for HSMs; on the lack of competency-based approaches in guiding the design of training and education programs; and the inadequate investment in the development of competencies of HSMs may be challenging for the HMW development [1, 7]. Other challenges facing the HSM workforce include work pressures, budgetary factors, advanced technological requirements, lack of personal will, rural/remote settings, and political instability hindering sustainability of development programs [6 ,8, 9, 10, 11, 12, 13, 14, 15].

In some developing Asia Pacific countries there has been limited guidance in the design of formal and informal training and development programs for HMW [1, 12]. This is because the competency requirements for health managers have not been clearly established in these countries [6, 12, 13] and the management competency improvements are often not embedded in regular management performance appraisals in healthcare organisations [1]. This provides inadequate incentives for investing in continuous, informal management development program for HMW [1, 7].

Although formal education is an important development strategy for HMW, research from Australia has been reported that among the awarded postgraduate qualifications for HSMs, very few were management specific [1, 7]. Such situations may challenge the HMW to achieve the core foundational knowledge required for management position. Research conducted in Vietnam reported that the hospital managers have focused more on their clinical profession where they can easily foresee and earn pecuniary benefits rather than their leadership and managerial development where the benefits are not as immediate [9]. This suggests the requirement of personal will and desire for the development of managerial capability.

The pressing needs of developing the health management workforce in the Asia Pacific region

Management competency assessments on health service managers conducted in Australia, Bhutan, China, Nepal, and India have suggested there are pressing needs for competency development amongst HSMs [5 ,6, 7, 12, 16, 17]. The formal and informal management training amongst health managers before commencing their management positions has been found to be inadequate [5, 6, 7, 16]. For example, a study conducted among health managers in China identified that less than half of the health managers participated in management training either prior to or after taking up their management positions [16]. With continuous healthcare reform, health systems in the Asia Pacific region are under pressure to improve cost efficiency while enhancing access and quality of care [13, 19, 20, 21]. Competent managers are required to lead the improvement process. However, formal and informal management training amongst health managers before commencing their management positions has been found to be inadequate [5, 6, 7, 16]. Hence, there is an urgent need in utilising various strategic approaches to equip health managers in working in a complex system with a higher level of awareness and required technical expertise for positive and measurable health outcomes [21, 22].

To maximise the efforts in assisting HSM development, learning from the past experience is necessary. Thus, a scoping review was conducted to identify and learn from the development strategies for HMW in Asia Pacific countries. This paper aims to present and discuss the key strategies that have been implemented in developing the health management workforce in the Asia Pacific region. In this scoping review, HMW development efforts refers to policy and strategies that focus on building management capacity and developing capable health service managers including identifying competency gaps and management development needs.

METHODOLOGY

The scoping review was guided by PRISMA-ScR (2018) [23]. The literature search was performed from May 2022 to August 2022 to retrieve original articles on efforts for developing HMW across the globe. Various synonyms or keywords were used in the search strategy to expand the search terms. Key words and key concepts for the data search are presented in Table 1. The word 'Asia Pacific' was precluded from the search term to avoid the potential exclusion of eligible articles reporting research conducted in Asia Pacific.

TABLE 1: KEY WORDS FOR DATA SEARCH

Management/ Manager	Competency	Competency development/Efforts/ Strategies	Health
Administrator*	Aptitude	Trainings	Hospital
Coordinator*	Achievement	Professional development	Health care
Managers*	Capacity	Upskilling, Capacity building	Health care system
"Department Head"	Proficiency	Staff development	Health sector
Team Leader	Skill	Strategy, Regulations	Health care services
Health Administrator	Competency	Mentoring	Primary Health care
Executives	Professionalism	Facility	Health facilities
		Policy, Ethics	Health service, Health system

A reference list search was conducted from the eligible research studies to identify any other relevant studies.

INCLUSION CRITERIA:

The scoping review included research articles that presented empirical studies and are published in English, in or after year 2000 and in peer-reviewed journals.

EXCLUSION CRITERIA:

The review excluded all types of review articles such as scoping reviews, systematic reviews, rapid reviews, non-research articles, opinion pieces or commentaries and publications in languages other than English.

DATA BASE SEARCHING:

Initially the literature search focused on subject heading databases. This allowed the maximum inclusion of all related articles from these databases. It also helped to find other synonyms of key words from related searches. Then keyword database was explored to narrow the literature search.

Subject heading databases:

1. Medline
2. CINAHL Complete
3. Ovid Emcare

Keyword Databases:

4. Scopus
5. Web of Science

During database searches each of the four key words were searched individually along with identified synonyms (e.g. the management/manager search included all synonyms as: Administrator or coordinator or managers or department head or team leader or health administrator or executives or management). After completion of the search for individual key words along with their synonym, a final search was conducted among identified research studies which included search using "and" for common search between the identified research. For instance, identifying common research studies between 1 and 2 and 3 and 4. For the Scopus database, * sign was used during keyword search to eliminate the chance of missing any relevant research studies.

SCREENING OF RETRIEVED STUDIES:

The identified research studies were exported to Clarivate's EndNote product and 120 duplicate articles were removed. The remaining 3,761 studies were exported to Covidence, a web based systematic review production tool for title, abstract and full text screening.

Title screening was conducted initially by the principal author (PP). As a result, 3,145 articles were deemed irrelevant to this study and therefore were not included in further screening. Then abstract screening of 508 articles was conducted independently by two authors (PP & ZL) with each of the articles given either a "yes", "no" or "maybe" on Covidence. Disagreement on whether the articles should be included or excluded were resolved by discussion between PP & ZL. PP performed full text screening on 117 articles. Based on the study's inclusion and exclusion criteria, 22 articles were moved onto the data extraction phase.

SELECTION AND EXTRACTION OF DATA

Twenty-two research articles were found to be eligible for data extraction in order to meet the research objectives. The types of data extracted were study setting, target group/size, study type, study design, aims/objectives, sampling technique and efforts/strategies in HSM workforce development from each study.

DATA ANALYSIS

Data analysis has identified four different types of efforts that has been put in place for development of HMW in the Asia Pacific region: i. Formal education and training; ii. Organisational informal professional development programs; iii. Research process confirming competencies and developing competency frameworks; and iv. Embedded competency assessment.

The review author (PP) synthesised the data from the 22 research articles that best met the topic requirements which were finalised by review author (ZL). The included studies that were evaluated based on the type of efforts implemented to develop HMW in the Asia Pacific region. The first step included an overview of 22 research studies and identifying the findings in each study. The second step led to condensing and summarising of these findings which was followed by a third step of grouping the findings thematically into four different categories.

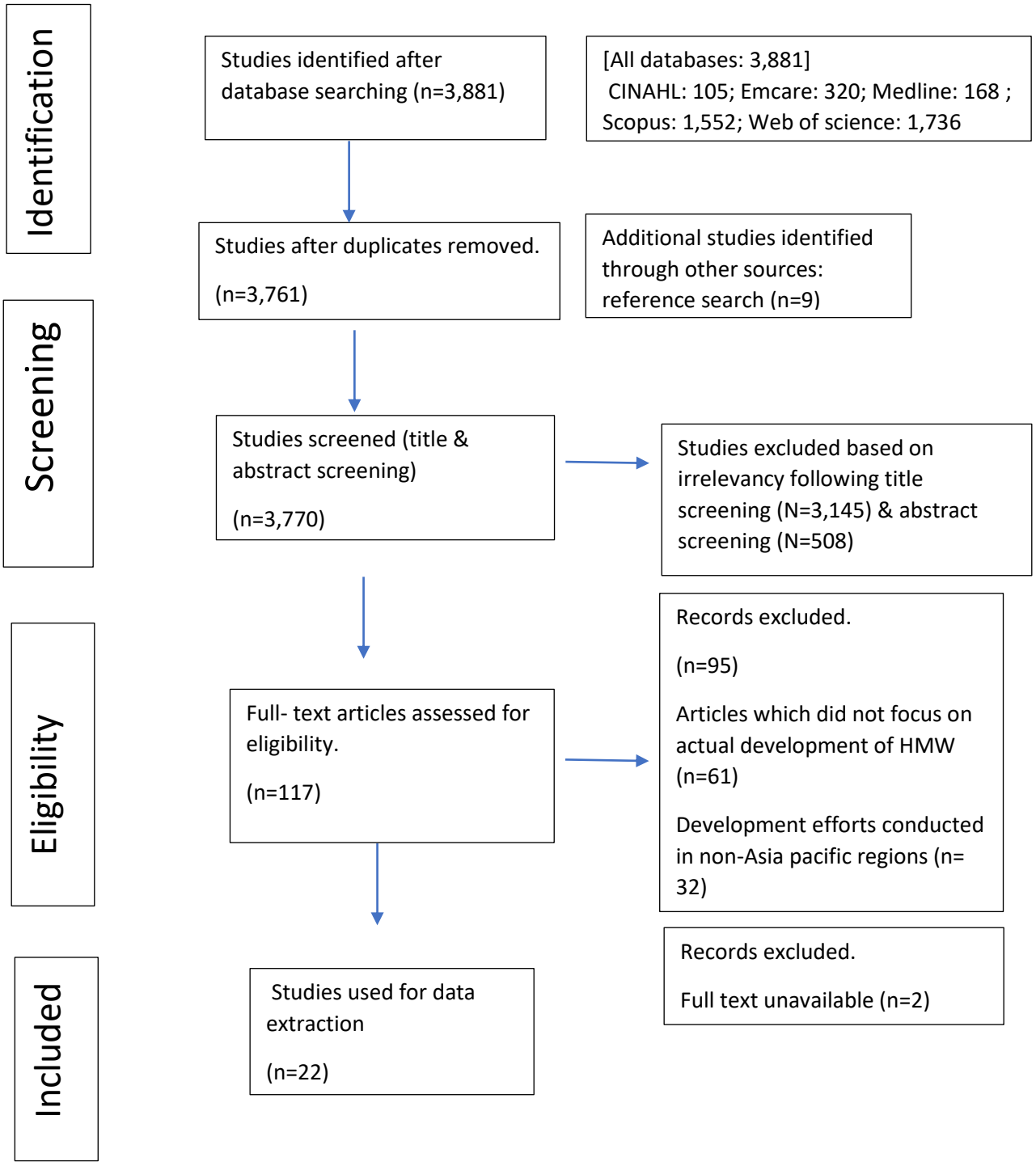
RESULTS

Twenty-two articles that represented studies undertaken in Asia Pacific countries were included in the scoping review. Figure 1 (PRISMA flowchart) shows key steps and results of the review process.

DISTRIBUTION OF REVIEWED RESEARCH ARTICLES

Nine of the research articles selected originated from Australia while three research articles were from India and two from Nepal. China, South. Korea, Thailand, Cambodia, Bhutan, Vietnam, Indonesia, and Timor-Leste each generated one research article (Map 1).

FIGURE 1: SCOPING REVIEW PRISMA FLOW DIAGRAM [23]



MAP 1: ASIA-PACIFIC REGION DISPLAYING THE NUMBER OF STUDIES USED IN THIS REVIEW ORIGINATING FROM VARIOUS COUNTRIES (TAKEN FROM WWW.ENGLISH-BLOGS.COM ACCESSED: 19 OCTOBER 2022).

CHARACTERISTICS OF REVIEW ARTICLES

The characteristics of the review articles are presented in Table 2. Sample size varied with quantitative studies ranging from 44 to 339 participants while qualitative studies sample size ranged from 17 to 300 participants and mixed method sample size ranged from 7 to 891 participants.

TABLE 2: CHARACTERISTICS OF DEVELOPMENT EFFORTS FOR HMW IN THE ASIA PACIFIC REGION

Reference	Study Setting	Target Group/Size	Study Type	Study Design	Aims/Objective	Sampling Technique	Summary of Findings
Cashin et al.	Australia: NSW	9 health managers	Mixed method	Maslach Burnout Inventory General Survey	Evaluated the introduction of a 12-month health manager mentoring program within a correctional facility in NSW, Australia	Non-sampling (volunteer participants)	A positive change was observed in the participants based on self-appraisal and peer's appraisal. Supervisees reported negative change on the same tool over the same period. Job satisfaction of the participants decreased, and job stress increased over the period in which the mentoring program was conducted but not to a statistically significant level.
Chadwell et al.	Nepal	103 hospital managers	Quantitative	Survey	Demonstrated the management training needs for hospital managers in Nepal	Purposive sampling	In most hospitals, overall management was provided by doctors. The need for a separate cadre of managers was supported by respondents but most doctors felt the best people to manage hospitals were doctors. Few managers had undergone training to take on management responsibilities. All types of managers, regardless of profession or type of hospital reported a competence gap.
Clarke et al.	Australia: NSW	17 nursing/midwifery unit managers(N/MUM)	Qualitative	Not stated	Evaluated the effect of 'take the lead' ('ttl') program on 17 N/MUM on their professional development components.	Purposive sampling	After the 'ttl' program N/MUM felt more valued, empowered, increment in leadership standards and increased networking opportunities.
Dorji et al.	Bhutan	339 PHC managers	Quantitative	Cross sectional	Identified the required management competencies,	Random sampling	Agencies responsible for health system need to focus more on the

					current competency levels, and strategies for improving the management competencies of Bhutanese PHC managers.		competencies defined by the study to positively influence health leadership and management development interventions.
Duffield et al.	Australia: NSW	18 Nurse unit managers	Qualitative	Delphi Survey	Studied on a master class leadership course for nursing unit managers.	Purposive sampling	The program was able to enhance participants aspects in terms of allowing the expression of opinions, networking, stretching their minds and time to reflect on their own experiences.
Gunawan et al.	Indonesia	300 First line nurse managers (FLNMs)	Qualitative	Not mentioned	Developed the managerial competence scale and psychometrically tested for first-line nurse managers of Indonesia.	Random sampling	The findings of the study demonstrated that the managerial competence scale is valid and reliable as a vehicle for assessment of competence for FLNMs.
Horvath C et al.	Cambodia	20 health managers	Mixed method	Not mentioned	Evaluated the IMPACT Cambodia program and determined the extent to which the program reached its intended outcome of increase management competence of participants.	Purposive sampling	Participant's competency in all management areas was increased. Improvement was observed in leadership and governance.
Howard et al.	Australia	117 senior and middle HSMs	Mixed method	Not mentioned	Validated the management competency assessment tool for HSMs which resulted from the development and validation of the framework, addressed by a previous paper.	Purposive sampling	Both validity and reliability of management competency assessment tool were demonstrated.

Jeon et al.	S.Korea: University Hospital, Seoul	44 Nurse Unit Managers (NUM)	Quantitative	Quasi experimental	Evaluated the ethical leadership, organizational citizenship behaviour and job outcomes of NUM.	Non-sampling (Volunteer participants)	There was improvement in competencies related to ethical leadership of nursing unit managers after the six- month leadership program.
Khadka et al.	Nepal	51 hospital manager/administrator	Mixed method	Cross-sectional	Assessed the managerial competencies of hospital managers of Kathmandu, Nepal	Purposive sampling	There is enormous need for development of lacking managerial competencies among hospital managers/administrators.
Kitreerawutiwong et al.	Thailand	487 primary care managers	Mixed method	Instrument development model	Developed and examined the psychometric properties of a competency scale for primary care managers in Thailand	Simple random sampling	The developed instrument demonstrated sound psychometric properties and therefore is considered an effective tool for assessment of the primary care manager competencies.
Liang et al.	China	498 senior hospital executives	Mixed method	Cross sectional, descriptive survey	Developed an understanding of the characteristics and training experience of hospital managers in one major Chinese city.	Purposive sampling	The survey confirmed that formal and informal management training amongst participants before commencing their management positions was inadequate.
Liang et al.	Australia	93 mid-level HSM (319 colleagues participated in the 360^0 assessments.)	Mixed method	Cross sectional, descriptive survey	Conducted a 360^0 assessment of the competence of Australian HSMs to identify managerial competence levels and training and development needs.	Non-sampling (Volunteer participants)	The study confirmed managerial competence for most of the middle-level HSMs from hospitals and CHS but found competency gaps.
Liang et al.	Australia	64 managers	Mixed method	Not mentioned	Introduced a validated process in management competency identification and development applied in Australia.	Purposive sampling	The framework developed is considered reliable and valid for developing a management competency assessment tool.

Liang et al.	Australia	74 Hospital managers	Mixed method	Exploratory	Confirmed the core competencies required for middle to senior level managers in Victorian public hospitals in both metropolitan and regional/rural areas.	Purposive sampling	The study supports the use of a competency-based educational approach to train and prepare current and future healthcare managers for their roles.
Lopes et al.	Timor-Leste	183 Primary Health Care Managers	Quantitative	Cross sectional survey	Assessed the levels of management competencies of primary health care managers	Stratified random sampling	PHC managers required more professional development programs/trainings in different domains which needs to be in line with health system goals and reinforced by a positive environment.
Prashanth et al.	Tumkur district, Southern India	21 Health Manager	Mixed method (Qualitative and Quantitative)	Not mentioned	Assessed the performance of health managers after periodic contact classes, mentoring visits and assignments to help practical application of knowledge and skills discussed in classroom.	Purposive sampling	A positive change was found after training program in facility near to district headquarters while low performance was observed in remote area far from headquarters.
Sandhu & Liang	India	7 senior managers	Mixed method	Exploratory case study	Assessed the managerial competencies of project managers of a National NGO in India for developing, implementing, and evaluating a new service model effectively.	Purposive sampling	Senior managers clearly demonstrated their understanding of a project's life cycle and were able to detail the key activities and procedures they developed under each phase of the project life cycle. However, they do need training to improve their competency to allow more effective project planning, design, and implementation.

Schultz et al.	Australia: Adelaide Hospital	160 Health care middle managers (HCMM)	Mixed method	Uncontrolled pre-post study design	Evaluated a change leadership development program (leading 4 change) to support HCMM	Non-sampling (Volunteer participants)	Health care middle managers developed leadership capacity for going through period of significant organisational change and enhanced workplace resilience.
Tiwari et al.	India: Madhya pradesh	114 Health manager	Quantitative	Not mentioned	Assessed the Post Graduate Diploma in Public Health Management (PGDPHM) program to bridge the gap in public health managerial capacity among health professionals.	Purposive sampling	This partnership between academic institutions and health system strengthened the capacities of partner institutions and networks of professionals to take the lead in designing, adapting, and sustaining innovative capacity building measures.
Tuong et al.	Vietnam	891 Hospital mangers	Mixed method	Exploratory factor analysis	Developed a leadership and managerial competency framework for public hospital managers in Vietnam.	Non-sampling (Volunteer participants)	The 81 items of leadership and managerial competencies were identified for public hospital managers.
Waters et al.	Australia	Nurse manager (NM)	Mixed method	Descriptive	Determined the participant expectations on mentoring program and outcomes of the pilot program.	Non-sampling (Volunteer participants)	The pilot mentoring program was highly successful to identify and address the needs of NM in professionally or geographically isolated areas.

HMW DEVELOPMENT EFFORTS IMPLEMENTED IN THE ASIA PACIFIC

Based on the development efforts in the 22 identified articles, four categories of HMW development efforts have emerged. All efforts identified have been grouped into these four different categories thematically as follows:
Formal education and training

Two research studies, one each from Cambodia and India, focused on formal education as the developmental efforts for HMW [11,24]. In Cambodia, formal education was provided through a competency driven curriculum which positively contributed to building leadership and governance of HMW. This also resulted in better health information and human resource system in Cambodia [24]. In India, health managers were provided with the opportunity to pursue post graduate diploma in public health management program. The study reported the improved competencies of managers after completing post graduate diploma in public health management program [11].

Organisational informal professional development programs

Seven research studies focused on organisational informal professional development training for HMW [10, 19, 25, 26, 27, 28, 29]. These programs included contents such as: development of ethical leadership, workplace resilience and stress management, communication, and relationship management, and leading and managing change. The study conducted in Australia on a change leadership development program designed to support healthcare middle managers through a period of significant organisational change reported that the training participants felt being valued and empowered after participating in the development program [19]. The participants were also motivated to perform their tasks most effectively. Some of these studies also reported positive outcomes of the informal training programs [19, 25, 26, 27, 29]. For instance, in South Korea, the ethical leadership program developed for nurse unit managers has improved their understanding of ethical leadership and creating ethical environment and cultures in hospital [25]. Study also found that the same development program may generate differing outcomes at different settings. For instance, the management development program conducted in Tumkur district in India was not equally effective in urban and rural settings [10].

Research process confirming competencies and developing competency framework.

Six research studies focused on competency framework development for HMW [1, 2, 9, 21, 30, 31]. These studies confirmed competencies required for HMW and developed frameworks that guided the development of short term and long-term strategies. For instance, the management competencies identified for HSM in the validated MCAP tool included: operations, administration and resource management, evidence informed decision making, demonstrated knowledge of healthcare environment and organisation, interpersonal communication qualities and relationship management, leading people, and enabling and managing change [2]. Another study in Vietnam identified and validated 14 essential competencies for hospital managers in Vietnam [9]. The identified essential competencies in Vietnam had 7 different competencies as compared to the competencies in MCAP i.e., Policy development and implementation, strategy development and orientation, plan making, risk and disaster management, quality management, investigation, and self-management. While the remaining 7 competencies were similar to MCAP 6 competencies. Another study in Indonesia constructed 7 essential competencies for nurse managers [30]. Four of the identified competencies were different from the competencies listed in MCAP (i.e., facilitating spiritual nursing care, self-management, utilizing informatics and applying quality care improvement). While three of the identified competencies in Indonesia were similar to MCAP [2, 30]. Similarly, five of the identified competencies in Indonesia were similar to those identified in Vietnam [9,30].

Embedded competency assessment

Seven research studies focused on presenting findings of management competency assessment of HMW [5, 6, 7, 12, 15, 16, 17] that identified competency gaps and identified the competency development needs that guided the design of targeted development programs. Competency assessment was conducted via either self-assessment only [5, 6, 12, 15, 16, 17],] or 360-degree process [7]. The findings of competency assessment of health managers in the Asia Pacific region are consistent with the findings of other studies and suggests for the competency development needs of these health managers [6, 12, 15, 16, 17]. However, competency assessment conducted in Australia confirmed managerial competence for the majority of health managers but identified competency gap [7] and it was confirmed that managerial strengths and weakness

varied across management groups in different organisations [7]. The findings also suggested the need of multifaceted development strategies for strengthening the HMW [7].

GOVERNMENT COLLABORATION WITH ANOTHER ORGANISATION

Collaboration between government and other education, research and healthcare organisations has been an important system level strategy for HMW development. Such collaborations have led to design and development of various formal and informal management development programs for HMW. For instance, In Cambodia, the National Institute of Public health (NIPH), with the approval of the Cambodia Ministry of Health, formed a technical working group including the U.S. Centres for Disease Control and Prevention and the Korea International Cooperation Agency. The working group developed and implemented a six-month management and leadership capacity building program that resulted in the improved management competency amongst health managers [24]. The State Government of Karnataka, India, and a consortium of five non-governmental organisations was established to organise a capacity building programme for health managers in the district. The programme focused on improving the performance of health managers with respect to planning and supervision of health services [10].

DISCUSSION

Seven out of nine studies included in the review discussed the positive outcomes of the training and development programs [11, 19, 24, 25, 27, 28, 29] indicating the necessity in investing in professional development of HSMs. There is evidence that participatory action research approach [PAR] been successful in building local capacity and enhancing the continuity of interventions [32,33]. This approach may be adapted in Asia Pacific countries for long term and sustainable improvements in program delivery. Only a small amount of management related research has been conducted in the Asia Pacific region as only 22 studies were identified during the data extraction process.

A management development program should be developed and implemented in consideration within an organisational context. There is evidence where management development programs have not produced the same result in different settings or even within the same settings at two different hospitals because of differences in working environments, governance, management structures, and sometime due to geographical conditions such as rural settings [10, 26].

This supports the pre-existing evidence in other literature that the capacity and management competency building interventions are influenced by contextual factors such as organisation culture, geographical locations and working environment at organisation [1, 7]. This also suggests the importance of an enabling environment and adequate incentives from the state health systems. Thus, to develop the competence of the HMW, it is critical to provide multilevel commitment from both the system and organisational levels to identify and address the bottlenecks related to organisation and other contextual factors.

Evidence has emerged that discusses the importance of embedding management competency assessment into the annual performance review process to provide evidence on the strengths and weaknesses of managers that can guide the setting for a professional development focus for health managers [12, 16, 17]. All seven competency assessment studies confirmed the existence of competency gaps that must be addressed. Considering the lack of formal and informal training broadly available and provided to HSMs, improved investment in developing the capability of health managers at the system and organisational levels is needed. Such investment may not be just in the form of professional development programs, as it may also include confirming competency requirements and developing competency frameworks for HMW. It is essential for establishing clear management competency requirements to guide management position, recruitment, development, and performance management of health managers [16]. The managerial strengths and weakness vary across health service management groups, hence specific and targeted development strategies must be developed [2].

In addition, the partnership between government, healthcare and professional organisations should be strengthened maximising the efforts in HSMs development [10, 11, 24]. Evidence suggests the importance of partnership in attaining the common goals for building capacity of HMW [10, 11, 24]. Academic partnership is an example of the interface between academia and the health system where the common goal for building capacity of health professionals may be achieved. An example of collaborative partnerships between academic

institutions and government could be jointly designing and providing educational degree program for health managers aiming to develop managerial capacities and competencies [11]. Also, collaborations between government and other organisations, such as non-government organisations and international organisations, may be able to achieve the intended outcome of building capacity of HMW. For instance, in Cambodia, the National Institute of Public Health collaborated with the U.S. Centres for Disease Control and Prevention to provide management and leadership trainings to health managers [24]. Improvement in leadership and governance was observed among the participants after the training [24]. Such collaboration may also help to form a technical working group of expertise from diverse regions and knowledge sharing to develop management and leadership capacity building program for HMW.

Healthcare is operating in a resource constraint environment and therefore benefits of any investment should be well demonstrated. Therefore, it is important to incorporate a valid evaluation process in management development programs so that benefits of the programs can be well demonstrated [29]. This will also allow effective learnings for future program improvement. These evaluations need to be conducted by following standard review protocols and using suitable validated tools [26].

STRENGTHS AND LIMITATIONS OF THE METHOD

This review relied upon reported development programs to highlight the development strategies within Asia Pacific nations. To the best of our knowledge, this is the first article to study the development efforts for HMW in Asia Pacific nations overall. This scoping review provides useful information on existing development strategies for health managers throughout the Asia Pacific region along with the type of development program in the specific country. However, the included studies were not evenly distributed as most of the studies were from Australia [1,2,7,19,26,27,28,29,31] and the number of available articles was relatively small in comparison with the number of countries included in the region. The exclusion of grey literature and articles not written in English created possible grounds for oversight.

CONCLUSIONS

The scoping review confirmed four different categories of existing development strategies for HMW in Asia Pacific nations: organisational informal professional development programs; competency assessment to identify management competency gaps; research process confirming competencies and developing competency framework; and formal education, and training.

Managerial strength and weakness vary across health service management groups thus, specific development programs must be designed to meet the differing competency development needs of health managers. The study reinforces the importance of evaluating the benefits of management development programs to maximise learnings and allow improvements. Government should play a key role in supporting HSM workforce development by setting clear policy direction and strengthening collaboration with healthcare organisations and professional institutions.

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Writing - Original draft preparation PP; writing - Review and editing, PP, ZL, JT. Both ZL and JT provided critical review and extensive editing during the initial development and revision of the paper. All authors provided final approval for publication.

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CONFLICTS OF INTEREST:

The authors declare no conflicts of interest.

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REVIEW ARTICLE

A FOCUSED LITERATURE REVIEW OF MISSED CARE IN RESIDENTIAL AGED CARE

Vida Karda Moghaddam[*1], *Richard Olley*[2], *Eleanor Milligan*[3], *Kylie Vuong*[1]

1. School of Medicine and Dentistry, Griffith University, Queensland, Australia
2. Griffith University, Queensland, Australia
3. School of Medicine, Griffith University, Gold Coast, Queensland, Australia

Correspondence: VIDA.kardanmoghaddam@griffithuni.edu.au

ABSTRACT

Missed care is any aspect of required care that is omitted (either in part or whole) or delayed. Residential Aged Care Facilities (RACFs) are susceptible to missed care due to a range of factors, including residents' complex needs, workforce composition, and constraints placed on resource availability. This focused literature review aims to evaluate the current evidence on missed care, including an analysis of the concept, causes, and outcomes of missed care in residential aged care in Australia.

Within most of the available literature, missed care is typically considered only within the context of nursing. It is noted that although the nature and identification of missed care were discussed extensively to provide a broad picture of the phenomenon, including possible prevalence and outcomes, they need to explicitly discuss the impact of missed care on residents, families, and other clinical and operational staff. Further research is needed to inform and improve the care of the elders in RACFs, considering this gap in the literature. This review has identified potential areas for enquiry into missed care to inform policy and practice to improve the care of elderly residents in RACFs.

KEYWORDS

missed care, quality, safety, residential aged care facilities, focussed review, nursing homes, long-term aged care

INTRODUCTION & BACKGROUND

Globally, there is a continued focus on delivering safe, high-quality, person-centred care to improve patient outcomes [1, 2]. Patients should receive timely care according to their needs. However, demanding care environments are a daily reality where health and personal care workers prioritise and rationalise care delivery [3, 4]. In such environments, care should be provided according to recognised standards of care and individual care plans, and if not provided, there is missed care. Missed care is known to be detrimental to the quality and safety of care provided in health and social care settings [5]. The concept of missed care emerged from growing concerns about the quality of care in these environments [5]. Missed care refers to any aspect of care that is not provided to a person but should have been provided according to the care plan and standards of care [6]. This includes all aspects of clinical, emotional, and administrative care [7, 8].

As a result of improvements in health and social care, people are living longer worldwide [9]. The Australian

population aged 65 and over, has increased by 17% (from 3.8 million in 2017 to 4.4 million people in 2022) [10]. By 2066, it is projected that those aged 65 years and older will make up between 21% and 23% of the total population in Australia [10]. Although this is positive, it poses some significant social and financial challenges, making it imperative to support ageing individuals [11]. As people age, we are more likely to experience complex health and social care issues, like cognitive impairment, sensory decline, chronic comorbidities, frailty, and other complex health issues [12]. This complexity may result in higher care needs, with more significant assistance and skilled care often cited as reasons for admission to residential aged care facilities (RACFs) or referrals to community and home care packages [13, 14]. RACFs have responsibilities for comprehensive care services, including social and pastoral care, meaningful activities, and clinical assistance with daily living [15, 16].

Research indicates that RACF residents have an estimated prevalence of 80% sensory loss, 60% dementia, 40% to 80% chronic pain, 50% urinary incontinence, 45% sleep disorder, and 30% to 40% depression [17]. Like many countries around the globe, Australia's healthcare system is facing these multifaceted challenges [18] associated with the growing demand for healthcare [19, 20, 21]. Over the past 5 years, there has been an increase of 3.1% in the number of people aged 65 and over living permanently in RACF (from 172,000 at the end of June 2017 to 178,000 at the end of June 2022). In Australia, almost 245,000 people aged 65 and over entered RACFs, with more than half (54%) aged over 85 in financial years 2021-22 [10, 22].

METHODS

This focused literature review included full texts of articles published in English from 1 January 2019 to 31 July 2023. It was obtained by searching the following bibliographic databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline and Scopus, with a combination of the following keywords in Table:

TABLE: SEARCH STRATEGY

Search	Query
#1	(missed care) OR (omit* care) OR (care undone) OR (undone care) OR (care unfinished) OR (unfinished care) OR (care left undone) OR (implicit ration*) OR (ration* care) OR (implicit ration* care) OR (missed nursing care) OR (unfinished nursing care) OR (miss care) OR (omitted care) OR (rationed care)
#2	(residential aged care) OR (nursing home) OR Residential OR (aged care) OR (long-term care) OR RACF*
#3	#1 AND #2

The search for articles was informed by three concepts: 1: the relevant population and setting (i.e., people aged 65 years and over in RACFs and settings similar to RACFs), 2: interventions performed and missed (i.e., whether primary care has been delivered) and 3: the reasons and outcomes when care is missed.

MISSED CARE IN RACFS

Missed care is an issue worldwide [23] and is not new [24]. This term was first used in 2006 by Kalisch, who identified nine elements of regularly missed nursing care and the reasons for them [7]. Kalisch (2006) defined missed care as an error of omission [24]. Schubert et al. later defined missed care as care that needs to be rationed due to scarce resources [4, 25]. Missed care concerns all healthcare providers, including nurses, physicians, and allied health professionals [26]. Previous studies in the United States [23], Europe [27, 28], Asia [29], and Australia [24] have provided insights into missed care.

In RACFs, the issue of missed care is particularly relevant [15]. RACFs are responsible for providing comprehensive care services, including social and pastoral care, meaningful activities, and assistance with daily living. Those residing in RACFs represent the most frail cohort in the aging population, with notably high rates of disability, frailty, co-morbidities, and low levels of independence [17], necessitating significant assistance with feeding, dressing, personal hygiene, and mobility [30]. The demanding nature of these obligations can be challenging and may be associated with missed care, impacting the overall quality and safety [15, 31, 32]. As the population ages, continuous evidence-based care improvements are essential [30].

RACFs differ from hospital care [33, 34] in that RACF providers supply a home-like environment for care delivery where independent home living in the community is no longer possible [12, 35]. In contrast, hospital care focuses on managing acute conditions. The composition of care providers and length of stay also differ [36].

Although we have some knowledge about what care is most often missed and the factors associated with missed care [24, 37, 38] based on the experiences and perspectives of nursing staff [39]; less is known from other health professionals, residents, and family members.
The evidence, at times, varies. For example, Zuniga and colleagues [38] found little missed care in nursing homes for activities of daily living, care, rehabilitation and monitoring, social care, and documentation [38]. In the Zuniga study, care providers believed less documentation could improve care quality with less time spent on administrative tasks, allowing more time with residents [38]. Further, Zuniga and colleagues reported better relationships with caregivers and better-quality care. Building stronger relationships may also help care workers be satisfied in their jobs. In contrast, Hackman and colleagues [40] found that 92% of respondents had experienced at least one episode of missed nursing care. Hackman and colleagues found the episodes of missed care were related to routine care, documentation, and social care [40], with work environment and work stress influencing care quality [40]. The Zuniga study, however, did not examine the impact of the identified factors on quality-related outcomes, including care workers' perceptions of quality of care and medical and psychosocial resident outcomes. [38]. A study in Canada by Knopp-Sihota and colleagues, in a survey of carers, also identified gaps in social care and rehabilitation, with tasks most often missed, such as talking to the patient, walking with the patient, doing nail care, mouth care, and grooming [37]. This survey reported associations between missed care and individual care aids factors, such as younger age, less experience, and working day shift, and structural factors [37].

In a study of missed care in RACFs in three Australian states, Henderson and colleagues [19] found that unscheduled tasks, such as answering calls and assisting people with multiple comorbidities to the bathroom, were most likely to be missed, with the impact of work intensification and staffing issues as the main factors associated with missed care. It has been identified that work intensification is related to illness acuity or level of care dependency and cost containment, while the staffing issues identified include undermining prescribed staffing ratios, skill mix, changing workloads across shifts, and inadequate support from other staff members [19]. Another factor associated with missed care is cost containment, sometimes with senior nursing staff substituted with less experienced nurses, assistants-in-nursing or personal care workers [19, 41, 42].

An additional examination of the phenomenon of missed care within RACFs found that staff competencies played a significant role in the non-performance of tasks [43]. A study in rural South Australia by Henderson and colleagues found that when RACFs are attached to hospitals, there is a reduced likelihood of the exclusion of acute-level nursing tasks and activities of daily living (ADLs). Henderson and colleagues also found that social, emotional, and recreational pursuits are more susceptible to being overlooked [43].

A systematic literature review of 27 studies by Ludlow and colleagues in 2021 found the most commonly reported activities missed were assistance with toileting/changing pads, communication with residents and family, mouth care/oral hygiene, patient surveillance, and general mobility [12]. Song and colleagues (2022) reported similar findings, with physical and social care missed by care aides in RACFs [44].

FACTORS ASSOCIATED WITH MISSED CARE IN RACFS:

Missed care can occur in all healthcare settings, including hospitals, outpatient clinics and RACFs. It can be associated with many factors, from heavy workloads, inadequate staffing, an under-skilled workforce, and work stress to resource constraints [26, 45, 46, 47, 48]. These factors underscore the need for systematic change. Although various reasons for missed care have been stated, some overlap. Hackman and colleagues [40] report five main factors for missed care in RACF from the care workers' perspective, including insufficient resources, residents' characteristics, unexpected situations in work units, activities without collaboration with the residents and challenges in organizing and leading care. In a separate study by Luongo and colleagues, allied health professionals, including physiotherapists and occupational therapists, reported funding and time constraints as the primary challenges for implementing best practices consistently in RACFs [49].

Ludlow and colleagues reported factors associated with missed care in RACFs into seven categories based on staff member characteristics, staff members' well-being,

resident characteristics, interactions, resources, the work environment, and delivery of care activities [12]. Blackman and his colleagues noted other factors associated with missed care, ranging from reduced staffing levels and skill mix, limited funding and resource constraints [47]. This is supported by Olley [50] who concluded that, as the aged care funding system is outdated, and there is no trade-off between quality and care and financial results, staff often cannot meet their job requirements, causing job stress and burnout [48].

As the complexity of care delivery in RACF increases, missed care has become a more multifaceted phenomenon. For example, inadequate funding may cause higher workload demands, potentially increasing staff burnout and lowering staffing levels [12]. A holistic approach is needed to address the multidimensional nature of missed care, including its associated factors, both internal and external factors, is needed to improve care quality and outcomes.

IMPLICATIONS OF MISSED CARE IN RACFS

The implications of missed care in RACFs have been wide-ranging. There have been reports of care aides in RACFs in western Canada experiencing yelling and screaming, verbal threats, hurtful remarks or behaviours, and being bitten, hit, pushed, or pinching due to rushed and missed care from residents with cognitive impairment [44]. In another study, missed care, such as inadequate patient surveillance and failure to administer medications in time, has led to adverse clinical outcomes [51].

However, it is important to note that the literature on missed care has been dominated by studies involving nursing staff. For example, Recio-Saucedo and colleagues [39] and Jones and colleagues [6], reviewed 14 and 54 studies, respectively, in 2018 and 2015. In both studies, the participants were mainly nursing staff. Given the interdisciplinary nature of care within RACFs, more diverse sampling is required [52]. Furthermore, most research has focused on types of missed care and its associated factors, while the implications of missed care for staff, residents living in RACFs, or their family members remain understudied. Further empirical studies from the stakeholders' views and experiences are required at the national and international levels are needed to extend the evidence base are required [12, 53]. It is important to note, RACFs are structured and funded differently in different jurisdictions; while some of the findings could be applied across settings, it is not always possible to generalise [52].

CONCLUSION:

It is essential for residential aged care organisations and related policymakers to work collaboratively to reduce the incidence of missed care and any related adverse events [54, 55]. It is also essential to provide aged care providers with a positive environment underpinned by staff well-being and a supportive workplace culture. This review highlights the need for further research into the frequencies of missed care, the factors associated with omissions in care, and the documentation of the implications of missed care in RACFs. The current focus on missed care from a predominantly nursing perspective omits significant other stakeholder experience and insights, such as the resident, carers and family, medical, allied health, and RACF leaders. Expanding our understanding of missed care to include these perspectives would greatly enhance our ability to make the necessary improvements.

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REVIEW ARTICLE

CONTINUING PROFESSIONAL DEVELOPMENT (CPD) IMPACT FOR CLINICAL AND NURSING PRACTICE: A SYSTEMATIC LITERATURE REVIEW

Haeril Amir, Rr.Tutik Sri Hariyati, Enie Novieastari, Trevino A. Pakasi*

Faculty of Nursing, Universitas Indonesia

Faculty of Medicine, Universitas Indonesia

*Correspondence: haerilamir12@gmail.com/haeril.amirskepnsmkep@ui.ac.id

ABSTRACT

INTRODUCTION AND AIMS:

Professionalism provides for an obligation for nurses in carrying out nursing care in hospitals and this is obtained from continuing professional development (CPD). The aim of this research is to review the benefits of CPD in nursing practice.

MATERIAL AND METHODS:

This paper is a literature review using several databases, namely Scopus, PubMed, Science Direct. Searching for articles were with the keywords /MeSh vocabulary - "[Continuing Professional Development]" OR "[CPD]" AND "[Nursing]"AND [Professional].

RESULT:

Based on the search results, nine articles were found which had used mixed (n=2), qualitative n= 2 and quantitative (n=5) methods.

CONCLUSION:

CPD impacts nurses' knowledge, skills, job retention, patient safety and quality of care.

KEYWORDS

Continuing Professional Development (CPD), nursing, review, professional.

INTRODUCTION

Continuing Professional Development (CPD) is an active participation process used by nurses in the form of continuous learning. It is also a commitment to maintaining, enhancing professionalism and career success [1]. CPD is significant in relation to the satisfaction of nurses and their career paths [2]. According to the Regulation of the Minister of Health of the Republic of Indonesia (Permenkes) No. 40 of 2017 on the professional career path of nurses, CPD is an effort to renew high standards of health services by means of professional practice [3], and improved patient care [4].

CPD has been utilized by nurses around the world. In Australia, CPD is required of nurses [5]. In the UK, CPD has a minimum requirement of 12 hours a year. It even reaches up to 30 hours in other parts of Europe, such as Belgium, France and Italy [6]. In Indonesia specifically, the implementation of CPD is still very basic. One of the reasons for this is the gap in competency and credentialing results. Additionally, meeting the requirements for nurse professionalism is a challenge in the process of achieving the career path process [7].

The implementation of nursing care by prioritizing professional practice is considered the goal and cannot be separated from CPD. If undertaken continuously, this has direct implications for the quality of nursing services in hospitals. Nurses are required to undertake CPD because they have high standards in their work, for example, they must ensure that the care provided is the best, individual-centered, and filled with compassion [8]. It is also for patient convenience [9], and patient safety [10], and it is claimed that with CPD, missed nursing care in hospitals can be avoided [11]. This statement is corroborated by the latest Indonesian Health law number 17 of 2023, meaning that providing health services there must be priority for patient safety [12]. This provision further supports the implementation of CPD and its benefits in improving knowledge and skills [13]. In addition, the development of technology along with the patient needs is a reason for nurses to develop their competence [3]. The implementation of CPD can be in the form of training, formal nurse education, workshops, seminars, research, and community service. In terms of career advancement, CPD is also an indicator and form of recognition or accountability of a nurse's clinical ability. It is also a requirement in determining a nurse's clinical privileges.

In hospitals, if we look at the facts, CPD is prioritized by nurses. The evidence is that they only do CPD when they need it [14], for example, for the purpose of career advancement. This is due to many factors, including the high cost of CPD, family obligations, work-life balance, and stress. As a result, there is still a gap in uptake and it definitely affects nursing practice in hospitals [15,16].

This review was intended to analyze the impact of CPD on the practice of the Indonesian nursing profession, especially in hospitals so that in the future CPD can be carried out continuously and routinely.

METHODS

The methodological framework used was based on Arksey & O'Malley. There were five stages, starting from identifying the research question, relevant studies based on the search strategy, selecting sources of evidence and compiling, mapping, reporting [17], and conclusions. The review was reported based on the PRISMA-Scr extension checklist [18].

IDENTIFYING RESEARCH QUESTIONS: DETERMINING CRITERIA

Research questions were organized based on PICO (Population, Intervention, Comparison, Outcome) [19]. Articles were universally filtered disregarding publication date. The main inclusion criteria here were that the article should be written in English and the title of the article not included review studies (Table 1).

SEARCH STRATEGY

Databases used were PubMed, Scopus, Google Scholar, and Science Direct. The Boolean phrases used were (Ti: Continuing Professional Development* OR CPD*) AND (Ti: clinical practice* OR clinical privilege* OR Nursing Practice). These keywords were a combination of synonyms and MeSH terms.

SELECTING SOURCES OF EVIDENCE

Four reviewers, H.A, RRTSH, TAP and E.N, sorted the extracted papers by title and abstract of each article for initial review, to then be matched with the inclusion and exclusion criteria. Suitable articles were reviewed in full text to reconfirm compliance with the following inclusion and exclusion criteria:

TABLE 1. PICO, INCLUSION AND EXCLUSION CRITERIA

PICO Element	Inclusion	Exclusion
P: Continuing professional development	Focus of Nurses' CPD	CPD in medical, pharmacy and midwifery, CPD in health services (Hospitals, *Puskesmas*)
I: Strategies used to improve the quality of nurse practice	Interventions to improve professionalism and service quality	-
C: Studies that include comparison, study design	Quasi experimental or experimental study, original research, case study	Systematic review, meta-analysis
O: Patient safety, miss nursing care, good clinical privilege	Includes all impacts of CPD	
Language	English and Spanish	Besides English and Spanish

COMPLILING, SUMMARISING and REPORTING DATA

Information was collected such as author's name, date/year of research, country where the research was conducted, methods used, research results and research gaps/recommendations. A summary of the search results can be seen in Figure 1. The results were then summarized and reported in descriptive form.

RESULTS

ARTICLE SEARCH RESULTS

Based on the search results of retrieved articles in several databases, 2,115 articles were found. They were then filtered by language and title, leaving 960 articles. After that, we assessed the articles based on Table 1, leaving 570 articles and sorted them again for duplicate publication (i.e. the same article found in different databases), resulting in 56 articles. The last step was to ensure 210 articles had full text and met the inclusion and exclusion criteria. Finally, this study obtained 15 articles consisting of qualitative (n=2, quantitative (n=5), and mixed method (n=2) studies. This process can be seen in Figure 1. Flowchart diagram.

FIGURE 1. FLOW CHART DIAGRAM

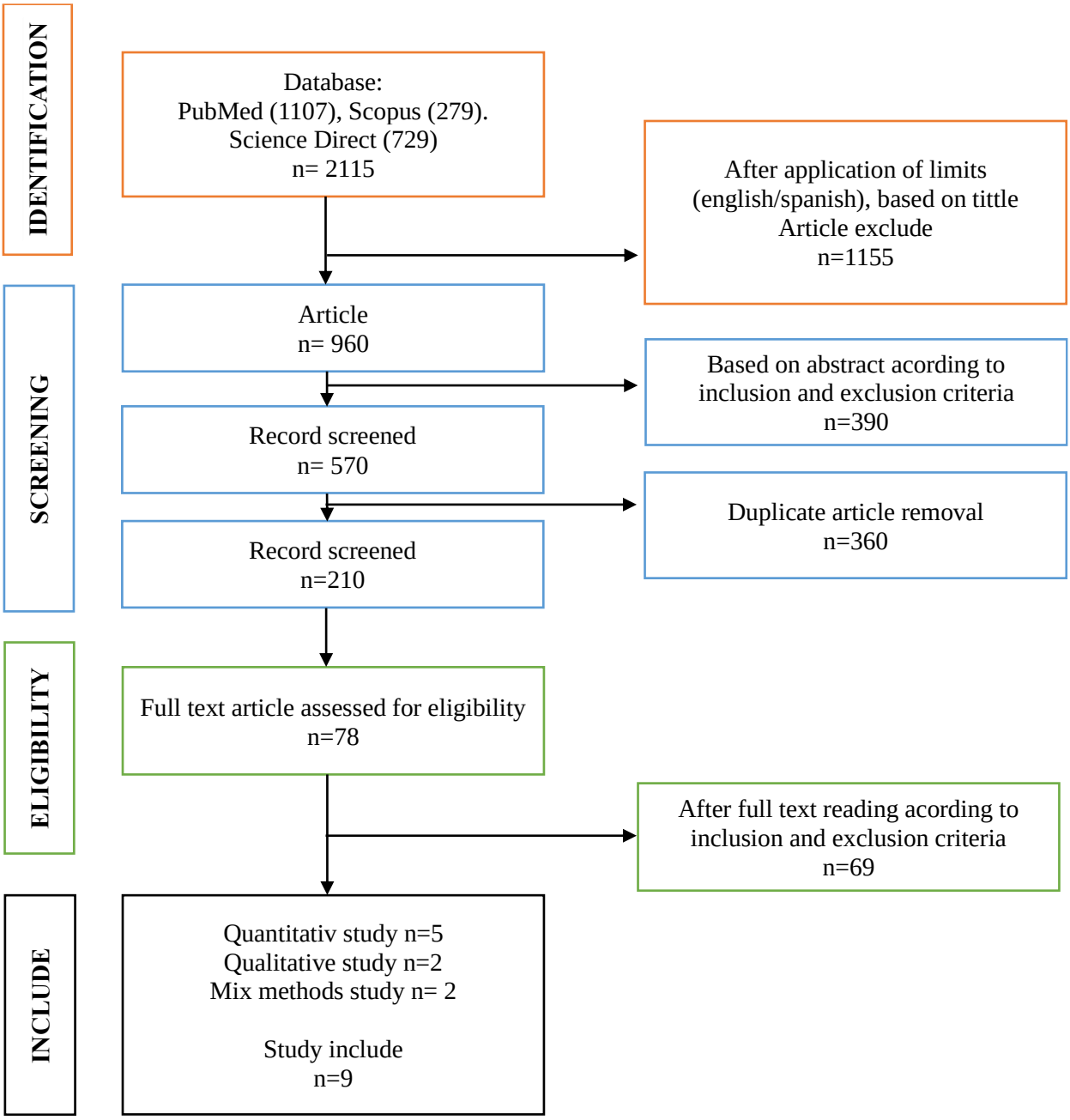

TABLE 2.CHARACTERISTICS OF THE SELECTED STUDIES IN THIS REVIEWT

Study Country	Aims/Design	Sample/data Size collection methods	Main result	Limitation
[20] Eutophia	Qualitative, sequential	Nine, semi-structured interview	3 themes identified: 1. Sharing knowledge about CPD in the form of PONT training 2. Availability of accessible training 3. Changes in the nurse	This study only used nurses as a source of information about the impact of PONT training. Interviews with leaders and organizations in support, especially CPD activities, are needed.
[21] Scotlandia	Quantitative/ Survey	2,813, Questionnaire	More than 75% of respondents spend 0-10 hours a month doing CPD. Discussion with friends was the most preferred activity by all respondents.	This research was a survey and there were limitations to the questionnaire in obtaining data. Although many respondents participated, they still suggested that other methods be used in the future.
[22] Filipina	Quantitative/Descriptive	105, Questionnaire	CPD can improve nurses' skills, performance and productivity.	This study suggests that research respondents are not only nurse educators, which was a shortcoming of this study.
[23] Myanmar	Quantitative	60, Questionnaire	There was an increase in pre-seminar knowledge and nurses also realized their self-efficacy improved.	The average knowledge score was high because the questionnaires were distributed after the seminar. Long-term research is needed to measure nurses' knowledge.
[24] United Kingdom (UK)	Mix-Methods/sequential explanatory design	39, Questionnaire and semi-structured interview	From the questionnaire results, e-learning helps nurses' CPD process. From the interview results, it was found that motivation influences CPD, perceived value and challenges of engagement in CPD.	This study was small-scale, only on 1 unit in the hospital, namely the pediatric ward.
[25] Kanada	Qualitative/Ethnography	10, Interviews	The INSÉPArable portfolio is a form of CPD supporting continuous patient safety from nursing practice experiences.	This study focused on the nurses' experience. In the future, it is recommended to focus on the patient so that patient-nurse interaction occurs at the same time.

[26] Indonesia	Quantitative/non-experimental design	149, Questionnaire	CPD has an effect on nurses' careers.	Respondents in this study were on a small scale because they were from 1 area. In the future, various places are needed to see the broad impact of CPD on nurses' careers.
[27] Rwanda	Quantitative/Cross-sectional study	463, Questionnaire	93.7% said CPD is very important, it concerns the quality of their service to patients and 92% thought Online CPD can be utilized as a source of new knowledge.	This study used a self-developed tool; although it was scrutinized for validity and reliability, we admit that it was not sufficient as the reliability test was conducted on a small sample.
[28] Kanada	Mixed-Methods/case study	55, Website questionnaire and semi-structured interview	Respondents reported the highest rate of using smartphones (53.8%) and the lowest rate of using mobile apps (35.8%) for CPD, while the interviews found the flexibility of using mobile-based learning, the level of autonomy and the comfort of self-learning.	The low response rate of participants may be due to the fact that the researcher did not directly supervise the participants, which may have biased the study.

DISCUSSION AND CONCLUSION

CPD IMPROVES KNOWLEDGE, SKILL, CONFIDENCE, AND JOB RETENTION

Abebe's research in Ethiopia collected data using in-depth interview techniques from nine perioperative nurses. From the results, nurses said CPD, in the form of training, can improve their skills, knowledge and confidence [20]. Martin's research has also highlighted the importance of CPD for the development of performance, skills and mediating the transformation of practice services from individuals [29]. Both are clear evidence of the need for CPD in hospital practice settings by nurses.

CPD is nothing new. Nurses and other professionals are willing to spend a few hours a month undertaking CPD [21]. Seeing this case, a study modified technology by conducting CPD online. This intervention certainly saves costs without clashing with nurses' routine activities, namely the results of Beckett by utilizing e-learning as a CPD program that is easily accessible in any condition as long as it is connected to the internet network [24]. Vernon's research also identified CPD with the help of a cellular application and indeed based on the results of this study it is actually easy for nurses to learn [28].

For nurses, there is no other option but to do CPD. Confidence in caring for patients is much better with CPD [30]. In fact, a theory by Bandura sets out that someone who is equipped with the right information will not be able to use the information if it is not driven by confidence, knowledge and trust in using the information [31].

Some research can reassure nurses that CPD makes them more productive in providing nursing care to patients [22]. Nurses believe that what they accomplish is not wasted and has a positive impact on the patients.

Confidence is also often linked to service satisfaction. Nursing is known as a caring and compassionate profession. However, the fact is that not just a few nurses experience fatigue which has a negative impact on patient care and worse if it leads to turnover [30], This is related to job retention. Hariyati's research specifically highlighted the benefits of CPD for nurses' career paths [26]. According to Hariyati and Safril, CPD is one of the main factors in determining the process and determination of nurses' career path. In Indonesia, this standard has been set and must be implemented by all nurses as a necessity and demand [26].

CPD FOR PATIENT SAFETY AND QUALITY OF CARE

CPD is also often linked to patient safety [29]. This is also supported by Allen's research in 2020 which asked participants about the benefits of their CPD practices, and the results showed that CPD can shape a nurse's self-identity, making nurses more confident in their actions to patients [33]. Moreover, Cervero (2015) research positions CPD at the forefront as a strategy to guarantee nurses' professional actions [34]. That way, nurses are able to take pride as a profession that implements evidence-based practice because it is supported by knowledge.

One aspect of evidence practice is the certainty of safe service [35]. All patients desire the best service, and it is not uncommon for them to be willing to spend their fortune to get it. Indicators of safe and comfortable service have become the demands of all health professions, including the nursing profession. Accomplishing this is not easy and requires the commitment and seriousness of nurses in order to continue to enhance their skills and knowledge through CPD. It is admitted that evidence-based practice necessitates expertise and competence [36]. Nurses must also ensure all treatments are in accordance with standards and prioritize patient safety [37,38].

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REVIEW ARTICLE

HAS THE CODE BEEN SUCCESSFUL? AN INTEGRATIVE REVIEW OF THE IMPACT OF THE WHO GLOBAL CODE OF PRACTICE ON THE INTERNATIONAL RECRUITMENT OF HEALTH PERSONNEL

Shruti Bhardwaj, Bino Paul*

Tata Institute of Social Sciences, India

Correspondence: shruti.bhardwaj09@gmail.com

ABSTRACT

International migration of health human resources (HHR) from low- and middle-income (LMIC) countries to high-income countries has been addressed on several international platforms since the late 1990s. World Health Organization (WHO) adopted the WHO Global Code of Practice on the International Recruitment of Health Personnel in 2010 to mitigate the adverse effects of HHR migration, but like other codes of practice aiming to provide ethical guidelines for international recruitment, the impact of the code is not clear so far.

This study is an integrative review of past studies assessing the impact and adherence of the code in WHO state members and regions. This review follows the Whittemore & Knafl (2005) guidelines for conducting the review [6]. A total of eleven studies were included in the review. The study results suggest that the code has not yet realized its full potential, especially in the countries that are more in need of health human resources. The direct impact of the code was found to be limited in areas such as key legislation in migration or bi-lateral agreements between source and destination countries or any financial mechanism to compensate source countries for the loss of HHR. However, as intended the code has been able to promote a global discussion and awareness of the issue related to migration and catalyse a few developmental changes.

The study is limited by geographical regions as it does not represent all geographical regions such as regions of the Americas or western Pacific regions. This study provides a future direction to evaluate the code's impact on LMICs and amendments to be made in the code to make it more effective.

KEYWORDS

WHO Code of Practice, WHO global code, ethical recruitment, health human resource migration

INTRODUCTION

The period between the late 1990s and early 2000s saw a sharp rise in the number of foreign-educated health professionals in many developed nations. The chronic shortage of health human resources (HHR) was addressed by many international forums and alliances. Several international agencies and alliances acknowledged that an adequate number of health human resources is required to achieve the internationally agreed development goals. The World Health Organization (WHO) noted that the migration of highly trained health workers has been increasing at an exponential rate weakening the health systems of developing economies [1]. It was further

noted that developing economies make a significant investment to educate, train and develop HHR and a mechanism must be established to mitigate the adverse effect of migration of HHR from such economies [1].

This period also saw several codes of practice being introduced to mitigate the adverse effects of health professional migration on developing economies such as The Code of Practice for the international recruitment of healthcare professionals (CoP) in 2001 by the UK [2] or Voluntary Code of Ethical Conduct for the Recruitment of Foreign-Educated Health Professionals to the United States (Code) for safe and fair recruitment of nurses from foreign countries in 2008 [3]. Though the impact of such codes of practice on international recruitment is not known, however, it has been encouraging global collaboration to manage migration [4]. WHO [4] noted that having a non-binding code, or a soft law, in place may exert a moral or ethical influence which may shape the behaviour of member states. A code of practice may establish a benchmark to monitor international behaviour. WHO adopted the WHO Global Code of Practice on the International Recruitment of Health Personnel (hereafter referred to as "code") in 2010 [5], but like other codes of practice aiming to provide ethical guidelines for international recruitment, the impact of the code is not clear. It has been more than a decade since the code was implemented however the influence, and impact of the code on member states, especially in developing countries is yet to be assessed. The issue of health human resources migration has become more relevant for LMIC countries in recent times as the world deals with a pandemic.

This study is an integrative review of past research on the code's impact and effectiveness on different aspects of health human resource migration. This review follows the Whittemore & Knafl [6] guidelines for conducting the review. Additionally, the PRISMA 2020 guidelines have been followed to report the review [7].

METHOD

ELIGIBILITY CRITERIA:

Studies were considered if the articles empirically, theoretically, or from a policy view assessed the impact of the code in any WHO state member or region. There was no restriction on the method and design of the study. A time range was applied to search engines. Articles published after 2010 were considered. Only English-language articles were included in the review. Articles reporting the progress of the code as per the WHO national reporting instrument were excluded. Also, Articles assessing the combined impact of the code with other codes of practice were excluded from the study.

SEARCH STRATEGY:

A basic Google and Google Scholar search was conducted to identify common terms referring to the code. After narrowing down key search terms authors identified literature published on the WHO Code of Practice in one specialized and one multi-disciplinary academic database. Search query included terms WHO AND ("code" OR "global code" OR "code of practice") AND (" international recruitment" OR "health personnel" OR" international migration"). Since the code was introduced in 2010, results were filtered with the year of publication from 2010 onwards. Only English language records were included. A grey literature search was also conducted in Google Scholar and the WHO institutional repository for information sharing (https://apps.who.int/iris/). Additionally, reference searching of studies included in the review was also conducted. Figure 1 indicates the search process for identifying and screening records. All the databases were last searched on December 1st, 2021.

DATA COLLECTION:

Records were imported to the Endnote online. After eliminating the duplicates, to screen the records and assess the eligibility of studies two reviewers worked together. Studies were included only if a) the study set in postcode introduction time b) focused on how code has influenced policy, strategies, or any other areas of health HR migration c) clearly stated that studies assess the adherence or impact of the code. In case of any disagreement, both the authors discussed the major objective and potential contribution of the study and based on that study were included/excluded. Studies were excluded if the period of study was not exclusively post-code introduction, the impact of the code was assessed in combination with other codes of practice or, the aim of the study was not clear. One study that appeared to meet the inclusion criteria however was excluded. The reason this study was excluded is because the article presents findings of the first round of the WHO reporting instrument [8]. A total of eleven studies were included in the review (Table 1).

DATA ANALYSIS:

Data was analysed using the Whittemore and Knafl process of data reduction, data display, data comparison, conclusion drawing, and verification [6] from all eligible

studies were extracted in a spreadsheet. The first author of the study performed data extraction after consulting the co-author. Once all the studies were summarised in the spreadsheet, the next phase was to identify commonly occurring variables or themes. Data was read again and again to find the initial themes or codes. Emerging codes were constantly compared with each other to find commonality or variability. The next stage was to merge the initial themes into groups and conclusion drawing. For accuracy, at the final stage conclusions were verified with the primary data source.

FIGURE 1. PRISMA FLOW DIAGRAM FOR STUDIES INCLUDED IN THE REVIEW

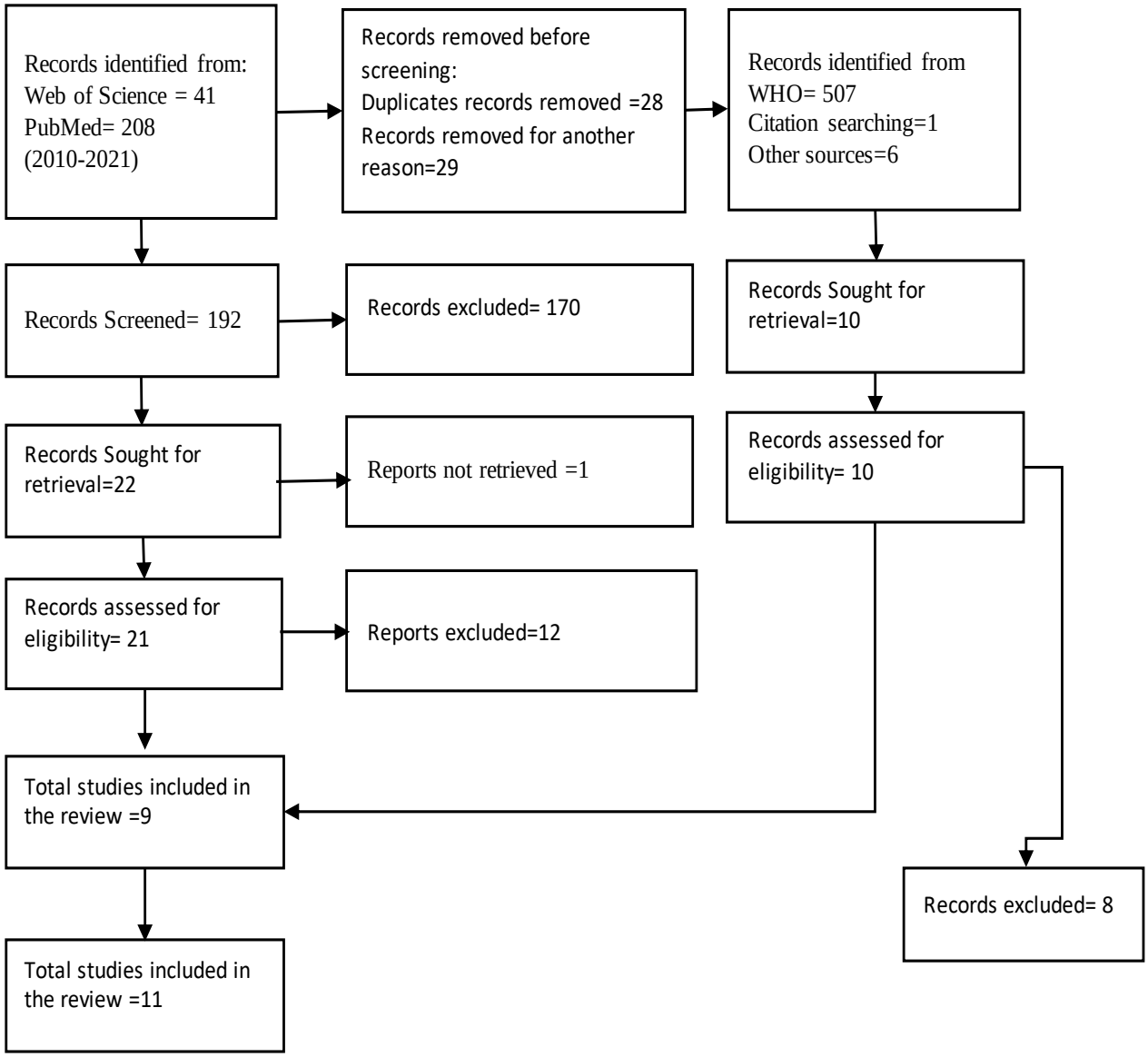

TABLE 1. SUMMARY TABLE OF STUDIES INCLUDED IN THE REVIEW

Date/Author	Country/Settings	Aim of the study	Method (study design, sample, data collection)	Conclusion
Edge and Hoffman, 2013	Australia, Canada, UK, USA	To measure awareness for and perceived impact of the Code and its implementation	42 key informants from across government, civil society and private sectors were qualitative surveyed	A gap between awareness of the Code among stakeholders at global forums and the awareness and behaviour of national and sub-national actors was found
Williams et. al, 2020	WHO Europe region	To assess adherence with the Code's principles and its continuing relevance	Data from the joint OECD/EUROSTAT/ WHO-Europe questionnaire from 2010 to 2018 was analysed to determine trends in intra- and inter-regional mobility of foreign-trained doctors and nurses working in case study destination countries in Europe	The proportion of foreign trained nurses and doctors has risen faster than domestically trained professionals, with increased mobility driven by rising East-West and South-North intra-European migration, especially within the European Union. The number of nurses trained in developing countries but practising in case study countries declined by 26%
Abuagla & Badr, 2016	Sudan	To ascertain the code's relevance and effectiveness &implementation	Secondary analysis in terms of available literature and documentation on the issue, and mostly by unpublished material from local sources. Five key informant interviews	Code has catalysed some vital steps in managing migration and strengthening the national health workforce. Yet, the country's response falls short of the effective measures required to address migration and to utilize the WHO Code to its full potential
van de Pas, Mans, de Ponte & Dambisya, 2016	A number of European countries and in Eastern and Southern Africa (ESA).	To assess the relevance and effectiveness of the code	In case studies from the European and eastern and southern African regions, the authors provide their experiences with and insights into the uptake of the Code	In Europe, the Code is effective and relevant but might require some tweaking. In Eastern and Southern Africa, the code is relevant but far from efficient in mitigating the negative effects of health workforce migration
Tangcharoensathien et al, 2018	Bhutan, Indonesia, Maldives, and Thailand	To assess policies and practices in 4 countries in Southeast Asia on managing the in- and out-migration of doctors and nurses to see whether the	Synthesis of documents on employment practice for local and expatriate health professionals by the country authors, followed by a cross-country thematic analysis.	The analysis reaffirms that systematic arrangements between source and destination country governments are useful in protecting health system integrity, moderating migration, and protecting out-migrating professionals.

		management has been in line with the WHO Global Code		
Paina, Ungureanu & Olsavszky, 2016	Romania	To explore Romania's implementation, relevance, and effectiveness of the code	Analysis of peer-reviewed and grey literature, in English and Romanian	Romania's implementation of the Code was observed to be limited. Gaps were identified regarding several aspects of the Romanian health system. The authors could not identify any evidence of monitoring of the Code's implementation to date
Tankwanchi, Hagopian & Vermund, 2019	South Africa	To estimate post-Code physician net migration (NM) in South Africa (SA), and SA's net loss of physicians to OECD countries from 2010 to 2014	Through the General Medical Council register, data on SA-IMGs from OECD. Stat based on the Joint OECD/Eurostat/WHO-Europe Questionnaire on non-monetary healthcare statistics, National Reporting Instrument reports database, analysis of emigration trends	Physician emigration from SA is slowing. Although our analysis of migration focuses mainly on post-Code trends, SA's physician emigration slowdown likely began earlier
Tam, Edge & Hoffman, 2016	Australia, Canada, UK, and USA	To represent a medium-term empirical impact evaluation of the Code, four years after its adoption. And to determine changes in stakeholders' perception of the implementation, utility, and relevance of the Code	44 respondents, from government, civil society and the private sector completed an email-based survey evaluating their awareness of the Code, perceived impact, changes to policy or recruitment practices resulting from the Code, and the effectiveness of non-binding Codes generally.	Insufficient national uptake and implementation of the Code's principles. Little has changed since the initial impact evaluation of the Code three years ago; since then, the Code has still not produced the tangible improvements in health worker flows it aspired to achieve
Tankwanchi, Vermund & Perkins, 2015	Sub-Saharan African	To monitor the post-CoP migration of physicians originating from Sub-Saharan Africa (SSA) and recruited into the physician workforce of the US	SSA-origin physicians' data was collected in December 2013 from the medical database system of an American Medical Association Physician Masterfile, we projected to 2015	The annual admission rate of SSA émigrés into the US physician workforce is increasing. This increase is due in large part to the growing number of SSA-born physicians attending medical schools outside SSA, representing a trend towards younger migrants. Most SSA

			with linear regression, and we mapped migrant physicians' locations using GPS Visualizer and ArcGIS.	migrant physicians are locating to large urban US areas where physician densities are already the highest. The Code of Practice has not slowed the SSA-to-US physician migration
Efendi & Chen, 2014	Indonesia	To monitor the implementation of the Code and impact of code on nurse migration in Indonesia	Qualitative and quantitative data, A triangulation approach was achieved through semi-structured interviews with key stakeholders, and records review of nurses' migration in the last two years.	The Code has been utilized by the Ministry of Health to manage migration. This guideline at the least provides direction that may be used where appropriate in the formulation and implementation of nurse migration.
Dambisya, Malema, Dulo et. Al, 2014	Eastern and Southern Africa	Seeks to address how the policy interests of African countries informed the Code, and how the Code has been used, implemented, and monitored in countries in the ESA region, particularly in relation to the concerns that motivated the Code	Various research strategies: i.an extensive review of literature, ii. a 'fast-talk' session at the 66th World Health Assembly,iii. a region-wide questionnaire survey to obtain views of government informants iv. three country case studies undertaken in Kenya, Malawi, and South Africa	Countries in the ESA region have not made much progress in implementing and monitoring the Code or using it in their engagement in global health diplomacy, and the code remains largely unknown in the region

RESULTS

AWARENESS, IMPLEMENTATION, AND DISSEMINATION OF THE CODE:

The awareness and knowledge of the code across the studies were reported to be limited. Edge and Hoffman [9] in their early evaluation of 8-10 months found a lack of awareness of the code among most of the respondents. The respondents in this study were key informants across government, civil society, and private sectors in four high-income countries namely the UK, USA, Australia, and Canada. A majority (60%) of respondents also believed that their colleagues were not aware of the Code. Among those who reported awareness of the Code among their colleagues, a significant number (14 out of 17) of respondents noted that the code's awareness was extremely limited. UK respondents were most aware in this study, no government sector respondents reported awareness of the Code among their colleagues [9]. A medium-term impact evaluation, using the same methodology and instruments, reported similar findings 4 years after the code's adoption [10]. Forty-one per cent of respondents reported that they were largely unaware of the code and its impact despite working in related sectors such as health policy and workforce development. Similarly, in a case study, respondents and key informants from South Africa exhibited a distinct lack of knowledge of the code's contents and purpose despite working with the national department of health and regulatory bodies. only one informant was aware of the Code. This lack of knowledge posed a barrier to engaging in a meaningful discussion with the informants on the implications of the Code for informing policy solutions for migration. In Malawi, most respondents were ignorant of the code despite working in the HRH technical working group. out of 9 respondents, 8 respondents had either never seen, read, heard or were aware of the code's content [11]. Kenya, was an exception in this study, having an intimate knowledge and understanding of the code.

Implementation of the code varied in different regions. Van de Pas et al. [12] noted a stark difference between European and Eastern and Southern Africa (ESA) regions, while European regions have effectively implemented the and most countries were aware of the code. On the contrary, in the ESA implementation of the code was lacking. Many countries such as Malawi and South Africa have not taken adequate measures to disseminate the code such as designating authorities [12]. Other countries such as Romania, and Sudan also fell short of implementation and dissemination of the code [13,14]. however, Indonesia is noted to have disseminated the code [15].

INFLUENCE OF OTHER EXISTING CODES OF PRACTICE:

Few studies suggested that the changes that the code was hoping to bring had already been made in response to previously adopted national/regional codes or profession-specific codes. In the short-term evaluation by Edge & Hoffman [9] Key informants working in nursing referred to the International Council of Nurses' Position Statement on Ethical Nurse Recruitment (2001) and the Canadian Nurses Association's Position Statement on Ethical Nurse Recruitment (2007), while those informants working with physicians referred to the World Organization of Family Doctors' Melbourne Manifesto (2002) while discussing policy changes[9]. Similarly, in the mid-term evaluation respondents referred to the Melbourne Manifesto and the UK Code of Practice, among other international codes while referencing tangible regulatory changes following the implementation of the [code10]. In South Africa, Occupation Specific Dispensation (OSD) introduced in 2012 was reported to have induced changes such as improved pay for healthcare professionals and was rated a highly successful measure to help better health workers, whereas the code has not been disseminated [11]. Tankwanchi [16] also noted that the decreasing emigration trends from SA could partly be credited to the introduction of the OSD to attract and retain the health workforce in SA, especially in the nursing sector. In Romania, the residency reform initiative was initiated before the Code's implementation began and provides an example of regulatory mechanisms that can be adapted and evaluated to support the Code's principles and ensure effectiveness [13]. The Code was either perceived as complementary providing further support or secondary to these existing agreements or codes, incapable of making a direct impact [10].

IMPACT OF CODE ON NATIONAL DECISION-MAKING

The perceived direct impact of the code on national health policies and regulations or decision-making was reported to be limited across the studies. In an early evaluation, eighty-six per cent of respondents from the UK, USA Canada, and Australia reported that the code has not made any meaningful impact on their country's health workforce recruitment practices, policies, or regulations [9]. In another study respondents When asked whether the Code had a meaningful impact on health worker

recruitment, fifteen respondents disagreed (34 %), with six and eight individuals indicating strong and moderate disagreement, respectively. However, thirteen respondents suggested that no specific amendments to the Code would improve its effectiveness in terms of producing a change in health worker recruitment policy or regulation [10]. The main findings between these two evaluations are strikingly similar. In both studies, most key informants reported that no significant policy or regulatory changes to health worker recruitment had occurred in their countries as a direct result of the Code [10].

IMPACT ON MIGRATION PATTERNS AND FLOWS:

The impact of code on migration patterns and flows was inconclusive in studies. The authors noted that due to the limitations in data, migration is either underrepresented or the workforce is overrepresented. Williams et. al [17] noted that the countries in Western Europe i.e., Austria, Belgium, France, Germany, Ireland, Norway, Switzerland, and the UK are still reliant on an internationally trained health workforce, and postcode implementation of the number of foreign-trained doctor and nurses has risen faster than the total stock of these health professionals in these countries. This growth in the number of physicians was the fastest between 2010 to 2014. From 2014 to 2018 the annual inflow of physicians trained in LMIC increased two-fold in case study countries. Conversely, this same period marked a fall in the annual inflow of doctors trained in EU countries, leading to a rise in the share of doctors trained in LMIC. In the case of nurses, the majority of nurses in four of the five countries were trained in another EU-EFTA country and the number of foreign-trained nurses grew by 29% between 2010-2018. In the UK, just over one-third of IEN was trained in LMIC. Though a decline in members of nurses from LMIC was observed, however, since 2016, there has been a steady increase in the annual inflow of nurses from LMIC in the case studies countries [17]. The study did not establish a cause-and-effect relationship between code and health worker migration and due to the limitations of data, hence a clear conclusion could not be drawn. Another study by Tankwanchi et al. [18] reported that after Three years of postcode adoption, the recruitment of sub-Saharan Africa (SSA) origin physicians in the US physician workforce has increased, driven mainly by SSA-born, foreign-trained physicians. The study reported that code has not slowed down physician migration rather the clustering of physicians in the same localities in several US metro areas pre- and post-code was observed, supporting the network theory of migration. Although there remains data limitations, and the estimation of migration could be underrepresented [18]. Tankwanchi et al. [18] note that it indicates a limited policy impact of code and passive recruitments of SSA physicians represent a paradox in US national policies. On the contrary, Tankwanchi et al. [16] noted that net physician emigration has slowed down from South Africa. However, it's unlikely that the code has had any impact on declining trends since it began before the code's inception and the region has not yet fully translated the code into policy instruments [16]. On the other hand, migration from Indonesia was reported to have increased fourfold between 2010 to 2012 compared to three years before the code was adopted [15].

IMPACT ON THE BILATERAL AGREEMENTS:

The systematic arrangement of skill exchange between the source country and destination country is a core element of the code. These systematic arrangements such as bilateral agreements can help develop explicit incentive-institution mechanisms that are agreeable to both nations enabling policy harmonization [10], moderating migration, and protecting internationally recruited professionals [19]. However, not many countries reported having entered into bilateral agreements or other arrangements for postcode adoption. In case such agreements were entered or existed, either these were not effectively implemented or a link between code and such agreements could not be established. For example, Sudan is reported to have entered bilateral agreements with two main destination countries i.e., Saudi Arabia and Libya, however, these agreements have not been effectively implemented and Sudan did not receive any financial and technical support in exchange for its health workforce [14]. Romania also has signed 11 bilateral agreements since 1990, with few destination countries for which it serves as a source country for health professionals however author could not link the agreements with the code and none of these could be identified in their original form [13]. In another study respondents from South Africa, Zimbabwe, Uganda, and Kenya stated that their countries have entered bilateral agreements with other states, however, no evidence was found to establish the contribution of code towards the negotiation of such codes [11]. Van de Pas et al. [12] noted that the preference of northern countries to use development aid rather than bilateral agreements to address health worker issues has prevented African countries from using code as a negotiating tool in health diplomacy. One study noted that Indonesia has entered an agreement with Japan to improve nursing capacity inspired by the code and has received financial and technical cooperation [15].

CODE AS A CATALYST:

The ability of code to raise awareness on HHR migration and promote a discussion on global platforms was recognized across the studies. Studies agreed that though not having enough power to influence key aspects of migration management such as legislation, the code has catalysed a dialogue and discussion relating to health workers' migration. A Study from Sudan noted that the code has catalysed the scenario of HHR migration from one of neglect to one of attention and subsequent active involvement [14]. Sudan reported that the code has boosted some health workforce development changes such as increased remuneration, increased training capacity, and entering into bilateral agreements. Sudan also introduced the first-ever national health workforce strategy in 2012 which was informed by the WHO Code [14]. In 2011, Sudan received a health workforce research grant and studies related to migration guided by the relevant provisions of the WHO Code [14]. For the Indonesian government code served as a guide for appropriate policy formulation and implementation in nurse migration [15]. The Code's recommendation to improve data on health workforce flows and systematic reporting mechanisms has led to the development of National Health Workforce Accounts (NHWA) [16]. Romania also, though not having fully implemented the code, has been part of the initiatives that raise awareness of the code and health workforce challenges such as the EU Joint Action on Health Workforce Planning and Forecasting and sharing health workforce data [13]. In the study conducted in Southeast Asia, authors found that code has been useful in addressing health workforce development and has informed some good practices to manage migration [19].

IMPACT OF CODE AS A VOLUNTARY INSTRUMENT:

Studies suggested the perceived impact of the code as a non-binding instrument was limited or had little effect on practices, especially in key policy areas. In one empirical study respondents believed that non-binding codes have limited or no effect. A limited sense of urgency and the voluntary nature were cited as the factors impeding the ability of code. Another reason cited responsible for limiting the ability of the code was prioritization and market consideration [9]. Similarly, another follow-up evaluation suggested that voluntary codes were generally of low- to mixed-effectiveness. Authors, however, noted that non-binding codes can have some effects such as a source of moral imperative, a guide for policymaking, or an advocacy tool [10]. Participants reaffirmed that the Code has its utility but health systems that involve multiple levels of leadership weaken the code. Van de Pas et al. [12] assessed that the Code lacks an enabling governance structure and the lack of a financial mechanism to reimburse resource-poor countries impedes the effectiveness of the Code. Another study supported it by noting that code is perceived as a watered-down document with no teeth making it not so important for national legal departments [11].

DISCUSSION

The review suggests that publicity, awareness, and dissemination of the code have not been enough for the code to penetrate national-level decision-making. There was a wide difference in implementation measures taken by high-income countries and LMICs. As van de Pas et al. [12] note countries that are more in need, have not fully implemented the code. Dambisya et al [11] note that perhaps there are more pressing issues for such countries than international migration such as rural/urban disparities, shortage of health professionals, low morale, and low salary. While the involvement of civil society has facilitated the adoption of the code, the absence of the same was cited as a barrier. At the same time, the impact of the code was overridden by various other existing codes of practice. The review also suggested that though the code has not yet been able to bring significant changes in key areas of migration such as national-level policies or bilateral agreements, it has been successful to catalyse changes across many areas of health human resources and bring issues of international migration on a front. Many destinations and OECD nations have started building their workforce strategies keeping the code as a guide and many source countries or LMICs have become more aware of the provisions that may protect their health systems.

The perceived impact of the code as a voluntary and non-binding instrument was also reported to be limited. Few studies raised the concern over the lack of urgency a non-binding code exhibits making it less effective. Also, a lack of a mechanism that may financially compensate the resource-poor countries was perceived to be a major factor in the ineffectiveness of the code. The incorporation of such a mechanism was sought in the early negotiation of code drafting, however, was dropped soon as the consensus was not reached, and many countries felt that it may delay the code's finalization [20]. In literature, voluntary approaches are known to ignore the important

problems and focus on the issues that are easy to find consensus upon [21].

The study could not draw a clear conclusion on the impact of the code on migration flows. The absence of complete and internationally comparable data poses a great difficulty for researchers while attempting to assess the magnitude, flows, and patterns of HHR migration. Though many nations from Organisations for Economic Co-operation and Development (OECD) are adhering to ethical recruitment practices and appear to discourage active recruitment from shortage areas, no decrease in the share of foreign health workers or decline in the annual inflow of foreign HHR was noted in postcode adoption hinting at the limited impact of code. As often misinterpreted the Code never intended to ban or prohibit migration of health workforce from source countries rather it calls for a more systematic, government-to-government arrangement that moderates the migration [22], especially from critically shortage areas and ensures that international workforce is protected by the system, eventually benefitting both destination and source country [5]. Studies noted that the ambiguous terms used in the code such as 'ethical' and 'active recruitment' create confusion further limiting its effects [12].

This review suggests that code has not yet materialized fully in many regions, especially in resource-poor regions, and its potential is yet to be achieved. The positive aspect is that the code has been able to bring global attention to HHR migration issues and active involvement of countries to promote ethical practices while recruiting an international workforce. This shift has given a voice to LMICs and provided ground to collaborate with developed nations to strengthen their HHR.

CONCLUSION

The WHO Code of Global Practice serves as a guideline to member states for the international recruitment of HHR. The code is aimed to help nations create a sustainable health workforce for their countries and find ways to protect and strengthen the health system of shortage countries. The review, however, suggested many countries have not implemented the code to the desired level. Especially in countries that require more protection against unilateral active recruitment of HHR, the dissemination and adherence to the code is close to non-existent. Limited awareness of the code's content and purpose throughout the studies stands as the biggest obstacle towards the code's success. Additionally, the non-binding nature of the code, lack of engagement of stakeholders or other high-priority issues in developing countries are the reasons limiting the code's adherence and effectiveness. The impact of the code on key areas such as policymaking has also been limited. This review was inconclusive about the migration flow and magnitude post-code implementation due to the data limitations. On the positive front, the code has promoted an international dialogue between the nations and many OECD nations have actively participated in devising strategies to protect and strengthen the health systems across the world. The huge projected deficit of HHR in many developed countries and the current outbreak of COVID-19 make the debate on HHR migration more pertinent. The code has a scope of protecting the source countries and helping destination countries to address the shortages of HHR and ethically manage the migration if implemented to its full potential.

This review poses several questions and areas to be explored in future research. Firstly, the included studies in this review do not represent all WHO regions. The authors could not find any studies reporting the adherence and impact of code in many geographical regions such as regions of the Americas or western Pacific regions. As evident, many significant regions are yet untouched and how the adoption of code impacted them is unknown. The impact of code on health workforce practices, policies, and sustainability, especially in traditional destination countries such as the USA and major host countries such as India or the Philippines is yet to be explored. The assessment of the impact of the code in these countries will clarify how a soft law may perform in different political, cultural, and economic settings. So far, the impact of the code on different health systems in host countries is unknown. Secondly, more studies can be conducted to explore the impact of bilateral agreements on HHR migration between countries that frequently share resources and how the adoption of the code may provide support to such agreements. Thirdly, the review also provides an idea of barriers limiting the impact of code, to be addressed in future revisions. A deeper analysis can be conducted to understand the motivation, migration intentions and patterns of HHR migration in nations that are central to the HHR migration economy. The WHO proposes a revaluation of the code's content periodically and such studies might be helpful to revise the code and make it more successful.

DATA AVAILABILITY STATEMENT:

This study was a review of published studies. All the eleven studies used for analysis and one study that appeared to match the inclusion criteria of review however excluded at a later stage, are openly available and can be found at the following DOI/link (In order as they appear in the text):

- Siyam A, Zurn P, Rø OC, Gedik G, Ronquillo K, Co CJ, et al. Monitoring the implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel. Bull World Health Organ [Internet]. 2013;91(11):816–23. Available from: https://doi.org/10.2471/BLT.13.118778
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- Tangcharoensathien V, Travis P, Tancarino AS, Sawaengdee K, Chhoedon Y, Hassan S, et al. Managing In- and Out-Migration of Health Workforce in Selected Countries in South East Asia Region. Int J Health Policy Manag [Internet]. 2017 May 8;7(2):137–43. Available from: http://ijhpm.com/article_3357.html

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REVIEW ARTICLE

DEALING WITH MENTAL HEALTH PROBLEMS AND WORK PERFORMANCE AMONG FRONTLINE HEALTHCARE WORKERS THROUGH THE INFLUENCE OF DIGITAL PLATFORM IN MALAYSIAN PRIVATE HOSPITALS: A CONCEPTUAL ANALYSIS

Kamalesh Ravesangar, Leow Lei Ping*

Department of Accounting and Business, Tunku Abdul Rahman University of Management and Technology, Penang, Malaysia.

Correspondence: anjalikha25@gmail.com

ABSTRACT

The purpose of this study to examine mental health problems of frontline healthcare workers and their impact on work performance through exploring the influence of digital platforms in Malaysian private hospitals. This research is essential in addressing previous knowledge and theoretical gaps on the antecedents that denote to mental health problems and how digital platforms are used to improve mental health wellbeing.

Basically, this study discusses the impact of four independent variables which are categorized as depression, anxiety, insomnia and distress factors whereas dependent variable is work performance. This study also will discuss problems concerning work performance of frontline healthcare workers (doctors, nurses, medical assistance, pharmacists and HR Management), specifically on poor service quality, turnover intention, work-related burnout, and exhaustion in Malaysian private hospitals. Hence, this study explores new solutions on the employees' work performance related issues to create awareness for the Malaysian private hospitals in improving mental health issues among front-line healthcare workers to enhance their work performance through the influence of digital platforms. Private hospitals in Malaysia are experiencing critical situations related to poor employees' performance which indirectly influence the overall productivity. Thus, private hospitals need to provide serious attention towards these related issues. A conceptual framework was formulated based on identified research gaps through the literature review.

It is expected that this study will enhance the awareness for the management in Malaysian private hospitals on dealing with mental health problems which impacts work performance by exploring digital platforms as a solution.

KEYWORDS

mental health, health care workers, work performance, digital platforms, private hospitals

INTRODUCTION

It is of utmost importance to recognize that issues pertaining to mental health should be studied as a state of well-being in which individuals are capable of assessing their abilities, coping with everyday life stressors, performing effectively, and contributing to their respective professions. [1]

Individuals exist on a spectrum ranging from good health to poor health, which can lead to illness or disability, thereby

impacting their cognitive, emotional, and social capacities. Consequently, poor mental health has been associated with absenteeism, decreased productivity, increased costs, and diminished morale among employees [2]. According to the findings of the WHO [3], depression, anxiety disorders, and other conditions result in a loss of $1 trillion from the global economy annually due to decreased productivity. Healthcare professionals often grapple with mental health concerns, experiencing high rates of burnout and sick leave [4]. Additionally, on a global scale, nearly one-third of Americans (33%) report psychological distress [5]. This can be attributed to a combination of factors, including heightened obligations and responsibilities similar to other occupations, elevated levels of work-related stress, and various other factors [6]. Some researchers have stated that anxiety is prevalent among medical staff in Malaysia, accounting for 28.6%, followed by anxiety, accounting for 10.7%, and stress accounting for 7.9 % [7]. The survey findings indicated that frontline medical staff were more susceptible to psychological distress and mental health issues as a result of their involvement in specimen collection, diagnosis, treatment, and patient care during the epidemic. In Malaysia, medical practitioners reported an average depression level of 3.99 (standard deviation [SD]: 4.69), with the majority (69.0%) experiencing depression. Mild depression was reported by 13.7% of practitioners, while 7.2% were moderately depressed, 6.0% were very depressed, and 4.0% were extremely depressed [8]. Another study focusing on the mental health of nurses in Malaysia during the pandemic, conducted by [9, 10], revealed that over 70% of the 1,057 respondents in the nursing profession reported feeling stressed. Nurses reported both intermediate and high levels of stress, accounting for 88.7% and 7.2% respectively. The most prevalent symptoms of stress included fatigue, tense muscles, sore back and neck, eating disorders, and insomnia [11]. Healthcare providers face an increased risk of developing mental disorders due to their heightened vulnerability to COVID-19 [12]. Occupational factors such as employment status, shift work, and years of experience can further exacerbate anxiety and depression among healthcare workers. Shift work, in particular, has been associated with anxiety and depression due to the challenges of maintaining concentration during long working hours [13][14].

Previous studies have indicated that frontline healthcare workers encounter immediate psychological effects, including anxiety, distress, depression, and fear of transmitting infections to their loved ones, friends, and colleagues [15]. Furthermore, it has been observed that anxiety and stress can result in a decrease in sleep quality [16, 17], ultimately leading to a significant decline in the self-efficacy of medical staff. Therefore, it is crucial to comprehend the repercussions in order to prioritize the mental well-being of healthcare workers who may suffer from anxiety, depression, acute stress disorder, burnout, and PTSD. Research conducted during a global pandemic revealed a widespread prevalence of anxiety, depression, and stress among healthcare workers both during and after the outbreak [18]. Moreover, these psychological symptoms can have long-term consequences, such as delayed emergency response and impaired attention and decision-making abilities during the ongoing pandemic [19]. Healthcare professionals often experience emotional exhaustion, burnout, helplessness, resentment, and overwhelm, all of which contribute to a decline in the quality of patient care [20, 21, 22]. Overall, the pandemic has resulted in reduced employee productivity and overwhelmed the healthcare sector. Some researchers have stated that extensive exposure to COVID-19 can lead to symptoms of stress, anxiety, and depression, which can ultimately impact employee performance [23].

Digital mental health platforms that prioritize evidence-based interventions have the potential to enhance the provision of mental health education for the entire workforce. These platforms can offer valuable skills such as teaching management, guided relaxation, and emotional regulation, without solely relying on qualified personnel. By operating on a large scale, digital solutions can provide therapeutic approaches and support positive behavioral change. They are accessible at any time and from any location, enabling timely assistance without the usual time constraints associated with individual therapy. Moreover, digital platforms are user-friendly and offer anonymity [24]. Despite the growing number of apps and websites, digital mental health interventions are not being fully utilized [25]. These interventions encompass various forms of contact with therapists, including messaging, phone calls, and video conferencing, as well as the delivery of therapy programs through computers, web, and mobile devices. They also include programs that utilize augmented or virtual reality, cognitive training on computers or the web, and peer and social support groups [26]. However, there is a lack of rigorous research on the effectiveness of digital interventions in promoting mental and emotional well-being, as well as their impact on other psychological and organizational outcomes [27].

Despite the rapid advancement of research on digital health interventions in the clinical field the significance of preventive mental health solutions in the workplace is frequently disregarded [28]. Although workplaces have the potential to serve as ideal settings for preventive programs, most organizations prioritize reactive measures that address the symptoms of workplace stress. Previous workplace mobile health interventions have been primarily based on programs traditionally utilized in a clinical context, such as cognitive behavioral therapy (CBT) or mindfulness-based cognitive therapy. These interventions often involve a 'virtual coach' or counselor who guides users through the content. By following a digital pathway, employees have the autonomy to take charge of their own journey, completing the intervention at their own pace, focusing on content that is relevant to their personal situation, and selecting a time that suits them while maintaining anonymity [29 ; 30 ;31]. Overall, this creates an environment with ample opportunities and minimal demands, facilitating the desired behavioral change and resulting in enhanced psychological outcomes [32]. This not only benefits the individual but also the organization as a whole. Current researchers have a particular interest in the correlation between mental health and technology. Some researchers suggest that technology has the potential to greatly enhance employees' mental well-being [33]. Despite the promising health outcomes that technology adoption has yielded in various fields, its full potential in the healthcare sector has yet to be realized [34]. During challenging situations like epidemics and natural disasters, digital solutions have proven to be valuable in countries such as China, India, Singapore, and Australia [35] [36]. For instance, China utilized various internet platforms like WeChat and Tencent QQ to provide telemedicine and psychoeducation services during the COVID-19 pandemic [36]. Similarly, the Australian government has already implemented psychosocial support services for common mental health issues, self-harm, and suicide through text messages, online chat platforms, phone calls, video conferencing, online group chats, email, websites, and mobile apps [37] [38]. In the United States, mental health professionals and the general public utilize podcasts as an accessible and educational medium to share and disseminate information about mental health [39].

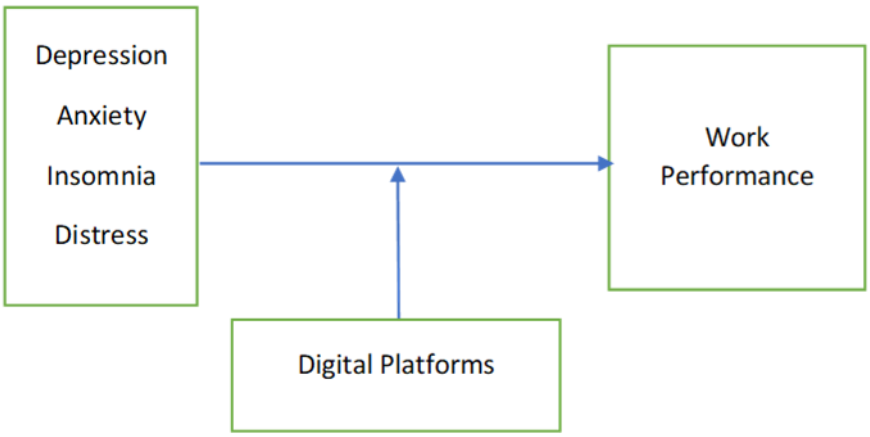
Only a limited number of studies conducted in Malaysia have focused on mental health concerns among healthcare providers. The objective of this study is to establish a framework for understanding mental health problems and work performance among health professionals in Malaysia by investigating the influence of digital platforms on enhancing mental health. Additionally, this research aims to shed light on the practical implications of utilizing digital platforms to improve the performance of frontline healthcare workers. Moreover, the study seeks to offer practical insights to practitioners (including frontline staff, hospital management, hospital managers, and middle managers) and policy makers who are interested in enhancing the performance of healthcare workers. In summary, the findings of this study are anticipated to serve as a valuable resource for departmental management in identifying factors that contribute to mental health issues, which directly impact work performance, and how digital platforms can support the mental well-being of healthcare workers. The research presented in this study offers a significant theoretical contribution. Scholars have become increasingly concerned about the impact of employees' mental health on organizations, and numerous studies have shown that mental health greatly influences both individual and organizational performance. However, previous research has primarily focused on the relationship between mental health and job performance in developed countries, neglecting the exploration of this relationship in emerging economies such as China. Therefore, the findings of this study are particularly valuable as they contribute to the existing literature on the role of healthcare employees' mental health in an emerging economy. Furthermore, this study provides valuable insights for future researchers, allowing them to delve deeper into mental health issues, work performance, and the utilization of digital platforms to effectively manage healthcare workers, including doctors, nurses, physician assistants, pharmacists, and HR managers.

CONCEPTUAL FRAMEWORK

Based on previous research, it has been found that the COVID-19 pandemic has had a significant impact on the mental health of healthcare workers. The deteriorating mental health of individuals due to COVID-19 has resulted in a decline in the performance of frontline healthcare workers. In order to maintain competitiveness, organizations are now placing a strong emphasis on the mental well-being of their employees, as it is believed to contribute to exceptional work performance. There is evidence to suggest that digital tools can play a crucial role in enhancing mental health, making them a valuable resource for employers [40]. Regardless of the specific approach taken, utilizing digital devices to support

employee mental health sends a clear message that self-care is important. It can also help reduce the stigma surrounding mental illness, encouraging employees to seek help before their mental health symptoms, such as depression and burnout, start to impact their job performance. The most effective support for healthcare workers involves recognizing the mental health challenges they face, implementing appropriate interventions to address the negative effects of the pandemic, and providing tailored healthcare plans through digital means. Given the uncertainty of the future, a conceptual framework has been developed to prioritize wellness efforts and serve as a foundation for addressing long-term mental health needs. This conceptual framework, depicted in Figure 1, is based on the work of Rajgopal [2], Lenzo et al. [18], and McMahon et al. [41].

FIGURE 1: DEALING WITH MENTAL HEALTH PROBLEMS AND WORK PERFORMANCE AMONG FRONTLINE HEALTHCARE WORKERS THROUGH THE INFLUENCE OF DIGITAL PLATFORM.



Adapted from [2], [18], & [41].

RESULT DISCUSSION

The result primarily discusses the negative impact on the mental health of employees in healthcare organizations. It highlights issues such as depressive symptoms, job dissatisfaction, burnout, anxiety, and distress. These factors not only affect the mental well-being of healthcare workers but also have implications for their physical health. The study specifically identifies burnout as a prevalent issue among doctors, along with job dissatisfaction. While most research focuses on patient health, it is crucial not to overlook the well-being of healthcare workers who operate in highly complex and stressful environments. The health of these workers also has an impact on the quality of life for both the general population and healthcare professionals. There existed initial yet strong scientific evidence regarding the efficacy of digital technologies in addressing mental health issues exacerbated by the COVID-19 pandemic, including anxiety, stress, depression, and overall mental and emotional well-being. The findings of this review illustrate the potential of digital technologies in bridging the gap in mental healthcare during and after the COVID-19 pandemic, when the dissemination of disease-related news and implementation of quarantine measures have severely jeopardized public mental health. This study serves as a timely synthesis of current advancements and assessments, providing valuable insights for the future development of digital psychological interventions tailored to diverse populations and contexts.

RECOMMENDATION & LIMITATIONS

During the COVID-19 pandemic, it is crucial for employees and healthcare workers to fulfill their responsibilities in protecting lives and maintaining the health of individuals. However, this unprecedented situation has resulted in widespread emotional distress. It is imperative to address this issue and prevent any long-term negative effects on the mental well-being of frontline healthcare staff as part of the overall response to the pandemic. To gain a better understanding of the mental health risks faced by healthcare employees, it is essential to identify the factors that impact their work performance. This will enable the development of methods and the provision of relevant support through a customized digital platform for healthcare professionals. Drawing from relevant literature,

we propose several measures to safeguard the mental health of healthcare workers in private hospitals in Malaysia. Firstly, the constant pressure to disseminate information to COVID-19 patients puts these employees at risk of experiencing depression, anxiety, and stress. Therefore, private hospitals must adhere to precautions and standard operating procedures when handling infected patients, ensuring that healthcare workers have access to adequate personal protective equipment to minimize such contact. Secondly, healthcare workers in settings where they lack awareness of the COVID-19 situation in their respective areas of residence should obtain accurate information from their hospital management and government through websites, blogs, and media outlets. Access to reliable information is crucial in keeping healthcare workers well-informed. Hospital administrators must prioritize the well-being of healthcare employees residing in areas heavily affected by COVID-19. This particular group, consisting of single/divorced individuals and those with a history of mental illness, is at a higher risk of experiencing depression and anxiety. To address this, it is crucial to implement mental health policies and provide ongoing counseling for these vulnerable individuals with significant personal backgrounds. In other countries, digital platforms have been successfully utilized to address mental health issues. However, there is limited research on the usage of digital platforms in the Malaysian healthcare industry, specifically. Therefore, it is important to consider implementing digital platforms to mitigate the impact of mental well-being issues among frontline healthcare workers. These platforms should provide easy access to online mental health consultation, counseling, or psychotherapy services for healthcare workers experiencing emotional disturbances due to the pandemic. By enabling healthcare professionals to communicate and share their emotions, challenges, and personalized solutions, digital communication platforms can serve as peer support networks, fostering resilience and camaraderie. It is worth noting that nurses, according to a study [15], tend to prefer emotion-focused coping strategies such as positive reframing, while seeking mental support from others is their least preferred technique. This highlights the significance of digital interventions as a valuable tool for emotional support. Ultimately, incorporating digital platforms into the healthcare system is an essential component of a comprehensive and community-driven response to the pandemic [26] [28].

In a post-pandemic world, it is crucial to maintain a balanced perspective on the role of digital interventions in mental health. The use of effective, hybrid, and responsive digital tools has the potential to greatly improve access to mental healthcare for healthcare workers. To enhance the evidence base for these interventions, it is essential to prioritize high-quality research and improve the funding environment for research projects. Even as the COVID-19 pandemic subsides, the psychological impact continues to persist. Therefore, it is imperative to ensure the continuous provision of online mental health services. Establishing support groups for medical staff in private hospitals can facilitate the sharing of personal and professional stress-related issues, ultimately enhancing the emotional support available to healthcare workers. Furthermore, further research is needed to explore other factors that influence mental health issues and impact the performance of frontline healthcare workers. These findings will provide reliable data for future policymaking and planning.

This study has identified several limitations. Firstly, there is a possibility of discrepancy between the different constructs found in the reviewed articles. This discrepancy arises from the varied application of conceptual elements, which is influenced by the nature of the research. However, we have minimized this possibility by carefully selecting the constructs through extensive readings. Secondly, the inclusion criteria may have restricted the number of relevant papers that were reviewed. The studies were chosen based on empirical research that had already been published, leading to the exclusion of 'grey literature' such as unpublished, non-peer-reviewed, and conference papers. Furthermore, some of the research was conducted early in the pandemic, so the mental health outcomes may still reflect pre-pandemic conditions. Moreover, this study did not consider translations and technical reports produced by mental health practitioners. Lastly, the inclusion criteria focused on literature related to the Covid-19 outbreak pandemic, which limited the number of studies on vulnerabilities after the pandemic. This limitation could have potentially resulted in different outcomes.

CONCLUSION

The COVID-19 pandemic has had a significant impact on the global health system, placing a burden on healthcare systems worldwide. It is crucial and essential to prioritize the mental well-being and adaptability of healthcare workers. The proposed framework offers a valuable tool for understanding the complex relationship between mental health, digital platforms, and work performance. Furthermore, it can serve as a guide for future academic

research in this area. Effectively managing the psychological effects of the pandemic requires a long-term commitment to supporting the mental health of healthcare workers at personal, organizational, and societal levels. By integrating these mental health solutions into the new normal, we can take the first step in recognizing their benefits and addressing other global public health challenges in addition to combating the COVID-19 pandemic.

This article explores recent advancements in various technological solutions aimed at addressing mental health issues. Digital platforms have the potential to disperse and enhance evidence-based psychotherapy. However, despite the progress made by digital platforms, there are still several constraints that hinder their application and adoption. Technological advancements are actively seeking to overcome mental health challenges by utilizing optimized and cutting-edge digital solutions through rigorous medicine and digital interventions. The COVID-19 pandemic has further emphasized the importance of health on digital platforms, but there is a lack of research in Malaysia, particularly in the field of health. Therefore, extensive research and policy support are necessary to implement digital platforms in the nursing field. Future research should focus on examining blended care models using scientific methods. It is inevitable that the future of mental health will incorporate digital solutions, which, if implemented correctly, can contribute to improving social well-being. Digital mental health interventions can serve as a compelling alternative to address the current challenges and barriers faced by healthcare professionals in seeking support for mental well-being in the post-pandemic era. Future research should also investigate user engagement and retention rates among frontline healthcare workers to determine the long-term effects of the intervention and its appropriate implementation.

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REVIEW ARTICLE

GEOGRAPHIC INEQUALITIES IN THE DISTRIBUTION OF DENTISTS: A SCOPING REVIEW

Zahra Zare[1], Erfan Kharazmi[1], Mohsen Khosravi[1], Khalil Kalavani[2]*

1. Department of Health Care Management, School of Health Management and Information Sciences, Shiraz University of Medical Science, Shiraz, Iran
2. Health Care Management, Kerman University of Medical Sciences, Kerman, Iran

Correspondence: zahra.zare1993@gmail.com

ABSTRACT

BACKGROUND:

Equity in health refers to ensuring that individuals have timely and sufficient access to healthcare services when needed. Human resources are a vital component of healthcare organizations, and they play a crucial role in improving people's access to services. Dentists, in particular, are essential healthcare professionals as oral and dental health significantly impacts overall societal health. This study aims to investigate the key factors contributing to the inequality in the distribution of dentists.

METHODS:

A scoping review was conducted, systematically searching three databases—Scopus, PubMed, and WOS—using relevant keywords until January 2023. A total of 565 preliminary results were screened, and 447 titles and abstracts were reviewed. Ultimately, 23 full-text articles were included in the analysis. Qualitative content analysis and thematic network were used to synthesize the extracted data.

RESULTS:

Thematic analysis of the evidence yielded four main themes that contribute to inequality in the distribution of dentists: the development of the inequality situation, methods for analyzing inequality, causes of inequality, and potential solutions to address inequality.

CONCLUSION:

Policymakers should gain an understanding of the determinants that contribute to inequality and how these factors manifest in their respective countries. Policymakers can work towards achieving a more equitable distribution of dentists by directing resources towards policies and measures that improve access to oral and dental services. This will ultimately enhance overall societal access to oral healthcare services.

KEYWORDS

Inequality, dentist, oral and dental health

BACKGROUND

Healthcare systems rely on various resources, including human resources, equipment, and facilities, to deliver services effectively. Among these resources, human resources are recognized as the most crucial asset for any organization [1]. The proper utilization of human resources is a key driver for societal growth and development [2]. Skilled healthcare professionals are considered the backbone of the healthcare system, contributing significantly to its functioning. In recent years, policymakers have placed substantial emphasis on this aspect and have implemented management policies focused on human resources as part of healthcare system reforms to enhance access to healthcare services [3].

Equity in healthcare refers to the timely and adequate access to healthcare services for individuals in need. Access to healthcare is a crucial indicator of quality of life and sustainable development [4]. Despite substantial resources being allocated to the health sector, there exists a significant gap between available resources and the actual requirements, underscoring the importance of efficient resource utilization. Merely increasing resources does not guarantee equity; it is essential to ensure their proper distribution. One of the key challenges faced by healthcare policymakers is achieving equal access and equitable distribution of human resources. Studies have revealed an imbalance in the distribution of healthcare professionals [5,6], leading to geographical disparities and disrupting the composition of specialized healthcare providers, resulting in resource wastage and posing challenges in evaluating healthcare services [7].

Healthcare managers should consistently assess and evaluate health resources and their distribution to improve community health. One significant challenge that has gained attention in recent years is the presence of profound inequalities in the healthcare workforce [8]. In particular, the shortage and improper distribution of dentists pose one of the greatest problems and challenges in the healthcare sector globally. Inequality in dental services is a public health concern, as research indicates unequal access to dental care services. While individuals should have appropriate access to healthcare services, studies demonstrate that dental care utilization is not evenly distributed across different countries [9,10].

In other words, access to oral and dental healthcare services faces significant barriers in every country. Shortages and insufficient numbers of trained dental professionals are common obstacles. This issue is observed in both developing and developed countries [11]. Various studies have shown that the distribution of dentists worldwide is uneven, and people's access to dental services varies across different countries. For instance, in Australia, the distribution of dentists is also imbalanced due to the influence of economic, social, and geographical factors [12]. Furthermore, research indicates that although the number of dentists has increased in recent years, their distribution has been inappropriate [13,14].

Research indicates that the performance of different regions within each country varies, and regions with proper resource distribution have experienced better growth and development [15]. Identifying the current status of access to services and the distribution of human resources is the first step in reducing inequality in this field. Numerous studies have been conducted worldwide using various techniques in this area [16-22]. However, since each study focuses on a specific country and approaches the subject from different perspectives, there is a need to review and summarize the diverse results. This study aims to examine the factors influencing geographical inequality in the distribution of dentists worldwide, providing a scientific and research foundation for future studies in the field of policymaking and equitable distribution of dentists, benefiting other researchers and policymakers.

METHOD

The present study is a review of articles related to "geographic inequalities in the distribution of dentists in different countries." We have utilized a scoping review methodology as it allows for the inclusion of literature with heterogeneous designs and samples [23]. Furthermore, this type of review study enables the identification of key factors associated with the concept and the creation of a comprehensive map of the available evidence on the subject [24].

DEFINING THE RESEARCH QUESTION

While the research question helps establish the study's scope, a scoping review follows an iterative process. Thus, the research question for this study was developed gradually through the literature review. The main focus of our study is to examine inequalities in the distribution of

dentists. Therefore, the research question guiding this study is: "What are the geographic disparities in the distribution of dentists?"

FINDING RELEVANT STUDIES

First, suitable keywords were extracted using terminologies such as MeSH and subject headings from the Library of Congress. Additionally, a quick search was conducted to enrich the keywords, and the titles, abstracts, and indexes of relevant articles were reviewed. Inequality, distribution, and dentist were the main keywords used for article search. Other keywords are listed in Table 1. Boolean operators were also used to formulate the search strategy based on the keywords provided in the table. All the keywords within each row were combined using "OR," and then the rows were combined using "AND." Subsequently, the rows were paired to increase search sensitivity. In the next stage, databases were searched. Credible foreign databases including PubMed, Scopus, Web of Science, and Google Scholar were searched. In addition to electronic searching, manual searching was also performed.

TABLE 1: SEARCH STRATEGY

NO	Construct	Search field/Limits
#1	Inequalities OR health care disparities OR inequity OR fair	In: Topic (Title, Abstract, Keywords)
#2	Distribution OR allocation OR "Gini coefficient"	In: Topic (Title, Abstract, Keywords)
#3	"Dental workforce" OR Dentists OR "Dentists-to-population ratio" OR "health workforce" OR "health human resource" OR "health manpower"	In: Topic (Title, Abstract, Keywords)

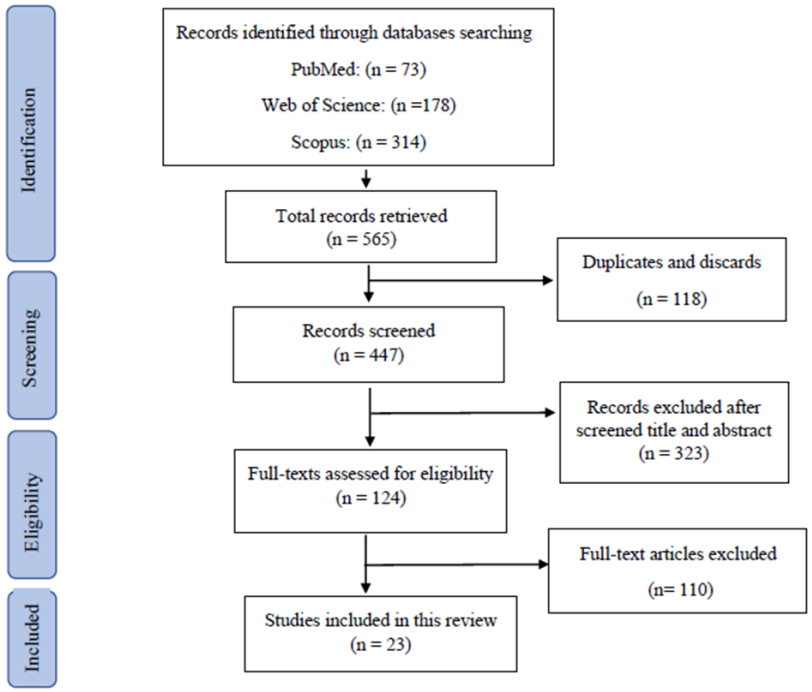
INCLUSION CRITERIA AND STUDY SELECTION

The titles, abstracts, and full texts of the studies that met the inclusion criteria of the current scoping research were reviewed. The relevant evidence found during the search process was documented using Endnote 20 software. At this stage, inclusion criteria included relevance to the research objective, publication in English, authenticity, and availability of full text Initially, two independent reviewers from the research team (ZZ, MKH) screened the titles of papers based on the outcome of interest. Among 565 articles, 418 studies were accepted for further assessment after excluding irrelevant titles. The abstracts of the remaining papers were then reviewed by two reviewers, and those that did not meet the study's aim were excluded. In cases of disagreement, a third reviewer (EKH) was consulted. This resulted in the selection of 124 full-text articles for further appraisal. Finally, two reviewers examined the full-text papers, and 35 studies, including 23 articles on inequalities in the distribution of dentists, were included in the study. The process of paper selection for this study is illustrated in Figure 1, which presents a PRISMA flowchart.

COLLATING AND SUMMARIZING THE DATA

quantitative analysis was conducted using Microsoft Excel Version 16, while qualitative thematic analysis was performed using MAXQDA version 10. Thematic analysis [25] was carried out as follows: First, the research team familiarized themselves with the data by reviewing all extracted information multiple times and comparing it with the original texts. Next, preliminary codes were identified based on the research question and outcome of interest. The team then engaged in an interpretive analysis of these initial codes, organizing them into subthemes and main themes. Subsequently, the team thoroughly reviewed the identified themes, combining, refining, separating, or discarding initial themes as needed. Finally, the team defined and labeled the themes and their related subthemes based on the relevance of the contents. The main themes and their related subthemes can be found in Table 2, which provides a comprehensive overview of the identified themes.

FIGURE 1: PRISMA FLO DIAGRAM



RESULTS

Our searches yielded 565 results, out of which 23 articles were included in the scoping review. Among these studies, a total of 17% were conducted in the United States, 13% in Canada, 13% in Iran, and 13% in Japan. Furthermore, the majority of the studies included in the scoping review were cross-sectional and retrospective in nature (Figure 2). The demographic characteristics of the included articles are provided in the appendix.

The results of the thematic analysis led to 4 main themes and 10 sub-themes related to inequalities in the distribution of dentists, which are presented in Table 2.

FIGURE 2: STUDY DESIGN

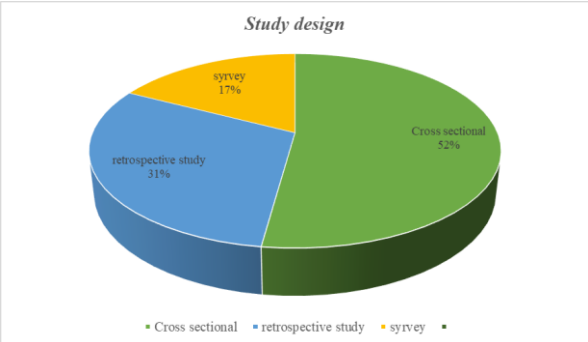


TABLE 2: EXPLORING INEQUALITY IN THE DISTRIBUTION OF DENTISTS

Themes	Subthemes	Codes
Developing the inequality situation	Demographic profile	Gender
		Age
		Income level
		Education
	Geographical attributes	Private or public
		Urban to the rural population
		The population of various regions
		East-to-West regions
		North to South regions
Approaches to Analyzing Inequality	Descriptive method	Population statistics
	Analytical method	Indicators of inequality
		GIS analysis
Causes of inequality	Human factors	Lack of opportunity for career advancement and professional growth
		Lack of interprofessional communication
		Lack of experience in different clinical cases
		Lack of teamwork
	Physical factors	Hard-working conditions
		Insufficient facilities and facilities
	Financial factors	Lack of economic incentives
		Insufficient salary
	Political factors	Lack of decentralization
		Lack of insurance coverage
Solutions to inequality	Managerial solutions	Vertical integration of services
		Dentist training
		Local decision making
		Create a strong support system
		Providing and promoting dental insurance coverage
	Financial solutions	Convenient refund system
		Providing financial incentives and subsidies to dentists

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1. DEVELOPING THE INEQUALITY SITUATION

The theme of explaining the inequality status aims to identify various characteristics based on which the inequality status is described in multiple articles. In this regard, demographic and geographic characteristics are considered categories within this concept.

1.1 Demographic profile

The findings from the included articles in the study indicate that certain demographic profile have a significant impact on the distribution of dentists, leading to inequalities. These characteristics include gender [26], age [27], income level [14, 27-33], and educational level [28, 32]. Approximately 34% of the articles highlight disparities in the provision of dental services due to variations in income across different regions. Additionally, it is noteworthy that socioeconomically disadvantaged areas have a lower concentration of active dentists.

Moreover, it was observed that there is a gender imbalance among employed dentists in deprived areas, with a higher representation of males compared to females. Gender emerges as a notable factor influencing the inequality in dentist distribution. Furthermore, research studies have indicated that a disparity in distribution is associated with a higher prevalence of highly educated individuals within the dental workforce.

1.2 Geographical attributes

Geographical attributes play a significant role in the unequal distribution of dentists across different regions. The findings of the study suggest that the population of specific areas has a notable impact on the availability and quantity of dentists [14, 28, 29, 33-41]. Furthermore, research indicates that urban areas experience a greater expansion of dental clinics and a higher number of dentists compared to rural areas [14, 19, 26, 31, 38-40, 42-45]. Moreover, evident disparities in dentist distribution are evident in large countries, with northern regions receiving fewer services compared to southern regions, and eastern regions facing fewer services compared to western regions [42, 34, 35, 19, 41]. Additionally, the nature of healthcare facilities, whether private or public, also contributes as a significant factor in the inequality of dentist distribution [31, 39].

2. APPROACHES TO ANALYZING INEQUALITY

This section examines the analysis methods employed in various studies and the measurement of inequality. The results indicate that the articles included in this study utilized both descriptive and analytical approaches to assess inequality. The review findings reveal that although 43% of the articles relied on descriptive methods such as dentist-to-population ratios [26, 14, 27, 34, 35, 37, 39-43], other studies attempted to measure inequality in dentist distribution using analytical indicators such as the Gini coefficient, Robin Hood index, and IRSD analysis [14, 29, 31, 32, 38-40, 44], as well as GIS analysis [28, 36, 30, 19, 37, 45, 33].

3. CAUSES OF INEQUALITY

This section examines multiple factors that contribute to the emergence of inequality in dentist distribution. Among these factors, studies indicate that human, physical, financial, and political reasons are among the most significant causes of inequality and hindered access to dental services.

3.1. Human Factors

The results of studies have indicated that the lack of career advancement and professional growth opportunities for dentists, absence of professional networking with other dentists, limited clinical experience in various cases [43], and inadequate possibilities for teamwork [38] in underserved areas with smaller populations are among the primary reasons for unequal dental practitioner activity within a region.

3.2. Physical Factors

Based on research findings, it has been observed that the majority of dental workforce prefer to practice in urban areas. Factors that may contribute to these professional preferences include challenging working conditions [39, 43], unfavorable facilities such as poor commuting and transportation options, lack of various amenities including suitable educational facilities for dentists' children, absence of recreational and entertainment facilities, lack of childcare facilities, and overall discomfort in daily life in rural areas [39, 40, 43].

3.3. Financial Factors

The findings of this study indicate that inadequate financial incentives, limited income, and insufficient wages for dentists are among the primary reasons for the low participation of dental practitioners in underserved and rural areas [40].

3.4. Political Factors

This investigation highlights that one of the significant barriers to achieving an equitable distribution of dentists across different regions is the prioritization of decision-making and planning for dental services in urban areas [40]. Moreover, inadequate insurance coverage for individuals in rural and underserved areas, along with a lack of dental service availability, contributes to reduced utilization of dental care by the population, leading to lower income for dentists and their lack of interest in practicing in these areas [28, 45].

4. SOLUTIONS TO INEQUALITY

This section encompasses all the solutions aimed at minimizing the inequity in the distribution of dental care. Among them, various studies have identified managerial and financial approaches as the most effective, alongside cultural and social strategies.

4.1. Managerial Solutions

Based on research findings, vertical integration of services by combining oral health and dental care interventions with public health and primary care has proven to be an effective solution in tackling the inequity in dentist distribution [31]. Additionally, allocating educational

positions in universities for students from underserved areas to practice in their own regions after graduation, along with an overall increase in dental training, can be a valuable solution [14,31]. Moreover, establishing robust support systems for service delivery in underserved and rural areas and simultaneously decentralizing decision-making to local authorities can alleviate many underlying causes of inequity in dentist distribution [31]. Additionally, enhancing the coverage of dental services in terms of population, services provided, and affordability has also been recognized as a highly effective solution [14].

4.2. Financial Solutions

It can be anticipated that addressing the inequity in dentist distribution can be improved through economic incentives such as budget allocation and offering additional remuneration for dental treatment [14,35,36,40]. Implementing suitable reimbursement programs for service contracts in underserved areas can also contribute to reducing the inequity in dental care distribution [30, 44].

DISCUSSION

Inequality is a significant concept for health policymakers, and the field of oral health and dentistry can face inequality for various reasons. The comprehensive findings of this study provide an overview of the injustice in the distribution of dentists and the reasons behind it, which can lead to inequality in oral health services.

Based on the current results, certain individual and demographic characteristics such as gender [26], age [27] income level [14, 27-33], and education level [28, 32] can have an impact on the inequality in the distribution of dentists, leading to the emergence of injustice in the distribution of dentists and, consequently, inadequate access to dental services for individuals. Grytten et al. also mentioned in their article that there were inequalities in the provision of public dental services resulting from income disparities between regions [27]. Additionally, Ahmad emphasized the positive relationship between the density of dentists and income and educational level [28]. On the other hand, the population size of different areas influences their income level, and the income of each region determines the preferences of dental workforce to work in underserved areas with a smaller population. Furthermore, inequality in the distribution of dentists is evident in rural areas compared to urban areas, and despite the greater need for dental services in underserved and rural areas, the number of service centers and practicing dentists in these areas is lower. Akhtar et al. stated that there are more dentists in large cities compared to rural areas, and there is a significant difference in the healthcare workforce between cities and rural areas [42]. Additionally, dentists are concentrated in major urban centers. Moreover, the findings of the current study demonstrate differences and inequalities in the distribution of dentists in geographically vast regions and countries with dispersed population distribution, with the eastern regions compared to the western and northern regions showing variations in different areas. The findings of Hashimura and Young studies were consistent with the findings of this study [35, 41].

In this context, it is not feasible for private clinics to operate in areas with a low population due to the need for a certain patient volume. Additionally, the substantial financial burden of installing advanced equipment for specialized dental procedures poses a challenge for small private dental clinics.

In addition to the aforementioned determining factors, the research highlights the significance of human, physical, financial, and policy factors as the primary drivers of inequality in dentist distribution. Dentists in underserved, low-population, or rural areas show less interest in practicing due to limited career prospects, a lack of professional networking opportunities, limited exposure to diverse dental cases, and the inability to work collaboratively. Emami and Mozhdehifard studies also support these findings [38, 43]. Moreover, the declining rural populations, accompanied by urbanization, impact income levels and pose economic challenges for maintaining dental practices in low-population areas, contributing to the unequal distribution of dentists. Additionally, the absence of basic amenities, lack of children's schools and local facilities, as well as residing in remote mountainous areas and isolated islands, along with overall harsh living conditions, further contribute to the observed inequality in dentist distribution across various regions. Okawa's study demonstrates the influence of adequate facilities, amenities, and fair compensation on dentist distribution [40]. In this context, centralized decision-making, the limited ability for local policymaking, and the exclusion of dental activities from the purview of healthcare authorities responsible for improving dental access all have significant policy implications for the unjust distribution of dentists. Susi and Okawa also arrived at similar conclusions in their respective studies [39, 45].

The present study also examines the necessary solutions to overcome the underlying causes of injustice in dentist distribution. In remote and rural areas, government support for dental services, improvement of dental care, and the establishment of public dental clinics are essential. In areas lacking dental professionals, economic incentives such as budget allocation and extra compensation for dental treatment can be expected to improve the situation. To ensure the availability of expensive dental equipment in rural clinic settings, it may be necessary to establish a system where local authorities and dental associations can contribute to equipment procurement budgets, enabling individuals to access services similar to those available in urban areas. Integrating dental services with public health services and expanding dental service coverage are also key strategies for addressing the injustice in dentist distribution. Additionally, increasing the training of dental professionals and allocating specific quotas for native individuals to study and practice dentistry are highly effective measures.

Based on the findings, it can be concluded that the socio-economic status of different regions, the urban-to-rural population ratio, total population in the areas, and inadequate facilities, amenities, and compensation in regions with lower populations and rural areas are the most significant factors influencing the unfair distribution of dentists in various areas. These findings provide valuable insights for policymakers to better understand the determinants and their interrelationships, enabling them to design effective interventions to reduce inequality in dentist distribution. Moreover, this study goes beyond theoretical comprehension and lays the foundation for future research, including the evaluation of the impact of each determinant factor on dentist distribution inequality and the assessment of the effectiveness of specific solutions in addressing the underlying causes of unfair dentist distribution at the local level.

LIMITATIONS:

In this investigation, we included articles employing various design and analysis methods to examine inequality in the geographical distribution of dentists. This inclusion may pose challenges in synthesizing the data. However, the design of the study encompasses an approach to assess and incorporate heterogeneous studies. Furthermore, while we made every effort to review all relevant studies on inequality in dentist distribution, access to all pertinent studies on dental services from sources such as websites was not available, and there is a possibility of missing some evidence. Lastly, the final limitation pertains to the generalizability and applicability of the results. In other words, the determinants of inequality may carry different weights among diverse country contexts.

CONCLUSION

The findings of this study highlight the importance of policymakers recognizing and understanding the factors that contribute to inequality in the distribution of dentists. By acknowledging these determining factors and their impact on access to dental services, policymakers can develop targeted strategies to address the issue effectively.

Allocating resources towards policies and initiatives that enhance people's access to dental services is crucial. Comprehensive insurance packages can play a significant role in ensuring affordable and comprehensive dental care for all individuals, regardless of their socio-economic background. This includes coverage for preventive care, routine check-ups, and necessary dental treatments.

In addition to insurance coverage, focusing on the equitable distribution of dental facilities is essential. This involves ensuring that dental clinics and practices are geographically accessible, particularly in underserved and rural areas. Also, to enhance community access to dental services, it is recommended to explore the utilization of digital/tele dentistry solutions. These innovative technologies, such as teleconsultation, tele dentistry platforms, and remote monitoring tools, have the potential to bridge geographical barriers and improve outreach to underserved populations. Finally, by improving the availability of dental facilities in these regions, individuals will have better access to necessary dental care and reduce the disparities in dentist distribution. Furthermore, supporting dentists who choose to practice in impoverished and low-income areas is vital. Providing incentives, such as loan forgiveness programs or financial assistance, can encourage dentists to work in underserved communities. This support not only addresses the shortage of dental professionals in these areas but also helps improve oral health outcomes and reduce inequalities.

Overall, policymakers should prioritize efforts to promote a fairer distribution of dentists and improve access to dental services for all individuals. By considering comprehensive insurance coverage, equitable distribution of dental facilities, and support for dentists in underserved areas, they

can contribute to reducing inequalities in oral healthcare and enhancing overall population well-being.

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APPENDIX - SUPPLEMENTARY

TABLE S1: DEMOGRAPHIC CHARACTERISTICS OF ARTICLES

Row	First Author	Year	Research Objective	Research Type	Research Community	Country
1	Ahmad (27)	2014	To identify disparities in the availability of dentists in Canada's largest urban center, Toronto, and explore whether distributional disparities are associated with underlying factors, such as affordability as measured by average household income.	Cross-sectional	Dentists	Canada
2	Ahmed (25)	2011	Determining the proportion of the health and medical human resource to the population	Survey	Providers of health services in the city and the countryside	Bangladesh
3	Akhtar (41)	1986	Estimating the ratio of healthcare personnel to the population	Cross-sectional	Health human resources	India and Zambia
4	Emami (42)	2016	To examine and map the distribution patterns of the dental workforce in Quebec, Canada	Cross-sectional	Dentists	Canada
5	Feng (33)	2017	Examining dental workforce access and utilization of dental services in Appalachia	Retrospective study	Dentists	US
6	Gallagher (13)	2018	To provide a contemporary analysis of HROH by examining the size and distribution of the dental workforce according to the WHO region and in the most populous countries	Cross-sectional	Health human resources	25 most populous countries in the world
7	Grytten (26)	2001	To identify possible factors associated with the marked geographical variation in the supply of public dental services in Norway	Retrospective study	Dentists	Norway
8	Hashimura (34)	2019	Determining the number of dentists per population	Survey	Dentists	Japan
9	Horner (35)	2007	To identify regional inequities in dental provider location and suggest an innovative methodology that could be useful in establishing new dental facilities that are geographically accessible	Cross-sectional	Dentists	US

Row	First Author	Year	Research Objective	Research Type	Research Community	Country
10	Jean (28)	2020	Analyze the dentist to population ratio relative to socio-economic profile to identify areas of workforce shortages and inform the policy direction of workforce recruitment strategies and public dental service planning	Cross-sectional	Dentists	Australia
11	Jo (29)	2020	To investigate the relationship between deprivation and distance to NHS dental providers in Scotland, Wales, and Northern Ireland	Cross-sectional	Dentists	Scotland, Wales, Northern Ireland
12	Jo (19)	2021	To illustrate, identify and assess a contemporary model of the geographic distribution of specialist dentists about population age groups and rurality	Cross-sectional	Dentists	Great Britain
13	Kiadaliri (14)	2013	To assess the pure and social disparities in the distribution of dentists across the provinces in Iran in 2009	Cross-sectional	Dentists	Iran
14	Krause (36)	2005	To analyze the availability of dentists in Mississippi by county over four decades to determine the geographic distribution of dentists, shifts in their distribution over time, and how this distribution relates to population demographics	Retrospective study	Dentists	US
15	Kruger (30)	2011	To examine the distribution of private dental practices in WA, especially in rural and remote areas	Cross-sectional	Dentists	Australia
16	Mozhdehifard (37)	2019	To evaluate the status of oral health promotion services and inequality assessment of total inequality in oral health workforce distribution in Iran based on distribution indices	Retrospective study	Fifty universities of medical sciences	Iran
17	Northcott (43)	1980	Estimated distribution of physicians and dentists in the Alberta area	Retrospective study	Physicians and dentists	Canada
18	Okawa (38)	2013	To clarify the geographic distribution of specialist orthodontists and dentists who provide orthodontic services in Japan	Survey	Dentists	Japan
19	Okawa (39)	2014	To examine whether the increase in the number of dental clinics in Japan has led to an improvement in their geographic distribution	Survey	Dentists	Japan

Row	First Author	Year	Research Objective	Research Type	Research Community	Country
20	Sefiddashti (31)	2016	To determine the trend of inequality in the allocation of human resources in the health sector in Tehran between 2007 and 2013	Cross-sectional	Health human resources	Iran
21	Susi (44)	2002	to analyze issues of provider availability and accessibility in Ohio using a geographical information system, or GIS	Retrospective study	Dentists	US
22	Young (40)	2018	Determining trends and patterns of supply and distribution of health personnel in eight countries	Retrospective study	Dentists	Eight European countries
23	Yuen (32)	2018	to determine the distribution of primary dental clinics in S~ao Paulo city	Cross-sectional	Dentists	Brazil

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REVIEW ARTICLE

ETHICAL PRINCIPLES OF AUTONOMY FOR HYPERTENSION PATIENTS: A CONCEPT ANALYSIS

*Endang Triyanto, Sidik Awaludin, Zuhariah Felis**

Faculty of Health Sciences, Jenderal Soedirman University, Central Java, Indonesia

Correspondence: zuhariahfelis@gmail.com

ABSTRACT

BACKGROUND:

Autonomy is a fundamental ethical principle within the nursing profession. It plays a significant role in patients' decision-making processes when seeking nursing interventions. In the context of hypertensive individuals, autonomy pertains to their capacity to manage and regulate their hypertensive condition. This encompasses the independent decision-making related to medications, lifestyle adjustments, and overall care.

METHOD:

The method utilized for this analysis is the Walker & Avant approach, 2011. The concept analysis was conducted by consulting literature on autonomy sourced from Google Scholar and Preplexity databases. The search keywords employed were "concept of autonomy" and "hypertension sufferers".

RESULTS:

The concept analysis followed the 8-step method outlined by Walker & Avant. This systematic approach, which involves identifying the attributes, antecedents, and consequences of autonomy, leads to the development of an operational definition. Autonomy is defined as the capacity of an individual to make decisions independently, without external influence, to manage themselves and take responsibility for the outcomes of those decisions.

CONCLUSION:

From the results of the analysis, it was found that autonomy is very beneficial for hypertension sufferers because a person can make decisions, so that they have self-satisfaction, increased motivation and clear life goals. Autonomy grants nurses the freedom to make clinical decisions based on their professional knowledge and skills. Nurses can determine the best course of action for patients without having to wait for instructions from a doctor, while still being accountable for their decisions and ready to explain their actions within the context of ethics and law.

KEYWORDS

Autonomy; Concept Analysis; Decision-making; Ethical Principle; Hypertension Patients

INTRODUCTION

The concept of autonomy is an ethical principle in the field of nursing. This concept is often used in the decision-making process carried out by patients in obtaining nursing action. Autonomy in hypertension sufferers refers to the individual's ability to manage and control the condition of hypertension. This phenomenon involves making independent decisions regarding medication, lifestyle and care in general.

As is known, the prevalence of hypertension cases continues to increase every year. According to the American College of Cardiology (ACC) [1], hypertension occurs when blood pressure is consistently > 130 mmHg for systolic pressure and > 80 mmHg for diastolic pressure and it must be measured more than once at different times. Hypertension is a non-communicable disease (NCD) which is currently the most serious health problem. Non-communicable diseases (NCDs) are the main cause of death or vital disability globally [2]. According to data from the World Health Organization (WHO) (2013), there has been an increase in hypertension cases from 639 million cases to 1.5 billion cases in developing countries and it was estimated that there will be an increase in hypertension cases of around 80% in 2025 [3].

Hypertension is a disease that is often called the silent killer, where if this disease is not treated immediately, it can cause the emergence of other dangerous, life-threatening diseases such as heart failure, kidney failure and stroke [4]. Therefore, hypertension should receive more attention or special attention and more thorough or comprehensive treatment starting from promotive, preventive, curative and rehabilitative. Where comprehensive or comprehensive treatment of hypertension aims to lower blood pressure either through conventional or non-conventional therapy [5]

Therefore, hypertension sufferers need to make the right decisions to treat hypertension, so that it does not cause complications that are dangerous for their lives. Autonomy is an individual's ability to behave, feel something, and make decisions based on their own will. Autonomy was defined as respect for individual rights where a person can make decisions according to his wishes without any influence from other people. Nevertheless, decision-making is still influenced by age, level of knowledge, and support from family [6]. Many expert opinions explain autonomy, but no one has provided a specific definition of autonomy itself, especially for people with hypertension.

Autonomy in hypertensive sufferers requires a clear definition. There are several expert opinions regarding the concept of autonomy. One of them, according to Ferdiana and Yuwono (2023), autonomy is a person's ability not to depend on other people and be responsible for what they do [7]. This definition is one of the definitions from experts, there are still many expert opinions regarding autonomy. However, until now there has been no agreement on the precise and specific definition of autonomy in the case of hypertension. In addition, there is no consensus on the instruments used to assess autonomy in patients with hypertension.

In several previous studies, there have been concept analyses of autonomy in elderly individuals receiving residential care [8], autonomy in mothers and the breastfeeding context [9], autonomy of patients in the context of care [10], and autonomy of practicing nurses [11]. However, there has been no concept analysis of autonomy in hypertension patients. Therefore, the concept of autonomy in hypertensive patients can still be considered ambiguous. Through this concept analysis, the researcher aims to understand the concept of autonomy in the case of hypertension and the instruments that can be used to measure autonomy in hypertensive patients. Research on autonomy, especially among hypertensive sufferers, is still limited, so to date there has not been a clear definition of the concept of autonomy, especially among hypertensive sufferers. Therefore, this research aims to find a more precise and more specific definition of the concept of autonomy, so that this concept is not referred to as an ambiguous concept.

METHOD

The method used in this article is the Walker & Avant 2011 concept analysis approach. By carrying out concept analysis, researchers can find or clarify a concept that is still ambiguous. This analysis was carried out based on literature had been previously obtained through a database to obtain articles. This concept analysis uses literature obtained through the Google Scholar, Preplexity, EBSCO and ResearchGate internet databases with the keywords "Autonomy Concept" and "Hypertension Sufferers". Inclusion criteria are articles related to the concept of autonomy, published from 2000 to 2023, and freely

accessible. Exclusion criteria are articles unrelated to the concept of autonomy, such as beneficence, justice, non-maleficence, veracity, fidelity and confidentiality.

FINDING AND DISCUSSION

Phenomenon: Hypertension is the most common cardiovascular disease and most commonly suffered by society. According to data from the WHO, around 1.13 billion people in the world suffer from hypertension in 2020. There are two types of hypertension sufferers, the first is that when a person is diagnosed with hypertension, he must undergo treatment and control hypertension. This requirement usually makes hypertension sufferers feel bored with continuous activities because someone who suffers from hypertension must undergo non-pharmacological and pharmacological treatment, especially if the treatment is unsuccessful [12].

The second type, who has successfully undergone treatment and recovered, usually immediately ignores taking medication and other things that could trigger the recurrence of hypertension. Hypertension sufferers admit that they do not undergo regular treatment because they do not know about the disease they suffer from, so this makes them unmotivated to carry out treatment or have their disease checked [13].

Of these two types, hypertension sufferers usually feel hopeless with the treatment they have been taking so far, so they decide to take other treatment and ignore the advice of health workers to seek treatment at health services. They usually decide to do complementary therapies such as taking herbs, acupuncture or acupressure which they believe can lower blood pressure and ignore medication from doctors [14].

Determine the aims of analysis: The aim of analyzing the concept of autonomy is to refine a concept which still ambiguous, obtain an operational definition of autonomy for hypertension sufferers, evaluate pre-existing instruments or obtain appropriate and new autonomy instruments for hypertension sufferers.

Determine the defining attributes: Characteristic attributes or concepts obtained, namely a person/individual, making decisions, managing himself, ability, consequences, other people, responsibility, strength. From the characteristic attributes obtained, an operational definition of autonomy can be formulated, namely the ability of an individual to make decisions with their own strength without the influence of other people to manage themselves and be responsible for the consequences.

Model Case Identification: Mrs. B, 60 years old, has been suffering from hypertension for the past 10 years. She mentioned that she rarely goes to the health center for check-ups because she feels healthy after taking her medication and stops attending follow-ups, disregarding the doctor's advice to maintain a proper diet. However, after a few months, if she experiences headaches, neck tension, and pain in several parts of her body, she will go to the health center for a check-up. The healthcare worker provided information about hypertension and advised her to have regular check-ups at the health center. Mrs. B understood and agreed to return for health checks.

A model case is an example that perfectly fits all essential characteristics of a concept. A model case is an ideal illustration that perfectly demonstrates the concept. Its function is to aid in understanding what is meant by the concept by providing a concrete example. In accordance with the case above, the patient was given information by the healthcare worker, and the patient understood what was conveyed by the healthcare worker. Without any coercion from any party, the patient made the decision to return for regular check-ups. This aligns with the model case from Yulianto & Awaludin (2024), where the nurse educates the family about each option until they understand and agree to a decision, which they then sign a consent to proceed [15].

Borderline Case Identification: Mrs. B, aged 60, has been suffering from hypertension for the past 10 years. She reported that she rarely visits the health center for check-ups because she feels healthy after taking her medication and subsequently stops attending follow-ups, disregarding the doctor's advice on maintaining a proper diet. However, after a few months, if she experiences headaches, neck tension, and pain in various parts of her body, she will seek medical examination. The healthcare worker provided information about hypertension and recommended regular check-ups. However, Mrs. B declined this advice, stating that she would try consuming herbal remedies to treat her condition as per her family's suggestion because she is concerned about the long-term use of medication and believes that herbal remedies are also beneficial for her health. The healthcare worker accepted Mrs. B's decision but continued to advise her to visit the health

center promptly if there is no improvement with the herbal remedies.

A borderline case is an example that nearly encompasses all essential characteristics of a concept, but there are some elements that may be lacking or not fully aligned. It helps to highlight the limitations of the concept. Its function is to identify which elements are crucial for the concept. In the case above, "the healthcare worker provided information about hypertension and recommended regular check-ups. However, Mrs. B declined this advice, stating that she would try consuming herbal remedies to treat her condition as per her family's suggestion". This illustrates that the patient is able to make her own decision, although she is still influenced by others, namely her family. This aligns with the borderline case from Yulianto & Awaludin (2024), "The family was concerned about the hospital treatment costs and intended to discharge their child who was receiving care. However, the healthcare worker suggested using health insurance, and the family agreed to this". This indicates that the decision-making was influenced by others [15, p. 31].

Contrary Case Identification: During a community visit, a patient named Mr. D, aged 65, was found to have a history of hypertension for the past 10 years. Mr. D reported that he rarely takes antihypertensive medication but consistently consumes herbal drinks, which he believes can lower his blood pressure. During the assessment, Mr. D mentioned experiencing headaches and slightly blurred vision. Upon examination, Mr. D's blood pressure was recorded at 160/100 mmHg. The healthcare worker did not provide any information to Mr. D and insisted that he start taking medication immediately and stop consuming herbal remedies.

A contrary case is an example that is entirely opposite to the concept. It describes a situation where the essential characteristics of the concept are absent or directly opposed. In the case above, "the healthcare worker did not provide any information to Mr. D and insisted that he start taking medication immediately and stop consuming herbal remedies". This demonstrates a lack of alignment with the concept of autonomy. This aligns with the contrary case from Yulianto & Awaludin (2024), "where the family did not want their child to be referred, but the nurse still advocated for the patient to be referred to another hospital" [15, p. 31].

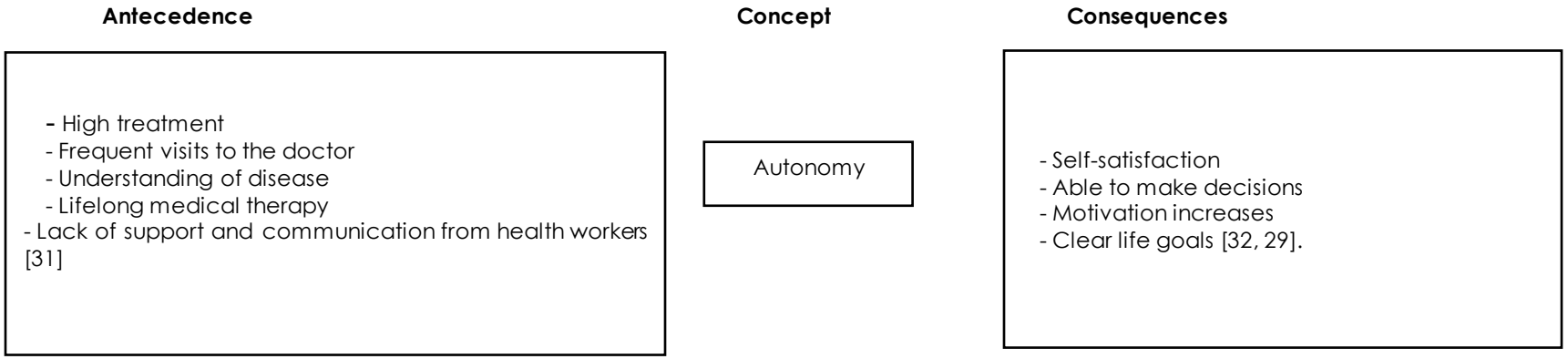
TABLE 1. DEFINE FROM VARIOUS LITERATURE ACCORDING TO THE CHOSEN CONCEPT

	Source	Definition of the Concept of Autonomy	Characteristics/Attributes
1.	Kartono, 2000	Autonomy is independence or the ability to stand alone with courage and responsibility for all behavior as an adult human being in carrying out one's obligations to meet one's own needs [16].	1. Individual/someone 2. Make a decision 3. Manage himself 4. Ability 5. Consequences 6. Other people 7. Be responsible 8. Strength
2.	Shafer, 2002	Autonomy is an individual's ability to make decisions and make themselves a source of emotional strength so that the individual does not have to depend on other people [17].	
3.	Wiyusni, 2002	Autonomy is a firm and consistent attitude in one's words and actions [18].	
4.	Lerner, R. M., & Steinberg, L. 2004	Autonomy is an individual's ability to behave, feel something, and make decisions based on their own will [19].	
5.	Asrori, 2004	Autonomy is an individual who dares to make his own decisions and understands the consequences he will face [20].	
6.	Setyo Utomo, 2005	Autonomy is a personality component that encourages a person to be able to direct and manage themselves and solve problems without the help of others [21].	
7.	Chaplin, 2005	Autonomy is an individual's freedom to take action decisions, become a unity that can command, control and manage itself [22].	
8.	Monks et al, 2006	Autonomy is an individual who makes decisions, is confident and creative [23].	
9.	Irene, 2007	Autonomy is the desire to do everything to manage yourself [24].	
10.	Fatimah, 2008	Autonomy is a person being relatively free from the influence of other people's judgments, opinions and beliefs [25].	
11.	Budiman, 2008	Autonomy is the ability that a person must have to be responsible for the actions they take and be able to establish good relationships with other people [26].	
12.	Sanjaya, 2010	Autonomy is the ability without interference from other people [27].	
13.	Kartadinata in Nurhayati, 2011	Autonomy is the motivational power within an individual to make decisions and accept responsibility or consequences [28].	

14.	Karabanova & Poskrebysheva, 2013	Autonomy is the ability to determine life goals and the ability to choose what to do next [29].
15.	Mu'tadin; Widiantari, 2010 in Ferdiana 2023	Autonomy is ability a person must not depend on others and be responsible for what he does [30].

IDENTIFY ANTECEDENTS AND CONSEQUENCES:

FIGURE 1. OVERVIEW OF ANTECEDENTS, ATTRIBUTES AND CONSEQUENCES OF AUTONOMY IN HYPERTENSIVE SUFFERERS



Define empirical referents: Empirical references classes or categories of actual phenomena which through their existence indicate the occurrence of the concept itself. Empirical references are not a tool for measuring concepts. Empirical references are a means by which you can identify or measure defining characteristics/attributes, so that empirical references relate directly to defining attributes, not the entire concept itself.

Empirical references once identified is very useful in instrument development because they are clearly linked to the theoretical basis of the concept, thereby contributing to the content and establishing the validity of any new instrument [33]. As a result of the identification of the attributes and concept of autonomy, the empirical references are: self-confidence, independence, willing to act alone, responsible, rational thinking, not influenced by the environment.

After obtaining empirical references, then the appropriate instrument that will be used to measure autonomy is two psychometric instruments, namely Autonomy Preference Index (API) and Multidimensional Health Locus of Control (MHLC). API is a validated instrument that consists of two scales, namely decision-making preferences and information seeking preferences. MHLC is a locus of control scale which validated to measure individual health beliefs which contains three domains, namely internality, opportunity and externality. This questionnaire contains 65 questions in 14 pages [34].

Preliminary validation of the instruments (API and MHLC) involves assessing their reliability and validity before they are fully implemented in clinical settings. This step ensures that the tools accurately measure what they are intended to measure and are consistent in their results. The API instrument aims to measures the preference for autonomy in decision-making among patients. The API is a validated instrument consisting of two scales: decision-making preferences (i.e., general items and vignettes) and information-seeking preferences [35] . The vignettes were limited to hypertension encounters to provide more reliable information about decision making preferences.

The MHLC is a validated, condition specific locus-of-control scale and was used to measure individual health attribution beliefs [36] . The MHLC instrument aims to assesses patients' beliefs about the control over their health outcomes, which can influence their autonomy. It contains three domains: internality, chance, and powerful-other externality. The 'internality' scale measures the extent to which patients believe that they are responsible for their own health. The 'chance' scale measures patient beliefs about the extent to which chance or fate determines health. The 'powerful-other externality' scale measures the extent to which patients believe that their health is affected more by surrounding influences than by their own behaviour.

Pilot testing using the API and MHLC instruments was conducted in the study by Nomura et al [36], with a general linear model was used to estimate the contribution of each of the two autonomy preference outcomes (decision-making and information-seeking) that were measured using the API. Variables that were found to be significant at the 10% level in a univariate model were used in multivariate analyses. For the analyses, each of the three MHLC domains was categorized according to the quartiles of its distribution. All tests were two-sided with a significance level of 5%. Calculations were conducted using SAS Version 8.12 for Window. The purpose of this study was to clarify patient autonomy preferences in a primary care setting, that is, to determine to what extent patients preferred to seek out their own medical information and to participate in healthcare decision-making, and to investigate the determinants of two autonomy preferences, that is, to determine which patient characteristics, health beliefs, and physician characteristics related to patient preferences would contribute most. This cross-sectional study was carried out between February and May 2005 at a hospital affiliated with the Northern Tokyo Center for Family Medicine with a sample size of 10 doctors.

Participating physicians randomly asked their hypertensive outpatients to answer a self-administered questionnaire. Patients were allowed to bring the questionnaire with them and to remain anonymous; they could drop it in the post provided for this study at the hospital during any time of the study period. The variables studied were patient sociodemographic characteristics, physician characteristics based on patient preference (i.e., ability to communicate, extent of clinical experience, qualifications, educational background, gender, and age), and the Multidimensional Health Locus of Control. The results of the study showed On the API scale from 0 to 100, the patients had an intermediate desire for decision-making (median: 51) and a greater desire for information (median: 95). A multivariate regression model indicated that decision-making preference increased when patients were woman and decreased as physician age increased, and information-seeking preference was positively associated

with good communication skills, more extensive clinical experience, physicians of middle age, and patient beliefs that they were responsible for their own health and was negatively associated with a preference for man physicians [34] .

An example of the application of the API instrument in a clinical setting is during routine check-ups, the API can be used to periodically assess changes in a patient's autonomy preferences, especially if their health condition or treatment options change. This allows for personalized care plans that align with each patient's autonomy preferences. Meanwhile, an example of the application of the MHLC instrument is MHLC can be used to assess a patient's belief about their ability to control their health outcomes. For instance, a patient who scores high on internal control might be encouraged to take an active role in managing their hypertension through lifestyle changes and medication adherence.

CONCLUSION

From the results of the concept analysis, the definition of autonomy is the ability of an individual/person to make decisions with their own strength without the influence of other people to manage themselves and be responsible for the consequences. As a result of the identification of the attributes and concept of autonomy, the empirical references are: self-confidence, independence, willing to act alone, responsible, rational thinking, not influenced by the environment. So, the appropriate instrument that will be used to measure autonomy is two psychometric instruments, namely API and MHLC. API is a validated instrument that consists of two preference scales, namely decision-making preferences and information seeking preferences. MHLC is a locus of control scale which validated to measure individual health beliefs which contains three domains, namely internality, opportunity and externality. This questionnaire contains 65 questions in 14 pages. Recommendations for future research include conducting concept analysis with other ethical principles in hypertensive patients and finding instruments that align with the analyzed concepts. Additionally, it is suggested to develop methods for integrating API and MHLC scores into the EHR system for continuous patient monitoring.

CONFLICT OF INTEREST:

All authors do not have conflict of interest in preparing this article.

AUTHOR CONTRIBUTION:

Zuhariah Felis contributed to conceptualization, data curation, formal analysis, resources, software, visualization, writing-original draft, writing-review & editing. Endang Triyanto contributed to funding acquisition, investigation, methodology. Sidik Awaludin contributed to project administration, supervision and validation.

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REVIEW ARTICLE

QUIET PANDEMIC AMID COVID-19: A LITERATURE REVIEW ON GAMIFICATION FOR MENTAL HEALTH

Swati Tayal[*1], Dr K. Rajagopal*

Symbiosis Centre for Management and Human Resource Development, Symbiosis International (Deemed University), Pune, India

Correspondence: swatitscholar@gmail.com

ABSTRACT

BACKGROUND:

COVID-19 affects individuals both physically and mentally. The key is to address emerging needs with a modest technique that helps boost the positive approach in individuals. Literature defines Gamification as engaging users with the non-game approach, using game design elements. Its growing popularity is evident in other fields, such as finance and retail.

OBJECTIVE:

This research aims to study the available literature that analyzes and understands using the Gamification approach for mental health in the pandemic.

METHODS:

The author performed a systematic literature review using the PRISMA technique among the selected articles published until Jul 2023, focusing on Gamification, mental health, and COVID-19 in highly reputed record databases, which were peer-reviewed studies. Therefore, the studies using the standard international language of English were eligible for this Study.

RESULTS:

The Study identified elevated articles exploring Gamification through mobile application software, web-based platforms, and other tools since COVID-19 limited in-person social contact for individual safety during peak time.

CONCLUSION:

There are limited studies of Gamification in mental health, and the existing studies suggest that Gamification supports the betterment of mental health. Future studies can explore the different areas of mental health with gamification-based applications or gamified approaches.

KEYWORDS

Gamification, mental health, systematic literature review SLR, COVID-19, mental well-being

INTRODUCTION

During COVID-19, a wave of unidentified quiet global pandemic occurred, also known as mental health. As per the WHO Study, more than 300 million people are suffering from mental health issues such as depression [30]. As set out in a WHO report, the pandemic has affected the mental health of individuals across gender and age groups in the form of stress and anxiety by 25% [1]. The WHO study also highlights that mental health impacts the workplace, where around $US1 trillion worth of productivity is lost globally yearly [2]. The world has changed since the COVID-19 virus became the new normal, spreading globally at super speed since December 2019 [3]. Many pandemics have occurred, which have historically impacted individuals' mental health, but the impact of COVID-19 remains undeniable [4]. This pandemic left people stranded at home to follow social distancing protocols, which was distressing [5, 6]. As a result, it has impacted individuals' mental health and well-being irrespective of age, gender, or location [7]. The circulation of COVID-19 vaccines offered the solution to the virus, but the impact on mental health still resides [8]. Since then, Mental Health awareness has gained attention for the past couple of months as we slowly recover through the vaccine boosters of COVID-19 [9].

Scholars and academics in the literature have highlighted the COVID-19 impact on the global population [10]. The literature highlights the different solutions for mental health issues, and some countries' governments have started taking initiatives to address them. Since the impact on mental health is not immediately visible, such as when an individual is physically hurt [11]. Many people are unaware of its impact on their mental state. However, the solutions to overcome such impact are limited in the literature, which acted as a research gap.

Gamification implements design elements with its game mechanism in the non-game mode to create a user experience that brings user attention and engagement [31]. Since 2010, it has become prominent with game elements such as rewards and badges. This study found a research gap in Gamification offering positivity for mental health. In this systematic literature review, the author explores different offerings through Gamification for individuals' mental health. It's catching up in healthcare and e-commerce and gaining scholarly attention [12, 13]. The benefits of Gamification are explored and captured in literature by academicians at physical and cognitive levels [14, 15]. Gamification attributes are achieved by carefully implementing the game elements in a gamified context, designed using its mechanism to gain a certain level of user engagement [15]. However, a common misunderstanding about Gamification is that it is a game instead, and its features are popular for non-game purposes. Thus, Gamification gives the user space to trial and practice and see if it's helpful for the individual to benefit from the extrinsic and intrinsic motivations [16]. Gamification enables extrinsic motivation through rewards and points, and intrinsic motivation is achieved by seeing progress and giving feedback to the user [17].

Although Gamification studies are expanding in different areas, a gap exists in mental health during the pandemic. The existing prior studies in the form of original research and systematic research were limited to the initial consequences of the pandemic on the cognitive level of individuals.

The author systematically conducted the literature study in reputable databases, where the results section detailed the analysis. This study was a comprehensive systematic literature review that aimed to examine the impact of Gamification on mental health and well-being in COVID.

METHODOLOGY

Academics suggest approaching literature studies using the systematic method, and in this research, the author adopted the use of a systematic literature approach with PRISMA. It's commonly applied in literature with the full name of Preferred Reporting Items for Systematic Reviews and meta-analyses [18]. The goal of this meta-analysis technique is to enable us to ensure that the protocol followed was transparent and rigorous. Key research conducted with this approach doesn't have limitations of arbitrary selection or any form of duplication. The PRISMA methodology has been commonly used in different fields of Gamification to find, analyze, and centralize research outcomes. This systematic study method approaches the research in five stages. The first stage begins with identifying the purpose of the research and research databases. Followed by setting the eligibility and quality criteria, it ends with screening final records. The author analyzed the final records considered in the Study in the later parts, where it was concluded, along with its limitations.

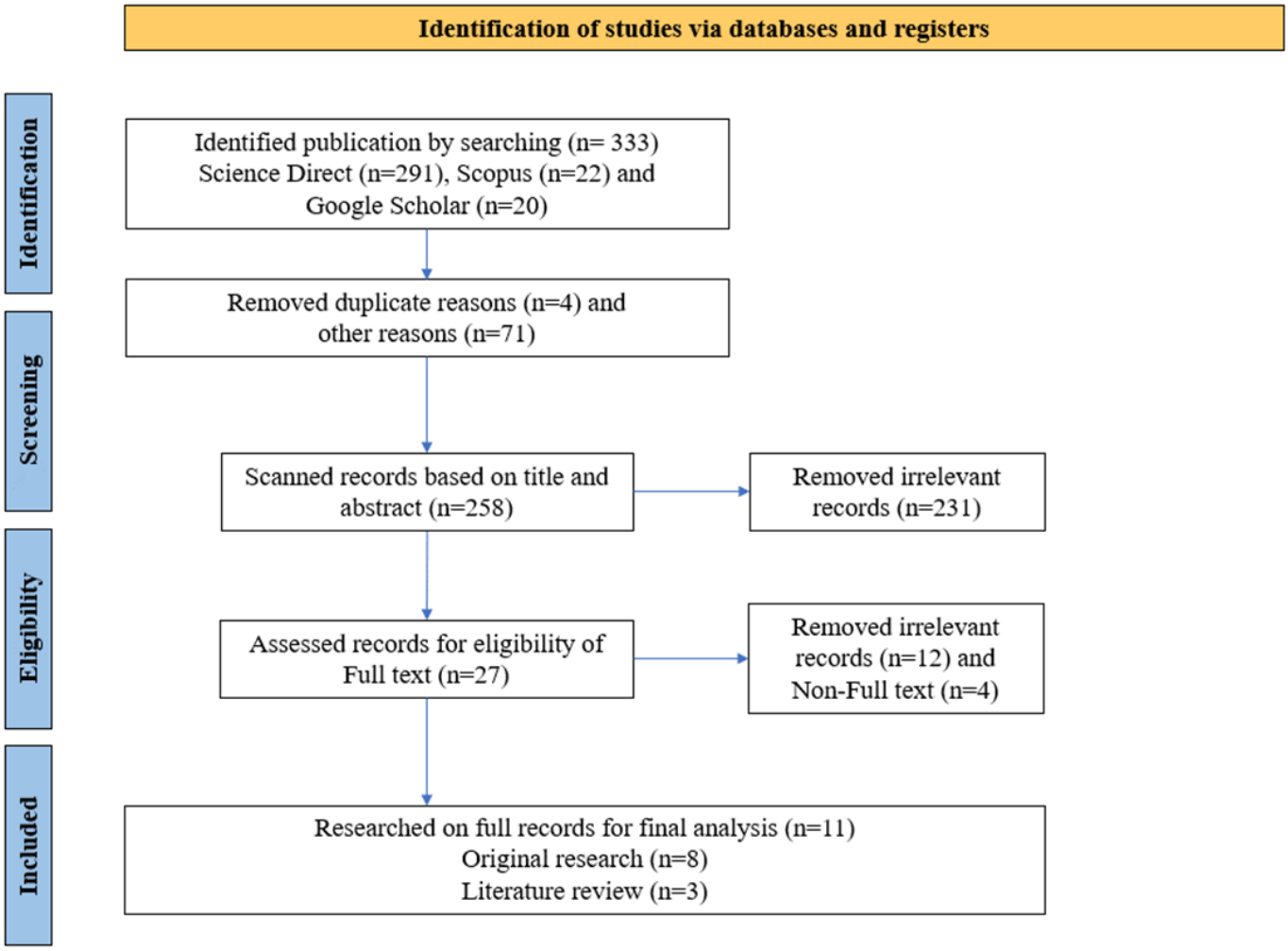
This study includes publications for three years, from 2020 untill the end of July 2023, and the author performed the last search on Aug 4, 2023. The articles reported in the literature use English as an international language, and the texts are complete texts based on authentic research. The elimination criteria of the papers were either duplicate or dual publications with full text and were available in the open access journals. The search directories are enormous because of the nature of the research. Therefore, the scope defined for this literature search was limited to high-impact databases, including Science Direct and Scopus, as they both are large databases at an international level and include good-quality papers. Table 1 lists the research study approach with the keywords from the research database to identify the papers, the Boolean operators used, and the study's timeframe and duration. The author searched by adopting Boolean operators such as AND and OR. The author used a search query on the electronic digital database to identify the review process performed as "Gamification AND mental AND (health OR wellbeing) AND COVID."

TABLE 1 – METHOD USED FOR THE SEARCHING

Keywords used	Boolean operator	Timeframe
Gamification mental health wellbeing COVID	AND, OR	2023(up to July 2023)

The COVID-19 pandemic occurred in December 2019, but WHO announced it as a global pandemic in 2020. The author searched from the beginning of the pandemic until July 2023 given that there are no publications on this pandemic prior to these dates. The search resulted in 333 records, whereas Science Direct identified 291, and the Scopus search resulted in 22. Because of the lack of studies, an additional Google Scholar search yielded 20 articles to consider. Figure 1 details the steps applied in the literature review and systematically concluded the eleven records. Among them, eight were original research records, and three were literature reviews. Thus, the study summarizes 11 records for the final analysis.

FIGURE-1 THE SYSTEMATIC FLOW APPLIED FOR THE STUDY THROUGH PRISMA METHOD



RESULTS & DISCUSSION

This study concludes with the 11 research records considered for the final analysis. In recent years, gamification has gained momentum in different fields, such as education and financial industries. Chart 1 reflects the publication by year, where 2020 has 9% publication, 27% in 2021, 2022 has 37%, and 2023 has 27 % publication.

Gamification has been growing in different fields, and health science researchers are identifying different areas of it [15]. However, based on the research from the mental health perspective, there is limited research in this area. Mental health awareness has been growing since 2021, and therefore, in this research, we observe the growing but limited publication in the same year.

CHART-1 ARTICLE PERCENTAGE PUBLICATION BY YEAR.

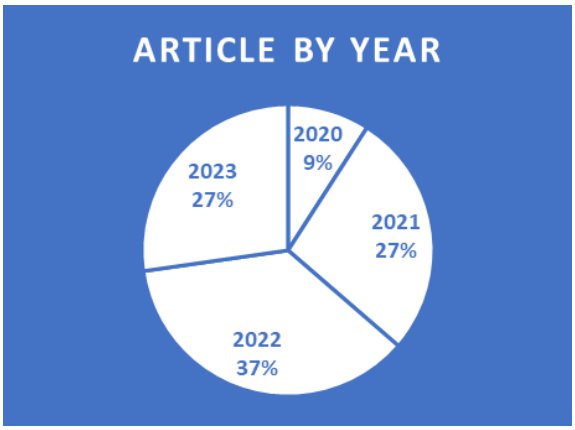


Table 2 summarizes the rank from the Scopus sources of the journal where the research papers are published, which are outcomes of this research study. Through this analysis, all the selected research papers are from different journals. The Elsevier publishers appeared with its two journals, Computers in Human Behaviour, which aligned with psychology in the cyber world, and the International Journal of Medical Informatics, which details medical healthcare aspects and required settings. The Digital Health journal details health in the digital world, published by Sage, and the Journal of Healthcare Informatics Research focuses on emerging areas in health from Springer Publisher. The JMIR publications appeared in three journals, such as the Journal of Medical Internet Research, which focuses on health in the Internet era. The JMIR Mental Health aligns on the mental health areas technology innovations. The JMIR Serious Games journal was a multidisciplinary journal aimed at emerging technologies such as VR and mobile applications. The Behavioral Sciences journal was a peer-reviewed journal based on behavioral and psychological aspects, and the Children and Society journal was an interdisciplinary journal dedicated to children-based research.

TABLE 2 – RANKING BY THE JOURNAL

Journal Name	Publisher	Cite score 2023	SJR 2023
Computers in Human Behavior	Elsevier Ltd	19.1	2.641
Journal Of Medical Internet Research	JMIR Publications Inc.	14.4	2.020
Journal of Healthcare Informatics Research	Springer Science and Business Media Deutschland GmbH	13.6	1.664
JMIR Mental Health	JMIR Publications Inc.	10.8	1.63
International Journal of Medical Informatics	Elsevier Ireland Ltd	8.9	1.110
JMIR Serious Games	JMIR Publications Inc.	7.3	0.986
Digital Health	SAGE Publications Inc.	2.9	0.767
Behavioral Sciences	MDPI	2.6	0.616
Children and Society	John Wiley and Sons, Inc	2.6	0.599

Table 3 summarizes the citations found in the Scopus directory for the research article considered for this Study. The author Drissi N [19] gained the maximum number of citations, followed by another author Six SG [20], where both have crossed more than 20 citations.

Chart 2 refers to the citations found in the Scopus directory from 2020 to 2023 for the records considered for this study. In 2020, the studies attained 1 citation; in 2021, they attained ten citations; in 2022, they attained 32 citations. Lastly, the year 2023 attained 60 citations.

TABLE 3 – NUMBER OF CITATION OF RECORDS BASED ON SCOPUS

Article Details	Total Citation till 2023
Drissi, [19]	24
Six, [20]	23
Suppan, [21]	12
Nicolaidou, [22]	11
Manzano-León, [23]	10
Yoon, [24]	10
Cheng, [25]	6
Xi, [26]	2
Piao, [27]	2
Litvin, [28]	2
Lubbe, [29]	1

CHART-2 ARTICLE CITATIONS BY YEAR.

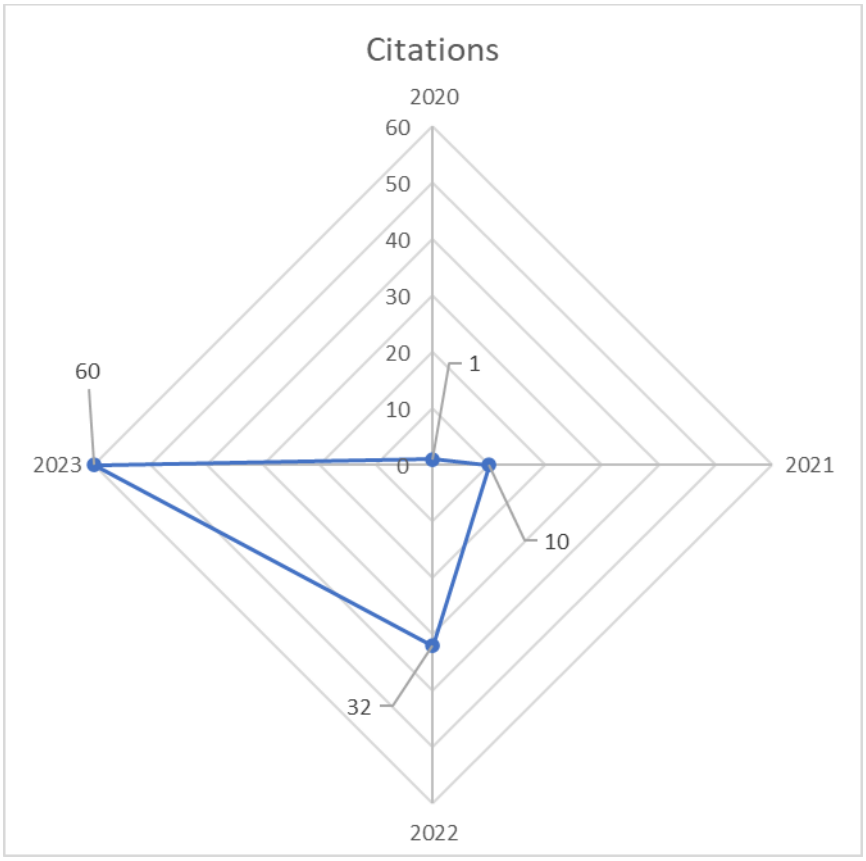


TABLE 4 – LITERATURE REVIEW

No.	Author	Year	Title	Methodology	Population	Findings
1	Drissi, [19]	2020	An analysis of self-management and treatment-related functionality and characteristics of highly rated anxiety apps	Systematic Literature review with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)	One hundred sixty-seven anxiety apps inclusive of Android and iOS Apps.	51% of apps used Gamification to motivate and encourage users

2	Six, [20]	2021	Examining the Effectiveness of Gamification in Mental Health Apps for Depression: Systematic Review and Meta-analysis	Systematic Literature review with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)	38 articles with 8110 participants	Apps for mental health were helpful and had both gamified and non-gamified features.
3	Suppan, [21]	2021	Impact of a Serious Game (Escape COVID-19) on the Intention to Change COVID-19 Control Practices Among Employees of Long-term Care Facilities: Web-Based Randomized Controlled Trial	A random control trial and the triple-blind approach and Escape COVID-19 as a serious game.	Switzerland participants from long-term care facilities. 295 responses	The gamified approach was more engaging in a serious game than traditional material.
4	Nicolaidou, [22]	2022	A gamified app for supporting undergraduate students' mental health: A feasibility and usability study	Feasibility technique and system usability scale. Student Stress Resilience App was combined with IoT Technology.	Seventy-four participants (44-M and 30-F) of undergraduate students' categories from 5 different university	Gamification with design principles can be a creative approach after the pandemic for mental health betterment.
5	Manzano-León, [23]	2022	Gamification and family leisure to alleviate the psychological impact of confinement due to COVID-19	Mixed methods Quasi-experimental Longitudinal	Spanish families, among which 18 are male, 64 are female parents, and 82 children.	Gamification can boost emotional competencies to decrease anxiety levels.
6	Yoon, [24]	2021	Perceptions of Mobile Health Apps and Features to Support Psychosocial Well-being Among Frontline Health Care Workers Involved in the COVID-19 Pandemic Response: Qualitative Study	Qualitative Study by a semi-structured interview with sampling technique as purposive	Singapore 42 participants as Frontline workers in twelve 1-1 interviews or focus group	A gamified approach by goal setting and a tailored method can help.
7	Cheng, [25]	2023	A meta-analytic review of gamified interventions in mental health enhancement	Systematic Literature review with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)	42 study where 5792 participants among the eight world areas	Gamification intervention for mental health tools was valuable.
8	Xi, [26]	2022	Effect of the "Art Coloring" Online Coloring Game on Subjective Well-Being	Independent 2-tail t-test and Univariate analysis	1390 global players	Gamification through colors can relax the

			Increase and Anxiety Reduction During the COVID-19 Pandemic: Development and Evaluation			mental stress in the subjective well-being (SWB)
9	Piao, [27]	2022	A Behavioral Strategy to Nudge Young Adults to Adopt In-Person Counseling: Gamification	Experimental and Random. Followed by the Hayes Model	120 people in the language community of the Korean and Chinese	Gamification makes a positive impact on individual personal counseling.
10	Litvin, [28]	2023	The Impact of a Gamified Mobile Mental Health App (eQuoo) on Resilience and Mental Health in a Student Population: Large-Scale Randomized Controlled Trial	A random control trial using the ANOVA method and the eQuoo app.	United Kingdom, 1165 Students, 180 University	The Gamification app has demonstrated value and effectiveness through its game elements.
11	Lubbe, [29]	2023	Experiences of Users with an Online Self-Guided Mental Health Training Program Using Gamification	Experimental design for six weeks	294 participants	Gamification with story form and reward for the user's self-compassion towards mental health was useful.

Table 4 sets out the author details for the literature review, including the academician, publication year, study title, type of research methodology used, population size, and critical findings.

Mental health is at the psychological level, impacting the individual through emotions and changing the individual's behavior. Figure 2 summarizes the keywords reflected in the articles considered for this study. It's about a person's attitude changes towards self and society and how they feel or react in different situations. Like the invisible nature of COVID-19, the mental health impact is not visible immediately. Several studies mentioned the importance of mental health beginning from childhood across different human life age groups and gender. The different forms of mental health are stress, anxiety, distress, and depression. Anxiety was also referred to in different ways by the author in the studies [19, 23, 26, 27, 28]. The word depression kept appearing in the literature review [19, 20, 25], and stress was identified in the studies by the author [19, 22]. Mental health and Gamification are elaborative topics; hence, Table 5 refers to the areas of mental health that emerged in this literature study. The themes of the research paper are part of Table 5, describing their application and where all studies with the same theme are applicable.

The three gamification themes concluded in this study's analysis are mobile software, online websites, and online tools. In mobile software, many gamified applications (Apps) resulted, among which two apps appeared: eQuoo and Student Stress Resilience. In the online context, different web programs were referred to during COVID-19 for serious games such as Escape COVID-19 while others for self-guidance. Lastly, online tools for counseling meetings during COVID-19 were used, such as the Zoom tool as the gamified approach.

TABLE 5 – THEMES IDENTIFIED IN THE STUDY

No.	Theme	Applications	References
1	Gamified Mobile Software Applications	Use of different Gamification Apps for different mental health purposes, enhancement, and depression. Use of Apps such as Student Stress Resilience and eQuoo. An art coloring technique was part of a gamified approach.	[19, 20, 22, 24, 25, 26, 28]
2	Gamified Online Web Programs	Usage of Serious games example Escape COVID-19. Use of Web platforms for questionnaires and self-guided programs.	[21, 23, 29]
3	Gamification with Online Meeting Tools	Tools like Zoom were part of the Gamification approach for personal counseling.	[27]

In Table 4, the second study is a literature analysis conducted in 2021 that also found the effectiveness of mental health using support from both game and non-game features, while the seventh study highlighted the promising benefits of gamification [20, 25]. The first study from Table 4 opened a deep dive into the different emerging areas of the gamified-based mobile application software that individuals can use, which also requires further studies [19]. As part of the research, the author also referred to handling anxiety levels with mobile apps. The article also highlighted the different forms of mental well-being that are effectively supported by mobile applications. In industry, different mobile apps use different versions of software. In this study, 123 apps had the platform of Android and were usable on non-Apple devices, and Apple iOS devices had only 44 apps. The apps include different management and coping mechanisms techniques for mental and cognitive therapies. These apps offer different functionalities at both online and offline levels, where users can chat for communication purposes. Thus, mental health care can be addressed during the pandemic with different mental health apps, as identified in the author's Study. The Study also suggested integrating apps as part of the mental health care process for professionals.

FIGURE-2 SUMMARIZE THE KEYWORDS APPEAR IN THE STUDIES

In the fourth and tenth study from Table 4, the author used Student Stress Resilience and eQuoo, a gamified app, to conduct the study, which supported mental wellness and anxiety [22, 28]. The participants in the sixth study who were frontline workers looked for other support features from the community, such as social influence [24]. In long-term care facilities, the third study authors used a serious game named Escape COVID-10 to study, resulting in better outcomes than traditional guidelines presentation [21]. The ninth study directed the analysis of gamification adoption among young people for counseling purposes [27]. Gamification is continuously gaining attention in other healthcare areas, as studied in the literature by academicians. Based on the research, the article's authors suggested using a gamified counseling approach for better user engagement. The author suggested carefully

considering using the information at low or high vividness as Gamification aims to ensure individual learning involvement and participation.

Another gamification fifth study was on web-based platforms for parents and children, and the author also highlighted the pandemic's impact on everyone, including their psychological issues [23]. Children's social gatherings and meetings are part of their daily activities, limited by the COVID-19 lockdowns. The stress coping mechanisms among parents of different genders are different, and with the Gamification attempt in the study, the parents could express this to other family members. In the eighth study, online gamification implementation with art coloring focused on the subjective well-being of adults with different colors [26]. In the eleventh study, the story mechanism of gamification and the reward system for motivation were promising for self-compassion [29]. This research attempted to probe the gamification aspects of mental health as it has become necessary for humankind and its well-being. However, the study is currently limited to Gamification, and future studies can explore its different dimensions. Mental health is an urgent topic in the ongoing post-pandemic worldwide, and thus, Gamification here offers to bring positive behavioral change. However, some common misunderstandings involve calling games with the name Gamification. However, using the game design and its mechanism to design and make it goal-oriented is to engage users with a non-serious purpose.

CONCLUSION

The distress of COVID-19 on mental health has left scars on individuals even with its recovery in the later year of 2023. Good mental health is also the foundation for life's survival and growth. As the government and institutions' awareness of mental health increases, the existing study analysis proposes gamification solutions to individuals. In literature, gamification has transformed the user experience by promoting better participation and encouraging morale. This research systematically studied eleven articles, as listed in the earlier sections. Current literature limits the Study with the gap of the longitudinal studies, and in the future, more studies can focus on different countries where the population count remains vast. The purpose of humankind is to have sustainable communities for future generations. Hence, gamification support brings changes in user perspectives and engagement so that they can focus on building a better future.

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RESEARCH NOTE

IDENTIFYING POTENTIALLY MODIFIABLE FACTORS TO REDUCE HOSPITAL READMISSIONS IN A TERTIARY CARE HOSPITAL IN SRI LANKA

Keshinie Randika Samarasekara

University Medical Unit, National Hospital of Sri Lanka, Colombo, Sri Lanka

Correspondence: k_samarasekara@yahoo.com

ABSTRACT

Identifying potentially modifiable factors associated with hospital readmissions would lead to reduction of the burden on healthcare expenditure and improvement of quality of life of patients.

A cross-sectional descriptive study was carried out on medical inpatients of University Medical Unit, National Hospital of Sri Lanka. Among the 425 participants, 178 (41.9%) had at least one prior admission over the preceding year. Participants with readmissions were significantly older than those with single admissions. The onset of illness/time since diagnosis, number of chronic illnesses, number of long-term medications, compliance with medications, compliance with follow-up, availability of family support, depression, anxiety, stress and alcohol use were associated with readmissions, whereas the location of follow-up, living arrangement and level of activity was not. A significant proportion of the study population had readmissions. Interventions aiming to reduce pill burden and to improve compliance with medications and follow-up are suggested, and further studies are recommended to assess their impact.

Where appropriate, patients should be directed to local hospitals/clinics for follow-up. Early identification of depression, anxiety and stress among patients and assessing each patient's alcohol intake, and making recommendations for them to obtain necessary help would be beneficial.

KEYWORDS

readmissions, modifiable factors, developing countries

INTRODUCTION

Healthcare systems worldwide experience a significant burden due to readmissions of medical inpatients. Various studies conducted in different healthcare settings show varying readmission rates, depending on the methodology, the time frame used in defining readmissions, and the age groups of patients studied. For example, a cohort study of discharge data of five consecutive years from twenty-one tertiary-care hospitals (eight in USA, five in UK, four in Australia, four In continental Europe) investigating rates and reasons of readmissions to the same hospital with specific disease conditions, showed a 10.6% readmission rate within 30 days of discharge.[1] A retrospective observational study performed at a large district general hospital in London, showed a readmission rate of 4.34% within 14 days of discharge from a medical ward.[2] A cross-sectional study using the 2008 Belgian Hospital

Discharge Dataset (which includes data for all inpatients in acute hospitals in Belgium) of one calendar year, showed a 10.3% readmission rate within 30 days of discharge.[3] Another study, done in the internal medicine department of a tertiary teaching hospital in Brisbane, Australia, on inpatients aged 50 years or more, with a previous hospitalization six months preceding the index admission, showed a readmission rate of 38.7% within six months of discharge.[4]

Readmissions of medical inpatients incur a remarkable burden to healthcare costs, and bear a significant impact on the welfare of patients.[5] It is also indicative of the quality of care provided to patients.[6]

Various studies conducted in developed countries have looked into potential risk factors for readmissions of medical patients.[1-9] Some of these studies have predominantly included elderly populations,[7,8,9] and some have included patients with specific disease conditions only.[1] These studies, including a systematic review,[9] have identified various socio-demographic factors and disease-related factors as reasons for hospital readmissions.

The factors leading to hospital readmissions among medical patients in Sri Lanka (and other developing countries) could be different to those of patients in developed countries due to differences in socio-economic background, and due to variations in disease patterns. There is a paucity of studies providing data on readmission rates or factors associated with readmissions among medical patients in developing countries, and there are no studies on such done in Sri Lanka.

Identifying these factors is useful to modify any potentially modifiable factors and reduce the burden on the already-strained healthcare system, which is functioning with resource limitations and constraints. Also, including the younger patient population in the study is important to minimize the impact on the economy by preventing hospital readmissions of the productive workforce of the country.

METHODS

A cross sectional descriptive study was carried out in April-May, 2022 with participation of consenting (informed written consent) medical inpatients admitted consecutively to University Medical Unit, National Hospital of Sri Lanka (NHSL).

Data was collected using an interviewer administered data proforma and self-administered 'Depression, Anxiety and Stress Scale - 21 Items' (DASS-21).[10]

The interviewer administered data proforma consisted of four sections: demographic data, admission data, disease factors and psychosocial factors. The section on admission data was designed to collect information on previous hospital admissions over the preceding year. This was filled by interviewing the patient and referring to medical records (e.g. clinic book, diagnosis cards). All readmissions were included, regardless of whether they were related to the index presentation or not.

The Self-administered DASS-21 scale has been validated for the Sri Lankan population. [11,12] The Sinhala and Tamil translations are available and have previously been used in Sri Lankan studies.[13] The participants were allowed to fill it in their preferred language.

Anonymously collected data was entered onto a spreadsheet and analyzed using IBM SPSS statistical software. Descriptive statistics were outlined with frequencies, percentages and mean with standard deviation. Significance of categorical variables were analyzed using chi-square test.

Ethical approval was obtained from the Ethics Review Committee of National Hospital of Sri Lanka. (Ref: AAJ/ETH/COM/2022/JANUARY)

RESULTS

The ages of participants ranged from 21 to 95 years. Majority of participants were male (59.5%). Approximately three-quarters (76.9%) of the participants resided in Colombo district, where the National Hospital of Sri Lanka is located. The demographic characteristics of the sample are further illustrated in table 1.

TABLE 1 DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE (N=425)

Category	Number / Mean ± SD	Percentage %
Age (in years)	60.7 ± 16.9 (range 21-95)	
Gender		
Male	253	59.5
Female	172	40.5
Area of residence (district)		
Within Colombo	327	76.9
Outside Colombo	98	23.1
Level of education		
Not schooled	34	8.0
Passed fifth grade	149	35.1
Passed GCE (O/L)	198	46.6
Passed GCE (A/L)	37	8.7
Undergraduate degree	5	1.2
Postgraduate degree	2	0.5
Occupation		
Unemployed	89	20.9
Day-wage worker	68	16.0
Monthly-salary earner (private sector)	73	17.2
Monthly-salary earner (government sector)	21	4.9
Private business owner	174	40.9
Monthly family income (LKR)		
<50,000	88	20.7
50,001-100,000	178	41.9
100,001-150,000	147	34.6

>150,000	12	2.8
Marital status		
Single	39	9.2
Married	316	74.4
Divorced	48	11.3
Widowed	22	5.2
Number of children		
None	58	13.6
1	86	20.2
2	201	47.3
3	57	13.4
4 or more	23	5.4

TABLE 2 NUMBER OF PREVIOUS ADMISSIONS IN PARTICIPANTS (N=425)

Number of previous admissions (within 1 year)	Number of participants	Percentage %
0	247	58.1
1	35	8.2
2	48	11.3
3	44	10.4
4 or more	51	12.0

Among the 425 participants, 178 (41.9%) had at least one previous admission over the preceding year. The number of previous admissions in study participants are summarized in table 2.

Age category of the participant showed a statistically significant association with readmissions ($p < 0.01$). None of the other demographic factors studied (gender, district of residence, level of education, occupation category, monthly family income, marital status and number of children) had a significant association with readmissions, when tested with Chi-square test. This is summarized in Table 3.

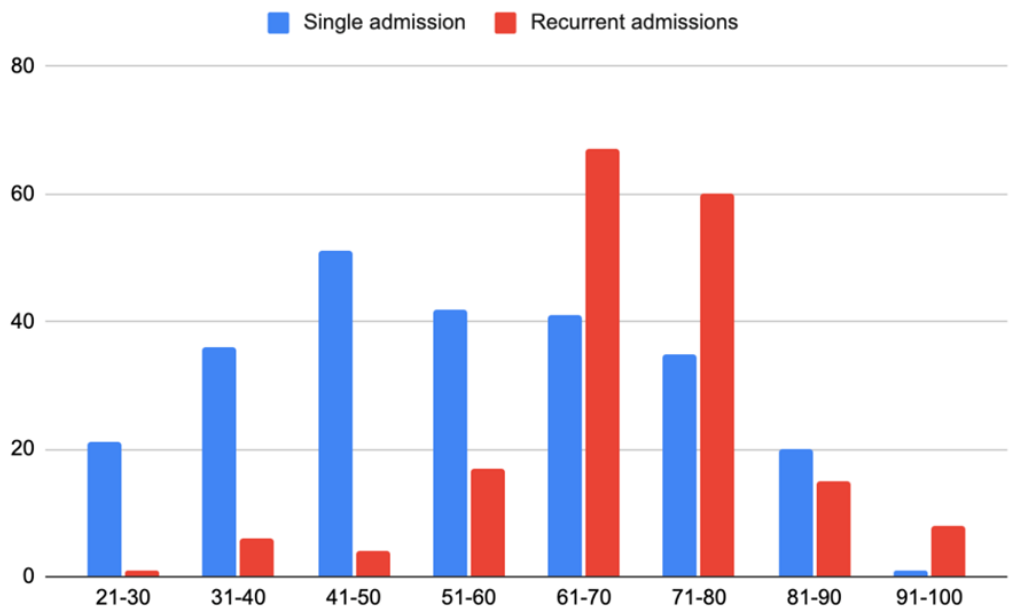
The age distribution of participants with single admissions and readmissions is illustrated in figure 1.

TABLE 3 ANALYSIS OF ASSOCIATION BETWEEN DEMOGRAPHIC FACTORS AND READMISSIONS

Variables	Single admission	Readmissions	Chi-square value (p value)
Age category			
< 25 years	12	1	72.5 (< 0.01)
25-50 years	96	10	
51-75 years	103	127	
>75 years	36	40	
Gender			
Male	149	104	0.15 (0.69)
Female	98	74	
Area of residence (district)			
Within Colombo	188	139	0.23 (0.63)
Outside Colombo	59	39	
Level of education			
Not schooled	17	17	3.01 (0.56)
Passed fifth grade	82	67	
Passed GCE (O/L)	120	78	
Passed GCE (A/L)	22	15	
Undergraduate degree	4	1	
Postgraduate degree	2	0	
Occupation			
Unemployed	53	36	3.98 (0.41)
Day-wage worker	44	24	
Monthly-salary earner (private sector)	46	27	
Monthly-salary earner (government sector)	12	9	

Private business owner	92	82	
Monthly family income (LKR)			
<50,000	52	36	3.14 (0.37)
50,001-100,000	104	74	
100,001-150,000	87	60	
>150,000	4	8	
Marital status			
Single	23	16	1.66 (0.65)
Married	186	130	
Divorced	24	24	
Widowed	14	8	
Number of children			
None	35	23	2.12 (0.71)
1	52	34	
2	119	82	
3	30	27	
4 or more	11	12	

FIGURE 1 DISTRIBUTION OF AGE FOR SINGLE ADMISSIONS (BLUE) AND READMISSIONS (RED)



The mean age of participants with single admissions was 54.58 years (SD 17.47), and that of those with readmissions was 69.12 years (SD 11.83). There's a statistically significant difference between these two means, when tested with t-test ($p < 0.01$).

When considering disease-related factors, the onset of illness/time since diagnosis, number of chronic illnesses, number of long-term medications, compliance with medications and compliance with follow-up were associated with readmissions ($p < 0.01$). Interestingly, location of follow-up was not associated with readmissions. Analysis of association between disease factors and readmissions using Chi square test is summarized in table 4.

Psychosocial factors associated with readmissions include, availability of family support, depression, anxiety, stress ($p < 0.01$), and alcohol use ($p < 0.05$). Living arrangement and level of activity was not associated with readmissions. Analysis of these factors with Chi-square test is summarized in table 5.

TABLE 4 ANALYSIS OF ASSOCIATION BETWEEN DISEASE FACTORS AND READMISSIONS

Variables	Single admission	Readmissions	Chi-square value (p value)
Onset of illness/ Time since diagnosis			
⩽1 year	162	17	133.25 (<0.01)
>1 year	85	161	
Number of chronic illnesses			
None	131	1	165.40 (<0.01)
1	29	16	
2	48	44	
3	26	64	
4 or more	13	53	
Number of long-term medications			
None	131	1	142.64 (<0.01)
1	7	7	
2	16	11	
3	32	36	
4 or more	61	123	
Compliance with medications			
Poor	1	12	121.53 (<0.01)

Fair	3	53	
Average	18	82	
Good	95	30	
Not applicable	130	1	
Follow up (location)			
NHSL	84	138	1.69 (0.43)
Local hospital	25	33	
Private sector	7	6	
Not applicable	131	1	
Compliance with follow up			
Poor	1	11	80.93 (<0.01)
Fair	5	33	
Average	20	90	
Good	90	43	
Not applicable	131	1	

TABLE 5 ANALYSIS OF ASSOCIATION BETWEEN PSYCHOSOCIAL FACTORS AND READMISSIONS

Variables	Single admission	Readmissions	Chi-square value (p value)
Living arrangement			
Lives with family/ extended family	193	143	2.08 (0.56)
Lives alone (home/ accommodation)	45	25	
Lives in a nursing home	3	3	
Lives on the street	6	7	
Level of activity			
Fully independent	229	157	2.57 (0.28)

Dependent for instrumental ADL	15	18	
Dependent for all ADL	3	3	
Availability of family support			
Available	179	78	35.52 (<0.01)
Not available	68	100	
Alcohol use			
None	96	73	7.33 (0.03)
Drinks in moderation*	133	79	
Heavy use**	18	26	
Depression			
Normal	238	81	147.18 (<0.01)
Mild	7	96	
Moderate	2	1	
Anxiety			
Normal	210	47	157.56(<0.01)
Mild	34	80	
Moderate	3	51	
Stress			
Normal	207	49	143.22 (<0.01)
Mild	35	81	
Moderate	5	48	

*2 drinks or less in a day for men or 1 drink or less in a day for women on days when alcohol is consumed, or 14 drinks or less per week for men or 7 drinks or less per week for women

** more than 2 drinks in a day for men or more than 1 drink in a day for women on days when alcohol is consumed, or more than 14 drinks per week for men or more than 7 drinks per week for women [14]

DISCUSSION

This is the first Sri Lankan study exploring the factors associated with hospital readmissions in medical inpatients. It showed a significant proportion (41.9%) of the sample had at least one previous admission over the preceding year. Studies done elsewhere in the world have used varying time frames (14 days,[2] 30 days, [1,3] 6 months[4] etc) for defining readmissions and therefore the

readmission rates cannot be compared across these studies.

In this study, age was the only demographic factor that showed a statistically significant association with readmissions (p <0.01). None of the other demographic factors studied (gender, district of residence, level of education, occupation category, monthly family income, marital status and number of children) showed a significant association.

Participants with readmissions were significantly older than those with single admissions, as seen in other studies in the literature.[3]

Among the disease-related factors studied, the onset of illness/time since diagnosis, number of chronic illnesses, number of long-term medications, compliance with medications and compliance with follow-up were associated with readmissions (p <0.01), whereas the location of follow-up was not associated. Among these factors, the number of long-term medications, compliance with medications and compliance with follow-up are potentially modifiable.

Interventions aiming to reduce pill burden and to improve compliance with medications and follow-up are suggested based on these results. Studies in other countries have demonstrated that medication review interventions are useful in reducing readmissions. [15,16] Some of these interventions can be adapted to the Sri Lankan setup, and further studies are recommended to assess their impact.

Where appropriate, patients should be directed to local hospitals/clinics for follow-up, as the location of follow-up has no association with readmissions.

When considering psychosocial factors, availability of family support, depression, anxiety, stress (p <0.01), and alcohol use (p <0.05) were significantly associated with readmissions, whereas living arrangement and level of activity was not associated. Among these factors, depression, anxiety, stress and alcohol use are potentially amenable to interventions.

Early identification of depression, anxiety and stress among patients and assessing each patient's alcohol intake, and directing them to obtain necessary help is recommended based on these results.

There is a paucity of studies on factors associated with hospital readmissions, and even the studies available in the literature have predominantly looked into readmissions in elderly populations [7,8,9], or in patients with specific disease categories (e.g. heart failure, atrial fibrillation, myocardial infarction)[1]. Therefore, comparison of the results would be futile as the patient populations studied are different. Furthermore, the time frame used in defining readmissions is different in each study, as mentioned earlier.

The DASS-21 scale is designed to measure the emotional states of depression, anxiety and stress over the preceding week. Therefore, the scores recorded by participants may not be indicative of their emotional states throughout the preceding year.

Furthermore, this study does not include readmissions of the study population of patients to other hospitals in Sri Lanka. This is a limitation of this study. Therefore, a further national level study including other hospitals outside Colombo district would be beneficial. Also, exploring other modifiable factors (such as smoking habits, diet and exercise) would be beneficial.

CONCLUSIONS

This study showed a significant proportion (41.9%) of medical inpatients of the university medical unit of the largest tertiary care hospital in Sri Lanka, had at least one previous admission over the preceding year.

It also identified important disease-related and socio-demographic factors associated with these readmissions, some of which are potentially modifiable and amenable to interventions.

Implementing interventions to modify these factors may reduce hospital readmissions, leading to reduction of burden on the healthcare system and improvement of quality of life of patients. Further interventional studies are recommended to assess the impact of such interventions on reducing readmissions.

Also, further national level studies are recommended to conduct multivariate analysis; to determine adjusted odds ratios of factors associated with hospital readmissions, using logistic regression.

ABBREVIATIONS

ADL- Activities of Daily Living

GCE (A/L) - General Certificate of Education (Advanced Level)

GCE (O/L) - General Certificate of Education (Ordinary Level)

LKR - Sri Lankan Rupee

NHSL- National Hospital of Sri Lanka

Declarations

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the Ethics Review Committee of National Hospital of Sri Lanka. (Ref: AAJ/ETH/COM/2022/JANUARY). Informed written consent was obtained from all participants. (For illiterate participants, informed consent was obtained from the legal representative of the participant). All methods were carried out in accordance with relevant guidelines and regulations in the Helsinki declaration.

CONSENT FOR PUBLICATION

Not applicable. Manuscript does not contain any individual person's data.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

COMPETING INTERESTS

None

FUNDING

None

AUTHORS' CONTRIBUTIONS

The author confirms sole responsibility for study conception and design, data collection, analysis, interpretation of results, and manuscript preparation.

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SHAPE SYMPOSIUM 2024

HEALTH CARE SYSTEMS SUSTAINABILITY: THE ROLE OF HEALTH CARE MANAGEMENT EDUCATION AND CONTINUING PROFESSIONAL DEVELOPMENT IN BUILDING A SUSTAINABLE HEALTHCARE SYSTEM

Dr Neale Fong

President of Australasian College of Health Service Management

Correspondence: nfong@bethesda.org.au

INTRODUCTION

It comes as no surprise that healthcare leaders today face unprecedented challenges. Some are immediate. Others are long-term. Many are interrelated. All are complex.

None of them are small, as they include financial sustainability, mission, quality and patient safety, rapidly advancing technology, changing consumer expectations, new market entrants, healthcare inequities, and more regulation. And one challenge tops that list: workforce shortages. Although many individuals continue to be drawn to healthcare, the numbers are insufficient to meet increasing demand.

But there is one more challenge which even tops this issue. And that is the continuing and growing need for capable and competent leaders and leadership in the world's most complex industry sector – healthcare.

Aiming for excellence in health are words that adorn our organisation's' mission statements and list of values. But is there something that can make the difference in outcomes for health at the patient level, at a system level, and at a population level? And if there is, can we identify what makes the difference, amplify it and exploit it to the world? My thesis is the one thing that will make the difference is the level of competence and capability of the leaders and leadership. What does this look like? What should we be doing to grow it and develop it?

Firstly, we must have a map to guide us, or a scaffold around which to build the core capabilities that are required for one to be a leader or for an organisation to have effective and strong leadership.

LEADERSHIP AS CAPABILITIES, NOT COMPETENCIES.

My personal preference is to use the term leadership capability over competency. The term competency is most appropriately used in training, to refer to the skills and knowledge that individuals require to do their job in a predictable environment. For many, it refers to a bare minimum required to do the job.

The term capability, on the other hand, includes competence, but much more. The goal of developing capabilities is to raise your level of ability much beyond the bare minimum.

In leadership development I also prefer the term capabilities because leadership development in itself is a lifelong journey. Over your lifecycle of leadership, you will use different capabilities to lead in one situation as opposed to another.

Leadership has no meaning without change. If the world were static, management would have it tightly organized, planned, and humming along in a highly ordered way. Leaders seek the opportunity to change, for change means improvement and growth. Leaders provide

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direction and purpose to change. In our turbulent, complex world, transformative change, may be the only way health care can continue.

THE JOURNEY HISTORY OF COMPETENCY FRAMEWORKS

Competency frameworks in all types of professions and industries have existed for some decades now. In 1978 the WHO published a paper entitled Competency-Based Curriculum Development in Medical Education. In 2002, the first competency-based curriculums were published by the three Royal Medical Colleges in the UK.

In the late 1990s the healthcare industry worldwide was awakened to the fact that it did not always live up to its traditional ethic "above all else, and first do no harm." Patients and populations for that matter, were being put at risk. Fundamental changes were needed and what became very evident was that we needed to make certain that leaders had the skills and tools to make and conduct the changes. Over the years, leaders in the quality space (Pronovost, Baldridge et al), have emphasised the need for leadership competencies.

In the mid 2000's Dickson from Royal Roads University in British Columbia led the way with the LEADS - in a caring environment. The Canadian LEADS framework has been on an evolving journey over the past 20 years and has remained elegant and translatable.

In 2013 the Australian Government Health Workforce Australia developed a nationally recognised leadership framework based on LEADS Canada and around the same time, the IHF contributed to the agenda by trying to fill a global gap in the leadership quest through launching a directory.

The Australasian College of Health Service Management has an industry led Master Health Services Management Competency Framework which is brought to life as the platform for the wide variety of college programs that in turn longitudinally support leaders as they learn.

The Framework underpins the credentialling program for Certified Health Managers that supports lifelong learning. The Fellowship Program and early career programs developed and delivered by the College all contribute to, and continue, the acquisition of competencies that in turn underpin the growth of capabilities to lead.

But competency models are only as useful as the leadership-development efforts they support. When they are incorporated into development programs based on sound adult learning principles, competency models can be powerful facilitators of individual change, but by themselves do little to help people develop.

And of course, the effectiveness of even the most skilled quality professionals will be bounded by the level of collaboration they experience from the other leaders and clinicians they work with. Attention to leadership as a team game and the need for a continuous learning focus will continue to be essential in supporting quality improvement gains in healthcare organisations.

LEADERSHIP DEVELOPMENT PAYS OFF

The Centre for Creative Leadership points out four reasons why organisations need to invest in developing leaders.

1. NAVIGATING CHANGE AND INNOVATION

The healthcare industry is constantly evolving due to new technologies, treatments, and regulations. Effective leaders can anticipate trends and prepare organisations for what lies ahead. Continuous learning and growth organisations demonstrate commitment by nurturing talent through leadership development.

2. POSITIVE WORK ENVIRONMENT AND CULTURE

Strong leadership fosters a healthy workplace culture leading to higher employee engagement, better patient care, and improved outcomes. Effective leaders inspire and motivate teams, leading to higher employee engagement and improved productivity.

3. DECISION-MAKING AND ADAPTABILITY

Leadership development ensures that future leaders align with the company's goals and vision by investing in their growth.

4. FINANCIAL PERFORMANCE AND STRATEGY EXECUTION

Leadership development drives sustained success by improving bottom-line performance attracting talent and enhancing an organisation's ability to navigate change, thus reducing costs, opening new revenue opportunities, and contributing to increased profitability.

THE PROBLEMS WITH TRADITIONAL EXECUTIVE EDUCATION

Moldeoveanu and Naraynadas state that "the leadership development industry is in a state of upheaval with the number of players offering courses to impart the hard and soft skills required of corporate managers soaring. And yet organisations that collectively spend billions of dollars annually to train current and future executives are growing frustrated with the results" [6].

Their studies indicate that more than 50% of senior leaders believe that their talent development efforts don't adequately build critical skills and organisational capabilities and that traditional programs no longer adequately prepare executives for the challenges they face today or tomorrow.

Most executive education programs, designed as extensions of, or substitutes for MBA programs, focus on discipline-based skill sets, such as strategy development or financial analysis, and seriously underplay important relational, communication, and affective skills. Traditional executive education is simply too episodic, exclusive, and expensive to achieve that goal.

There are a growing number of online courses, social and interactive platforms, and learning tools from both traditional institutions and startups that can make learning flexible and accessible, thus enabling employees to pick up skills in the context in which they must be used. A fundamental belief must be that leadership is a learnable skill and a personal responsibility.

CONCLUSION

Leadership programs underscore that investments benefit individual participants and help transform their organisations. The organisational benefits are the result of greater leadership abilities and expanded access to knowledge and resources resulting from leaders expanded professional networks.

Connected, resilient, and skilled leaders are essential to transformational changes as we collectively look to advance health equity, strengthen the workforce, and embrace the information and digital challenges ahead of us.

Investing in leadership development provides a structured and comprehensive approach to developing leadership skills and competencies.

A leadership development program can give enhanced leadership skills, improve self-awareness, and give a deeper understanding of strengths and weakness. They help you acquire new knowledge and understand best practices that will enable you to lead effectively in a dynamic and uncertain environment.

Eric Hoofer said, "In times of change, learners inherit the earth while the learned find themselves beautifully equipped to deal with a world that no longer exists."

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SHAPE SYMPOSIUM 2024

VISION CARE AS A STRATEGY TO PREVENT FALLS AMONG PEOPLE WITH MODERATE OR SEVERE INTELLECTUAL DISABILITY IN THE HOSTEL SETTING IN HONG KONG

Phil Wai Shun Leung, Anthony Cheuk Hang Leung, Daphne Siu Ling Chan, Carmen Sze Oi Tsang*

Rehabilitation Service, Haven of Hope Christian Service, Hong Kong, China

Correspondence: wsleung@hohcs.org.hk

ABSTRACT

BACKGROUND

Factors contributing to the higher fall risk among people with intellectual disabilities (PIDs) are complex due to their discrete patterns of multimorbidity. Visual impairment, such as cataract, was common at old age and could be a crucial risk factor. Given the insufficient evidence regarding this relationship, the present study aimed at investigating this issue in a hostel setting in Hong Kong.

METHODS

This study was conducted in four hostels which served people with moderate to severe intellectual disability. Health data of residents collected in the year of 2022-23 was utilized for the current analysis. Data included fall risk, assessed by the Morse Fall Scale, as well as other health conditions (osteoporosis, osteoarthritis, cataract) and demographics (age and gender) among residents.

RESULTS

The sample consisted of 199 residents (85 were males and 114 females), with an age range of 22 to 76 years. Around 40% (85; 42.7%) of them aged above 45 years old. Among the whole sample, cataract was the most common health condition and its prevalence reached 27.14%. Those who aged 45-year or above were 4.61 times (95%CI 2.09-11.07) more likely to have cataract. Bivariate analysis results showed that presence of fall risk was associated with older age (above 45 years old; OR 2.38; 95%CI 1.28-4.49), diagnosis of cataract (OR 3.3; 95%CI 1.71-6.33) and osteoarthritis (OR 12.68; 95%CI 1.70-564.75). Logistic regression analysis further illustrated that cataract (p = 0.04) remained as a significant predictor of fall risk after controlling age, gender, osteoarthritis and osteoporosis in the model.

CONCLUSION

Our data showed that presence of cataract diagnosis was significantly associated with higher fall risk among PIDs in hostel setting. Given cataract was a prevalent condition especially among aging PIDs, early screening and intervention could be crucial components of fall prevention strategy in a hostel setting.

KEYWORDS

Aged care, fall prevention, Hong Kong

INTRODUCTION

Falls are a health crisis which accounted for one-third of deaths among elderlies aged 60 or above [1]. Deteriorations in physical and cognitive competences associated with aging were both considered as the reasons of increased likelihood of fall [2]. For example, peripheral sensory dysfunction and diminished capacity of executive function could both increase the physical and cognitive burden of maintaining posture balance, which in turn resulted in fall [3,4]. Some evidence further suggested that a fall episode could not only worsen existing gait and posture problems [5], but also result in the fear of future fall which drove elderlies to restrict daily activities. The vicious cycle between exacerbated physical deficits and fear of future fall, in the long run, resulted in a higher risk of fall, and even developing psychological problems such as depression [6,7].

Visual impairment associated with cataract was one of the leading causes of fall among elderlies [8, 9]. Owing to the partial or complete optical opacification of lens in eyes, cataract caused light to scatter instead of forming a sharp image on the retina, resulting in a reduction of the visual acuity [10]. One cohort study conducted in England found that elderlies with cataract were 1.36 times more likely to fall than those without this diagnosis [8]. Another study also reported that older people with cataract were significantly more likely to have history of fall than those without this diagnosis [9].

There were a few studies which had investigated the prevalence of cataract or other types of visual impairment among persons with intellectual disability (PIDs). An earlier study in Hong Kong reported the prevalence of 5.7% to 6.5% among those aged 40 years or above living in residential care facilities [11]. Some previous evidence had suggested that visual impairment could be more common among PIDs than the typically developing elderlies. Among a sample aged 60 years old or above, the prevalence of moderate to severe visual impairment were higher in the group of PIDs (27.9%) than those without the disability (0.66% and 13% among '60 to 69 years old' and '80 years old or above' groups respectively) [12].

Previous findings concerning the relationship between cataract and fall risk among PIDs were mixed [13,14]. For example, one study conducted in Australia found that visual impairment increased the fall risk by about two times among a sample of PIDs who attended a medical clinic [13], while another cohort study, also conducted in Australia, did not replicate similar relationship [14]. It would be interesting to explore this relationship in the unique residential setting in Hong Kong, which is considered as 'crowded and packed'. Indeed, one study revealed the problem of inadequate indoor space in hostels for PIDs in Hong Kong [15]. It is expected that the limited space and presence of physical obstacles could relate to the fall risk. Given visual acuity could be crucial to avoid obstacles and prevent from falling [16], the impact of cataract on their fall risk among PIDs could be more significant in this setting.

Given the above evidence, the primary objective of current research was to examine the accountability of cataract on the fall risk among persons with moderate to severe intellectual disability in Hong Kong hostel settings. As suggested by the empirical evidence, other related conditions such as age, the diagnosis of osteoporosis [17] and osteoarthritis [18] were also measured as covariates in order to investigate how these factors could independently predict the fall risk among the residents. The main hypothesis was that cataract could independently predict fall risk after controlling for age and other health related conditions. Given the potential higher risk of cataract among this group of population, how cataract could affect their fall risk was an important piece of information when designing effective fall prevention strategies.

METHODS

PARTICIPANTS

All participants were residents in the selected four hostels which served people with moderate to severe intellectual disability in Hong Kong. In these hostels, the health data of residents were collected in a yearly basis with the consent of parents or guardians, in order to monitor their health conditions and achieve early detection of any physical problems. For the purpose of this research, these secondary data were collected with the approval from the organization, and the relevant health data in the year of 2022 to 2023 were extracted for further analysis.

PROCEDURES

Before conducting data collection, research staff explained the research objectives and procedures to the Head and Hostel Managers of the organization in order to seek their approval. Upon receiving their approval, research staff were given the right to access to the

electronic health data stored in online data base with password protection. One experienced research staff was responsible for the data extraction and analysis processes.

DATA EXTRACTION

The main outcome variable was the residents' fall risk measured by the Morse Fall Scale (MFS) [19]. The MFS was a screening tool for evaluating the level of fall risk with six items, namely "history of falling", "secondary diagnosis", "ambulatory aid", "IV/Heparin lock", "Gait/Transferring" and "Mental status", which each of them scored from 0 to 30. Total scores of all items could differentiate the fall risk of PIDs as 'no' (score of 0 to 24), 'low' (25 to 50) or 'high' fall risk (51 or above). The MFS were completed by either occupational therapists or nurses in the hostels.

Besides the fall risk of participants, other relevant data was also extracted from the health data. The independent variable was the presence of cataract diagnosis. Other covariates included the demographics (age and gender), as well as the diagnosis of osteoporosis and osteoarthritis among residents.

Given the data period covered the COVID-19 pandemic, some residents chose to stay at their home for a long period of time to avoid infection in hostels. In order to minimize the potential bias, residents spending lower than 90% of time in hostels within the year of 2022 to 2023 were excluded from this study.

DATA ANALYSIS

For the purpose of data analysis, participants were assigned to either younger (below 45-year-old) or older subgroup (45-year-old or above). The three MFS risk levels were further transformed into a binary variable, with (low and high risk) or without (no risk) fall risk.

Fisher's exact tests and chi-square tests were used for the bivariate analyses, and logistic regression was conducted to measure the independent effect of measured variables on the fall risk level. Data analysis was conducted using the software IBM SPSS version 22.0.

RESULTS

The health data of a total of 204 residents in the four selected hostels was extracted, among which five residents were dropped out from the analysis based on the above exclusion criterion. Therefore, a total of 199 residents were included in this study and their demographic details were presented in Table 1. Among the resulting sample, 104 were males and 95 were females. Their mean age was 48.5 years old with only 13.6% of residents were below 35 years old, suggesting that most of them were at least in the stage of middle age. Nearly 30% of them aged over 55 years old. Using a cut-off of 45 years old, 85 and 114 participants belonged to the younger and older subgroup, respectively. The age distribution showed that ageing was a prominent issue in the four hostels.

TABLE 1: DESCRIPTIVE STATISTICS OF RESIDENTS (N=199)

		n	%
Age	25 or below	5	2.51%
	26-35	17	8.54%
	36-45	63	31.66%
	46-55	56	28.14%
	56-65	39	19.60%
	66 or above	19	9.55%
Gender	Male	104	52.3%
	Female	95	47.7%
Health conditions	Cataract	54	27.14%
	Osteoporosis	8	4.02%
	Osteoarthritis	10	5.03%
Fall risk	No risk	112	56.28%
	Low risk	66	33.17%
	High risk	21	10.55%

Among the residents in the four hostels, cataract was found to be the most common health condition and the prevalence reached 27.14%, followed by osteoarthritis (5.03%) and osteoporosis (4.02%; Table 1). Based on the scores in Morse Fall Scale, about one-third of them (33.17%) were classified as having low fall risk, while 10.55% of them were of high fall risk (Table 1). As shown in Table 2, cataract was found to be more prevalent among the older subgroup and they were 4.71 times (95%CI 2.21-10.08) more likely to receive this diagnosis when compared with the younger residents. Furthermore, presence of fall risk (with low or high risk) was 2.39 times (95%CI 1.33-4.29) higher in the older age group.

Bivariate analyses were conducted to examine the relationship between different health conditions and fall risk (Table 3). Results illustrated that presence of fall risk was significant more likely among those with the diagnosis of cataract (OR 3.30; 95%CI 1.71-6.33) and osteoarthritis (OR 12.81; 95%CI 1.59-103.15). Finally, logistic regression was conducted to investigate the independent effects of cataract, demographic details and other health conditions on the presence of fall risk (Table 4). It was found that cataract remained as a significant predictor after controlling gender, age, the diagnosis of osteoporosis and osteoarthritis, with an elevated likelihood of the presence of fall risk (OR = 2.47; 95%CI 1.22-5.01).

TABLE 2: PREVALENCE RATES OF HEALTH CONDITIONS AMONG THE WHOLE SAMPLE AND THE TWO AGE GROUPS

		All n (%)	Younger n (%)	Older n (%)	OR (95%CI)	p in chi sq tests
Cataract	Yes	54 (27.14%)	10 (18.52%)	44 (81.48%)	4.71	0.00*
	No	145 (72.9)	75 (51.72%)	70 (48.28%)	(2.21-10.08)	
Osteoporosis	Yes	8 (4.02%)	1 (12.50%)	7 (87.50%)	5.49	0.14[a]
	No	191 (95.98%)	84 (43.98%)	107 (56.02%)	(0.66-45.54)	
Osteoarthritis	Yes	10 (5.03%)	0 (0.00%)	10 (100.00%)	NA[b]	
	No	189 (94.97%)	85 (44.97%)	104 (55.03%)		
Fall risk	Yes	87 (43.72%)	27 (31.03%)	60 (68.97%)	2.39	0.00*
	No	112 (56.28%)	58 (51.79%)	54 (48.21%)	(1.33-4.29)	

a p value in Fisher's Exact test

b Odds ration could not be calculated due to an empty cell

* significant at 0.05 level

TABLE 3: RELATIONSHIPS BETWEEN VARIOUS HEALTH CONDITIONS WITH FALL RISK

Parameters		No fall risk n (%)	With fall risk n (%)	OR (95%CI)	p in chi sq tests
Cataract	Yes	19 (35.19%)	35 (64.81%)	3.30 (1.71−6.33)	0.00*
	No	93 (64.14%)	52 (35.86%)		
Osteoarthritis	Yes	1 (10.00%)	9 (90.00%)	12.81	0.01*[a]
	No	111 (58.73%)	78 (41.27%)	(1.59−103.15)	
Osteoporosis	Yes	2 (25.00%)	6 (75.00%)	4.07	0.08[a]
	No	110 (57.59%)	81 (42.41%)	(0.80−20.71)	

[a] p value in Fisher's Exact test

* significant at 0.05 level

TABLE 4: LOGISTIC REGRESSION PREDICTING FALL RISK AMONG RESIDENTS

	B	SE	P value	Exp(B)	95% CI
Constant	-0.90	0.27	0.00	0.41	
Gender	0.00	0.31	0.99	1.00	0.54-1.85
Age group	0.46	0.32	0.15	1.29	0.84-3.00
Osteoporosis	1.42	0.85	0.10	4.13	0.78-21.88
Osteoarthritis	1.97	1.10	0.07	7.15	0.84-61.16
Cataract	0.90	0.36	0.01*	2.47	1.22-5.01

* significant at 0.05 level

DISCUSSION

The current research aimed to provide preliminary evidence concerning the prevalence of cataract and how it could predict the fall risk of PIDs in a hostel setting. Our results showed that cataract was the most prevalent health condition among our residents, with more than one-fourth of them received the diagnosis. Furthermore, cataract not only increased the fall risk by approximately three times, the higher risk remained significant even after controlling age, gender, the diagnosis of osteoporosis and osteoarthritis in a subsequent regression analysis. This finding supported our hypothesis that visual impairment with cataract was a specific predictor for fall risk of ID in the residential setting.

Our present results echoed with previous findings concerning the association between cataract and fall [8,9]. The reduced visual acuity with cataract was proposed as the reason of inflated fall risk among PIDs [16]. Particularly, impairments in central and peripheral visual field due to cataract caused a biased sensory input [20]. This could result in posture imbalance [21], and eventually increased the chance of fall. Although the packed environment in four hostels was not objectively measured in this research, it was likely that environmental factors could intensify the relationship between poor visual acuity and fall in this setting.

The relationship between cataract and fall risk could be elucidated by factors other than worsened visual acuity. Dysregulated circadian rhythm and sleep hormones release could be a result of cataract due to declined amount of light input, with evidence showing that cataract surgery could result in improved regulation of circadian rhythm [22,23]. Furthermore, the resulting poor sleep quality could further deteriorate abilities of coordination and gait balance which increased the possibility of fall [24]. Future research would be necessary to investigate the relationships between cataract, sleep quality and fall risk among PIDs.

It should be noted that daily activities of PIDs in hostels could potentially result in the heightened vulnerability of fall. Due to the technology advancement, people spend long time in using mobile phone or tablets nowadays. Similarly, many PIDs in hostels also enjoyed using the electronic devices as an entertainment, such as watching movies or playing games. Lengthy usage of these devices among PIDs could result in computer vision syndrome including eye strain and blurred vision [25], which may in turn cause an increase in their fall risk.

Despite cataract, our findings also showed that both osteoporosis and osteoarthritis were associated with the fall risk among residents. Given the current research employed a cross-sectional design, the direction of relationships could not be found from our data. Still, current findings were consistent with previous empirical evidence concerning the roles of these conditions in fall risks. For example, osteoarthritis was found to be a significant risk factor of fall in Dore et al.'s study [18]. Another study showed that people with the diagnosis of osteoporosis did not show lower balance confidence nor poor obstacle avoidance abilities, and thus this diagnosis was not associated with a higher fall risk [17]. More evidence would be necessary to clarify whether these conditions could cause a heightened fall risk among PIDs.

There were a few limitations which needed to be considered when interpreting the current results. First, the sample size may not be sufficient to detect significant results despite several trends were observed (e.g. association between age and osteoporosis). Second, the current sample only included residents in a hostel setting. Given that the environments in hostel and at home could have great discrepancies, the current findings had limited

external validity in community settings. Third, without the use of control group, our data was not able to compare differences between ID and typical developing peers in hostel settings, or between PIDs with different etiologies (e.g. Down's syndrome, Fragile X syndrome) [26]. The inclusion of control group could provide a clearer picture on the role of cataract on fall risk among different population. Finally, MFS was used as the fall measurement tool and only nominal data (with or without fall risk) was employed as the outcome variables. The results could be enriched if it could be supplemented with a scale which measured the severity of fall risk in a continuous scale.

IMPLICATIONS FOR PRACTICE AND POLICY

The current results provided useful implications to improve the practice and policy in the care of PIDs in hostel setting. Fall prevention is considered as an important task in hostels, especially for ageing PIDs. The present study successfully identified cataract as an important health condition associated with high fall risk. Therefore, in daily practices of hostels, vision care can serve as a component of fall prevention strategies. It is acknowledged that the delivery of assessment and intervention for cataract may be difficult due to the mood and behavioral problems among PIDs. However, with a higher level of awareness of the importance of their vision, any screening results of cataract or vision status can provide useful information for the hostel to determine the necessary fall precaution strategies. For instance, environmental modification measures can be considered, such as arranging a less crowded area for residents with poorer vision, as well as more regular clean up to remove obstacles on the floor in hostels.

In the policy level, the government can consider providing additional support in promoting vision care services in hostels. Li and her colleagues suggested that although there were various challenges of providing vision care for PIDs, the situation could be improved by delivering more trainings to promote knowledge and awareness of this issue for different stakeholders including optometrists, as well as other caregivers and care workers [27]. As a result, more resources and efforts will be required to promote readiness of healthcare professionals to effectively assess and intervene the visual impairments among PIDs.

CONCLUSIONS

The current study revealed that cataract was a prevalent condition among residents in hostels, especially among those who aged over 45 years old. Furthermore, the diagnosis of cataract was also found to be a predictor of heightened fall risk in a hostel setting. Particularly, cataract uniquely predicted fall risk after controlling demographics, and the diagnosis of osteoarthritis and osteoporosis. The results recommended vision care as a possible monitoring strategy to alleviate fall risk among PIDs in hostels.

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SHAPE SYMPOSIUM 2024

THE ROAD HOME: BUILDING THE EVIDENCE BASE FOR A SERVICE DELIVERY MODEL THAT INTEGRATES HOUSING, MENTAL HEALTH, MEDICAL AND LEGAL SERVICES

Anne Smyth[1], Lesley Thornton[1], Kym Coupe[2], Carolyn Lynch[3]*

1. LDC Group, Australia
2. Road Home and Mental Health, First Step, Australia
3. Women Services, Launch Housing, Australia

Correspondence: Anne@ldc.net.au

THE FOCUS OF THIS MANAGEMENT PRACTICE ANALYSIS

The evaluation of the Road Home (RH) program has revealed many learnings of interest to practitioners, researchers and evaluators. The focus of this analysis is twofold - on an innovative approach to building an evidence base using a developmental evaluation [1] and action learning [2] design and how research knowledge and skills can be applied in practitioner contexts and be robust, rigorous and above all useful. It particularly features the role of reflective practice, an affordable, underutilised and easy to access evaluation and program improvement method for practitioners working with evaluators and researchers. Appreciating what is involved in approaching evaluation and other forms of organisational research in this way is important if industry collaborations and innovations that bring theory to practice and practice to theory are to be successful.

THE ROAD HOME PROGRAM AND CONTEXT

Where housing, health, legal and mental health services come together to support vulnerable people where, how and when they need it.

RH is a partnership between a community mental health, medical and AOD service First Step (FS) and First Step Legal (FSL) and a major housing and homelessness service provider Launch Housing (LH) in Melbourne Australia. The First Step team have partnered with housing workers to form an integrated multi-disciplinary care team to provide holistic, onsite support to people with multiple complex needs. Specifically, RH provides an integrated, timely, localised and tailored response to clients who are experiencing homelessness and significant housing stress. This is in stark contrast to the conventional and single discipline, siloed outreach and in-reach approaches that characterise service delivery in the community sector requiring referrals offsite. The often-delayed responses involved usually result in poor outcomes for clients and absorb considerable time for case managers to organise. This multidisciplinary model represents a genuinely innovative service design in the housing and homelessness space.

THE CLIENTS

People who are in crisis often have complex, co-occurring needs that act as barriers to positive housing outcomes. These people have experienced significant, sometimes lifelong trauma including abuse, neglect and violence and have had poor experiences with the service system resulting in little trust and disconnection

The clients RH serves are women and families who are in crisis (housing and much more) and have complex, co-occurring needs (MH, Medical, Legal) that act as barriers to engagement with services and positive housing outcomes. Their experience of often lifelong trauma, repeated, poor and exhausting experiences with the service system resulting in little trust has plunged them into homelessness. They are very vulnerable.

The program pilot, now in its third year, has being formally evaluated from the outset by LDC Group evaluators

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external to the services mentioned - the lead author is one of those evaluators. The evaluation is informed by their academic and research background applied in collaboration with the professionals from each of the services involved. In addition to the evaluation expertise brought by the evaluators, the multiple perspectives and practices contributed by team members from their different disciplines has immeasurably enriched the evaluation and the program and resulted in positive outcomes for all participants. They have all felt empowered by their expanded knowledge and skills in navigating the service system outside their specific area of expertise. The evaluative skills of the team members and their confidence in this area has also developed – an uncommon legacy of evaluations.

BUILDING THE EVIDENCE BASE - WHY DEVELOPMENTAL EVALUATION [3]

"At the heart of our approach is a desire to improve the system of supports available to people who experience some form of disadvantage, in order for them to live meaningful lives in their community."

The RH model has been built and adapted as it is being delivered with evaluation findings 'woven in' to guide, critique, strengthen and respond to emergence. Developmental evaluation, an exploratory, learning oriented and adaptive approach is particularly suited to the RH program because it works well to assist social innovators develop social change in complex, dynamic and uncertain environments. It facilitates real time data gathering and feedback to support adaptive and agile program development and learning and is fully integrated with program development. Development evaluation's participatory nature enables team members to play an active role in the evaluation and foster understanding and knowledge to explain what is occurring, why and with what impact.

The positioning of evaluators is quite different to traditional evaluations with evaluators typically positioned as outsiders for (perceived) independence and objectivity. Instead, the evaluators are integrated into the team to gather, interpret data, frame issues, surface, test and challenge models. This places a responsibility on evaluators to consistently promote rigour and protect against potential collusion. That requires us to systematically and regularly reflect on our role and provide opportunities to discuss and review our observations and responses to a range of data by:

- Reporting to the Advisory Group oversighting RH
- Helping the team reflect on their practice and understand what is contributing to impacts, why and how
- Active project management
- Preparation of interim reports on learning, impacts and outcomes.

As evaluators we bring a research 'sensibility' to the work emphasising the tests of sound qualitative research in organisational settings including rigour, systematic and methodical processes, thoroughgoing analysis and documenting useful outcomes. For us and the team it is imperative that the evidence is grounded in the experience of the program and demonstrates a clear chain of evidence. [4, 5]

BUILDING THE EVIDENCE BASE - WHAT WE DID

The evaluation was approved by the LH research and ethics process and all data deidentified. Data includes a range of quantitative information to provide a picture of the volume and type of client activity - presentations, support provided and outcomes. Qualitative data is gathered to show and explicate client and staff experience of the program and its impacts. This includes understanding what it takes organisationally to implement and sustain such a program. Specifically, this data provides insights into what it takes to build an effective multidisciplinary team, helps explain the impact of the numbers and documents rich and powerful stories about clients' RH experience. These are gathered by staff from clients who do not usually feel able to interact with external evaluators they do not know.

Evaluators and participants progressively analyse and make sense of this data and identify themes [6] which are fed into program processes including reflective practice meetings, program management and advisory group governance meetings, together with progressive reporting.

BUILDING THE EVIDENCE BASE – REFLECTIVE PRACTICE [7, 8] THE GAME CHANGER

I felt like once we started this process, we got better at working together quicker and things settled, and we started to understand what we are doing together. Reflective practice changed for the better the connectiveness

Crucial for us as we exchange ideas, and it helps us to keep going.

(Reflective practice) is grounding – it's like having a meeting with yourself, (we are) …. more aware of what we do and how we function, ways of navigating things so we can work better together

Team and client engagement took some time to develop as staff came to grips with a very different way of working and built trusting relationships. Vulnerable clients who had a poor experience of the service system were hesitant to become involved. These two elements were intertwined and as confidence grew so did engagement. A critical factor in this was the introduction some months into the program of monthly team reflective practice meetings facilitated by the evaluators

These meetings have served multiple purposes consistent with developmental evaluation where the data is dynamically folded into program development and learning. Specifically, they enable the evaluators to:

- Strengthen team and client engagement with the program
- Work in step with the team to conceptualise, test, and understand what is occurring in real time as the model is applied in practice
- Chart shifts in the team's thinking, processes, and practice
- Surface exceptionally rich and nuanced client and staff data and insights
- Build team trust and deep cross disciplinary learning
- Reshape RH in light of emerging information
- Help embed RH to become 'how we do things around here'

DISSEMINATING THE EVIDENCE BASE - REPORTING AND ADVOCACY

Getting the evidence out there is a concern for researchers and for practitioners who want to influence its broader application to strengthen services and value to clients and the community. A decision was made by the project governance group in conjunction with the evaluators to communicate the strong evidence of value, benefit and impact in the final year of the pilot rather than at the end of funded project. This is in contrast to traditional reporting both in practice land and in the academy.

The focus shifted to system advocacy and targeted dissemination to maximise chances of extending the RH model at LH and potentially to housing other providers and secure funding. This is beginning to bear fruit in terms of interest by some organisations and those working in the field. The suite of reporting products includes two substantial interim reports, a number of annotated slide packs tailored to specific audiences, impactful stories and visuals to explain the value and benefits of funding and implementing this model and the numbers – client activity data and outcomes. It also includes presentations to significant practitioner conferences; THEMHS Mental Health Services Conference August 2024, The Australian Evaluation Society International Evaluation Conference September 2024, The Australian College of Mental Health Nurses October 2024 and well as housing, mental health and legal forums.

LEARNINGS ABOUT WHAT IT TAKES TO RESEARCH AND EVALUATE WITH PRACTITIONERS

For researchers to evaluate and research effectively with practitioners in a genuinely collaborative manner goes way beyond the transfer of knowledge from researchers to practitioners. This involves:

- *Recognition and respect* for the different kinds of knowledges researchers and practitioners bring to a task that is actively exchanged, each learning from the other
- *Collaborative codesign* that explicitly factors in different knowledge and skills and addresses researcher and practitioner needs, interests and tensions
- *Leadership* (from the managers of LH, FS and FS Legal) that supports and guides staff as they grapple with the changes a significantly new service model represents as it seeks to integrate very different ways of working
- *The use of frameworks and tools* that support the dynamic interaction between generating quality data, program development and practice change with each informing the other. This includes sound project management and governance, the application of a theory of change and transition [9] to guide the project, implementation guidance, reflective practice, collaborative data gathering and sense making
- *A focus on dissemination not just publishing in journals.* Seeking a variety of ways to get the evidence-based findings out there to different audiences to promote and accelerate change

A WORD ABOUT IMPACT AND OUTCOMES

"You get better outcomes when working in a collaborative way. We work with highly complex people so no one person can be expert in all these areas. When you have lots

of people involved and everyone has [a] different role and everyone is addressing a different barrier."

This quick overview will give you a sense of RH impact and outcomes. The team have reported the following:

- Barriers are removed and active, timely support to access services is provided – these include legal issues such as accumulated fines, significant mental health issues, addiction and medical problems.
- Clients experience services as responsive, flexible and supportive
- There have been demonstrable improvements in mental and physical health, legal, and tangible housing outcomes
- There has been a tmelier identification and management of clients at risk.
- Increased client engagement and help seeking behaviours have increased
- Staff have reported reduced stress, a more effective use of time and an increased sense of safety and satisfaction with their role
- There has been a reduction in siloed responses through the integrated, multidisciplinary teamwork model with much better client engagement and outcomes
- The upskilling of staff about how to work with mental health, legal and health factors to achieve improved client housing outcomes has been significant.

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SUSTAINABILITY OF HOSPITAL ACCREDITATION PROGRAMS IN LOW AND MIDDLE-INCOME COUNTRIES: LESSONS LEARNED FROM SRI LANKA

Dilantha Dharmagunawardene[*1,2], *Mark Avery*[1], *Paula Bowman*[3], *David Greenfieldand*[4], *Reece Hinchcliff*[1,3]

1. School of Applied Psychology, Griffith Health, Griffith University, Australia
2. Ministry of Health, Sri Lanka
3. School of Public Health and Social Work, Queensland University of Technology, Australia
4. School of Population Health, University of New South Wales, Australia

Correspondence: dilantha.dharmagunawardene@griffithuni.edu.au

ABSTRACT

OBJECTIVE:

Many hospital accreditation programs developed for or implemented in Low and Middle-Income Countries (LMICs), including Sri Lanka, have been discontinued due to multiple factors. This study was conducted to elicit and analyse factors influencing the Sri Lankan hospital accreditation program that was initiated in 2015.

DESIGN & SETTING

This case study employed document reviews and 18 key informant interviews with stakeholders involved in Sri Lanka's accreditation program. Collected data were thematically analysed.

MAIN OUTCOME MEASURES:

Data extraction was guided by the constructs of the ACES-GLEAM Framework, which was developed based on the results of a scoping review.

RESULTS:

Barriers identified were frequent changes in the leadership and strategic plans, lack of awareness and competencies on accreditation among local stakeholders, and non-alignment of accreditation standards with the local health system context hampered by resource and infrastructure constraints. Enablers for program development commonly raised were the commitment of stakeholders, the availability of institutional structures for quality assurance, donor funding from the World Bank, and technical expertise and surveyor training by the Australian Council on Healthcare Standards International.

CONCLUSIONS:

The study identified that multiple factors contributed to the poor sustainability of the Sri Lankan accreditation program. These findings can be useful reflections and guidelines for the accreditation stakeholders to establish sustainable and effective programs in LMICs

KEYWORDS
Hospital accreditation, Quality, Patient Safety, Low and Middle-Income Countries, Sri Lanka, Case Study

INTRODUCTION

Hospital accreditation programs are designed to strengthen the quality and safety (Q&S) of hospitals and health systems. Q&S issues can exert an immense burden on healthcare systems. In LMICs, there are an estimated 134 million adverse event incidents per year, resulting in 2.6 million deaths [1]. It is estimated that 25% of hospitalized people experience harm from healthcare, and 1 in 24 people die due to unsafe care in LMICs [2]. Accreditation, as a strategy to improve Q&S, is a key global focus for health systems strengthening, especially in LMICs, due to the human and economic impact of unsafe, low-quality healthcare [1, 2, 3].

Accreditation is defined as a "self-assessment and external peer review process used by healthcare organizations to accurately assess their level of performance in relation to established standards and to implement ways to continuously improve the healthcare system." [4, p.05]. During the accreditation process, the performance of healthcare organizations is assessed based on pre-defined standards, which are usually developed based on structure, process, and outcomes (i.e. the Donabedian Framework) [5]. Accredited healthcare organizations strive to apply, meet, and maintain their performance by conforming to these pre-specified standards (quality assurance) [6]. Since accreditation agencies regularly update their accreditation standards to enhance quality, accredited healthcare organizations must also strive to adopt new evidence-based practices (quality improvement) [7]. In these ways, accreditation programs generally have focus on quality assurance and quality improvement objectives.

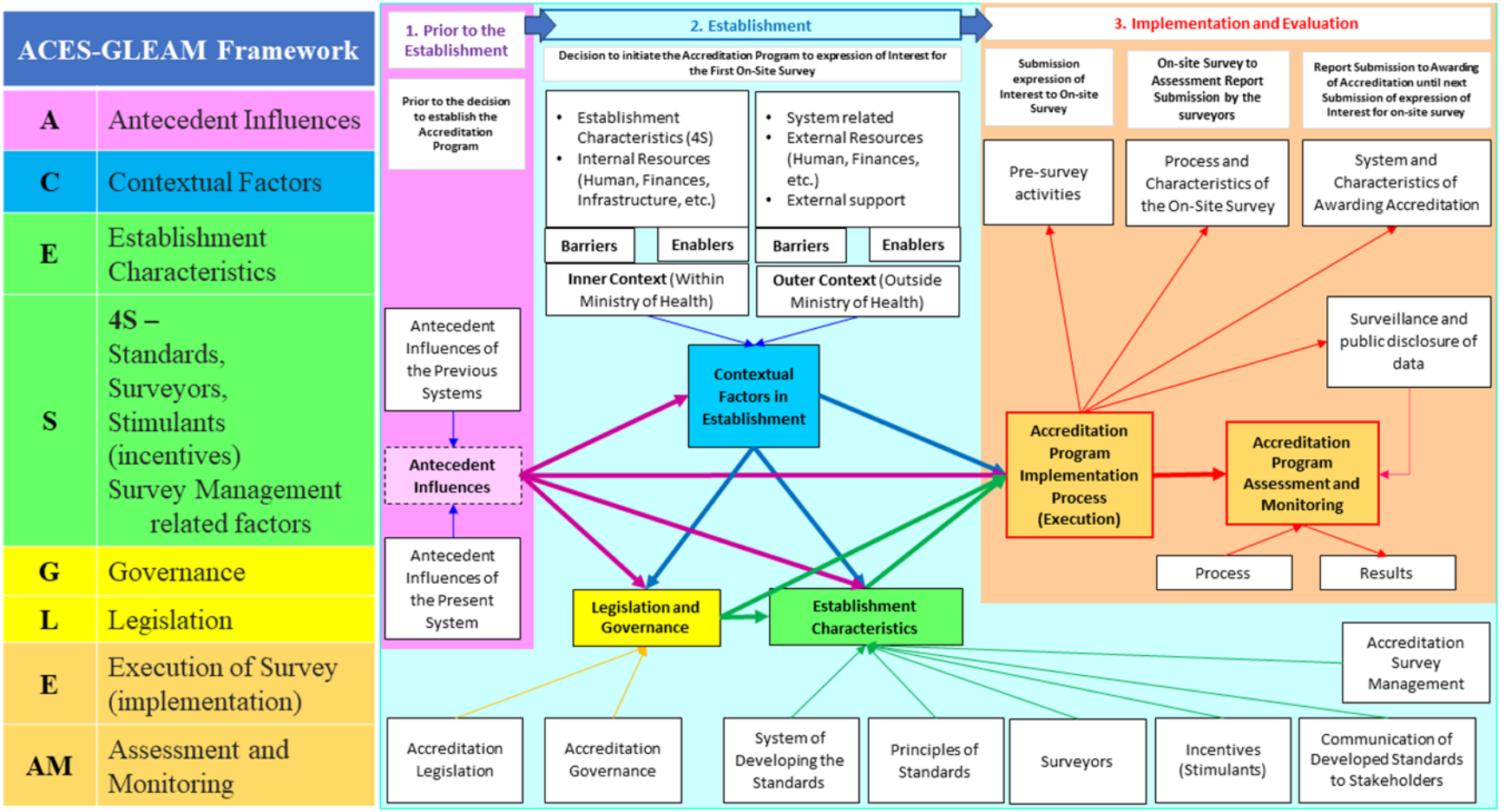
While positive contributions to improve Q&S are being increasingly implemented, there are numerous challenges to implementing accreditation programs in LMICs [8]. The sustainability of programs in several LMICs has been compromised due to a range of cultural, resourcing, and governance issues [9]. One of the key challenges is cost; of the initial development, ongoing operation, and considerable training and preparation costs [10]. Accordingly, many commenced or implemented accreditation programs, including in Sri Lanka, have been discontinued without producing clear benefits [11, 12, 13, 14]. This makes the sustainable implementation of hospital accreditation programs an important global Q&S priority. This case study aimed to elicit in-depth, first-hand information on factors associated with the accreditation program establishment processes in Sri Lanka, where the country's accreditation program was initiated in 2015 and discontinued in 2019. This research note presents preliminary reflections on the results.

METHODS

A qualitative case study method [15, 16, 17] was used. Document reviews and key informant interviews were used for the data collection. Based on the results from a scoping review, an interview guide was developed using the constructs of the ACES-GLEAM Framework (Figure 1). Subsequently, the guide was validated by relevant experts and pilot-tested with independent Sri Lankan healthcare administrators. The main constructs of the ACES-GLEAM framework are Antecedent influences, Contextual factors, Establishment characteristics (sub-themes (4S) – standards, surveyors, stimulants (incentives), survey management), Governance, and Legislation, Execution of the survey, and Assessment and Monitoring of the program.

Interviews were conducted in English with 18 participants in April 2024 (Sri Lankan Ministry of Health (MoH) officials – 6; Sri Lankan Hospital Administrators – 3; Surveyors from Australian Council on Healthcare Standards International (ACHSI) – 3; Sri Lankan accreditation surveyors – 3; Postgraduate medical trainees and medical officers who were involved in the process – 3). Transcripts and data from document reviews were thematically analysed using a critical review method [18]. Ethical clearance was obtained from the Human Research Ethics Committee of Queensland University of Technology, Australia (Ethics Approval Number 6951).

FIGURE 1: THE "ACES-GLEAM" FRAMEWORK



FINDINGS

These findings are the preliminary review from the interviews and document reviews that were conducted. The classification based on the constructs of the ACES-GLEAM Framework (Figure 1) is used to present the findings.

ANTECEDENT INFLUENCES

A need to go beyond the existing long-standing quality assurance program was the main reason for change mentioned by the senior officers of the MoH. The Sri Lankan quality assurance program was initiated in 1988, and two hospitals (Castle Street Hospital for Women and District General Hospital, Ampara) gained international recognition for their quality initiatives by winning international quality awards. Subsequently the "National Policy on Healthcare Quality and Safety" highlighted implementation of hospital accreditation processes as one of the strategies for enhancing the managerial systems and process improvement [19]. This need, combined with the personal interest, enthusiasm, and international exposure of senior officers, fuelled the initiation of the new accreditation program.

In addition, a few Sri Lankan private hospitals were accredited by the Joint Commission International (JCI) and the ACHSI as a strategy for promoting medical tourism [20, 21]. The involvement of the ACHSI and its experts in private hospital accreditation was one of the influences mentioned by the interviewees. The document reviews and interviews completed illustrated that international donor agencies (mainly the World Bank) extended financial assistance for the establishment of an accreditation program through the "Health Sector Development Project" [22], aligned with the global trends of Universal Health Coverage (UHC), Millenium Development Goals (MDGs), Sustainable Development Goals (SDGs).

LEGISLATION AND GOVERNANCE

The document review identified that the "National Policy on Healthcare Quality and Safety" was approved by the Sri Lankan Cabinet of Ministers on 27th May 2015 as the main guiding document for this accreditation initiative, [19] and "National Council for Accreditation (NCA)" was initiated with technical assistance from the ACHSI [23]. NCA had representation from medical administrators, academia, and professional colleges but with no representation of the non-medical community. According to the documentary evidence, only a few meetings of the NCA were held. Almost all the study interviewees had the impression of minimal impact from legislation for the establishment of the new accreditation program. Interviews and documentary evidence highlighted that there was a positive operational governance by the Directorate of Healthcare Quality and Safety (DHQS) [23], and initiatives were implemented through available institutional structures, termed Quality Management Units (QMUs)

ESTABLISHMENT CHARACTERISTICS – STANDARDS

Interviews revealed that initial attempts were made to adapt JCI, Indian National Accreditation Board of Hospitals (NABH), and ACHS standards to the Sri Lankan context, and later, it was decided to adopt the accreditation process and the program structure of the ACHS standards, "EQuIP6" [24]. Document reviews reported that two workshops on standards development were held for the members of NCA by the ACHSI experts, and 32 committees (each composed of a leader, convenor, and members representing medical administrators, academics, and clinicians from professional colleges) were formed. These committee members were approved for higher remuneration payment compared to the standard government rates.

After 18 months only 17 committees finalized their respective standards and the attempt to design national standards through a multi-stakeholder participatory approach failed due to the inability to meet the project deadlines. Therefore, the final accreditation project implementation used "EQuIP6" Standards [24]. This approach aligned with the perceptions of some study interviewees, that healthcare provision should be of equal standard for every system and as the Sri Lankan private hospitals and Australian remote, resource-constrained healthcare facilities and settings were using the same "EQuIP6" Standards. In contrast, other interviewees had many concerns about employing standards that do not match the Sri Lankan context. They proposed that there should be a clear road map with a robust monitoring and evaluation process and a long-term plan for incremental implementation, if "EQuIP6" standards are to be implemented within the Sri Lankan public sector hospitals, as there were concerns about achievability of this direction.

ESTABLISHMENT CHARACTERISTICS – SURVEYORS

This study found that a combination of local surveyors, who were trained by ACHSI and ACHSI surveyors, were utilized for the accreditation surveys. Local surveyors were purposively selected by the MoH for the ACHSI training and

were mainly composed of medical administrators and clinicians. They were trained in a 5-day workshop, and 12 surveyors were selected after an examination and assessment process conducted by the ACHSI.

ESTABLISHMENT CHARACTERISTICS – STIMULANTS (INCENTIVES)

No financial or non-financial incentives could be identified during the scrutiny of documents or from the interviews.

ESTABLISHMENT CHARACTERISTICS – SURVEY MANAGEMENT

Accreditation survey management was handled by the DHQS and almost all the interviewees were very positive about the meticulous coordination and facilitation undertaken. At the institutional level, the surveys were coordinated by the QMUs. Some of the Sri Lankan interviewees had concerns about the poor communication of the standards to the participating hospitals and the lack of awareness of "EQuIP6" standards at the institutional level. This was believed to be due to the provision of a one-day training program on standards only for hospital administrators and the distribution of standards only two weeks before the survey.

EXECUTION (IMPLEMENTATION) OF THE SURVEY

The initial accreditation surveys were conducted as a gap analysis approach in six pilot hospitals, and it was considered valuable as training for local surveyors (identified in the document reviews). The ACHSI surveyors interviewed mentioned that the surveys employed standard international accreditation methodologies. They had positive perceptions of the facilitation by the local trainee surveyors and engagement from the local hospital staff. However, they identified issues due to language barriers and cultural mismatch and mentioned many important gaps in implementing standards, especially in relation to infection control. All Sri Lankan interviewees were extremely positive about the surveys as a learning exercise.

ASSESSMENT AND MONITORING OF THE PROGRAM

The interviewees mentioned that the gap analysis report regarding the initial surveys was delayed by the ACHSI, as there was a contract payment amount due from the Sri Lankan government. The report was later available but was not disseminated by the DHQS to the stakeholders and was not publicly made available. Senior officers from the MoH mentioned that the survey report results were presented and discussed at the higher-level committees (i.e. the National Health Development Committee).

CONTEXTUAL FACTORS

The contextual factors identified through this study have been initially classified as internal and external factors and then as enablers and barriers (Table 1).

TABLE 1: ENABLERS AND BARRIERS REPORTED THROUGH DOCUMENT REVIEWS AND PERCEPTIONS OF THE INTERVIEWEES

	Enablers	Barriers
Internal		
Resource-related – Human Resources	• Commitment of senior officials of MoH • Engagement and willingness to learn from the involved institutional staff	• Frequent changes in the leadership at the focal point of implementation • Decision-making by only a few senior officials at the MoH • Not involving multidisciplinary and non-medical teams and experts • Institutional staff were not aware of the standards or the objectives of the gap analysis • Competencies of the health staff in regard to accreditation – confined mainly to staff of central-level structures

	Enablers	Barriers
		• Inclusion of only medical staff and inclusion of purposively selected individuals, as local surveyors,
Resource-related – Financial		• Financial constraints at the institutional level to implement the standards
Resource-related – Others		• Infrastructure constraints at the institutional level to implement the standards (mentioned mainly by ACHSI assessors)
System-related	• The "National Policy on Healthcare Quality and Safety" approved by the Cabinet of Ministers • Availability of institutional structures for quality assurance and quality improvement – Quality Management Units with required human resources – Medical Officer, Nursing Officer, and Development Officer, equipment and infrastructure	• No legislative backing or not integrated with legal or governance reforms • Sudden and frequent changes to the strategic plans, presumed to be done to meet the project's financial deadlines • Frequent changes and diversions to the program • Enormous workload of the hospitals with quality not a priority (mentioned mainly by ACHSI assessors) • Non-alignment of standards with the local working environment or context • Non-utilisation of incentives
External		
Resource-related – Human Resources	• Training from international ACHSI experts for surveyors and leaders from MoH • International exposure of leaders through external collaborations • Training on standards development for members of NCA by ACHSI experts	
Resource-related – Financial	• Financing from international donor agencies (The World Bank), as the second "Health Sector Development Project"	• Discontinuation of donor funding by the World Bank in 2019 • National economic crisis during 2022
System-related		• EQuIP6 based standards were outdated, with the lengthy project

	Enablers	Barriers
		duration, and EQuIP7 became the most up to date version
Other		• COVID-19 pandemic during 2020 and 2021

DISCUSSION

This case study for Sri Lanka analysed the document reviews and perceptions of key informants, to identify multiple factors that contributed to the accreditation program establishment in Sri Lanka from 2015 and its subsequent discontinuation in 2019. The preliminary results for this study were classified using the novel ACES-GLEAM framework, which revealed similarities and contrasting features of the Sri Lankan accreditation program establishment process to other LMICs.

The Sri Lankan hospital accreditation program establishment was financially and technically supported by international donors and accreditation agencies (which is similar to most other LMICs) [12, 25, 26, 27, 28]. Despite these initial international collaborations, the program was discontinued once the support had concluded, reflecting a spectrum of resource (mainly financial constraints, followed by infrastructure) [11, 12, 27, 29, 30], contextual (failure to adapt standards to the local working environment) [12, 31, 32] and governance (frequent changes in leadership at the focal point of implementation) [11, 28, 29, 33] challenges, which are common to most LMICs [8, 11, 12, 27].

Sri Lanka had a long-standing quality assurance program, an established national focal point for quality (DHQS), and a widespread established network of institutional QMUs. This contrasted with the initiation of accreditation in some LMICs, where accreditation programs were initiated by international agencies as a remedy to strengthen weakened health systems [11, 28, 34, 35]. However, the COVID-19 pandemic and economic crisis have weakened the Sri Lankan health system to a certain degree and contributed to the discontinuation of the program.

Another contrasting feature in Sri Lanka, which was not reported in the literature relevant for other LMICs, was the frequent changes in strategic plans presumed to be done to meet the financial deadlines of foreign-funded projects. Accordingly, accreditation standards development to align with the local context had to be abandoned prematurely, and standards were inadequately disseminated to the participating hospitals. This is one of the weaknesses of the short-term project approach in accreditation program establishment in LMICs, where long-term planning and stepwise approaches are more beneficial when considering the resources, contextual, and governance limitations [27, 28, 33, 36]. Therefore, foreign collaborations should target long-term improvement of the capacities of LMICs for establishing tailor-made accreditation programs aligned with the country-specific contexts rather than short-term coercive transfers of externally developed accreditation programs and standards.

The main limitation in this study was the risk of recall bias, but the timing of informant interviews three years after discontinuation was considered a sufficient period to enable participants to speak honestly about their experiences.

CONCLUSION

This case study highlights the challenges associated with developing a sustainable accreditation program in LMICs, where the local context (resources, system, capacity for implementation) may not always be well understood by global accreditation and donor agencies. Frequent changes in Sri Lankan leadership and strategies, financial constraints, non-alignment of accreditation standards to the local context, and lack of capacity to integrate the international accreditation system in terms of competencies, infrastructure, and resources contributed to the ineffectiveness and poor sustainability of the Sri Lankan accreditation program. The findings from this case study highlight opportunities for accreditation stakeholders to refine the processes used to design and implement hospital accreditation programs in LMICs and, in this way, strengthen the quality and safety of healthcare globally.

AUTHORSHIP

DD did the initial conceptualization, design of the research, analysis, interpretation, and prepared the initial draft of the manuscript. PB contributed for reviewing initial conceptualization, study design, and methodology. MA refined the interpretation of results and co-reviewed the initial draft of the manuscript. DG reviewed the design and interpretation of the results. RH reviewed the initial conceptualization, design of the research, analysis, and final approval of the manuscript. All authors reviewed the manuscript before final submission.

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CONFLICTS OF INTEREST

DD is currently engaged as an international assessor for the Australian Council on Healthcare Standards International (ACHSI). MA is the Editor-in-Chief of APJHM.

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MATERNITY CARE SUSTAINABILITY IN RURAL AUSTRALIA

Linda K Jones, Sarah Elliott, Lynne Staff*

School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, New South Wales, Australia

Correspondence: linjones@csu.edu.au

ABSTRACT

INTRODUCTION:

In recent years there has seen significant closure of small maternity units particularly in rural regions of Australia. Those small maternity units that do continue to care for childbearing women may only provide antenatal and postnatal care with women giving birth in a larger maternity unit often some distance away.

There are some small maternity units that continue to provide complete care to childbearing women which is the focus of this research. The issue here is that these small rural maternity units tend to only cater for women who are having a low-risk pregnancy. When the women are deemed 'high risk' they will need to transfer to a larger maternity unit for their ongoing antenatal visits and to birth. These larger maternity units are often some distance away requiring women to travel for each antenatal care visit and for birth.

This research aims to explore women's experience of having to transfer their care to a larger maternity unit due to being deemed at risk through interview of 40 women deemed at risk.

METHODS:

Focus of the research was women's experiences of needing to transfer their maternity care and used a qualitative descriptive phenomenology approach. To date seven women have been interviewed.

RESULTS:

This paper presents the preliminary findings from the interviews that have been undertaken to date on seven women. The data is presented under emerging themes which will be refined with further interviews. The emerging themes are 'women had no agency', 'the hidden cost' and 'the journey continues'.

CONCLUSION:

The paper presents the preliminary findings from these interviews. Ultimately the aim is to assess how care can be improved for these women and potential options/models of care and make these small rural maternity units sustainable.

KEYWORDS

rural women, maternity care, high risk, transfer, experiences.

INTRODUCTION

It is estimated that there are 300 maternity units across Australia with approximately 70% classify themselves as being in a rural and remote area (Homer et al., 2010). Though it has been reported, however, that it is challenging to accurately identify the number of rural and remote maternity units due to inconsistency in record keeping (Longman et al., 2014). In recent years there has seen significant closure of small maternity units particularly in rural regions. It is estimated that over the last 20 years 130 maternity units have closed (Bradow et al., 2021). Reasons attributed to this include maternal and neonatal safety due to lack of adequately qualified workforce, specifically midwives and GP obstetricians or anaesthetists. This is partially because these maternity units require 24 hour surgical and anaesthetic coverage onsite (Kruske et al., 2015). These small maternity unit closures are not always, however, because of staffing shortfalls and occur despite the evidence indicating that normal birth can safely occur in these units (Barclay & Kornelsen, 2016; Bradow et al., 2021). Those small maternity units that do continue to care for childbearing women may only provide antenatal and postnatal care with women giving birth in a larger maternity unit often some distance away (Homer et al 2010). There are some small maternity units that continue to provide complete care to childbearing women which is the focus of this research.

There has been some research undertaken where small maternity units have closed resulting in the need for women to access their childbearing care in a larger maternity unit that is often some distance away. Closure of maternity units have resulted in several issues. This includes the potential increased stress and risk to families as birth may occur outside of appropriate healthcare setting as well as the increased costs associated with increased travel and potential accommodation away from home and away from the women's family and support networks (Bradow et al., 2021; Evans et al., 2011; Hennegan et al.,2014; Ireland, 2009; Kruske et al., 2008). Consequently, this results in "significant social and health service risks that in turn exacerbate avoidable clinical risks" (Barclay & Kornelsen, 2016: 10). There are several specific consequences that have been identified in relation to childbearing care of these women following the closure of small maternity units. This includes delay in reporting pregnancy (Ireland, 2009), having no antenatal care (Ireland, 2009; Kruske et al., 2008), presenting to maternity unit late in labour (Ireland, 2009; Kruske et al., 2008), increased out of hospital unplanned births to name a few (Barclay & Kornelsen, 2016; Kildea et al., 2015), and most often needing to relocate to a larger centre to await the birth of their baby (Bradow et al., 2021; Evans et al., 2011; Hennegan et al.,2014) . Much of the work undertaken in this area has been specifically related to the impact on Aboriginal and Torres Strait Islander women in rural areas in Australia and the issues faced with maternity unit closure. Aboriginal and Torres Strait Islander women are usually identified as being of higher risk and are often required to birth in a larger usually metropolitan hospital, forcing them to relocate prior to birth and wait for this to happen. This results in added expense and isolation from any level of support as well as being away from other children and family members (Evans et al., 2011; Hennegan et al.,2014; Ireland, 2009; Kruske et al., 2008).

There are some small maternity units that continue to provide childbearing care for women who are deemed at low risk, meaning that all care is provided by the healthcare staff in that maternity unit. Sometimes women from these maternity units are required to transfer their care to a bigger maternity unit where there is higher level care (Kruske et al., 2015). A retrospective study was undertaken by Kruske et al., (2015) examining clinical outcomes of women who needed to transfer from one small maternity unit to a larger unit. This was from what is called a Primary Maternity Unit in Queensland which is a free-standing birth centre providing childbearing care to women predominantly by midwives in collaboration with general practitioners and limited obstetric, anaesthetic and paediatric support. In this unit women were required to transfer their care if complications arise to a higher-level service or larger maternity unit around one hour away. This study only examined the reasons for transfer and the travel times involved. It did not explore the women's experience of being transferred for care.

There has been some research undertaken looking at outcomes when women are required to transfer from rural hospitals to larger facilities during an obstetric emergency (Rigby et al., 2018). For instance, women in threatened premature labour are often transferred to larger facilities during pregnancy in case they birth a premature infant because they are in preterm labour, premature preterm rupture of membranes or have an antepartum haemorrhage (Rigby et al., 2018). The aim of this research was to ascertain the clinical reasoning behind the transfer of these women.

The focus of this research is when women are booked into a small maternity unit, usually that is rural or remote, for their childbearing care but are deemed to be at a high risk, determined by the risk assessment guidelines. This can be because of their 'advancing' age, high BMI or development of gestational diabetes, hypertension, just to name a few. These women consequently must travel past the local maternity unit to attend antenatal care visits and of course childbirth in the larger maternity unit. Under these circumstances women are travelling some distance for their antenatal appointments, waiting for some time to see, usually a different doctor each time and then returning home. When they are due to birth, these women often have to then relocate themselves close to the hospitals or are induced so that the labour and birth are 'planned'.

There appears to have been little exploration of women's experience when they are deemed at risk and are required to transfer their care and have their antenatal and childbirth in a larger maternity unit that is usually some distance away. This research aims to explore women's experience of having to transfer their care to a larger maternity unit due to being deemed at risk through interview.

METHODOLOGY

There is a need with this research for an approach that focuses on people consciousness of experiences of a phenomenon. In this case women who have to transfer their antenatal and childbirth care to a larger maternity unit. Such an approach that would be suitable is phenomenology which is the study of a phenomenon as a 'lived experience' or as it is meaningfully experienced (Whitehead et al, 2020). It is the role of the researcher to look, listen, feel, view, experience and go with the individual on their experience and thereby investigate, describe, interpret and extrapolate meanings of the essence of the phenomenon (Whitehead et al, 2020). Phenomenology provides such a means to achieve this goal and is the methodology that will be used for this research. This research is exploring an area with there is limited literature and as such used a qualitative exploratory phenomenological approach.

SETTING

Women who live in a rural and remote part of NSW and are booked into a local maternity unit for childbearing care who are then deemed at risk and required to have their antenatal care and childbirth in a larger maternity unit.

Recruitment

Recruitment of the women occurred through a specific research project social media site. Inclusion criteria is women over 18 years who had booked into a small rural or remote maternity unit for their childbearing care who are required to have their antenatal and birth care transferred to a larger maternity unit for ongoing care. These women will be a convenience sample and recruited postnatally around 10 to 12 weeks or more after birth. It is anticipated that 40 to 50 women will be recruited or until saturation of data and no new information is revealed.

DATA COLLECTION

Ethics approval was obtained from the Charles Sturt University Human Research Ethics Committee in November 2023. All participants received a copy of the Participant Information Sheet and Consent Form prior to commencing the interviews. Informed consent was obtained prior to starting the interview. Data collection began in August 2024.

Semi structured interviews were used. This technique for data collection uses an interview guide with set questions for discussion. The questions are open ended and non-directive designed to trigger and stimulate an open discussion. In other words, the guide is flexible enough to facilitate the interviewer to follow leads and areas of interest (Whitehead et al., 2020). Interviews occurred through Zoom, were audio recorded and lasted for approximately 40-60 minutes. This was then transcribed verbatim utilising zoom and checked for accuracy.

DATA ANALYSIS

Transcripts were deidentified with participants choosing their pseudonym from a list of gem names. Thematic analysis is a systematic process that allows the researcher to go through three major steps of: identifying patterns in the data; classifying or encoding the patterns; and interpreting the patterns.

RESULTS

Twenty-six women have responded to the expression of interest to be part of this research to date. These women have been contacted to organise an interview. Included thus far are women who have had to transfer their maternity care due to being low high risk, high high risk and also situations where the local hospital has closed, does not have a maternity service, or has been on bypass and women have had to transfer care as a result. High high risk includes women who have had to be admitted to another

hospital for ongoing care for things such as premature labour. Low high risk includes women with such concerns as a high body max index, high blood pressure or diabetes. These women require extra surveillance but are usually not admitted into hospital.

Overwhelmingly the women who have been interviewed have expressed gratitude for the opportunity to share their experience with many reflecting that this is the first time they have spoken about their experience. This paper presents the preliminary findings from the interviews that have been undertaken to date on seven women. The data is presented under emerging themes which will be refined with further interviews. There are no direct quotes added at this stage of the data analysis as this is preliminary findings. The emerging themes are 'women had no agency', 'the hidden cost' and 'the journey continues'.

WOMEN HAD NO AGENCY

Generally, women felt that they were invisible through the process and more of a number than a person. Women felt that healthcare professionals focused on the baby and ignored that there was a women carrying that baby. Healthcare professionals were too busy to care for the women even to the extent of not informing the women what was happening to them and what to expect. Women commented that they were so shocked about the suddenness to transfer, and in part, this was caused by not being given any knowledge of what was happening to them or what to expect. There was also no continuity of care for women, resulting in them having to repeat their story over and over to a different health provider at each visit. They expressed their frustration at having to do this.

This frustration extended to the lack of communication between the local hospital and the hospitals that women were transferred to. Women commented that the hospital they were being transferred to did not know enough about them. Furthermore, several women mentioned that they were pushed out of their bed as the this was needed for someone else. One woman was removed from her bed and left for three hours in a waiting room until she and her infant were 'officially' discharged.

For the women who were interviewed antenatal and postnatal care was the most problematic. This was because of the travel that was involved with having to transfer and the implications that this had on them personally. There were some women who reported having their antenatal care undertaken over the phone from the transferring hospital, but with no personal contact with anyone from the hospital they were transferred to. This is an area that needs further exploration in the remaining interviews.

THE HIDDEN COSTS

Having to transfer care involved a cost to the women. This included having to take time off from work to attend for care. As a consequence of the distances between maternity units, women had added costs of overnight accommodation and meals. This also meant the women were away from their families and support. This travel also entailed a cost of fuel for the car they travelled in. In some cases, partners had to take time off work to be with the women at this time.

In addition, there was the emotional cost of this transfer of care. Women reflected about the toll that this had on their partners and support people. More importantly was the toll that being transferred had on the women themselves, as illustrated here:

"Just because a woman seems strong on the outside and can hold their own, doesn't mean she isn't crumpling on the inside. It would be fair to say I could have PTSD from our journey, never diagnosed but a definite no from me for ever having more children. I couldn't do that again and come out sane." (Sapphire)

AND THE JOURNEY CONTINUES

Once the baby is born, these challenges for the women and her family continue and do not stop following the birth. There are often protracted nursery stays for the infant, with all that this entails. Once the infant(s) is discharged, ongoing check-ups of the baby are required, which occur at the hospital they were transferred to. These visits also entail the costs of travel, accommodation and meals. Further was the ongoing anxiety and concern these women expressed with the continued difficulties they had previously experienced.

Despite all of this, however, women expressed their gratitude for the care they had received. This can be summarised by the following:

"We really do live in a lucky country. But it is hard when you are from regional Australia." (Sapphire)

DISCUSSION

Overwhelmingly the women who have been interviewed had expressed gratitude for the opportunity to share their experience with many reflecting that this is the first time they have spoken about their experience. Generally, women felt that they were invisible through the process and more of a number than a person. Women felt that healthcare professionals focused on the baby and ignored that there was a women carrying that baby. Healthcare professionals were too busy to care for the women even to the extent of not informing the women what was happening to them and what to expect. The focus on the baby, or fetocentric care has been previously discussed in the literature as an issue identified by many women (Yates, 2016) and is reported to contributed to perceptions of birth trauma and related development of post traumatic distress (Harris & Ayers, 2012).

Women having to transfer care involved several costs. This included having to take time off from work to attend for care. As a consequence of the distances between maternity units, women had added costs of overnight accommodation and meals. This also meant the women were away from their families and support. This travel also entailed a cost of fuel for the car they travelled in. In some cases, partners had to take time off work to be with the women at this time. This has previously been identified in research into this area (Bradow et al., 2021; Evans et al., 2011; Hennegan et al.,2014; Ireland, 2009; Kruske et al., 2008).

In addition, there was the emotional cost of this transfer of care. Women reflected about the toll that this had on their partners and support people. This has also been reported in the literature and what has contributed to women not having further children (Bradow et al., 2021; Evans et al., 2011; Hennegan et al.,2014; Ireland, 2009; Kornelson et al., 2001; Kruske et al., 2008).

Once the baby is born, these challenges for the women and her family continue and do not stop following the birth. This is particularly the case for women who birth prematurely as the baby remains in hospital, sometimes for some time. Women then continue to travel to the hospital or stay there for some time to be with their baby. The increased psychological toll for these women can sometimes be significant.

This is an under investigated area with increasing numbers of women being transferred for care. This will contribute valuable data that will help inform practice, health service and health policy development.

CONCLUSION

This research aimed to explore women's experience of having to transfer their care to a larger maternity unit due to being deemed at risk through interview. Interviews have been undertaken on seven women to date. The emerging themes are 'women had no agency', 'the hidden cost' and 'the journey continues'. This indicates that having to transfer care to a larger maternity unit during childbearing has a significant toll on women and their families. More work needs to be undertaken to ascertain from the support people and health professionals to understand their experiences.

AUTHORSHIP:

All authors have contributed to the conception of this research, writing of research grant application, undertaking the research and the development of this paper. Authors have approved the final version of this paper.

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CONFLICTS:

The authors declare that there are no conflicts of interest involved with this research and preparation of this paper.

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A STUDY ON THE ASSOCIATION BETWEEN POVERTY, DEMOGRAPHICS, FAMILY SUPPORT, AND CANCER CARE IN JHARKHAND, INDIA

Imteyaz Ahmad[1], Padmaja Gadiraju*[1], Punam Singh*[2], Ranjit Kumar Dehury*[2], C. Vanlalhruaii*[1], MD Tabrez Alam*[3], Parthsarathi Dehury*[4]

1. Centre for Health Psychology, School of Medical Sciences, University of Hyderabad, Telangana - 500 046, India
2. School of Management Studies, University of Hyderabad, Telangana – 500 046, India
3. Indian Institute of Dalit Studies, New Delhi – 110 049, India
4. School of Public Health, AIPH University, Bhubaneswar- 754001, India

Correspondence: imteyazahmad777@gmail.com

ABSTRACT

OBJECTIVE:

The complex relationship between cancer care and poverty was examined in this paper. The study identified the association of various demographic factors with cancer care. The study also analyses the family's role and the support network in cancer care.

METHODOLOGY:

The study employed a mixed-method approach to understand cancer care in Jharkhand, India comprehensively. The study was conducted as a cross-sectional survey with 204 reproductive cancer patients. A structured interview schedule covered the socio-demographic variables and cancer care facilities. The study also used case study methods with three eligible adults who underwent or were currently undergoing cancer treatment. Descriptive statistics were used to summarise the study findings. The narratives of each case study construct a comprehensive understanding of each patient's journey with cancer care. The study has received ethical approval from the Institutional Review Board (IRB) and the cancer hospital.

RESULTS:

The survey results show that 47% of the respondents access treatment. Only 12.7% of respondents had taken the HPV vaccine, and 44.6% got physiotherapy during the treatment. Forty-four percent of respondents accessed counselling services from health services providers. Respondents' characteristics, such as age and gender, were strongly associated with access to counselling services. Education and family income were statistically associated with access to cancer care treatment. Only 7.4% of respondents arranged transport for treatment, and 11.8% arranged logistics and various treatment therapy for cancer care. Cancer patients from Jharkhand frequently face discrimination in receiving health care due to their economic condition. The case study perceived the differences in wealth, social class and family role in cancer care. As a result, cancer patients often feel hopeless and isolated, leading to depression and anxiety.

CONCLUSION AND IMPLICATION:

Poverty plays a negative role in providing and accessing cancer care in the state of Jharkhand. The role of family and society is essential for a cancer survivor. Psychological support from the family gives hope to life of the cancer patients. In

addressing the complex relationship between financial burden and cancer care, both government agencies and the social structures must implement comprehensive strategies.

KEYWORDS

Cancer care, poverty, demography, family support, Jharkhand, India

INTRODUCTION

Cancer is a leading cause of morbidity and mortality worldwide. The burden of incidence, morbidity, and mortality disproportionately affects the developing world. The world is hampered by cancers attributable to infectious diseases and risks associated with diet, tobacco, alcohol, lack of exercise, and industrial exposures [1]. India, marked by its diversity and complexity, is confronted with a pressing public health issue involving poverty and cancer care. A higher incidence of several cancers and lower survival rates are common among the poor. Poverty contributes to an increase in cancer incidence and mortality. Several factors are responsible for the increased mortality and morbidity from cancer among low-income people [2–4]. A study found the effect of poverty on increasing the death rate of cancer disease. Low-income countries have a higher rate of cancer mortality than high-income countries. The GDP income significantly impacts individuals' health, quality of life, and cancer mortality rates [5]. Many cancer cases in India are associated with tobacco use, infections, and other avoidable causes. The number of new cases of cancer diagnosed every year and the number of deaths is increasing in India [6,7]. A study found that lack of social support was associated with a higher cancer incidence and mortality risk. The study also identified that social support affects cancer onset and prognosis via a range of factors, including healthier lifestyles and adherence to therapeutic regimens [8].

Indian oncology clinicians identified three key challenges in cancer care: practical constraints, cultural values, and structural conditions. The practical constraints include access and treatment. Cultural values include communication, stigma, and the clinic. Structural conditions include inequalities related to place, gender, and class [9]. A study shows the age-standardized prevalence of cancer in India is estimated to be 97 per 100,000 persons, with a greater majority in urban areas. The average out-of-pocket spending on inpatient care in private facilities is three times greater than in public facilities [10]. Public expenditure on cancer in India is low compared to high-income countries. Out-of-pocket payments account for most of the cancer expenditures, leading to catastrophic expenditures for patients and their families [11]. A study found over 8,00,000 new cases and 5,50,000 deaths occur annually due to cancer in India, with the rural and underprivileged population representing the majority of patients [12]. Jharkhand, a state in eastern India, struggles with a multifaceted challenge concerning cancer care, where poverty plays a pivotal role in determining access to quality healthcare.

The complex relationship between cancer care and poverty is examined in this paper. The study identified the association of various demographic factors with cancer care. The study also analyses the family's role and the support network in cancer care.

METHODOLOGY

The study adopts a mixed-method approach to comprehensively reflect upon the interplay of poverty and cancer in a purposively selected region. The study design is an exploratory cross-sectional design. Structured interview schedule and open-ended in-depth interviews are tools used for data collection. The interview schedule comprised sections on demography, access to cancer care facilities and socioeconomic conditions of cancer patients. The survey method allowed for the collection of quantitative data to analyse various aspects of cancer care. In-depth interviews used to apply the case study methods which explored the impact of social determinants, poverty and other factors. The target population for the survey includes cancer patients who are currently receiving treatment or have received treatment in Jharkhand in the last year. Ranchi Cancer Hospital and Research Centre was approached for quantitative data collection. A purposive sampling technique was used to collect data.

The study was provided with ethical approval from the Institutional Review Board (IRB) at the University of Hyderabad. Cancer cases for in-depth-interviews were recruited from Ranchi Cancer Hospital and Research Centre and Rajendra Institute of Medical Sciences, Ranchi. The sample size was determined using the prevalence of cancer in Jharkhand. The sample calculated was 204 respondents. Three eligible adult participants were found in the oncology centres at different hospitals in Jharkhand; among them, one participant has undergone cancer treatment while two others were currently undergoing treatment. Descriptive statistics are generated as a part of the study findings using SPSS version 25.

Cancer patients' lived experiences are represented in the case studies. The three cases highlight three major issues pertaining to the cancer impact; the first is poverty, the second is fear and family support, and the third is about social stigma.

RESULTS

The socio-demographic characteristics of reproductive system cancer patients who took part in quantitative data collection were mostly of 40-59 years of age category and the mean age was 45.27 years. Female patients were considerably higher than men (74.5%). Highest patients were of Hindu religion background (69.6%). Comparison in terms of education reveals higher percentage share of patients who never attended formal schooling (43.1%). Rural-urban distribution of patients was similar, though, in rural areas number of patients were slightly higher than urban. In the three income groups shown in table 1 middle income group is observed with slightly higher incidences of reproductive system cancer. Otherwise, higher income groups are found with lesser incidences of reproductive system cancer.

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS

Respondents' characteristics	Category	Frequency	Percentage	Total (N)
Age	20 to 39 years	56	27.5	204
	40-59 years	123	60.3	
	60 years and above	25	12.3	
	Mean age	45.27		
Gender	Male	52	25.5	204
	Female	152	74.5	
Religion	Hindu	142	69.6	204
	Muslim	49	24.0	
	Christian	13	6.4	
Education	Not attended school	88	43.1	204
	Up to 10th standard	78	38.2	
	10th and above	38	18.6	
Type of Residence area	Urban	84	41.2	204
	Rural	87	42.6	
	Semi-Urban	33	16.2	
Infrastructure	Kutcha	30	14.7	204
	Semi-Pucca	94	46.1	
	Pucca	80	39.2	
Total Annual income of the family	Up to 100,000 INR	68	33.3	204
	100001-200000 INR	72	35.3	
	200001 INR and above	64	31.4	

Access to cancer care is critical for recovery. Vaccination and counselling services were satisfactorily accessible with regard to different age categories. Counselling services is more accessible by male patients compare to female. Christian patients get cancer treatment more often than Hindu and Muslim patients. Although, access to physiotherapy is negligible among Christian patients but common among Hindu and more common in Muslim patients. More than 63% patients who are educated up to 11th and above standards get treatment, which is highest among education categories.

TABLE 2: ACCESS TO CANCER CARE

	Respondents' characteristic	Treatment	Vaccinated (HPV)	Physiothe-rapy	Counselling services	Total
Age	20 to 39 years	46.4	1.8**	35.7*	66.1***	56
	40-59 years	48.8	17.9	51.2	35.0	123
	60 years and above	40.0	12.7	32.0	44.0	25
Gender	Male	42.3	17.3	38.5	61.5***	52
	Female	48.7	11.2	46.7	38.8	152
Religion	Hindu	45.8**	12.0	45.1***	40.8**	142
	Muslim	40.8	14.3	55.1	59.2	49
	Christian	84.6	15.4	0.00	30.8	13
Education	Not attended school	28.4***	10.2	44.3	42.0	88
	Up to 10^{th} standard	60.3	12.8	42.3	44.9	78
	11^{th} and above	63.2	18.4	50.0	50.0	38
Household income	Up to 100,000 INR	44.1	14.7	35.3**	47.1	68
	100001-200000 INR	45.8	11.1	56.9	41.7	72
	200001 INR and above	51.6	12.5	40.6	45.3	64
	Total	47.1	12.7	44.6	44.6	204

Significance: ***p<0.01, **p<0.05, *p<0.1

CASE STUDY 1 - POVERTY AND CANCER

Mohammad Hushen (name changed), a 38-year-old daily wage labourer, was battling with tongue and skin cancer. Hushen was not very educated. In his family, five members were there in aggregate (a couple and three children). Children were below seven years of age. Hushen was the sole earning member of the family. Four months ago, he was diagnosed with cancer. Despite being aware of the disease, he continued working as a daily wage labourer. He was more concerned about family expenses, including his treatment costs. His pain aggravated, and his energy to continue working went down substantially. The family came under excess financial pressure. Children's education is negatively affected. The family became financially indebted. The family was fearful of stigma; therefore, they did not tell others about the disease for long time.

Hushen lived in a small village where no good healthcare services were available. In the initial days of pain and suffering, he took pain relief tablets over the counter. It only wasted crucial time of diagnosis. He was diagnosed with cancer at an advanced stage. His treatment started, but the cost was unbearable. He sold inherited land and household items in the process of treatment.

Later, when his neighbours and community members came to know about his cancer. They came forward and helped him by crowdfunding. He felt bad about losing his physical ability and becoming dependent on others.

CASE STUDY 2 - FEAR AND FAMILY SUPPORT

Suman (name changed), a 26-year-old woman living in Bokaro (a city), Jharkhand, was diagnosed with reproductive cancer. She had been suffering from severe abdominal pain, nausea, and vomiting. Her family took her to the nearest hospital, but the doctors could not determine the disease properly. After continual suffering, she was referred to the RIMS Ranchi for diagnosis. It was eventually diagnosed as reproductive cancer after multiple hospital visits and tests. Suman lived a healthy and satisfied life until she was diagnosed with cancer. She was unable to come to terms with the cancer she was diagnosed with. It took a toll on the poor mental condition of her. She felt completely cut off from the family and community.

Suman was scared of going through chemotherapy and other treatments and was confused about the future and how to cope with the disease. She felt helpless as she could not do anything to eliminate the disease. Mainly the fear of death was overwhelming her. The physical pain and fatigue further worsened her mental trauma. She was constantly feeling tired and had no energy to do anything. She also felt isolated as she could not share her pain and suffering with anyone.

Her parent's struggle to manage treatment expenses was also distressing her. Fortunately, her parents found support from a non-governmental organisation (NGO). The NGO helped them financially and managed counselling sessions for Suman.

Suman was able to overcome the mental distress and gained confidence to fight the disease.

CASE STUDY 3 - STIGMA AND SOCIAL SUPPORT

Nisha (name changed), a 37-year-old married woman living in Hatia (a rural area), Jharkhand, was diagnosed with colon cancer. She was a mother of seven children. Her husband worked as a watchman. The family belonged to a lower-income stratum.

She suffered from abdominal pain and sought treatment from local healthcare providers. They could not detect cancer in many consultations. A physician asked to take a cancer test. Then, she was diagnosed with colon cancer. Her husband showed confidence that he would do everything to make her free from cancer. Initially, they did not know much about where to go and how to seek treatment. They lost a lot of money and sold assets in private physician treatment, but they got no relief. The family came under huge debt.

Relatives did not pay any attention to the family's distress. Later, her husband isolated her from the rest of the family due to the fear that she could infect others. Her family developed an understanding that this disease is caused due to her past sins. Nisha was told that she had brought shame to the family. As a result, she developed mental health issues like anxiety and insomnia.

She was brought to Ranchi Cancer Hospital and Research Centre while she went through all the stigma and trauma.

DISCUSSION

Cancer and financial distress are connected, and they interplay with stigma and deteriorated mental health. The adverse impact of cancer on poor families in India is phenomenal. It encompasses a lack of resources, fear, and stigma. The lack of public cancer care services also contributes to the problem. In rural and remote areas, patients take a long route to reach cost-effective and quality cancer care facilities.

Cancer treatments are costly, and all patients cannot afford the necessary care. This can lead to further emotional distress and a more significant burden on the family [13–16].

A study found financial difficulties arose due to the cost of treatment and the need to travel to receive it [17]. The study argues that patients suffering from cancer stay away from household work due to stigma and fear. This study addressed the NGOs assisting cancer patients in accessing adequate treatment. Similarly, a study argues that the role of philanthropic organisations was providing information about available cancer care facilities, helping them navigate the healthcare system, and sometimes even providing transportation to hospitals and financial aid [18]. Cancer patients from Jharkhand frequently face discrimination in receiving health care due to their economic condition. As a result, cancer patients often feel hopeless and isolated, leading to depression and anxiety [19].

CONCLUSION

The challenges posed by poverty are multifaceted and have far-reaching consequences for individuals as well as communities to cope with cancer in this region. Poverty not only limits access to early detection and timely treatment but also exacerbates the physical and emotional burdens faced by cancer patients and their families. The role of family and society is very important for a cancer survivor. Psychological support from the family gives hope to life of the cancer patients. Healthcare institutions should take counselling services and palliative care. In addressing the complex relationship between financial burden and cancer care in Jharkhand, it is the responsibility of both government agencies and non-governmental organisations to implement comprehensive strategies.

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CONFLICT OF INTEREST:

None

ETHICAL APPROVAL:

Was obtained from the University of Hyderabad ethical clearance committee..

CONSENT TO PARTICIPATE:

A written consent was obtained from participants before beginning the study.

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ADDING LIFE TO YEARS: COMPREHENSIVE END-OF-LIFE CARE FOR ALL

Ryan IP, Dicky Chow, Dorothy Yeung, Jessie Zhang, Betty Shu*

Our Hong Kong Foundation, Hong Kong, China

Correspondence: dorothy.yeung@ourhkfoundation.org.hk

ABSTRACT

BACKGROUND:

End-of-life care (EoLC) plays a pivotal role in respecting an individual's desire for a peaceful death. It encompasses a comprehensive approach to address medical, social, emotional, and spiritual needs in the final 6 to 12 months of people's life. Building upon the insights from our 2019 EoLC study titled Fostering Medical-Social Collaboration in Achieving Quality End-of-Life Care, which offers an in-depth analysis of EoLC in Hong Kong, this report seeks to reconceptualize and enhance our comprehensive assessment of the EoLC landscape in Hong Kong.

METHODOLOGY:

Employing a mixed-methods approach, this study synthesises international evidence-based policies, stakeholder insights, and analyses of local community resources, aiming to craft a robust EoLC strategy that is attuned to the needs of an ageing society.

FINDINGS:

The study revealed that EoLC not only benefits individuals, including patients, carers, and families, but also has a positive impact on the healthcare system. The context of population ageing intensifies the need for sustained improvements in EoLC provisions. Our investigation identified several critical gaps in the system, service provision, and education.

While Hong Kong's Advance Decision on Life-sustaining Treatment Bill is commendable in promoting EoLC, this bill alone may not be sufficient to address the full range of care needs. Discussions on EoLC should not be limited to the last 6 to 12 months of one's life but should be a topic that can be discussed by citizens of all ages.

The insufficient medical-social collaboration complicates the navigation of community service systems for patients and carers. Often, it necessitates consulting multiple service providers independently, which can create a high threshold for accessing suitable services. Services should also be expanded beyond medical care to encompass the medical, social, emotional, and spiritual needs of citizens in their final stage of life, ensuring holistic care.

IMPLICATIONS:

Acknowledging the demographic shifts and consequent healthcare challenges an ageing population poses, our study accentuates the urgent need for augmented support and strategic enhancements within Hong Kong's EoLC ecosystem. We propose six policy recommendations which span across the system, service, and education sectors, encapsulated by our strategic outline "One Framework, Two Sectors and Three Strategies". These recommendations are designed to advance the development of a person-centred, dignified, and coordinated EoLC in Hong Kong equipped for an ageing demographic.

CONCLUSION:

This paper asserts the significant role of strategic policy and community-based support in reinforcing EoLC, ensuring it aligns with the needs and expectations of an ageing population. Such initiatives are intended not merely to enrich life quality in later stages but also to significantly reduce the healthcare system's burden. As Hong Kong's population ages, these policies provide clear, evidence-backed directions to foster a compassionate, effective, and holistic EoLC system, ensuring it is a cornerstone of healthcare strategy moving forward.

KEYWORDS

End-of-life care (EoLC), Life-sustaining Treatment Bill, Hong Kong

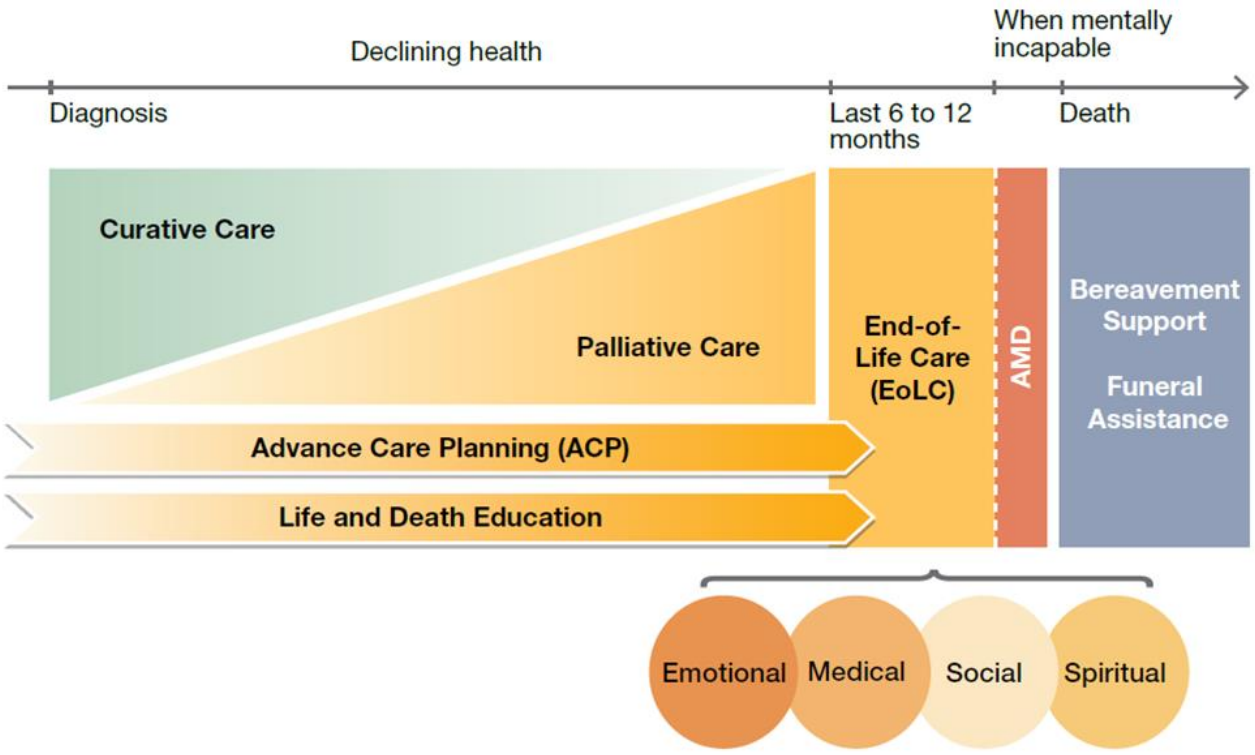
INTRODUCTION

Under Hong Kong's Advance Decision on Life-sustaining Treatment Bill, individuals aged 18 years or above are allowed to make an Advance Medical Directive (AMD), legally supporting their choices of the medical treatments they wish to decline when no longer capable of decision-making. The associated law amendments also aim to remove existing legal barriers for healthcare professionals in following AMD [1]. While commendable, this bill alone may not be able to address the full spectrum of care needs beyond medical care. Additionally, individuals should be empowered to make informed decisions about AMD through facilitated discussions regarding individuals' needs and the available options.

Hong Kong Demands for Comprehensive End-of-Life Care

End-of-life care (EoLC) plays a pivotal role in respecting an individual's desire for a peaceful death. It encompasses a comprehensive approach to address medical, social, emotional, and spiritual needs in the final 6 to 12 months of people's life [2].

FIGURE 1. SPECTRUM OF CARE



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EoLC not only benefits individuals, including patients, carers, and families, but also has a positive impact on the healthcare system. Data reveals a notable surge in medical service utilisation during the last 6 months of people's life, [3], exerting a considerable strain on hospitals and healthcare resources. As hospital services are costly and highly specialised, diverting the demand for EoLC from hospitals to community can optimise resource allocation, while catering to the preference of 90% citizens to remain in community at the final stage of their lives [3-4].

METHODOLOGY

This work builds upon the insights from our 2019 EoLC study titled *Fostering Medical-Social Collaboration in Achieving Quality End-of-Life Care*, which offers a comprehensive analysis of EoLC landscape in Hong Kong. Leveraging on the insights of diverse stakeholders across different sectors and disciplines, this report provides recommendations at the system, service, and education levels.

RESULTS

The study revealed that EoLC not only benefits individuals, including patients, carers, and families, but also has a positive impact on the healthcare system. The context of population ageing intensifies the need for sustained improvements in EoLC provisions.

Our investigation identified several critical gaps in the system, service provision, and education.

SYSTEM LEVEL: ACP FRAMEWORK

Recommendation 1: Develop a Territory-wide Standardised Advanced Care Planning (ACP) Framework

To address the issue where AMD cannot address the full spectrum of care, a territory-wide standardised ACP framework offers a solution. While AMD is a legally binding document that focuses on medical treatments during incapacity, ACP serves as a vital communication process through which individuals can express their values, beliefs, and preferences, facilitating the creation of personalised plans for medical, personal, and social care [5].

In Taiwan, ACP consultation is mandatory before establishing an AMD under the "Patient Right to Autonomy Act" [6]. Singapore's national ACP programme, "Living Matters", effectively normalised conversations about EoLC in an Asian context, reducing cultural taboos and enhancing accessibility for ACP services in over 60 healthcare and social care institutions [7-8]. ACP enables individuals to create legally binding documents (e.g., AMD) and facilitates discussion among family members on EoLC that incorporates individuals' values and preferences.

However, ACP does not have a formal status in Hong Kong. There is a lack of standardised care focus, service providers, and target audiences in different ACP programmes [9-13], resulting in varying levels of support and coverage, as shown in Figure 2. Therefore, the Government should develop a territory-wide standardised ACP framework to guide the design of ACP programmes and set a formal status for ACP in Hong Kong.

FIGURE 2. THE FRAMEWORK OF EXISTING ACP PROGRAMMES IN HONG KONG

Extensive ● Moderate ● Limited

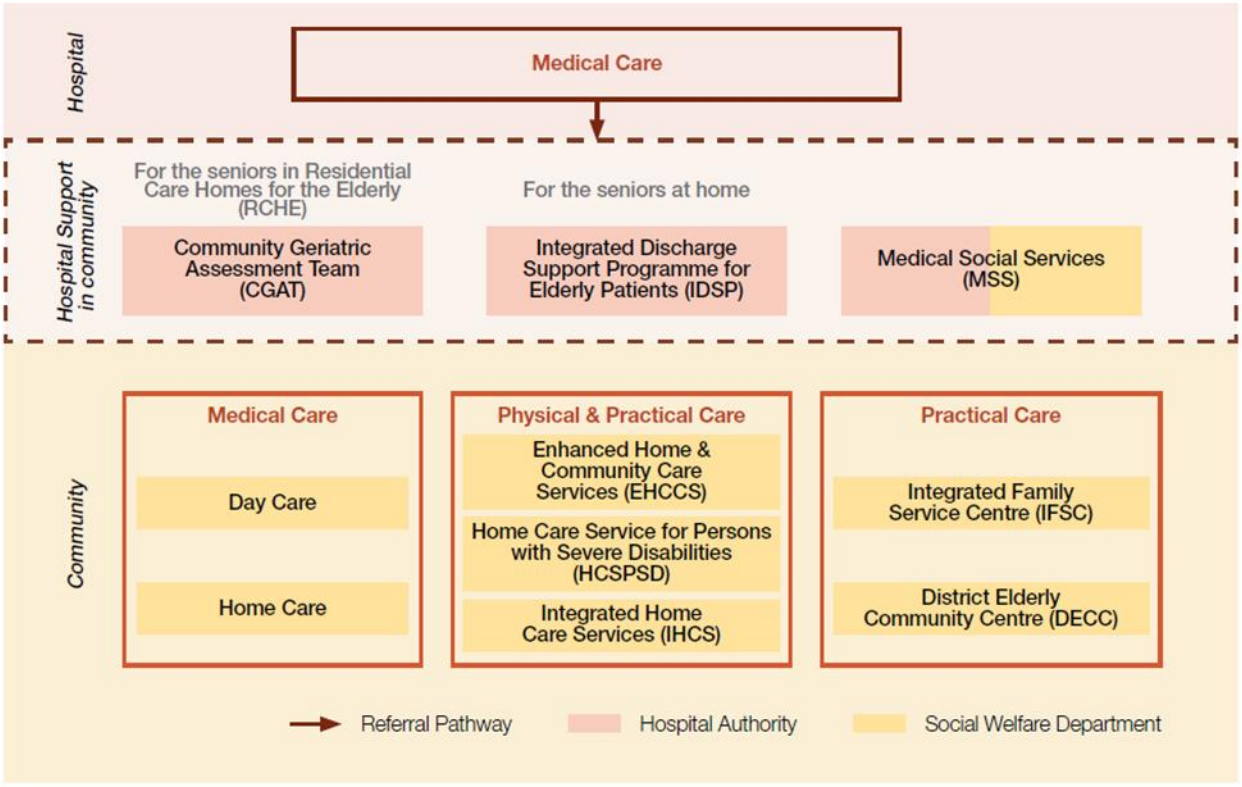
Consultation Service Providers	Target Audience	Medical	Long-term Care	Financial, Legal & After-death Arrange-ments	Psychosocial & Spiritual
Hospital Authority	Doctors and healthcare workers	Patients with advanced progressive disease	●	●	●	●
Hong Kong Family Welfare Society	Trained social workers	Individuals aged 55+ or patients with chronic disease	●	●	●	●
Jockey Club End-of-Life Community Care Project	Trained social workers	• Prognosis of <12 months • Psychosocial or spiritual distress • Referred by certain hospitals	●	●	●	●
「吾」可預計 (Public education programme)	N/A	General public	●	●	●	●
「奢預記」 (Public education programme)	N/A	Individuals aged 60+	●	●	●	●

Drawing from successful models in the United Kingdom, Singapore, and Australia [14-17], the recommended ACP framework should consider both system infrastructure and an individual's journey. System infrastructure should incorporate the training of professionals and the inclusion of ACP information in the existing electronic health record system (i.e. eHRSS for Hong Kong), while the individual's ACP journey should encompass public education, active engagement, proper documentation, and regular review and implementation of ACP documents. The documentation of ACP should be effectively communicated with different units in hospitals, especially the Accident and Emergency Department, and other health and social care institutions.

SERVICE LEVEL: HOLISTIC EOLC SERVICES

In the current service landscape, as shown in Figure 3, while providing medical care in public hospitals, the Hospital Authority (HA) extends support for the patients to the community level through programmes such as "Enhanced Community Geriatric Assessment Team for EoLC in Residential Care Homes for the Elderly" (Enhanced CGAT), Integrated Discharge Support Programme for Elderly Patients (IDSP) and Medical Social Services (MSS). These services aim to connect patients to community-level services provided by the Social Welfare Department (SWD) and community partners, covering medical care, physical and practical care, and psychosocial care.

FIGURE 3. CURRENT SERVICE DELIVERY PATHWAY IN HONG KONG



Although both HA and SWD provide various medical-social transition support for patients and their carers, the lack of coordination leads to service fragmentation. Individuals may need to navigate the community service system by themselves and consult multiple service providers separately, resulting in a high threshold for accessing suitable services.

Nevertheless, this service gap is now bridged by community efforts. Jockey Club End-of-Life Community Care Project (JCECC) was launched in 2016 to improve the quality of EoLC. It introduced two community-based EoLC models, the Integrated Community End-of-Life Care Support Teams (ICEST) and EoLC in Residential Care Homes for the Elderly (RCHEs). These models foster collaboration between public hospitals, RCHEs, and different sectors, promoting holistic support for terminally ill patients in the community.

JCECC has presented significant impact. Patients who had the EoLC at home or in RCHEs services for three months experienced both physical and mental improvements, accompanied by fewer hospital bed days and A&E attendances[18]. Nonetheless, JCECC was set to conclude in

2026, raising concerns about the future of the established medical-social network.

In Singapore, a national care integrator called Agency of Integrated Care (AIC) was established in 2009 under the Ministry of Health. As a single agency, AIC manages referrals, coordinates aged care services, and enhances service development and capability-building across the medical-social domains. By fostering medical-social collaboration, AIC enhances service accessibility and continuity of care [19].

Recommendation 2: Formulate an EoLC Service Strategy

To better coordinate EoLC services, it is imperative to establish a clear role delineation and collaboration model among organisations and professionals. An EoLC service strategy that connects existing medical and social services is therefore crucial to ensure coordinated and comprehensive EoLC.

Drawing from examples in the United Kingdom and Australia [20-22], the Government should consider common themes present in overseas models, including the emphasis on ACP, holistic care, care coordination and utilisation of technology.

To better deliver EoLC in a coordinated manner, it is crucial to expand the focus beyond the last 12 months of life to encompass palliative care (PC). Incorporating elements of early PC into curative care can ensure that individuals receive holistic care, including symptom relief and emotional support, while still pursuing curative treatments.

A local study featured a structured ACP programme introduced by a hospital PC unit in collaboration with various specialties. It reduced acute admission and length of stay of patients by 35% and 39% respectively, while ensuring the concordance of patients' wishes with end-of-life and funeral arrangements [23]. Better incorporating early PC into the care continuum can raise awareness towards EoLC and facilitate patients in making informed decisions, ensuring that their wishes are respected and fulfilled.

By formulating an EoLC service strategy that incorporates these elements, Hong Kong can work towards establishing coordinated services that cater to the diverse and evolving needs of individuals requiring EoLC.

"Many doctors and medical social workers outside Palliative Care Unit are not fully aware of community EoLC resources."
- Consultant of palliative care in a public hospital

Recommendation 3: Establish a Clear and Consistent Communication Pathway to Connect EoLC Services and Facilitate Medical-Social Collaboration

To provide patients with integrated medical-social care, it is crucial to establish a clear and consistent communication pathway to connect EoLC services between hospital and community, facilitating medical-social collaboration. This communication pathway should integrate existing service referral links, streamlining the process of connecting patients with suitable services.

Drawing references from the examples of JCECC and AIC in Singapore, the Government should put in place a mechanism to coordinate with hospitals, holistically assess patients' needs, match them with existing social services, and follow up regularly. This can ensure that patients receive integrated EoLC across hospitals and the community.

EDUCATION LEVEL: STRATEGIES TO RAISE AWARENESS

There is a palpable disparity in awareness and information dissemination among the population. Although a substantial percentage of individuals (75%) felt comfortable or did not experience any discomfort discussing life and death issues, a staggering 70% lacked awareness of EoLC, underscoring the opportunity to enhance education in this domain [24].

Furthermore, it has been observed that citizens prefer to receive EoLC information from relatives and non-religious acquaintances (e.g., carers) (55%), healthcare professionals (HCP) in the community (41%), and HCP in hospitals (40%)[3]. It is concerning, however, that the actual flow of information does not align with these preferences—most information is transmitted through hospital-based healthcare professionals (32%), while fewer individuals receive guidance from their preferred sources, — only 29% and 9% of individuals receive information from relatives and non-religious acquaintances (e.g., carers) and HCP in the community respectively.

Therefore, it is crucial to provide EoLC education strategically. For EoLC service users, promoting life and death education should be prioritised, while for EoLC service providers, the Government should empower health

and social care professionals through enhanced university curriculum and on-the-job training, as well as ACP training.

"We should empower doctors across specialties, as well as health and social care professionals, to initiate difficult but necessary conversations, making EoLC more accessible."
- Professor engaged in EoLC training and education

Recommendation 4: Promote Public Life and Death Education

Hong Kong can strategically promote public life and death education by adopting a three-step approach targeting individuals at different stages of life and with varying levels of preparedness, which involves raising awareness, facilitating discussion, and taking actions.

To enhance awareness among students and the public from an early age, the Government may draw reference from Taiwan's approach of integrating life and death education into school curriculum. Taiwan's initiative serves as a comprehensive model that emphasises policy establishment, teacher training, enriching curricula with relevant activities, and extending education into the community [25].

For individuals facing deteriorating health conditions and their families, health and social care professionals should provide information on ACP, tailored to the severity of health conditions and preparedness level. This can encourage patients and their families to participate in discussions related to EoLC and take action in ACP and AMD for the later stage. Additionally, terminally ill patients and their families should actively participate in ACP and AMD, as well as receiving bereavement support when needed.

"The Government should strategically plan for life and death education targeting citizens of different ages and care needs."
- Programme director of community care service

Recommendation 5: Equip Community Professionals and Volunteers with ACP Training

Community professionals and volunteers who are delivering services to individuals with declining health should be incentivised to undertake ACP training and become ACP facilitators. Through providing ACP to all age groups across different service settings by these trained personnel, EoLC information can be disseminated to a wider population. This is also aligned with people's preference, considering that HCP in the community, and relatives and non-religious acquaintances (e.g., carers) are preferred as the top two EoLC information sources.

Such training should extend beyond working professionals to include volunteers and laypeople. This practice is also evident in the "Respecting Choices" model in the United States, which offers a robust training protocol for participants of different backgrounds. This model is comprehensive, encompassing an array of ACP skills tailored for different health statuses [26]

Moreover, Singapore's national ACP programme "Living Matters" also illustrates the benefits of training ACP facilitators for both clinical and social care settings [27]. A network of over 5,000 certified and proficient ACP facilitators has been created to effectively disseminate accurate and compassionate EoLC information to the public [28]. The Government may reference these models in promoting ACP training in Hong Kong.

Recommendation 6: Enhance University Curriculum and On-the-Job Training in Health and Social Care

Currently, university curriculum and on-the-job training for healthcare professionals in EoLC tend to be fundamental, which may only include hospice visits. This may not fully prepare them for the complexities of providing comprehensive and quality EoLC, sometimes leading to a greater emphasis on curative treatments which may come at the expense of a patient's overall quality of life. Hence, the relevant institutions should enhance EoLC elements in the curriculum and training, emphasising the importance of striking a balance between disease management and improving a patient's quality of life.

In addition, there is a need to enhance communication skills among health and social care professionals, particularly in conveying prognosis and conducting sensitive EoLC discussions. Ethical training for healthcare professionals should prioritise the shift of focus from treating diseases to considering the patient's overall well-being, promoting a more compassionate and patient-centred approach. Extending trainings beyond healthcare professionals to other social care professionals is equally critical, to ensure that a multidisciplinary team is well-equipped to provide holistic care, engage in meaningful discussions about death, and meet the unique needs of patients and their families who face end-of-life issues.

DISCUSSION

The implementation of the Advance Decision on Life-Sustaining Treatment Bill in Hong Kong marks a significant step forward in empowering individuals to make informed choices about their medical treatment preferences. However, our findings highlight the critical need to expand the focus of EoLC beyond just medical decisions. A holistic approach that encompasses medical, emotional, social, and spiritual dimensions is essential for truly respecting individuals' wishes during their final stages of life.

Our study underscores the multifaceted nature of EoLC needs. The preference for community-based care over hospital settings does not only aligns with patients' desires but also presents an opportunity to alleviate strain on healthcare resources. This is particularly crucial in the context of Hong Kong's ageing population.

The identification of systemic gaps in EoLC delivery is a key finding of our research. The absence of a standardised ACP framework in Hong Kong emerges as a significant barrier. Establishing a territory-wide ACP framework could facilitate more meaningful discussions between patients, families, and healthcare providers, ensuring that individual values and preferences are prioritised in care planning.

Service fragmentation across medical and social domains presents another challenge. While initiatives like JCECC have made progress in bridging these gaps, their limited duration raises concerns about long-term sustainability. Our recommendation for a comprehensive EoLC service strategy aims to address this by promoting sustained collaboration between hospitals and community services. The stark contrast between individuals' comfort in discussing life and death issues and their lack of awareness about available EoLC options highlights a significant gap in public knowledge. Our proposed strategic public education initiatives, drawing inspiration from successful models in Taiwan, could foster a more informed community capable of engaging proactively in ACP discussions.

The need for enhanced training for healthcare professionals is another crucial finding. Our recommendations focus on improving communication skills, ethical considerations, and understanding of palliative care. By integrating EoLC training into university curricula and ongoing professional development, we aim to equip healthcare providers with the tools to navigate the complexities of end-of-life discussions and provide more compassionate, person-centred care.

Our six policy recommendations are designed to create a cohesive framework for EoLC in Hong Kong, addressing immediate care needs while adapting to the evolving landscape of an ageing society. By emphasizing system-level changes, service coordination, and educational enhancements, we believe we can build a robust EoLC ecosystem that respects individual preferences and optimises resource allocation.

While our study offers valuable insights into EoLC in Hong Kong, it is essential to highlight areas for future research and refinement. While we addressed various cultural and spiritual considerations, future studies could explore these complex factors in greater depth. Furthermore, the implementation of our recommendations may encounter practical challenges, such as resource allocation and necessary systemic adaptations, which are common hurdles in healthcare innovations.

Despite these limitations, our study provides valuable insights into the current state of EoLC in Hong Kong and offers a roadmap for improvement. While we touched on cultural and spiritual aspects, future research could delve deeper into these nuanced factors, exploring how they influence EoLC preferences and outcomes across different communities in Hong Kong. Additionally, future research could focus on implementation science, examining the success factors in translating policy recommendations into effective practice, ultimately leading to more effective and culturally sensitive care practices.

CONCLUSION

In conjunction, these recommendations support the vision where EoLC is delivered in a person-centred, dignified, and coordinated manner in Hong Kong. The implementation of policies and programmes at all levels—system, service, and education—would create synergy and contribute to the development of comprehensive EoLC. This ensures EoLC is well-integrated into the care continuum, respecting and responding to people's preferences and rights to compassion and care at the final stage of life.

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SHAPE SYMPOSIUM 2024

AVOIDANCE OF MEDICINE WASTAGE IN PRIVATE CLINICS IN HONG KONG: PRACTITIONERS' PERSPECTIVES

Simon Yuen, Calvin Cheng, Helen Wong*

School of Professional Education and Executive Development, The Hong Kong Polytechnic University, Hong Kong, China

Correspondence: simon.yuen@cpce-polyu.edu.hk

ABSTRACT

Hong Kong with its well-established healthcare and medicine system and professional health services is one of the renowned healthiest places in the world. In fact, Hong Kong's healthcare system is running on a dual-track basis comprising public and private sectors. This study intends to explore medicine waste management and sustainability. First, we examine the existing phenomenon of Hong Kong medicine waste. Also, we discuss the causes of medical waste from a private clinic doctors' perspective. In addition, we identify possible policies and recommendations to minimize the medicine wastage in private clinic in Hong Kong as well as improve the healthcare supply chain practices.

Qualitative research with in-depth interviews of doctors and medical practitioners have been carried out to gather their views and opinion of medication wastage, including the current medicine waste situation and the means of handling the expired medicines. Also, the study analyzes the centralized procurement platform effectiveness and suggests some possible policies for government to adopt. Interviewees mentioned that medication waste has occurred over decades. Medicine wastages are not only financial burdens, but also social burdens. If the medication waste problem cannot be alleviated, it will affect the population health and environment in the long run.

An all-rounded healthcare supply chain with efficient logistics operations would help the government to collect excess medicines from private clinics and redistribute to some Non-Government Organizations (NGOs). In fact, all parties including manufacturers, distributors, prescribers, and patients have the responsibilities to maintain and implement suitable policies to prevent bulk medicine waste. This research study provides the foundation of medicine wastage in private clinics in Hong Kong. Future research can investigate the medicine wastage in other aspects as well as consolidate the literatures in both industrial and public perspectives.

KEYWORDS

Medicine wastage, healthcare, supply chain, Hong Kong

INTRODUCTION

Hong Kong, with its well-established healthcare and medicine system and professional health services, is one of the renowned healthiest places in the world. Hong Kong's healthcare system is running on a dual-track basis composing public and private sectors [17]. The public sector is managed by the Hospital Authority while the private sector is managed by the private practitioner's own. Although these two sectors are adopting different operation modes, the ultimate goal of the healthcare system is to safeguard local population health and quality of life [15].

In the past few years, Hong Kong has been facing increasing medicine waste quantities and environmental challenges. Medication waste refers to pharmaceutical products that is leftover, unused, or expired throughout the medication supply chain [23, 7]. Some research found that landfills in Hong Kong contain antibiotics which might involve immense stress on the natural environment [14]. Residues will influence microorganisms and marine fish in the water sources, enter human food chain and lead to long-term effect on humans [16]. As the healthcare budgets of Hong Kong are limited, unused medicines will be considered a squander of resources. It is therefore necessary to reduce the city's medical waste and minimize financial and environmental burdens.

A massive volume of medical waste is a serious issue for any city. The accumulated large quantities of drug waste impose financial burdens and environmental pollution [3]. In view of this, the Hong Kong Hospital Authority should frame various policies to reduce medicine waste.

The main objective of this study is to investigate the phenomenon of medicine waste and propose possible policies to reduce medicine waste. Through in-depth interviews with private clinic practitioners, the study figures out the possible reasons of medicine waste in private clinic sectors in Hong Kong and finds ways to enhance the city's healthcare system. Specifically, the following sections include: [1] a review of relevant literature; [2] the methodology of data collection; [3] a discussion of the causes and solutions of medical wastage in private clinics; [4] recommendations on how to reduce medicine wastes; and [5] a conclusion of the discussion.

LITERATURE REVIEW

Medicine wastage includes any medicine that remains unused or expired anywhere along the medicine supply chain [23]. Medication waste can be generated in all stages of pharmaceutical supply chain, including doctors' prescribing, pharmacists' dispensing and unused or expired medicines [4]. For instance, physicians repeat prescriptions or dispensed in massive quantities, or patients intentionally or unintentionally fail to take medications as prescribed. These will lead to unused medicines accumulation at home [2].

Medicine wastage is a common problem among developed and developing countries around the world [10]. At least 20% of medicines are wasted and returned to pharmacies in New Zealand and the United States each year. In Tanzania, more than 50% of medicines dispensed are wasted annually.

Studies found numerous contributing factors to medicine wastage on the patient side. For instance, discontinuation of medication, switching of medication, or death of patients [23]. Patients' poor adherence to medication, excessive prescription or altered therapy method also result in medicine waste [8, 5]. Few studies have investigated the contributing factors to medicine wastage on the clinic side. No study has examined the medicine wastage generated in private clinics from the practicing private doctors' perspective.

RESEARCH METHODOLOGY

In order to gain better insight into the medicine wastage issues and possible measures to reduce medicine wastage in private clinics in Hong Kong, in-depth interviews with the private clinic doctors were conducted. In-depth interviews were used because they allowed the respondents to express their feelings and beliefs freely and could collect higher quality of data because of the opportunity to build rapport and trust with the respondents [22].

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RESEARCH FINDINGS AND DISCUSSION

The research results showed that the amount of medical wastage of private clinics depends on the operation of each clinic. Private clinic chains, shared private clinics and individual private clinics are all different in their operation mode and medicine handling practices, which lead to different extent of medicine wastage. In the following, we will discuss these two causes deeply.

DIFFERENT TYPES OF PRIVATE CLINICS

Undoubtedly, private clinics in Hong Kong are one of the main parties contributing to medicine waste. Most private clinic chains use centralized procurement platforms for their medicines, which help reduce their drug waste. However, for shared private clinics and individual private clinics, they have to purchase medicines from pharmaceutical companies themselves. Pharmaceutical companies are used to offering them bulk-purchase incentives (like buying 50 packs and get 10 packs free) or selling them nearly expired medicines at a discount,

resulting in excessive medicine stocks and medicine wastage. As research found out, drug representatives from pharmaceutical companies use a variety of promotional techniques to attract private clinics to purchase their medicines, for instance, offering gifts, providing research grants, or paying visits frequently [6]. In addition, shared private clinics face big difficulties in managing their medicine usage as each doctor may have a different specialty and have different types of patients. They need to stock different types of medicines (general medicines and specialized medicines) in the same clinic. Excessive medicine orders and inventory will therefore occur. Besides, general practices doctors with various medicine types would have more wastage. These are the main reasons why private clinics generate massive medicine waste.

DIFFERENT MEANS OF HANDLING EXPIRED MEDICINES

Improper control and handling of expired medicines always result in environmental and public health risks. There are diverse ways for private doctors to handle and prevent expired medicines. According to the research participants, some private doctors will store medicine expiry dates into their computers and keep checking the dates regularly. They will take out those medicines which are going to be expired in 3 months or 6 months, thereby maintain medicine inventory precisely and reduce waste. Some private doctors will return medicines to the drug suppliers to minimize wastage. For medications which have been expired only for a short period or worn off slightly, some private doctors will give them to their families for personal use. However, some liquid medicines (like eye drops and liquid antibiotics) definitely cannot be used after expiration. Medical authorities found that though the effectiveness of the expired medicines may decrease, but their potency can remain even a decade after expired [13].

RELATIONSHIP BETWEEN PHARMACEUTICAL COMPANIES AND PRIVATE CLINICS

Most of the medicines of private clinics are supplied by pharmaceutical companies. This is a typical buyer-seller relationship. Some research found that an open and transparent relationship between pharmaceutical companies and private clinics could reduce medicine wastage [9]. If pharmaceutical companies can collaborate with private clinics and adjust distribution quantities of medicines according to the actual needs of private clinics, this could minimize medicine waste. However, as the research participants pointed out, it is difficult to determine whether close relationship between pharmaceutical companies and private clinics can decrease the medicine wastage in Hong Kong. Each stakeholder has its considerations. For private clinics in Hong Kong, medicine waste is not their main consideration. What they are concerned about more is the cost-effectiveness of the medicine procurement.

CENTRALIZED PROCUREMENT PLATFORM

Centralized medicine procurement platform is a single team or a department handling all the medicine procurement for the organization [11]. The public healthcare sector of Hong Kong has long been adopting this procurement approach. But for private healthcare sector, each private cline uses its own regular procurement means. There is no incentive for private clinics to adopt centralized medicine procurement platform since regular procurement process already contains discounts from the pharmaceutical companies. Adopting a centralized procurement system would not allow them to enjoy extra discounts. Therefore, it without incentives for private practitioners to adopt centralized procurement platform. Besides, there will be high switching costs for private clinics to adopt centralized medicine procurement platform, including time and extra money.

SEPARATION OF PRESCRIBING AND DISPENSING

Prescribing and dispensing are two crucial roles in the treatment of patients. Prescribing concludes patients' problem evaluation, and suitable medication therapy selection and gives information for the therapy (Gilbert, 1998). Doctors are the most significant source for prescribed medicine. Doctors can decide the use of medicine for each patient professionally. Dispensing is checking for possible medicine interaction and medicine use consultation [18]. Due to the lack of pharmacists, some Asia countries are trying to separate the prescribing and dispensing of physicians and pharmacists [20]. The purpose of separating prescribing and dispensing is to boost the drug treatment and ensure better practice in prescribing level [21].

Hong Kong is a fast-paced city where people are always in a rush. Unlike other countries, in Hong Kong, prescribing and dispensing of medicines are both made by private clinics. Private clinic doctors are used to provide medicines to patients after medical consultation. Fast and instant response to patients and effective treatment plan are the key to success for private clinics in Hong Kong private clinics' is the superiority. If medicine prescribing and dispensing can be separated in Hong Kong, such that the doctors of private clinics provide medical prescriptions

while the pharmacists of pharmacies provide the prescription medicines, private clinics will no longer need to keep and manage their own medicines. It can avoid medicine wastage in private clinics. Besides, it can also avoid the conflict of interest for prescribers and ensure good practice in dispensing [21]. However, separation prescribing and dispensing are not supported by the general public in Hong Kong at the moment as most of the patients prefer to get the medicine from doctors immediately.

INCREASE IN SUPPLY CHAIN AND LOGISTICS INVOLVEMENT

Medicine supply chain and logistics practice is one of the important aspects in dealing with medicine wastage. Increasing logistic involvement to deliver new medicines and collect unused medicines regularly may help to manage medicine waste effectively, as logistic companies can help to return excessive medicines and avoid medicine waste. According to research participants' information, some NGOs will recycle medicine and redistribute it. However, patients may be concerned with the source. Therefore, some community pharmacies will check the medicines' condition before redistribution. It is suggested that the Hong Kong government can utilize licensed Logistics Service Providers (LSPs) to sell, store, and distribute medicines to private clinics and NGOs to reduce wastage.

RECOMMENDATIONS

Education is seen as a crucial strategy to minimize medication waste [1]. It will be helpful to increase private doctors' awareness of medicine waste as one of the main sources of medical waste is the private clinics. Behavioral change is necessary for doctors and patients to assume the responsibility for a sustainable healthcare system. Besides, prior research indicated that shared decision making between prescribers and patients can reduce polypharmacy and tailor medicines to patients' individual needs. It can help to alleviate the existing problem.

The Hong Kong Government could arrange a regular medicine recycling program for private clinics and private doctors. Allowing them to pass unused or expired medicines to the public hospitals for centralized treatment to prevent improper disposal and avoid health problems [19]. This can reduce inappropriate disposal of medicine waste by private clinics, for instance, flushing medicines down the toilet.

CONCLUSION

Medicine wastage has become a serious problem in Hong Kong. The objective of the study is to identify the causes of medicine wastage in private clinics from the private doctors' perspective, and to recommend appropriate policies to address the problems. In this study, qualitative research using in-depth interviews with private clinic doctors was conducted. The study revealed that medicine wastage is mainly due to inefficient operation mode and unproper medicine handling practices of private clinics. If the problem cannot alleviate, it will affect population health and environment of Hong Kong for the long run. Research participants gave their opinions about measures to reduce medicine wastage in private healthcare sector, including separation of prescribing and dispensing of medicines and increase in logistic involvement. It is recommended that the Hong Kong government should arouse the private doctors' awareness of medicine waste through education and setup a regular medicine recycling program for private clinics.

The main limitation of this study is that it relied solely on a qualitative approach to gather information. Future research using an empirical method, such as a survey with a larger sample size, could be conducted to investigate the various factors impacting medicine wastage in private clinics. Overall, the study provides a solid foundation for practitioners and governments to develop appropriate policies and measures to address the issue of medical waste in the private clinic.

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RESILIENCE CAPACITY OF PRE-HOSPITAL EMERGENCY MEDICAL SERVICE (EMS) PROVIDERS AND THE FUTURE AGENDA FOR SUSTAINABLE DEVELOPMENT OF A RESILIENT EMS SYSTEM IN THAILAND

Alina Pant, Thunwadee Suksaroj, Piyapong Janmaimool, Orapin Laosee, Cheerawit Ratannapan*

Program in Health and Sustainable Development, ASEAN Institute for Health Development, Mahidol University; Thailand

Correspondence: Alinapant12@gmail.com

ABSTRACT

In the current scenario, demand for emergency care is rising due to the shift in disease patterns all around the world, from growing burden of non-communicable diseases to the pre-existing communicable diseases. The principle aim of an emergency medical service (EMS) system is to prevent premature mortality, reduce pain and prevent long term disability. EMS workers serve on the front lines of emergency medical care, which is one of the most important components in an EMS system of any country. Since the latest pandemic has caused increased burn out and stress among the service providers with long term mental and physical effect which is yet to be researched in Thailand, and no study in particular have addressed to evaluate the resilience capacities of the front-line EMS workforce and identify components that influence their performance and response to emergencies.

This study aims to measure the resilience capacity of pre-hospital EMS providers of Thailand along with providing recommendations to policy makers regarding EMS service provider future agendas and standard methods for proper workforce development in order to tackle future public health emergency situations. The respondents were EMTs, ENPs, paramedics, frontline rescuers working in the provinces as an EMS service provider under the ministry of public health (MOPH), National Institute of Emergency Medicine (NIEM), Thailand. Total 500 participated in the survey from 32 different provinces.

Resilience capacity was divided into high, moderate and low components and factors were developed through literature review and grouping was done. With a total of 41 questions: Safety, Competencies, Wellness and Behavioral Health. Open ended questions reflected the perception and experiences of the EMS service providers regarding the strength and improvement areas of the EMS system in Thailand.

The result from the survey shows that the EMS service providers have moderate resilience in terms of Behavioral Health which is related to their psychometric properties and main components to measure the resiliency scales. Similarly, in terms of Safety, Wellness and Competencies components the EMS services have shown moderate level of resilience capacity as a front-line worker in the emergency medical service system to prepare for the future public health emergencies.

The findings of the research present the perception and opinions of various EMS providers working in different provinces of Thailand. This study explores the present status/situation of front-line workers of the EMS system in Thailand. The findings provide crucial recommendations to health policy makers for developing resilient EMS system and their workforce in

Thailand focusing on pre-hospital care setting. This research suggests measurement tools and plans focusing on the EMS future agenda 2050.

KEYWORDS

emergency medical services; EMS; pre-hospital system; EMS workforce; health system resilience; personal resilience

BACKGROUND

An EMS system is a comprehensive health care system and the crucial element of the health system including universal health coverage. It is a system of coordinated response and timely emergency medical care with the involvement of various agencies, stakeholders and communities [1]. The principle aim of EMS system is to prevent pre-mature mortality, to reduce pain and prevent long term disability. EMS system focus on delivering timely and quality care to victims of sudden and life-threatening emergencies for the motive of preventing needless deaths [2]. Pre-hospital care includes the care provided from the scene of injury, home, school, or accident area until the patient/ sick person arrives at a formal health care facility for the specific treatments from the health experts (2). The pre-hospital care is provided by emergency physicians, emergency medical technicians, paramedics, nurses and different volunteers [3, 4].

The pre-hospital EMS of Thailand is based on the combination of Anglo-American Model (Scoop and Run) and The Criteria Based Dispatch (CBD) [5]. Thailand also follows the similar model of Service d'Aide Médicale Urgente (SAMU) from France and the service providers are trained using the Australian education system, while the division and classification of healthcare facilities are based on the American College of Surgeons model [6].

Resilience is defined as one's ability to get back to the normal life and be mentally stable after facing unforeseen circumstances. It is the characteristics that provide positive adaptation to the stressors and crisis situation. In the past decade, the international health systems have emphasized on the importance of resilience among the service providers. EMS service providers serve on the front lines of emergency medical care, which is one of the most important components in an EMS system of any country. They are a critical part of the nation's emergency response system and the front line of medical responses [7, 8]. EMS service providers as health care providers, play an important role in preventing and containing the spread of diseases infections, delivering proper pre-hospital care to the patients and are important for overall response and service delivery. However, there is evidence to suggesting that solely education and training are insufficient in preparing prehospital providers to respond to PHEs. Undoubtedly, mental health of first responders is a compelling concern, especially in pandemic conditions and mass casualty events concerning their coping level and mechanism [9, 10]. Paramedics, emergency medical technicians, ambulance drivers, nurses and others who are the workforce of the EMS system are a high risk working group for having adverse mental health impacts [11]. To address the behavioral and mental health issues and various challenges faced by EMS workforce, there has been increasing attention to support their resilience, as a process of recovery following adverse events which involve behavioral, cognitive and affective responses which in turn supports positive adaptation of psychological well-being and functioning. Workforce resilience is positively correlated with life and job satisfaction, coping self-efficacy and self-esteem [12].

There still exists the knowledge gaps in the existing theories and framework relevant to the personal resilience capacities of EMS workforce to properly respond during mass casualty events like emerging and re-emerging diseases outbreaks and others. Resilience is important as it will help to adapt in unseen circumstances, utilize the resources available, properly mobilize the emergency service providers and ensure the safety and wellbeing of frontline workers [13].

In conclusion, mental and physical well-being and positive coping mechanism among the emergency frontline workers are an important aspect in order to prepare well and withstand the future public health emergencies and support the well-functioning of the large EMS system in the country. Therefore, this study focuses on emergency health system resilience specifically in relation to the EMS service providers. This study aims to explore the resilience capacities of the EMS providers of Thailand along with providing recommendations to policy makers regarding

service provider's future agenda and creating a resilient Thai EMS workforce which is most crucial since the global pandemic. This research also explores the role of behavioral health, safety, wellness and competencies of EMS service providers in the pre-hospital EMS system.

METHODS

A cross sectional study was conducted in 32 provinces of Thailand among the 500 EMS providers registered in the national system with at least a year of work experience as an EMS workforce. A nation-wide voluntary, anonymous online survey was started from January to May 2023. Survey tool was be used for questionnaire collection through the sampling process among EMS service providers and ambulance team which included paramedics and emergency medical technicians (EMTs) (frontline emergency service providers in Thailand). Questionnaires was sent out via online mode in coordination with MOPH. The samples were Thai EMS service providers registered with National Institute for Emergency Medicine (NIEM), EMIT using inclusion and exclusion criteria. The study area was defined by the total 29 "dark-red zone" provinces, and a request letter was sent to all priority provinces to provincial public health directors to distribute the survey questionnaire to the eligible EMS service providers. Convenient sampling was used to select EMS service providers (FR, EMTs, ENPs and paramedics) from provinces that were distributed in all 13 health districts of Thailand and total 76 provinces. All red zones were included in the study and the Provincial Health Office directors were approached and requested for responses.

The research instrument in this study utilized a standard validated questionnaire with survey tools to interview the EMS service providers and professionals. The items were finalized from the literature review, theories and models of personal/ psychological resilience. Questionnaires in Thai language were structured based on the components of the EMS workforce in order to measure their resilience level and factors influencing their adaptive capacity in emergency situations. The research tools all were aligned to the overall research objectives of this project and based on intensive literature review and resilience theories. There were 4 major factors and total 41 items in the questionnaire. All participants were informed about the purpose, objectives and outcomes of this study and about the confidentiality for the respondent's information. Consent was obtained before the surveys' which was included in the introduction part in the questionnaires.

The four resilience components and the items were designed from the desktop reviews. The questionnaire was pre-tested among 38 respondents before the actual data collection. After the ethical clearance from the Mahidol Ethical Review Board, validation of the survey questionnaire was done by calculating the IOC score method for content validity, which were validated by 3 experts (from Mahidol University and MOPH), questions were added, adjusted and changed according to the scores and comments. Then, it was followed by pre-test before the start of actual data collection. Cronbach Alpha was used to check the reliability score among 38 respondents. The individual scoring for safety wellness and competence questions were 0.68, 0.79, 0.80 respectively, with combined score of 0.88, and for the RS-25 questions it was 0.90.

The first part of questionnaire contains 15 questions on demographic information followed by Part 2 on the themes extracted for the resiliency of EMS service provider' and checklist to understand the resiliency level of them. The final part included additional questions on service providers benefit, opinions and suggestions.

The components of EMS workforce resilience are based on the SAQ questionnaire developed by Sexton, J.B. et.al. including six factor analytically derived scales of teamwork climate; safety climate; job satisfaction; perceptions of management; working conditions; and stress recognition. [14]. For this research 16 items self-rated questionnaires are scored on 5- point scale from 1= strongly disagree to 5= strongly agree, to measure the resilience level in the domain of safety, wellness and competencies of EMS workforce in context of Thailand. Mean scores were calculated to categorize into high, moderate and low resilience in context of safety wellness and competent factors associated with the EMS service providers. For the behavioral health measurement, the modified RS-25 questionnaire was used which has been validated internationally and has complete psychometric properties with Cronbach alpha for the total scale of 0.93. The sub-scale of the RS-25 are personal competence (17 items) and acceptance of self and life (8 items) [15].

Proposal was reviewed by the Ethical Review Board Committee of Mahidol University. Protocol number MU-CIRB 2022/247.1409 approved on 3rd November 2022. With

renewed copy valid until 2025. Permission was obtained from the MOPH NIEM Thailand, Provincial Public Health Offices and respective hospitals and EMS organizations in the form of an approved letter.

The SPSS version 22 software was used for data analysis for the descriptive analysis. description of socio-demographic characteristics: mean, median, SD and percentage of all variables were presented. Information was summarized using frequency tables and cross tabulations. For the open-ended questions and key informant interviews, NVivo-14 software was used for thematic analysis. The questionnaires were labeled and coded by the researcher. The data generated from the questionnaire was reviewed and coded individually by the researcher.

RESULTS AND DISCUSSION

TABLE 1 NUMBER OF SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION

Characteristics	n=500	Frequency (n=500)	Percen (%)
Age of EMS service providers			
Early working age 15-24 years		73	14.6%
Prime working age 25-54 years		**404**	**80.8%**
Mature working age 55-64 years		23	4.6%
(Mean= 35 years; SD= 10.5; Min= 16; Max= 64)			
Gender			
Male		206	41.2%
Female		**294**	**58.8%**
Marital status			
Single		**280**	**56.0%**
Married		186	37.2%
Divorced/ separated		34	6.8%
Monthly income			
≤20,000 TBH		235	47.0%
>20,000 TBH		265	53.0%
Educational level			
Elementary/ high school		127	25.4%
Undergraduate degree		**277**	**55.4%**
Postgraduate degree		29	5.8%
Vocational certificate		67	13.4%
Current position as an EMS provider			
EMR		**124**	**24.8%**
Frontline rescuer		63	12.6%
EMT BLS provider		41	8.2%
EMT intermediate		45	9.0%
Advanced EMT Paramedic		70	14.0%
ENP		**140**	**28.0%**
Head of ERs		17	3.4%
Years of experience as EMS provider			
1 year		19	3.8%
1-2 years		85	17.0%

3-5 years	125	25.0%
5-10 years	89	17.8%
>10 years	**182**	**36.4%**
Expect years to retain as EMS workforce		
<5 year	102	20.4%
5-10 years	126	25.2%
10-15 years	42	8.4%
15-20 years	31	6.2%
Until retirement	**199**	**39.8%**
Highest training attained		
First responders training	77	15.4%
Basic level training	137	27.4%
Intermediate level training	7	1.4%
Advanced level training	**265**	**53.0%**
Other related trainings	14	2.8%
Work hours (per week)		
< 10 hours	106	21.2%
10–20 hours	91	18.2%
21–30 hours	50	10.0%
31–39 hours	66	13.2%
≥40 hours	**187**	**37.4%**
Change in work schedule after Covid-19		
Yes, prolonged	**289**	**57.8%**
Yes, reduced	26	5.2%
No changes	185	37.0%
Risky events or incident during work time		
Never	268	53.6%
Yes, unsafe condition	93	18.6%
Yes, near miss events	65	13.0%
Yes, accident with minor injuries	38	7.6%
Yes, accident with need of hospitalization	36	7.2%

TABLE 2. TOTAL RESILIENCE CAPACITIES

Resilience components	TBH	TS	TC	TW
n=500				
Mean	**139.8**	**19.4**	**19.2**	**23.5**
Median	143.0	20.0	19.0	24.0
Std. Deviation	19.8	2.9	3.2	3.8
Minimum	78	9	8	10
Maximum	175	25	25	30

TBH= Total Behavioral Health (25 items): 7-point Likert scale

TS= Total Safety (5 items): 5-point Likert scale

TC= Total Competence (5 items): 5-point Likert scale

TW= Total Wellness (6 items): 5-point Likert scale

TABLE 3. RESILIENCE CAPACITY OF THAI EMS SERVICE PROVIDERS

Resilience levels n=500	Frequency	Percent %
High resilience	127	25.4
Moderate resilience	**248**	**49.6**
Low resilience	125	25.0

As show in Table 3, we can see about half of the service providers (49.6%) in Thailand have moderate level of resilience as an EMS workforce, while about 25% of them show high resilience and 25% have low resilience capacity. To conclude, the result from the measurement of resilience capacity among all 500 service provider's data suggests that while the majority of EMS providers feel resilient in terms of their competencies, safety, wellness and also their behavioral health, there's room for improvement, especially for the percentage of respondents with low resilience. Continued professional development, training programs, and support systems from the EMS agencies could help boost competency-related resilience. Efforts to enhance safety protocols, improve safety communication, and address specific safety concerns could help improve the safety climate resilience. Regular training, refresher's programs, focusing on the teamwork and collaboration could be beneficial strategies to consider. Understanding the characteristics, perception and experiences of those service providers with low resilience could inform support strategies for further improving the overall resilience of the EMS workforce in Thailand.

CONTENT ANALYSIS OF OPEN-ENDED QUESTIONS WITH EMS SERVICE PROVIDERS

Deductive approach for codes and themes developed were used, for the resilient EMS system. The answers were coded, categorized, and sorted under five main themes on the perspective of EMS service providers regarding the EMS system of Thailand. The two open ended questions were asked about the perception and opinions of the frontline workers on the key strength and improvement areas necessary in the EMS system of Thailand focusing on strengthening their health workforce. The organizational system's resilience theory was followed to identify and discuss on key dimension in this study. Which are: health system performance and resiliency framework, health system resilience analysis framework, CAS framework [16-19].

TABLE 4: THEMES GENERATED FOR STRENGTH OF EMS SYSTEM AND IMPROVEMENT AREAS IN EMS OF THAILAND FROM WORKFORCE PERCEPTION AND EXPERIENCE

S. N	Themes (n=5)	Sub-themes (n=15)
1	**Communication**	1. communication technology 2. notification and dispatch
2	**Coordination**	1.collaboration and coordination 2.patient involvement and satisfaction 3.referral mechanism 4.teamwork
3	**Leadership**	1.accessibility of EMS services, coverage and responsiveness 2.safe system 3.rapid response
4	**Competency**	1.competent workers 2.trained workforce
5	**Structure**	1.equipment and resources 2.funding 3.risk compensation 4.adequacy of workforce

We classified the approaches to organizational resilience into five thematic areas based on the system thinking approach: (1) Communication system; (2) coordination; (3) Leadership; (4) Competencies; and (5) Structure. The approaches were summarized within these thematic areas.

CONCLUSION

The results from the study presented the EMS service provider's resilience capacities in in terms of the dimensions of psychological resilience, wellness, safety and competencies. Their resilience capacity was measurement by checking the mean scores and the cut off points as stated in the methodology section. The finding shows that the EMS service providers have moderate level of resilience.

The study reveals that focus is much needed to be provided for psychological coping mechanism of the service providers, program specific for mental health checkup, counseling, risk benefits, compensation and incentives to frontline workers which are the assets of the system and the main pillar for the sustainable development of the emergency care services. Interventions to improve the coping and adaptive capacities for the service providers must include mindful self-care and resiliency interventions, promote stress reduction activities in the organization, and Thailand should focus on the organizational resources that could be used to enhance the resilience and better preparedness of staffs for future emerging and re-emerging infectious diseases situation.

The results from this study may help EMS agencies and administrators to create new initiatives and support networks for the frontline workers, focusing on all pre-hospital staffs to focus on their wellness, safety, retain qualified and skilled workforce and prepare a resilient team to tackle any emergencies in Thailand.

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SHAPE SYMPOSIUM 2024

ACCESS TO GENERIC MEDICINES THROUGH THE PEOPLE'S MEDICINE CENTRE (PMC) IN ODISHA, INDIA: A QUALITATIVE STUDY

Ranjit Kumar Dehury[*1], *GVRK Acharyulu*[2], *Varalakshmi Manchana*[3], *Parthsarathi Dehury*[4], *Imteyaz Ahmad*[4,5], *Nischala Sripathi*[5], *Abhishek Dondapati*[6]

1. School of Management Studies, University of Hyderabad, Telangana - 500 046, India
2. School of Management Studies, University of Hyderabad, Telangana, India
3. School of Medical Sciences, University of Hyderabad, Telangana 500 046, India
4. School of Public Health, AIPH University, Bhubaneswar- 754 001, India
5. Centre for Health Psychology, School of Medical Sciences, University of Hyderabad, Telangana - 500 046, India
6. Administrative Staff College of India (ASCI), Hyderabad, India

Correspondence: ranjitkumardehury@gmail.com, ranjit@uohyd.ac.in

ABSTRACT

INTRODUCTION:

Access to medicine is a concern in India and other developing countries. In India, Pradhan Mantri Bhartiya Janaushadhi Priyojana (PMBJP) helps to a certain extent in provision of medicines to people experiencing poverty. PMBJP is India's central government scheme hosted by the Department of Pharmaceuticals, which comes under the Ministry of Chemicals and Fertilizers. The scheme was uniformly introduced in all the states of the country to benefit the people at large in 2008. The objective of the scheme is to provide high-quality medication to everyone belonging to different strata of the population, especially underprivileged and impoverished people. The state has high regional inequality where few districts are economically developed while many others are economically backward, and access to medicine remains a challenge. This paper explores the knowledge and awareness of the scheme among PMC owners, grievances, and market competition of PMCs.

METHODS:

This study adopted a qualitative research method to understand the concerns of pharmacists and PMCs. An interview schedule was used to assess the situation. The research revolves around subjects such as proprietorship, motivational aspects, monetary provision, faith, satisfaction, perceived benefits, and challenges of the stakeholders. Therefore, open-ended, in-depth interviews were best suited for the study. PMC pharmacists were the only participants in the study. The data collection took place in January and February 2023.

RESULTS:

The results are presented under three themes pertaining to the PMC business: awareness, grievances, and market competition. The study revealed that the ownership of the PMCs was of two types in the state of Odisha, India: one was an old PMC that started between 2008 and 2015, and the other type was a new PHC that started after 2015. In 2015, radical changes were brought into the scheme. The popularity of the scheme among private pharmacists became a phenomenon after 2015; earlier, it was under the control of the government and the District Red Cross (DRC). The scheme

was made open for all independent private pharmacists in 2015. The risk of expired stocks constantly loomed over the PMC business. PMC owners discussed expired drug management mechanisms. Market competition was very much in favor of the PMC owners, as their products were much cheaper than the branded market products. However, they reel under small earnings due to the low price of their products.

CONCLUSION:

Disseminating information about the PMBJP scheme is currently limited to existing pharmacists. The scheme could be promoted to recent graduates with D. Pharma or B to expand its reach. Pharma degrees, encouraging them to become independent PMC pharmacists. Additionally, enhancing mechanisms for managing expired drugs would make the PMC business more appealing. Reforms are also needed for older PMCs (established between 2008 and 2015) to prevent conflicts with authorities and other schemes. While PMCs benefit from lower product prices, they must increase sales volume to achieve satisfactory income, which should be considered to improve the financial outcomes for PMC owners.

KEYWORDS

Pharmacy, Universal health care, Access to medicine, NCD, Global South, Regional imbalance, Healthcare management

INTRODUCTION

Essential medicines are required for the effective treatment of patients, reducing out-of-pocket expenditures and minimizing the risk of medication errors [1]. At the primary level, pharmacists can dispense essential medicine and administer doses to control the risk of medication errors [2]. Pharmacies established under the welfare scheme can serve the objective of providing affordable medicines for the masses [3].

The Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) scheme helps in the provision of subsidized medications to people through outlets owned by pharmacists. Furthermore, quality is assured in these shops through direct monitoring by the ministry of the government [4]. A pharma advisory forum constituted by the government of India in 2008 through the concerned ministry. The forum coined the term Jan Aushadhi (medication for common citizens). It advocated the Jan Aushadhi Campaign and helped the Indian parliament launch the Jan Aushadhi Scheme in 2008 [5,6]. Furthermore, in 2015, the classification of the scheme changed to PMBJP [3]. The Pharmacies established under this scheme are called Jan Aushadhi Kendra. The English translation of this term could be the People's Medicine Centre. Hence, it is abbreviated as PMC in this paper.

The implementation of the PMBJP scheme relies on PMCs operating effectively at the local level. Initially, launched in selected districts in India in 2008, the scheme aimed to establish one PMC in each of the 630 districts nationwide, with plans for further expansion into district subdivisions and major towns and village centers by 2012 [3,7]. Between 2008 and 2014, the scheme experienced limited progress, with fewer than a hundred PMCs being established. However, after the NDA government restructured the program after 2015, there was a significant increase in the number of PMCs, exceeding 9,000 across the country by 2022 [3].

PMCs have been established across India to open outlets in all public hospitals and accessible locations [8]. There are two categories of PMCs: old PMCs, which were set up between 2008 and 2015, and new PMCs, which were established after 2015. The old PMCs were created with initial funding provided to District Red Cross (DRC) societies, facilitating the establishment of infrastructure and procuring an initial stock of drugs. In contrast, the new PMCs were developed by incorporating private pharmacists as stakeholders in the scheme. These pharmacists received a one-time grant from the PMBJP scheme to operate the outlets on a self-sustaining model. Under this model, the government provides only initial financial support, whereas nongovernmental organizations (such as DRCs) and private pharmacists are responsible for generating profits to sustain the operations of outlets [6,7]. The PMBJP scheme offers collaborating entrepreneurs (private pharmacists) a 20% discount on the maximum

retail price (excluding taxes) for medicine purchases, which is adequate to cover profit margins [6,9,10].

The primary objective of PMCs is to help out the underprivileged population with medication. PMCs employ educational and promotional strategies to achieve widespread access and dispel the common misconception that higher prices equate to better quality. Additionally, the scheme facilitated through PMCs aims to generate employment opportunities for unemployed pharmacists [11].

This paper explores access to information and awareness about the scheme among PMC owners, grievances, and market competition among PMCs.

METHODOLOGY

In-depth interviews with seventeen numbers were conducted to obtain information about pharmacists providing services to people. The PMCs are taken from the website and used for raw data. This study was conducted in the province of Odisha due to its lack of infrastructure and overall inaccessibility of healthcare [12,13]. The functionality of PMCs in Odisha is essential to dispense good healthcare. The PMBJP scheme is important for all provinces in India, and certain regions, such as Odisha, have an acute need for such initiatives.

UNIVERSE OF THE STUDY

Odisha consists of 30 administrative units known as districts and is governed by devolved power from the state [14]. For this study, data were collected from five purposively selected districts. These five districts encompass Kalahandi and Rayagada, which are located in the southern part of the province. These districts are predominantly tribal and rural and are characterized by primary sector activities and longstanding poverty. In contrast, Angul and Keonjhar from the northern region were used because of their industrial mining activities. Khordha, located on the eastern side of the province, is both a coastal and economically prosperous district, serving as the capital region of Odisha and focusing primarily on tertiary sector activities [15].

UNIT OF THE STUDY

The individuals interviewed were employed pharmacists with decision-making power for the business of PMCs, each with a minimum of five years of experience in the field. The participants were chosen through convenience sampling. Some potential participants declined to participate because of rush hour constraints, whereas others requested that the researchers return at different times. Researchers conducted visits to the PMCs and interviewed the pharmacists at suitable and convenient times for the participants. The interviews were conducted onsite at the PMC centers from January to March 2023. Recording was performed via an audio recorder. The languages used for the interviews were Odia and Hindi. The paper has followed the COREQ-32-item checklist for qualitative research to increase the quality of reporting [16]. The participants' consent was obtained at the beginning of the interviews.

DATA ANALYSIS

Normal transcription from the Odia and Hindi languages was performed in English. The free version of InqScribe was used to convert the recorded audio into text. The transcripts were then translated into English. To ensure anonymity and confidentiality, all personal information of the interviewees was removed from the transcripts. Apart from redacting the participants' actual names and identifying details, no further modifications were made during the translation process. Pseudonyms were assigned to participants for the purposes of data analysis. Language experts were consulted to verify and ensure the accuracy of the translations. For the current paper, three themes were chosen from a more extensive study to present an important aspect of the PMC ecosystem in Odisha. The interview guide was structured around predetermined themes. Codes were developed on the basis of the transcribed interviews, and relevant sentences and sections were highlighted and categorized according to these codes. An inductive approach in the analysis is utilized to explore the phenomenon as per the study's objective. MaxQDA software was used to analyze the data.

RESULTS

The results are discussed in terms of the three themes that reflect access to information and awareness about the scheme among pharmacists, the grievances of the pharmacists, and the market competition situation for PMCs.

ACCESS TO INFORMATION AND AWARENESS ABOUT THE SCHEME AMONG PHARMACISTS

Knowledge and awareness about the scheme among PMC pharmacists are crucial. Greater knowledge may lead to the expected outcome of the scheme. The results

under this theme are discussed from the perspective of PMC pharmacists.

There was no provision for private pharmacist inclusion in the initial years of the PMBJP scheme (from 2008--2015). The scheme was implemented with the help of the District Red Cross (DRC) society across Odisha. A PMC pharmacist, Ranjan (name changed), working at Angul DRC-run center, recalled that an official notification from the central government of India that one PMC would be established in each district under the leadership of the DRC society with the collaboration of the district health department. Therefore, the scheme's first phase did not have to do anything about the scheme promotion among private pharmacists. However, in 2015, the scheme was modified, and private pharmacists were invited to integrate into it. The new modified scheme gained quick momentum, and in a short period, the PMCs spread across Odisha. Private PMCs grew in cities. However, their expansion remains limited in remote and rural areas. A lack of information and awareness was one of the significant factors.

The provision of money under the scheme to open a PMC was widespread information that attracted most PMC pharmacists. The source of information about the scheme to PMC owners came from fellow pharmacists. Newspaper advertisements notified them about the scheme, but detailed information and encouragement were provided by fellow pharmacists already engaged in the PMC business. Dilip (name changed), a PMC pharmacist who came into the PMC business two years ago, said, "There is a (PMC) store of my friend; he informed and invited me to start this business, as it is a good venture."

In 2015, when the PMBJP scheme was revamped, it attracted existing private pharmacy owners. Many chose this opportunity and transformed their old pharmacy into new PMC pharmacies. Because they are in the pharmaceutical business, they become easily informed about the scheme. Manohar (name changed), a PMC pharmacist for six years, emphasized that it was not difficult for him to acquire information about the scheme because he had been in this occupation for a long period of time.

GRIEVANCES OF THE PMC OWNERS

Stocks that have expired are a common grievance among PMCs. There was a two percent extra margin on the product's maximum retail price (MRP) along with the twenty percent profit margin to cope with the losses incurred due to expired stocks. Some PMC pharmacists were efficiently managing their stores with the provisions in the scheme. Dilip (name changed), a private PMC owner, denies any sort of loss or grievance caused by the scheme. According to him, two percent extra margin on MRP is just okay to manage the losses. However, Devdut (name changed) found this arrangement in the scheme insufficient to cover the losses. Hence, a mechanism to manage expired products is needed to make the PMC business favorable for PMC owners. Ranjan (name changed) highlighted that to avoid expired stocks, one must order less than what is actually demanded. Therefore, PMCs often run out of stock and cause inconvenience to customers. This inconvenience results in the reduced reliability of customers on PMCs. It affects business in the long run, Ranjan said. As the pharmacist at the DRC-run PMC, Ranjan noted that he had to bear all the losses at the time of the COVID-19 pandemic lockdown. He was not allowed to report enormous expired stocks to the DRC society.

Compensation for the support staff at the PMCs is not regulated in the scheme. Owing to all dependency on the twenty percent MRP margin, PMC owners find it difficult to compensate the supporting staff appropriately. Rent and manpower are the major expenditure heads for a PMC owner. Arpana (name changed) suggested that the scheme can introduce a provision to support either of the expenditure heads to ensure the sustenance of the PMCs. Old PMCs managed by DRC society lack technological advantages over new private PMCs. Ranjan was a DRC-run PMC pharmacist; he noted that he is still providing handwritten bills to his customers because he does not have time to learn and install computers to generate bills. Despite the enormous demand for PMC medicines at his outlet, he feels incapacitated due to the disadvantage of the absence of technology.

One DRC-run PMC that was functioning inside the government hospital campus faced severe problems. The district collector has not reimbursed the bills to be paid for supplies for the last six months. The PMC faced an extreme shortage of stock and found it difficult to operate. Rahul (name changed) was the appointed pharmacist at the PMC. He alleged that the district collector was interested in promoting the state-run Niramaya scheme and not the central government-funded PMBJP scheme.

MARKET COMPETITION AND PRICE STABILITY

Competition is a common phenomenon in businesses, and price discounts are common. PMC owners/operators were

asked whether they face market competition of any sort and how they cope with that. Devdut said, "We are already selling at the lowest market price; how does the market competition affect us." He mentioned that there was no possibility to reduce the price further, as there was a need to cover the cost of running PMC. Ranjan's statement supports the Devdut argument; according to Ranjan, a twenty percent price margin is just sufficient to run a PMC.

Niramya is a state-sponsored free medicine distribution outlet located in the vicinity of all public hospitals. Ranjan said, "Niramya cannot affect their business as it was functioning with a different set of objectives and principals; they are not a profit-making entity." Prabeer (name changed) said, "If any patient goes to Niramaya (pharmacy), they will get only a three-day dose. To continue the medication further, they have to come to us." There was no competition among the PMCs themselves. These authors reported that an environment was more conducive if another PMC was nearby. Prabeer said that by having another PMC in proximity, we are able to retain the customers and not lose them to the non-PMC pharmacies; suppose I have four medicines out of five mentioned in the prescription. I can refer the customer to the neighboring PMC."

DISCUSSION

Revamping the PMBJP scheme was a significant move by the government in 2015 [3]. It welcomed private pharmacists and career seekers in the pharmacy sector [9]. The expansion of information among such groups that can contribute to the success of the PMBJP scheme is highly desirable. Private pharmacists who were already serving quickly took over the scheme. However, new career seekers were not visible in the PMC business in Odisha, where a strong network of existing pharmacists operated behind the large-scale establishment of PMCs.

As a grievance or challenge, PMC pharmacists face expired drug stock. The PMC business model is efficient. However, a good drug inventory planning system can help PMC pharmacists budget, procure, and control the business [17]. Old PMCs still function on the old system. Therefore, they face severe challenges. The scheme was revised, but the old PMC mechanism remained untouched. It should be revived with active policy intervention [5].

Currently, the PMC business is performing best. It is efficient in delivering affordable medicines to the masses [5]. However, low-priced PMC products require the selling of higher volumes to earn sufficient income to compensate staff, pay rent, and meet other expenditures.

CONCLUSION

The spread of information about the PMBJP scheme is limited to existing pharmacists only. However, this scheme can be promoted among college passouts to obtain D. Pharma. or B. Pharma degree and become an independent PMC pharmacist. It can be seen as a small start-up with enormous growth potential. To make the PMC business more attractive and beneficial, mechanisms to manage expired drugs should be made robust. Old PMCs (starting between 2008 and 2015) need reform, as they should not come into conflict with authorities and other existing schemes. It is appreciable that PMCs have an edge over market competition due to the significantly lower prices of their products. However, they need to sell more in volume to earn satisfactory income from low-priced drugs. This phenomenon should be taken into consideration to increase the income of PMC owners.

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CONFLICT OF INTEREST:

None

ETHICAL APPROVAL:

The data were obtained from the Institute's ethical clearance committee.

CONSENT TO PARTICIPATE:

Written consent was obtained from the participants before beginning the study.

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ROLE OF SOCIAL DETERMINANTS OF HEALTH IN REPRODUCTIVE CANCER CARE AMONG WOMEN: A CROSS-SECTIONAL SURVEY FROM DIVERSE DEMOGRAPHIC AND REGIONAL SETTINGS IN INDIA

Padmaja Gadiraju[*1], *C. Vanlalhruaii*[1], *Ranjit Kumar Dehury*[2], *Punam Singh*[2], *Imteyaz Ahmad*[1,3], *Parthsarathi Dehury*[3]

1. Centre for Health Psychology, School of Medical Sciences, University of Hyderabad, Telangana – 500 046, India
2. School of Management Studies, University of Hyderabad, Telangana - 500 046, India
3. School of Public Health, AIPH University, Bhubaneswar- 754001, India

Correspondence: gpadmaja.psychology@uohyd.ac.in

ABSTRACT

Access to reproductive cancer care in India is significantly affected by social determinants of health. Reproductive cancers, including cervical, ovarian, and uterine cancers, constitute a significant health challenge for women in India. This cross-sectional survey aims to comprehensively assess the landscape of reproductive cancer care among women in India, exploring access, awareness, and barriers to timely diagnosis and treatment. This study highlights challenges in delivering care for reproductive cancers among women in India.

A cross-sectional survey design was adopted, involving a representative sample of women from four diverse geographical regions, urban and rural settings, and varying socioeconomic backgrounds. Structured interviews were conducted, and questionnaires were used to collect data on participants' awareness of reproductive cancers, utilization of healthcare facilities, and experiences related to access to cancer care. The study adopted a convenient sampling approach and captured data from 509 women diagnosed with reproductive cancer.

The collected data were analysed using the SPSS 25 version. Univariate, bivariate and multivariate analyses were performed. The survey identified one-fourth of the respondents as having ovarian cancer, and 23.4% were diagnosed with cervical cancer. One-third of the study respondents were diagnosed with breast cancer, and 18% had other reproductive system cancers. The survey also assesses the prevalence of risk factors contributing to the incidence of reproductive cancers.

Socioeconomic status, education level, rural–urban settings, and cultural beliefs influence the healthcare-seeking behavior of the study participants. Insufficient knowledge, the stigma of reproductive health problems, and a lack of family income frequently discourage women from obtaining timely medical treatment.

KEYWORDS

Reproductive Cancer, Diverse Demographic, Social Determinants and Regional Setting

INTRODUCTION

Reproductive cancers, such as breast, cervical, ovarian, and uterine cancers, have important effects on the health and death rates of women worldwide. Social determinants of health (SDOH), such as economic status, education and geographic location, significantly impact the quality and availability of cancer care. Gaining insight into the influence of these factors on reproductive cancer treatment is essential for developing successful treatments and policies.

Socioeconomic status (SES) is a highly significant factor that affects the outcome of cancer care. Research consistently indicates that women from lower socioeconomic status (SES) households have a lower probability of receiving cancer tests in a timely manner and are susceptible to being detected at advanced stages of the disease [1]. The study revealed an association between a lower socioeconomic level (SES) and a lack of adherence to treatment guidelines for early-stage ovarian cancer. Women with socioeconomically disadvantaged backgrounds face difficulties such as inadequate healthcare availability and financial constraints, resulting in substandard medical treatment and sometimes adverse outcomes. This highlights the necessity for targeted treatments for women diagnosed with reproductive cancer.

The delay in diagnosing a condition often results in worse outcomes and increased mortality rates [2,3]. Financial constraints, such as the inability to meet the expenses of insurance or out-of-pocket payments, greatly affect the capacity to obtain preventive care and treatments [4]. This study examined the total individual expenses associated with different treatment approaches for ovarian cancer. This study reveals substantial cost disparities on the basis of the treatment method, with certain approaches causing significant burdens on patients. This emphasizes the importance of considering both the clinical effectiveness and the economic consequences when selecting options for treatment [5].

Education is strongly linked to socioeconomic status (SES) and has a significant effect on the accessibility of reproductive cancer care. Women with higher education levels tend to possess better health literacy, which empowers them to adequately navigate healthcare systems, understand medical information, and adhere to proposed cancer screenings [6]. This study assessed the level of awareness of cervical cancer among women and investigated the factors that influence their knowledge. A substantial percentage of women have a limited understanding of cervical cancer, and this lack of knowledge is associated with lower levels of literacy, which, in response, can be caused by characteristics such as educational attainment, socioeconomic status, and healthcare accessibility. Enhancing education and raising awareness are crucial for more effective prevention and early detection [7].

In contrast, individuals with lower levels of education tend to have limited knowledge about the risks and symptoms of cancer, leading to delays in seeking treatment and reduced involvement in preventative activities [8]. Access to reproductive cancer care is substantially influenced by geographic location, and rural women encounter different problems in this regard. Rural regions frequently lack healthcare establishments, specialized cancer centers, and oncology experts, increasing the travel distance for treatment and lowering the availability of medical care [9]. In addition, rural women are more vulnerable to having a lower socioeconomic status (SES), which increases the obstacles they face in accessing timely and sufficient healthcare [10].

In the context of reproductive cancer care among women in India, social determinants of health play an important role in affecting the incidence, diagnosis, treatment, and survival rates of cancers such as cervical, ovarian, and breast cancers. As per the NFHS-5, intersectional socioeconomic disparities in breast cancer screening have revealed significant disparities in accessibility. Women belonging to marginalized communities, namely, those with lower socioeconomic status, experience lower rates of screening, highlighting the necessity for focused initiatives to address these disparities [11]. A study conducted on sociodemographic and reproductive risk factors for cervical cancer in rural India identified several aspects that contribute to the risk. Early marriage, a high number of pregnancies, a low level of education, and restricted availability of healthcare services were reported. These findings emphasize the necessity of implementing focused prevention and awareness initiatives to address the risks of cervical cancer in rural areas [12,13]. A study conducted on adolescents from low socioeconomic backgrounds in India revealed that insufficient health communication, education, and social support have a substantial influence

on their involvement in cancer preventive behaviors. It is essential to prioritize the development of awareness and support networks to increase cancer prevention efforts for those at risk [14].

The literature highlights the significant impact of social determinants of health on the provision of reproductive cancer care for women. Factors such as socioeconomic status, education, geographic location, and the healthcare system influence cancer care access and outcome disparities. It is crucial to address these factors by implementing specific interventions, implementing policy changes, and implementing community-based initiatives to reduce inequalities in reproductive cancer care. This study aims to determine the role of social determinants of health in reproductive cancer care in India.

MATERIALS AND METHODS:

Reproductive cancers, such as cervical, ovarian, and breast cancers, create substantial health risks for women in India. Socioeconomic status, cultural beliefs, geographic location, and healthcare access are among the social determinants that impact the accessibility and utilization of reproductive cancer care. An analysis of these factors was conducted via a cross-sectional survey method. The utilization of this study methodology provides the gathering of data at specific times, resulting in a valuable understanding of the social determinants that impact cancer treatment approaches for women.

STUDY POPULATION AND SAMPLING

This survey focused on women of reproductive age from four diverse regions of India: Telangana, Odisha, Jharkhand, and Mizoram. Telangana belongs to the southern part of India, whereas Odisha and Jharkhand are in the eastern region. The state of Mizoram belongs to the northeast region of India, where the prevalence of cancer is high compared with that in other states. The sample was chosen for those who were either at risk of or had received a diagnosis of reproductive cancer. The sample included women from a wide range of socioeconomic statuses, with different educational levels, belonging to various religious and cultural categories, and residing in both rural and urban regions. The inclusiveness of this diversity ensures that the survey encompasses a wide spectrum of social determinants that impact cancer care. A structured interview was conducted among 509 women via a structured questionnaire.

The continent sampling method was adopted in different hospitals and healthcare institutions. Sampling was performed according to the disparities in healthcare accessibility between urban and rural communities, as well as within the selected states in India, marked by significant inequalities in health infrastructure and services. These surveys collect quantitative data on variables such as age, religion, family annual income, education, and access to healthcare. Other potential factors, such as types of cancer, risk factors, and symptoms, were included in learning about individual health habits, such as participating in cancer screening and treatment.

DATA ANALYSIS

The study used SPSS (version-25) for coding and computing the variables. The demographic characteristics of the participants were analyzed via descriptive statistics. The analysis detected significant trends in the data, such as the proportion of women who were aware of their risk factors and symptoms regarding reproductive cancer according to their social determinants. The associations between social determinants and outcomes such as HPV vaccination, cancer diagnosis, treatment, physiotherapy and counseling services were investigated via inferential statistics. Approaches such as cross-tabulation and chi-square tests were used to determine the variables that significantly affect access to healthcare.

RESULTS

Table 1 presents the sociodemographic profile and various social determinants of health of the study respondents. Among the study population, most (86.4%) of the respondents were up to 60 years of age. The mean age of the respondents was 48.34 years. Fifty-six percent of the respondents were from Hindu religious groups. In terms of education attainment, 53.2% of the respondents had received primary education. The majority (71.5%) of the respondents were homemakers. Fifty percent of the respondents reported that their family annual income was up to an international normalized ratio (INR) of 1,50,501, the mean household income. Nearly 30% of the respondents were from the Jharkhand region.

TABLE 1. SOCIODEMOGRAPHIC STATUS OF THE STUDY RESPONDENTS

Respondents' characteristics	Categories	Frequency	Percentage	Total
Age	Up to 60 years	440	86.4	509
	61years and above	69	13.6	
	Mean age	48.34		
Religion	Hindu	286	56.2	509
	Muslim	59	11.6	
	Christian	164	32.2	
Caste	SC	58	11.4	509
	ST	190	37.3	
	OBC	132	25.9	
	General	129	25.3	
Education	Primary	271	53.2	509
	Up to 10th	177	34.8	
	11th and above	61	12.0	
Occupation	Employed	145	28.5	509
	Homemakers	364	71.5	
Family income (Annul)	No income	79	15.5	509
	Low Income (Up to 150500)	255	50.1	
	High Income (150501 and above)	175	34.4	
States	Jharkhand	152	29.9	509
	Mizoram	114	28.3	
	Odisha	113	22.2	
	Telangana	100	19.6	

TABLE 2. TYPES OF REPRODUCTIVE CANCER WITH RISK FACTORS AND SYMPTOMS

Factors	Category	Frequency	Percentage	Total
Type of cancer	Ovarian	127	25.0	509
	Cervix	119	23.4	
	Breast	172	33.8	
	Another reproductive organ	91	17.9	
Self-reported top five Risk factors	Tabacco chewing	215	42.2	509
	Poor sexual hygiene	143	28.1	
	Multiple sexual partner	112	22.0	
	History of STDs	81	15.9	
	Multiple Abortion	66	13.0	

Top five symptoms	Heavy bleeding	290	57.0	509
	Foul-smelling discharge	221	43.4	
	Postmenopausal bleeding	215	42.2	
	High fever	163	32.0	
	Discomfort while sitting	117	23.0	

Table 2 shows various types of reproductive cancer and the top five risk factors and symptoms. One-fourth of the respondents were diagnosed with ovarian cancer, 33.8% with breast cancer, 23.4% with cervical cancer and nearly 18% with other reproductive system cancers. The top five self-reported risk factors were tobacco chewing (42.2%), poor sexual hygiene (28.1%), multiple sexual partners (22%), a history of STDs (15.9%) and multiple abortions (13%). The top five symptoms of reproductive cancer were heavy bleeding (57%), foul-smelling discharge (43.4%), postmenopausal bleeding (42.2%), high fever (32%) and discomfort while sitting (23%).

TABLE 3. OBTAINING CANCER CARE AMONG STUDY RESPONDENTS AS SOCIAL DETERMINANTS OF HEALTH

Respondents' characteristics	Categories	Cancer care among study respondents				Total N
		Vaccinated HPV	Treatment	Physiotherapy	Counseling	
Age	Up to 60 years	15.0	65.9	28.9	38.2	86.4
	61years and above	17.4	62.3	23.2	20.3	13.6
Religion	Hindu	5.2***	73.1***	19.6***	52.8***	56.2
	Muslim	10.2	64.4	39.0	40.7	11.6
	Christian	34.8	52.4	39.0	4.3	32.2
Caste	SC	1.7***	63.8***	25.9**	34.5***	11.4
	ST	31.1	52.1	37.4	9.5	37.3
	OBC	7.6	73.5	23.5	42.4	25.9
	General	6.2	77.5	20.2	68.2	25.3
Education	Primary	12.2	60.1**	27.7	35.4	53.2
	Up to 10th	19.2	68.9	28.2	31.6	34.8
	11th and above	18.0	78.7	29.5	49.2	12.0
Occupation	Employed	18.6	62.1	30.3	23.4	28.5
	Homemakers	14.0	66.8	27.2	40.7	71.5
Family income (Annual)	No income	24.1***	58.2***	32.9***	29.1***	15.5
	Low Income (Up to 150500)	7.8	73.7	18.8	51.4	50.1
	High Income (150501 and above)	22.3	56.6	39.4	16.0	34.4
State	Telangana	4.0***	77.0***	9.0***	8.0***	19.6
	Odisha	1.8	99.1	0.0	100.0	22.2
	Jharkhand	11.2	48.7	46.7	38.8	29.9
	Mizoram	38.2	48.6	43.8	1.4	28.3
Total		15.3	65.4	28.1	35.8	509

Note: Significance level: ***p< 0.01, **p< 0.05, *p< 0.1

Table 3 presents the levels of cancer care provided by various social determinants of health among the study respondents. Cancer care, such as receiving the HPV vaccine, treatment, physiotherapy and counseling, was considered for analysis. Only 15.3 percent of the respondents were vaccinated, and 65.4 percent received treatment. Twenty-eight percent of the respondents received physiotherapy, and 35.8 percent received counseling services.

The age distribution shows that only 15% of the respondents aged 60 years were vaccinated. Nearly 66% of the respondents from the same age group received treatment for reproductive cancer. One-fifth of the respondents, who were 61 years old and above, received counseling services. With respect to educational background, more respondents with higher education levels reported receiving more cancer care than did those with lower educational statuses. More respondents from high-income levels than those from lower-income levels received more vaccinations, treatment, and physiotherapy. Social determinants of health, such as religion, caste, education, family income and regional state, were strongly associated with cancer care treatment.

Figure 1 illustrates respondents' preferred health facilitiesfor cancer care. The majority (63.3%) of the respondents preferred govt. hospital for cancer care treatment. Twenty-one percent of the respondents preferred private hospitals, 12% preferred charity-based hospitals, 2.6% preferred semigovernment hospitals, and only 0.6% preferred corporate hospitals for cancer care.

FIGURE 1. PREFERRED HEALTH FACILITIES FOR TREATMENT

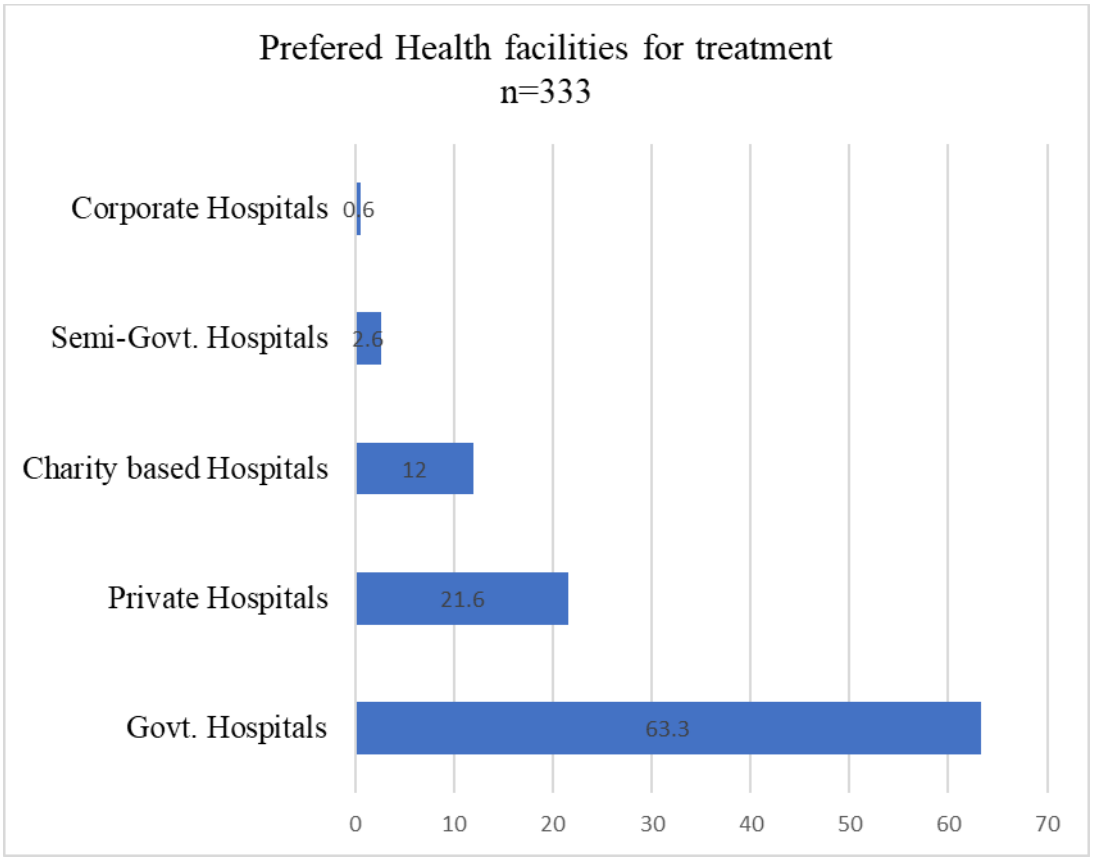

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FIGURE 2. CAUSES FOR PREFERRING HEALTH INSTITUTIONS

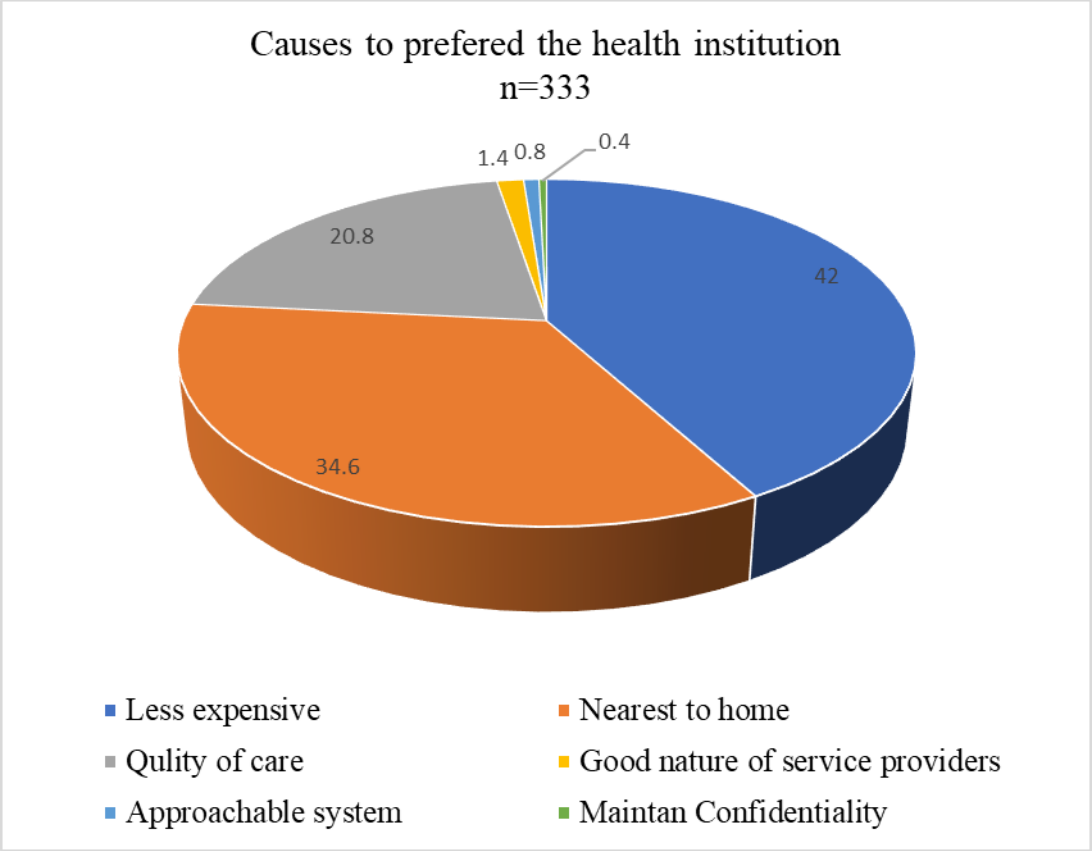

Figure 2 shows the causes of preferred health institutions for reproductive cancer care. The majority (42%) of the respondents preferred a particular health institution because it was less expensive. More than 34% of the respondents preferred the health institution because it was nearest to the home. One-fifth of the respondents preferred it due to quality of care, 1.4% for the good nature of the service provider, 0.8% for the approachable health system and 0.4% for maintaining confidentiality.

DISCUSSION

Socioeconomic status, education, occupation, healthcare access, and geographic location constitute the social determinants of health (SDH) that significantly shape differences in access to reproductive cancer care. This paper examines the significance of social determinants of health (SDHs) in the provision of reproductive cancer treatment for women in India. It focuses on findings from cross-sectional surveys in various demographic and geographic regions.

Social determinants of health refer to nonmedical factors that impact health outcomes. This includes the circumstances under which individuals are born, develop, reside, labor, and age, together with the broader range of influences and structures that shape the conditions that define daily life. Within the context of reproductive cancer care in India, social determinants of health (SDHs) have an important effect on the availability of timely diagnosis, therapy, and supportive care.

The socioeconomic status (SES) of a person is an important variable that affects their ability to obtain healthcare services. The current study revealed that family annual income is strongly associated with receiving reproductive cancer treatment. The financial limitations faced by women from lower-income households result in a reduced likelihood of them undergoing routine cancer tests, including Pap smears and mammograms [15]. Similarly, the present study revealed that respondents from lower annual income backgrounds had less access to physiotherapy and counseling services. Empirical evidence indicates that economic disadvantage restricts the availability of preventative healthcare, leading to delayed detection of cancer and unfavorable prognoses [16]. This study also indicates that the majority of respondents were unable to access private and corporate hospital-driven cancer care due to their disadvantaged economic conditions. Moreover, the financial burden of treatment for reproductive cancers can be too severe for many

households, resulting in inequalities in adherence to treatment and rates of survival [17].

Education is vital in the timely identification and treatment of reproductive cancers. The current study revealed that respondents with a low level of education received less treatment than did those with a higher level of education. Higher levels of education among women correlate with increased awareness of the symptoms associated with reproductive cancers and timely medical intervention [7]. However, a lack of education leads to a postponement in the early detection of diseases, especially in rural and semiurban regions characterized by limited health literacy [18]. The current study revealed inadequate knowledge about the risk factors for reproductive cancer among the respondents. Data from cross-sectional surveys have shown that women who have limited knowledge about reproductive cancers frequently attribute symptoms to benign illnesses, therefore postponing the seeking of specialist medical care [19].

Access to healthcare services in India shows significant disparities across regions. Owing to the proximity of healthcare facilities in cities, women residing in urban regions are more likely to access reproductive cancer treatment than their rural counterparts are. Rural women frequently face significant barriers to accessing healthcare, such as considerable distances to healthcare facilities, limited transportation, and a lack of qualified healthcare practitioners [18,20]. The presence of these barriers leads to inequitable availability of cancer screening, diagnosis, and treatment services in various regions of the nation. The present study shows that the respondents preferred healthcare institutions because they are nearest to their current place of residence.

Social determinants of health are significant contributors to inequalities in the delivery of reproductive cancer treatment for women in the study area. Factors such as socioeconomic level, education, geographic location, healthcare infrastructure, and occupation significantly affect the availability of cancer treatment. Enhancing cancer outcomes and obtaining health equity for women in various demographic and regional contexts in India requires the implementation of focused public health interventions, policy changes, and awareness campaigns to address these factors.

CONCLUSION

Preliminary findings reveal varying levels of awareness regarding reproductive cancer care, with regional disparities influencing the adoption of preventive measures such as HPV vaccinations for cervical cancer. To address these social determinants, the survey results contribute to implementing comprehensive efforts such as educational campaigns, enhancing healthcare accessibility, and addressing socioeconomic disparities to ensure fair and equal access to reproductive cancer care in India. Addressing reproductive cancer care among women in India requires dealing with the social determinants of health. Interventions should prioritize reducing socioeconomic inequities, enhancing health literacy, and facilitating access to healthcare services. Addressing these factors can potentially optimize early identification, deliver timely medical intervention, and ultimately increase the chances of survival for women in India who are affected by reproductive cancers.

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ETHICAL APPROVAL:

Was obtained from institutes ethical clearance committee.

CONSENT TO PARTICIPATE:

A written consent was obtained from participants before beginning the study.

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SHAPE SYMPOSIUM 2024

HEALTHCARE AT ARM'S LENGTH: EXPLORING THE ASSOCIATION OF DISTANCE AND THE HOUSEHOLD WEALTH INDEX IN ODISHA, INDIA

Imteyaz Ahmad[1], Ranjit Kumar Dehury[2], Padmaja Gadiraju[1], Parthsarathi Dehury[3], Janmejaya Samal[4], Manas Ranjan Behera[5]*

1. Centre for Health Psychology, School of Medical Sciences, University of Hyderabad, Telangana - 500 046, India
2. School of Management Studies, University of Hyderabad, Telangana - 500 046, India
3. School of Public Health, AIPH University, Bhubaneswar- 754 001, India
4. SRM University Chennai, India
5. School of Public Health, Kalinga Institute of Industrial Technology (KIIT) Deemed to be University, Bhubaneswar 751024, India

Correspondence: imteyazahmad777@gmail.com

ABSTRACT

INTRODUCTION:

Location or distance from healthcare facilities affects the use of health facilities by households. The use of health facilities also have an impact on the socioeconomic conditions. Distance from healthcare facilities significantly affects catastrophic health expenditures. This study aimed to determine the association of physical distance to healthcare facilities with the economic deprivation of households.

OBJECTIVE:

This study aims to analyze the distance of healthcare facilities from households in different wealth index categories of Odisha. The study argues that the household wealth index is associated with the distance to healthcare facilities.

METHODOLOGY:

This study is based on six purposively selected districts in Odisha: Rayagada, Kalahandi, Angul, Keonjhar, Khordha, and Kendrapara in India. A cross-sectional household survey was conducted to collect the data. A total of 902 household data points were collected. Data analysis was carried out using SPSS version 25.

RESULTS:

A difference is observed among households that need to travel more than one hour to reach a private doctor or private hospital: 42.6% of poor households face this challenge, whereas only 25% of wealthy households do. Among those who cannot reach a public hospital in less than an hour, a larger proportion are from poor households (62.6%). The poor and wealthy segments of the population have nearly equal access to NGO-run healthcare facilities in terms of proximity. We observe that poor households are less likely than wealthy households to reach private pharmacists in less than an hour and are more likely to require over an hour to reach them.

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CONCLUSION:

Ensuring healthcare facilities is the minimum requirement within one hour of reach for every household in India. Underreporting of illnesses and diseases is one of the major factors of high mortality in the population. Physical accessibility to healthcare facilities can reduce the mortality burden on the population.

KEYWORDS

Distance, Healthcare facilities, Hospitals, Pharmacies, NGO-run facilities, Odisha

INTRODUCTION

The distance between patients' homes and healthcare facilities significantly impacts their access to and utilization of healthcare services, particularly among socioeconomically disadvantaged populations. This review synthesizes research findings on how distance to healthcare facilities interacts with various factors to influence health outcomes, healthcare utilization, and patient satisfaction.

With increasing distance, the cost of access to healthcare facilities increases. Cost can be best measured by the time spent reaching a facility. Delayed consultation is an outcome of long distances from the pediatric rheumatology center [1]. A greater travel distance increases the risk of more comorbidities, which leads to a greater duration of hospitalization. Referral healthcare institutions attract more patients who travel longer distances, as regional healthcare institutions do not have specialized care [2]. Patients prefer a lesser distance of their home from the hospital as well as the availability of suitable transport to reach the facility and the likelihood of their being able to return by the same evening after their encounter with the hospital is over [3]. Efficient healthcare facility utilization depends on proximity to the facility in addition to increased patient–doctor interaction and laboratory services [4].

Relatives of mentally ill patients feel morally obligated to visit patients at care facilities. However, visitors face challenges due to geographical distance along with other social and professional commitments [5].

Antimicrobial resistance (AMR) is a global silent pandemic [6]. Ensuring effective, accessible diagnostic networks is critical for diagnosing, monitoring and preventing AMR. This wide network of healthcare facilities is not present in most low- and middle-income countries [7].

Distance from healthcare facilities can be highly important in the context of road accidents, as it may impact the survival outcome for crash victims [8]. In poisoning cases, many deaths can be averted by immediate access to health services along with improved case management [9].

The reproductive healthcare needs of women critically depends on multiple factors, such as doctor availability, waiting time, cleanliness, privacy and affordability. Among these factors, service proximity is the utmost requirement [10]. The special newborn care unit (SNCU) can be effective when it is closer to the homes of mothers and newborns with adequate support from back-referral transport facilities [11]. In cases of abortion, safe abortion is compromised because abortion facilities are far away [12]. Distance has some common companions who challenge patients and the healthcare system. Banerjee and others [13] postulated that long waiting times, affordability, poor quality of care, attitudes of health workers, poor transportation facilities, a lack of infrastructure together with distance, challenges the rural population and urban slum dwellers in accessing primary health care services. This directly hampers equitable distribution and access principles [13–15]. However, patients prefer to travel distance if doctor–patient interactions are informal and if the quality of care is good [16].

HIV patients travel more than 30 km for antiretroviral therapy (ART), as it benefits patients. However, long distances from facilities lead to nonadherence in many cases [17,18]. Forgetfulness, running out pills, alcohol abuse, perceived stigma, depressive symptoms, and fear of side effects are other complementary factors of HIV-ART treatment nonadherence [18].

Compared with non-SC/ST groups, deprived and vulnerable population groups such as SC and ST groups are

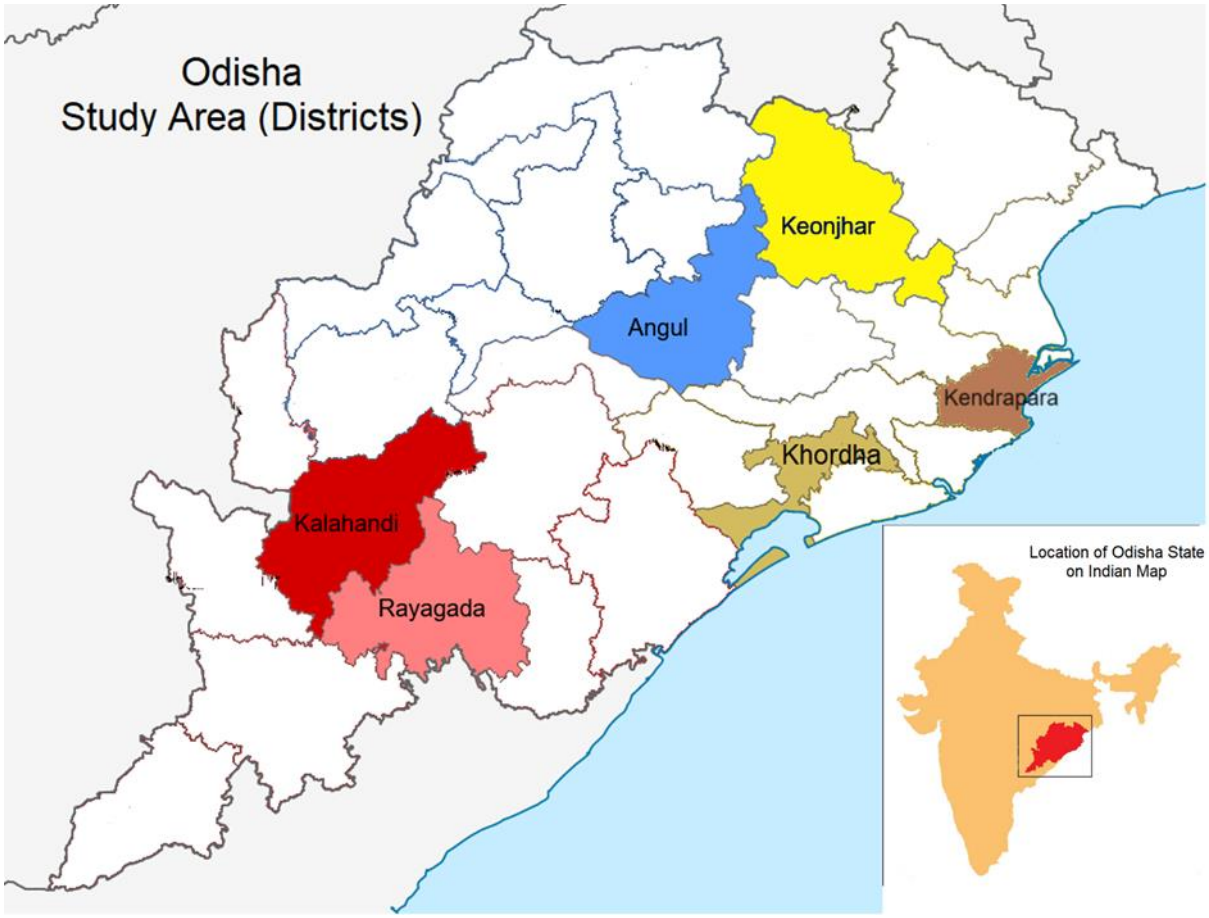
located farthest from healthcare facilities [19]. The status of SC/ST women is even worse than that of SC/ST men in terms of reaching reproductive health services compared with their counterparts [20].

This paper aims to analyze primary data to determine the relationship between healthcare facility distance and household economic conditions in Odisha.

MATERIALS AND METHODS

The study is based on six purposively selected districts in Odisha: Rayagada, Kalahandi, Angul, Keonjhar, Khordha, and Kendrapara. The six purposively selected districts represent southern, northern, and coastal Odisha. The three regions have three different types of economic identity. Rayagada and Kalahandi are southern Odisha's tribal population-dominated regions where households mostly depend on primary activities to earn their livelihood and are economically deprived compared with other districts of the province. North Odisha is represented by Angul and Keonjhar districts. These two districts are known for coal and iron ore mining. Household income is relatively good in this region. The coastal regions of Khordha and Kendrapara depend on the service sector, where several public and private corporations are active (Figure 1).

FIGURE 1: STUDY AREA



Note: Map not to scale, only for representation purposes

SAMPLING

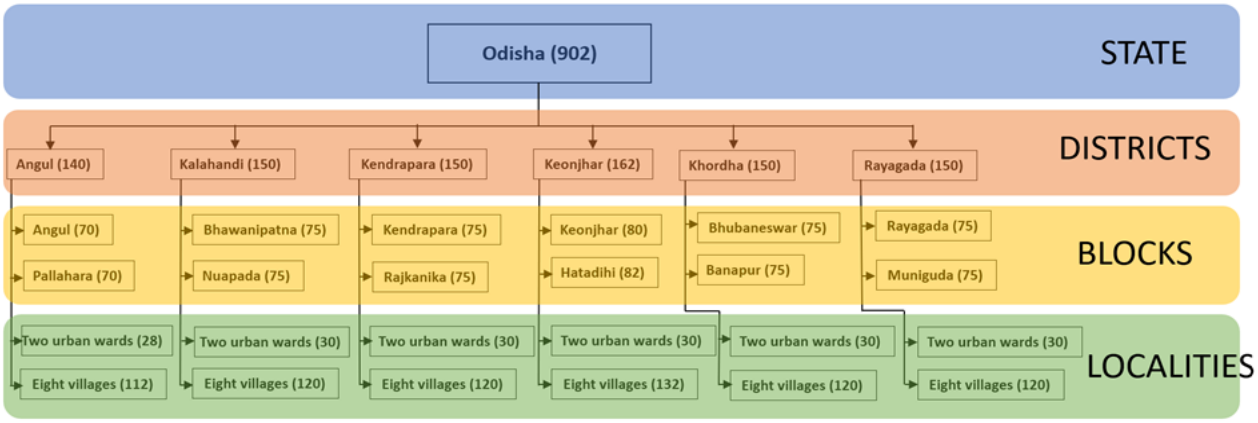
The sample size was calculated via the following formula: $n = z^2 pq/d^2$ (where z = 1.96, p = prevalence of OOP expenditure on medicines (55.8%), q = 1-p, d = design effect (0.035)) [21]

After adding 20% for nonresponses, the sample size was estimated to be 928. Households were chosen as the research unit. A multistage cluster sampling design was adopted. A total of 902 households were surveyed in six districts of Odisha. Twenty-six surveys were discarded because of incomplete responses.

A stratified random sampling procedure was adopted to select the locations and households. In the six selected districts of Odisha, samples were collected. One hundred fifty-five households from each block were surveyed per the estimated sample size (Figure 2). Owing to nonresponse and other challenges, the samples collected were slightly

affected and adjusted. Two blocks were selected from each district: one block, which is district headquarters, and another block, which is situated remotely from the district headquarters. The number of households surveyed in each block was almost the same. A selected block is divided into five different localities, where one urban ward is chosen with four villages. An urban ward is where an administrative unit such as town Panchayat, Nagarpalika, or cantonment board is situated. From four different directions (north, south, east, and west), four villages were purposively selected. In the selected localities, households were randomly selected. A door-to-door household survey was carried out.

FIGURE 2: SAMPLING AND DATA COLLECTION TECHNIQUES



INCLUSION-EXCLUSION CRITERIA

Households were residents of the localities for at least the last five years. A minimum of two family members should reside in a house. The respondent must be eighteen years and above. The respondent should actively participate and contribute to the household. Irrespective of whether a patient or affected person was in the house (with acute or chronic illness/disease), all the randomly selected households had an equal chance of being surveyed.

APPROACH TO THE FIELD

The survey took place from October 2022 to February 2023. Three field investigators collected the data. The World Health Organization's (WHO) 'Manual for the Household Survey to Measure Access to Use of Medicines' [22] was used to develop a structured household questionnaire.

A structured household questionnaire was used to collect the data. A total of 902 household data points were collected. Data analysis was carried out in SPSS version 25 and Microsoft Excel.

ANALYSIS

Four types of health facilities are chosen to investigate the relationship between distance and household economic status: private doctor/hospital, public hospital, NGO-healthcare facility, and private pharmacist. Household economic status is measured through the household wealth index. The wealth index is prepared via the World Food Program guidance paper on the creation of a wealth index (Hjelm et al., 2017). The procedure included a list of household items, types of houses and crowding data in the principal component analysis (PCA) to draw the wealth index. Three household categories were created: poor-category households, middle-category households, and wealthy-category households. The independent variables were the time required to reach a private doctor/hospital, public hospital, NGO-healthcare facility, and private pharmacist. The time to reach is categorized into three categories: less than one hour (<1 hour), do not know, and more than one hour (>1 hour).

RESULTS

Among the total sample of 902 participants, 60.2% were male, and 39.8% were female. The mean age of the participants was 42 ± 12.87 years. The largest group of participants (41.1%) were educated up to primary school. At the same time, the second largest group (30.2%) was those who were illiterate or never attended school. The secondary, higher secondary, and graduation-passed populations formed 28.7% of the total sample. Household heads constituted 64.6% of the respondents, whereas spouses constituted 25.3%. Female-headed households accounted for 14.1% of the total sample. A total of 53.8% of the households had only one earning person, while 30.8% of the total sample had two earning members. At the same time, nearly 10.3% of the households mentioned that there

was no earning member in the household. The main occupation that helped households earn a livelihood was daily wage labor (27.7%). The percentage of agricultural labor was 18.8%, while that of farmers was 16.7%. The social group composition revealed that 35% were scheduled tribes (STs), 27.3% were other backward castes (OBCs), 23% were general, and only 14.5% were scheduled castes (SCs).

The dependent variable in this study is the household wealth index. There is a negative correlation between household wealth and healthcare facility distance. This means that the greater the distance between healthcare facilities is the lower the wealth index score of the household. The correlation is significant for all three facilities except private doctors/hospitals.

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Characteristics	Categories	Frequency	Percentage	Total
Age	18-40	469	52.0	902
	41-60	354	39.2	
	60+	79	8.8	
Mean Age	42 ± 12.87			
Sex	Male	543	60.2	902
	Female	359	39.8	
Education	No schooling/illiterate	272	30.2	902
	Primary	371	41.1	
	Secondary	133	14.7	
	Higher secondary	62	6.9	
	Graduation	64	7.1	
Occupation	Daily wage labor	250	27.7	902
	Agricultural labor	170	18.8	
	Farmer	151	16.7	
	Small shop/business	116	12.9	
	Unemployed	91	10.1	
	Other	124	13.7	
Social groups	Scheduled tribes	316	35	902
	Other backward castes	247	27.3	
	General	208	23	
	Scheduled castes	131	14.5	
Rural–Urban	Rural	744	82.5	902
	Urban	158	17.5	

TABLE 2: CORRELATIONS BETWEEN THE DISTANCE OF HEALTHCARE FACILITIES AND THE HH WEALTH INDEX

	HH wealth index	Significance
Private doctor/hospital	-0.059	0.076
Public hospital	-0.209**	0.000
NGO-run facility	-0.161**	0.000
Private pharmacist	-0.295**	0.000

** Correlation is significant at the 0.01 level (2-tailed)

Private doctors or private hospitals were accessible within an hour for all wealth categories, and the frequencies and percentages were similar across each group. However, a difference is observed among households that need to travel more than an hour to reach a private doctor or private hospital: 42.6% of poor households face this challenge, whereas only 25% of wealthy households do.

Unlike private doctors or hospitals, public hospitals are government healthcare facilities where service charges are nominal. Public hospitals are accessible by 595 (66%) households out of 902 in less than one hour. However, those who are unable to reach this area in less than one hour constitute a greater portion of poor households (62.6%). More wealthy households (36.6%) than poor households (30.4%) access public hospitals in less than one hour.

NGO-run facilities are not for-profit organisations. Their aim is to benefit the underprivileged groups in the population. However, the poor and wealthy sections of the population are served almost equally in terms of proximity to NGO-run healthcare facilities. Sixty percent of poor households travel more than an hour to reach NGO-run facilities, whereas only 3.6% of wealthy households face this situation.

Private pharmacists are reachable in less than one hour by 473 (52.4%) households out of 902. Compared with wealthy households, poor households are less likely to reach private pharmacists in less than one hour and more likely to reach them in more than one hour.

Concerning the "do not know" responses, the average number of poor households across all healthcare facilities in this dataset is 123. The middle class has an average "do not know" response of 133, whereas wealthy households have an average response of 146.75 across facilities.

The chi-square test is statistically significant for all four types of healthcare facility access by different wealth index categories of households.

TABLE 3: ASSOCIATION BETWEEN HEALTHCARE FACILITIES AND THE HOUSEHOLD WEALTH INDEX

Healthcare facilities	Categories	Household wealth index categories			Total	Chi-square
		Poor	Middle	Wealthy		
Private doctor/hospital	Less than an hour	126 (33.6)	123 (32.8)	126 (33.6)	375 (100)	p<0.05
	Do not know	96 (28.3)	115 (33.9)	128 (37.8)	339 (100)	
	More than an hour	80 (42.6)	61 (32.4)	47 (25)	188 (100)	
Public hospital	Less than an hour	181 (30.4)	196 (32.9)	218 (36.6)	595 (100)	p<0.01
	Do not know	44 (23.9)	60 (32.6)	80 (43.5)	184 (100)	
	More than an hour	77 (62.6)	43 (35)	3 (2.4)	123 (100)	
NGO-run facility	Less than an hour	23 (39.7)	13 (22.4)	22 (37.9)	58 (100)	p<0.01
	Do not know	228 (30)	256 (33.7)	276 (36.3)	760 (100)	
	More than an hour	51 (60.7)	30 (35.7)	3 (3.6)	84 (100)	
Private pharmacist	Less than an hour	112 (23.7)	165 (34.9)	196 (41.4)	473 (100)	p<0.01
	Do not know	124 (37.8)	101 (30.8)	103 (31.4)	328 (100)	
	More than an hour	66 (65.3)	33 (32.7)	2 (2)	101 (100)	

Note: Frequences outside parenthesis and percentages inside parenthesis

DISCUSSION

The negative relationship between healthcare facility distance and the household wealth index indicates that a greater distance from healthcare facilities may lead to poorer household wealth scores. There are repercussions of being situated far from healthcare facilities. For example, high transportation costs, increased comorbidities and the spread of noncommunicable diseases (NCDs) in low- and middle-income countries have increased [1,2,23].

Private pharmacists are the first point of contact for illnesses in communities because they save consultation fees and travel expenses [24]. However, these benefits are only possible when private pharmacists are present in the vicinity. The present study revealed that private pharmacists are far from poor households.

Poor households in remote areas generally do not have access to healthcare services. A private pharmacy in a neighborhood could prompt a response to the lack of basic facilities in rural areas [25]. There are also informal healthcare providers who serve in remote rural areas [26]. Their role needs to be scrutinized, and their services can be formally accommodated.

The data indicate that middle- and wealthy households are less likely to know the approximate distance to a healthcare facility than poor households are. This could be because distance is less of a concern for upper-class households, as they have greater access to affordable transportation options than poor households do. The advantages of wealthy households are well recognized in terms of health outcomes by Shahid and others [27].

CONCLUSION

Distance to healthcare facilities is a critical determinant of healthcare access, particularly for socioeconomically disadvantaged populations. Low proximity to healthcare services is one of the major factors that constitute better access to healthcare. Addressing high distance to healthcare facilities requires a multifaceted approach, including improving transportation infrastructure, enhancing the availability of local healthcare services, and ensuring that high-quality care is accessible to all, regardless of geographic location. Such measures are essential for reducing health disparities and improving overall health outcomes for vulnerable populations.

Quality and affordable healthcare services are supposed to be at arm's length for every citizen. Innovative models of basic healthcare provisions can be emphasized to meet this objective. For example, the public–private partnership model of pharmacies. One such model already functions in India and is known as Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP). There is a need to revolutionize the spread of such pharmacies across India. Remote and rural areas need cost-effective connectivity to advanced centers of healthcare facilities across India. At the regional level, public hospitals must be accessible within one hour.

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CONFLICT OF INTEREST:

None

ETHICAL APPROVAL:

Was obtained from the University of Hyderabad ethical clearance committee.

CONSENT TO PARTICIPATE:

A written consent was obtained from participants before beginning the study.

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HEALTH SYSTEM RESILIENCE AND SUSTAINABILITY IN INDIA - ODISHA'S STRATEGIES ON HUMAN RESOURCES MANAGEMENT DURING COVID-19

Bhuputra Panda[*1], Mohammed Zoheb[2], Nishisipa Panda[1], Jyotirmayee Rath[1], Saumya Ranjan Pani[1]*

1. School of Public Health, Kalinga Institute of Industrial Technology (KIIT) Deemed to Be University, Campus-5 (KIMS), Bhubaneswar, 751024, Odisha, India.
2. Independent consultant

Correspondence: bhuputra.panda@gmail.com, directorksph@kiit.ac.in

ABSTRACT

Background: The COVID-19 pandemic caused widespread loss of life, economic downturns, and emotional distress; it overwhelmed the public health delivery systems across the globe. Odisha was one of the few states in India that deployed proactive management of human resources in health (HRH) to fight the menace. This paper analyzes key decisions related to HRH during COVID-19. The findings aim to strengthen HRH practices to address future pandemics.

Materials and Methods: We analyzed the structures, functions, and processes related to HRH management during the COVID-19, using a qualitative lens. Through purposive sampling, in-depth interviews were conducted with 20 key informants, including policymakers and state-level managers. Data were analyzed thematically to reflect upon the perspectives of key stakeholders, identify barriers and enablers, and document the decision-making dynamics.

Results: Odisha state strengthened its hospital infrastructure and capacity of health workforce through additional deployment and skill upgradation in a short period. Restriction of movements and strengthening the health system pillars led to considerable success. As COVID-19 cases surged in mid-2020, focus shifted to clinical treatment, active case finding and surveillance. Specific training modules were developed with guidance from the Ministry of Health, WHO, and UNICEF. A whole range of human resources were trained by both online and offline modes. Community-level training programs focused on enforcing COVID-appropriate behavior and management of vulnerable population. Infusion of technology enhanced the system's capacity to deliver high quality training in a short period of time to a vast majority of stakeholders.
Conclusion: The Odisha State Disaster Management Authority (OSDMA) and the National Health Mission (NHM) played critical roles in enhancing systems' preparedness and institutionalizing such large-scale capacity building initiatives during periods of crisis. The state's approach in terms of scale, skill, and speed of human resources management could be a model for addressing future health crises.

KEYWORDS

COVID-19, pandemic, policy analysis, disaster management, decentralization, Odisha, India

BACKGROUND

The world witnessed one of the most protracted and devastating health disasters of 21st Century in the form of COVID-19 that created havoc in terms of loss of life and livelihood, economic recession, emotional turbulence and incapacitation of public systems. Healthcare delivery units were pushed to the brink of collapse, governments struggled to implement timely and effective responses due to the unpredictability and severity of the outbreak.

In India, COVID-19 episode was brought under the Disaster Management Act (DMA) with overarching restrictions and regulations on movement and services. Critiques were explicitly opining about lack of appropriate legislative measures to deal with a COVID-19 like situation [1]. Throughout various phases of the pandemic, India in general and Odisha state in particular, were the focal points of scientific scrutiny [2]. For instance, the COVID-19 data reporting in India was scrutinized extensively because of its disagreement with crematorium data and paradoxically low case fatality rates compared to other countries [3, 4]. However, it was also acknowledged that the response of any country to an unprecedented pandemic is influenced by several underlying factors such as infrastructure, trained human resources, decision-making acumen, socio-cultural feasibility and scientific advances in vaccine development [4, 5].

Odisha government adopted multi-pronged strategies for managing and coordinating government operations that included appointing coordinators, creating new (and repurposing existing) health workforce, enforcing public health measures through law enforcement agencies, setting up specific institutional mechanisms for evidence uptake, and reframing policy decisions related to health and livelihood [6]. Odisha is one of the few Indian states that took swift and decisive actions against the rapidly spreading COVID-19 pandemic. Odisha was a 'first' in many steps - imposing partial lockdown in select districts, upgrading healthcare infrastructure in short time, establishing COVID-19 hospitals with intensive care units (ICU) through public-private partnership mode, and setting up COVID-19 hospitals in every district headquarters [7]. One of the most striking efforts in this direction was with regard to policies on management of human resources in health (HRH) which is the center of investigation of this paper.

This study synthesized important policy responses of the government of Odisha during the pandemic, particularly in the domain of human resources management. Further, it highlighted the barriers and enablers that influenced COVID-19 policy decisions. The findings will help reinforce existing systems and develop new mechanisms for improved crisis management in the future.

METHODS AND MATERIALS

STUDY DESIGN, SETTINGS AND PARTICIPANTS

Through the lens of HRH, the paper focused on the structures established, functions delegated, and processes followed during various phases of the COVID-19 pandemic. We used a cross-sectional qualitative study design. Through purposive sampling, we interviewed key informant interviews (KII) with decision-makers to gather comprehensive insight. Essentially, the study involved conducting a retrospective policy analysis pertaining to HRH and how it influenced the dynamics of COVID-19 progress in the state.

DATA COLLECTION TOOLS AND TECHNIQUES

We conducted in-depth interview of 20 key informants at the state level, mainly policy makers and state level managers across various departments, such as, nodal officers appointed for coordination and crisis management, officials of law enforcement agencies and partners from private sector/self-help groups/civil society organizations. Each interview lasted for about 40-90 minutes. Informed consent was obtained from each participant and anonymity of responses was maintained. During KII, questions included: key decisions taken by the department during the pandemic, roles during COVID pandemic, the challenges faced, and the mechanisms developed for coordinating / communicating with other departments and stakeholders. Specific questions were asked pertaining to the sphere of decision he/she has taken, bottlenecks and enablers during implementation of those decisions.

DATA ANALYSIS

Data collection and analysis was undertaken in a parallel manner to look for gaps in the information being collected. The transcripts were anonymized by assigning unique identifiers and secured in a password-protected computer accessible only to the research team. Atlas.ti. 8.0 software was used for text coding and categorization. Thematic analysis by Braun and Clark guided the data analysis [8].

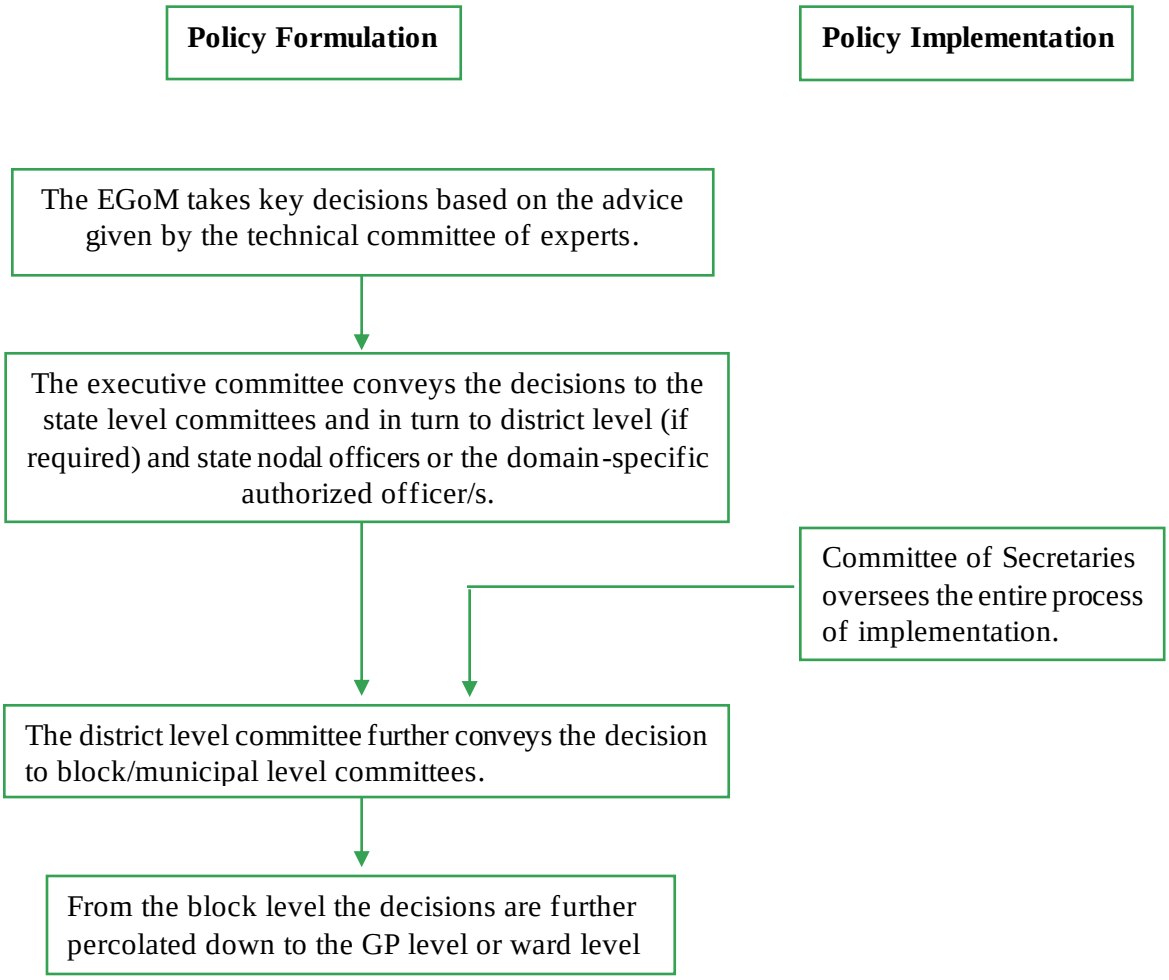
This process required the authors to read and re-read the transcripts to identify potential themes. Transcripts were analyzed alongside the original recordings to look for inconsistencies and ensure deeper understanding.

RESULTS

KEY DECISIONS

During March-April 2020, very few cases and fatalities were reported in India as well as in Odisha [9]. However, as days progressed, by May-June, cases surged; therefore, subsequent decisions related to 'lockdowns' and 'shutdowns' were taken with much caution and precaution. The State government and local governments had a herculean task of restricting movements and preventing infection on the one hand and preparing health systems on war footing to meet the case load on the other. Recognizing the limited effect that such 'lockdowns' and 'shutdowns' exerted on the public healthcare system, Odisha took proactive steps to enhance its capacity with regard to hospital beds, healthcare professionals and logistics [10]. Moreover, technological advances, supported by a strong research support base helped contain the damage. Through efficient public–private partnerships and infusion of technology India bounced back with two 'made in India' vaccines over a span of one year [11].

FIGURE 1- POLICY FORMULATION AND IMPLEMENTATION DURING COVID MANAGEMENT, ODISHA

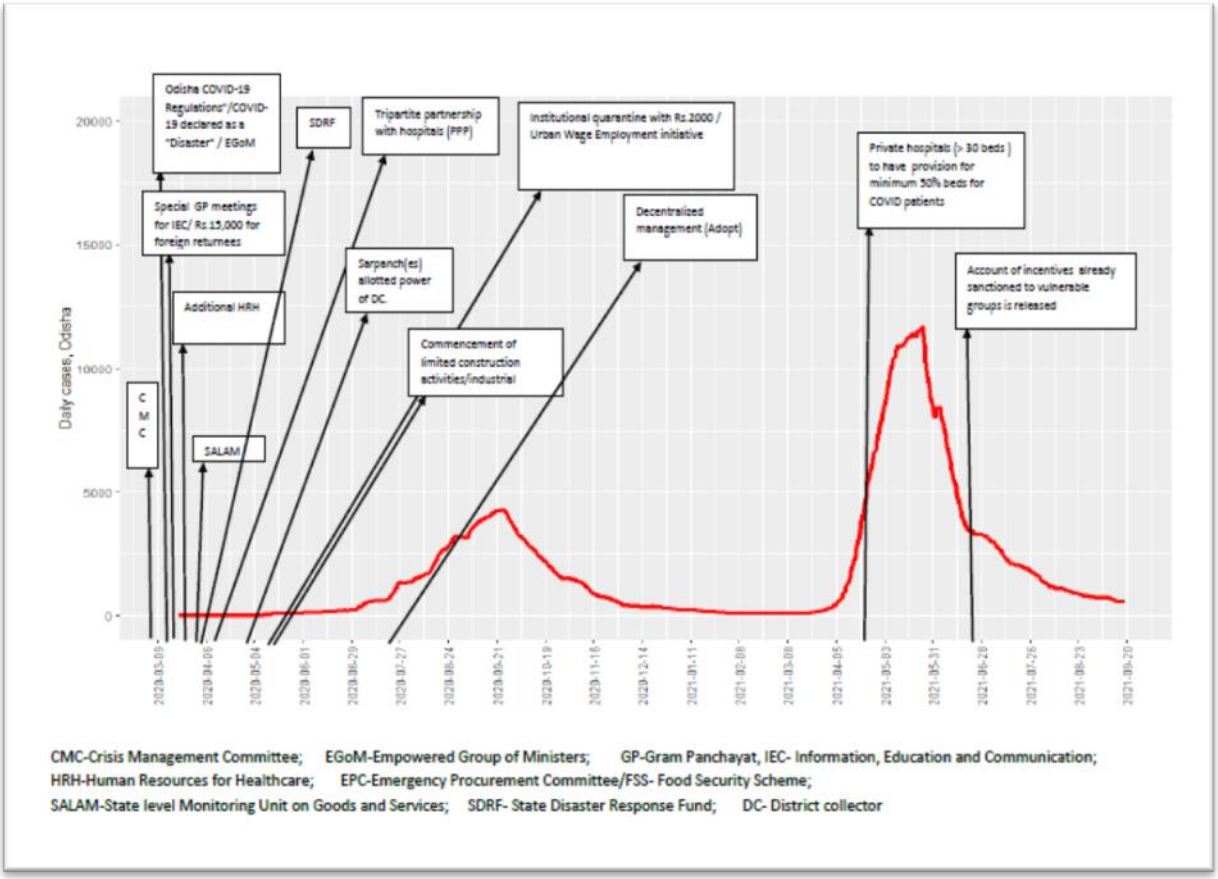


Government of Odisha formed an empowered group of ministers (EGoM) as the top-notch policy making body for managing COVID which was assisted by an executive committee and a committee of secretaries (Figure 1). At the district level, enormous powers were delegated to the District Collectors; and at the gram panchayat level, the Sarpanch embodied the powers of the District Collector with specific roles and responsibilities.

It is evident, the government of Odisha resorted to restriction of movement as the 'first decision' during March 2020 and in the subsequent four months introduced a

battery of decisions, the phase of 'maximum decisions' which temporally corresponds to the momentum gathered at government of India level and at international level (Figure 2). However, there were also instances of complacency and public unrest which eventually resulted in the second wave of 2021. In absolute numbers, the second wave was not as devastating for Odisha as for many other states owing to a variety of reasons; at the same time the state outsmarted because of high level of compliance with COVID protocol by the general public as well as a well-coordinated government machinery with a well-thought-out strategy. The role of Odisha's earlier experience of dealing with disasters was clearly visible in this context.

FIGURE 2 – MAPPING OF KEY POLICY DECISIONS DURING COVID-19, ODISHA



Source: Gazette notifications, Government of Odisha

HRH MANAGEMENT PROCESSES

As the number of cases started rising in Odisha, the government foresaw the demand of health care services in the near future. The focus was on two aspects: clinical treatment of the disease as well active case finding through surveillance. Thus, to address the unmet need of the population, additional recruitment and rapid training programs were urgently undertaken for both clinical and public health management.

Facility management comprised of assisting the patient's status; segregating into different grades – mild, moderate, severe, looking for the existence of co-morbidities, assessing the complication, and administration of drugs and oxygen during the first and second waves. Specific training modules were designed for these components under the technical guidance of the Ministry of Health and Family Welfare, WHO and UNICEF. The community training component comprised of enforcing COVID Appropriate Behaviour (CAB) at all levels (markets, quarantine centres etc.); managing milder cases at the local level; and orienting the front-line workers about the guidelines issued for the vulnerable groups.

CASCADING TRAINING MODEL

The state followed a 'cascading model' which meant, in the beginning nodal officers were trained at a tertiary health care institution. Next, under the leadership of a Professor of Internal Medicine, all doctors and staff nurses and other paramedics were trained in batches. Later, many other professors and technical experts from different medical colleges became trainers. Every training session

was overseen by a nodal person, appointed by the state government.

"With the infection rate being low in the initial phase, in-house training was allowed for doctors because this was needed very much for practical training which is associated with the ICU management."

Practical training was given regarding the management of patients in the ICU. Thereafter, training program was extended to other health care providers: staff nurses, AYUSH doctors and MBBS doctors, medical students, nursing students, laboratory technicians, even veterinarians. Veterinary laboratory technicians were trained and involved in conducting the RT-PCR test and Rapid Antigen Test in different points of time.

At the district level, a nodal person typically an Additional Director of Public Health (ADPHO) ranked doctor, was designated. In some cases, the district level communication officers also shared responsibilities. The team, led by the Chief District Medical Officer (CDMO) and the District Program Manager under the National Health Mission (NHM) continuously monitored the district-level training. State-level master trainers, trained either in-person or virtually, became trainers for the district level participants. Simultaneous arrangements were made to train peripheral staff virtually. For three to four days a week, the SCB medical college training team served as a nodal team, providing virtual training to both government and private sector doctors. Further down, at the block level, the trained staff conducted capacity building for TMCs.

An innovative model was initiated - the members those who were kept under quarantine in the TMCs were trained about the basics of COVID transmission and the prevention at the community level so that they could be utilized later on as the change agents.

At the village level, front-line volunteers, such as ASHA workers served as the frontline workers. Due to limited resources, especially in remote tribal districts, they couldn't regularly attend district-level training. Instead, sector meetings were held where trained Medical Officers and other staff of the Primary Healthcare Centre (PHC) trained batches of 10 to 15 ASHAs.

Ambulance (108) workers and Rapid Response Team (RRT) members received virtual training both at state and district levels. Staff of Panchayati raj department, police personnel, social workers, even the sanitation workers of municipal corporations and the urban bodies were trained by their respective departments. Common training resources such as materials and presentations were developed with the help of SIHFW and technical groups.

TRAINING CONCEPTUALISATION AND DESIGN

A vertical team consisting of experts from different directorates and partners such as UNICEF, WHO and public health institutes was formed and led by a senior administrative officer. There used to be regular meetings for finalization of curriculum and training pedagogue. A brief Training Need Assessment (TNA) was done before finalising the topics of the training.

State used to get feedback from the district levels and the ground levels regarding the real requirement for the trainings; and the state designed it on a time-to-time basis and as per the need; it was also modified. It was a bi-lateral process between state and district.

Meetings were held almost on alternate days and different training topics were discussed and finalised. It was vetted by the entire technical committee. Some of the training programs for the block development officer (BDO) were also designed with the help of UNICEF.

Even from IIPH, which is one of the basic training units in the state of Odisha, on behalf of Government of India there were also active members in this committee and they were also providing support through information dissemination to us."

The NHM was an integral part of this training program. Officials of NHM were closely monitoring the training at district levels. Trained resource persons of the state helped training the Auxiliary Nurse and Midwives (ANMs), health supervisors other paramedics as well. Before implementation, mock drills were conducted in different hospitals to ensure that the training was effective. State and district-level experts supervised these drills to ensure accurate replication.

We conducted a mock drill involving a scenario in which a patient is coming and how to reduce the lag period in addressing the real need of the patient.

TRAINING COMMUNICATION

At the state level prior to finalizing the training, a list of the trainees, training modules, and resource persons was

finalized. WhatsApp numbers of the trainees were collected and shared with the state to keep them informed about the schedule. All the virtual training sessions were uploaded to platforms like YouTube and shared with all the trainees.

The list was also being circulated to all districts and in all WhatsApp groups relating to health care. There were some 12 or 14 WhatsApp groups relating to health which can cover, most of the health care providers both from the government side as well as the private sector, like IMA, like the doctors from Rotary group etc.

Special efforts were made to impart training in local language (Odia) especially for FLWs/Community managers, while doctors and nurses were rained in English. The sessions were tailored to the trainees' needs, with MoHFW, GoI modules being adapted for context.

The Government of India had also designed many other trainings and people from the states, they were also attending those trainings but the difference is that training should be context based….The things, the complicated things described in other languages, either in Hindi or in English may not be always palatable to them or acceptable by them easily.

ENABLERS AND BARRIERS

Odisha's intensive training efforts significantly enhanced the knowledge and skills of service providers and frontline workers. This preparation proved vital during the second wave, enabling the well-trained staff to effectively perform their duties and save lives.

In the second wave, the state had been to some extent stable in the sense that many of the persons existing in the system as well as the private sector were trained in the management of COVID, both at the facility level as well as the community level. So, many trained hands were available at the second wave.

Disseminating information about the disease and the expected behaviour from the public was carried out through different channels like government websites, social media in both audio and visual format. This also helped the trainers/ trainees getting access to credible information at rapid pace.

Virtual training allowed widespread participation, and the collaborative, selfless efforts of participants in quickly learning and sharing knowledge helped prepare the workforce to respond effectively to the disaster.

Virtual platforms became helpful. Had we taken the physical mode of the training, it would have taken a very long time. But training on virtual mode practically solved that problem. Many people could be connected in a single session.

Multiskilling of human resources through rigorous trainings and hiring in 25% over and above the criteria as laid down by Indian Public Health Standards (IPHS) helped the state to tide over the paucity of human resources in health. Increasing the digital literacy among front line workers by distributing electronic gadgets and striving to make them tech-savvy helped them access to the virtual trainings efficiently. At the same time, training session were also conducted in physical mode for batches of 10-15 participants; thus, there was sincere efforts to make sure no individual remained untrained owing to lack of network signal or any device-related barriers.

Probably Odisha is one of the few states which had not stopped these VHND sessions and immunization sessions. So, in those sessions, hands-on training was also imparted.

The lack of information about the disease behaviour, its' cure and treatment along with new influx of information circulating about the causes of the disease posed a challenge in training of the human resources. The nodal officers and the entire team of trainers had to work at an extremely fast pace for long hours to gather the information, prepare the training materials as per the guidelines and circulate it widely.

During the first wave much less was known regarding the virus because it was completely new. Even at the national level and international level there was no sufficient data or guidelines framed for addressing this disease.

Identifying the categories of HRs to be trained, designing the training modules, collaborating with trainers, making them available on time and use of IT infrastructure for virtual training at such a large scale was also a hurdle. The apprehension that whether training in virtual mode would be effective or not, how would it be managed and whether it would be beneficial to the trainees was a big question in the minds of planners.

CONCLUSION

Odisha was one of the few Indian states that mounted a proactive and sustained response to the rapidly growing COVID-19 pandemic. It was the first state to enforce a partial lockdown in select districts even before the national lockdown. It also invested heavily in proactively strengthening the healthcare system, establishing COVID-19 hospitals with intensive care units (ICUs) through a public-private partnerships (PPP). Odisha's extensive experience in disaster management in terms of preparedness, relief, operations, manpower augmentation, and community support came very handy in handling COVID-19. The Odisha State Disaster Management Authority (OSDMA) played a crucial role in terms of using its expertise and networks to shape an effective pandemic response, applying key disaster management lessons to combat the public health crisis. The NHM provided critical support to deployment of human resources and offering capacity building strategies to various district and sub-district functionaries. Capacity building initiatives of government of Odisha, in terms of scale, skill and speed, was one of the best practices. Additional deployment of human resources during non-crisis time, in a phased manner, would address the human resources gap during a crisis. A module on disaster management and crises of protracted period may be incorporated into the routine curriculum for various types of field level functionaries. Special emphasis may be laid down on addressing mental health issues of care givers and care seekers during any crisis. Investing in digitization of health informatics would have long-term rewards for the public health sector of the State.

ETHICS APPROVAL STATEMENT

Ethics approval for the research was obtained from the Institutional Ethics Committee of the Indian Institute of Public Health, Bhubaneswar (Reference # IEC No.: - IIPHB/IEC/2021/29) on 03/01/2022.

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DECLARATION OF CONFLICTING INTERESTS

The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHOR'S CONTRIBUTION

BP led the conceptualization of the study and manuscript development; MZ contributed to the analysis of data and manuscript writing; NP interpreted the data, synthesized information and wrote the paper; JR analyzed the data, reviewed the manuscript and contributed to write-up; SRP analyzed the data and made revisions to the manuscript. BP finalized the manuscript.

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