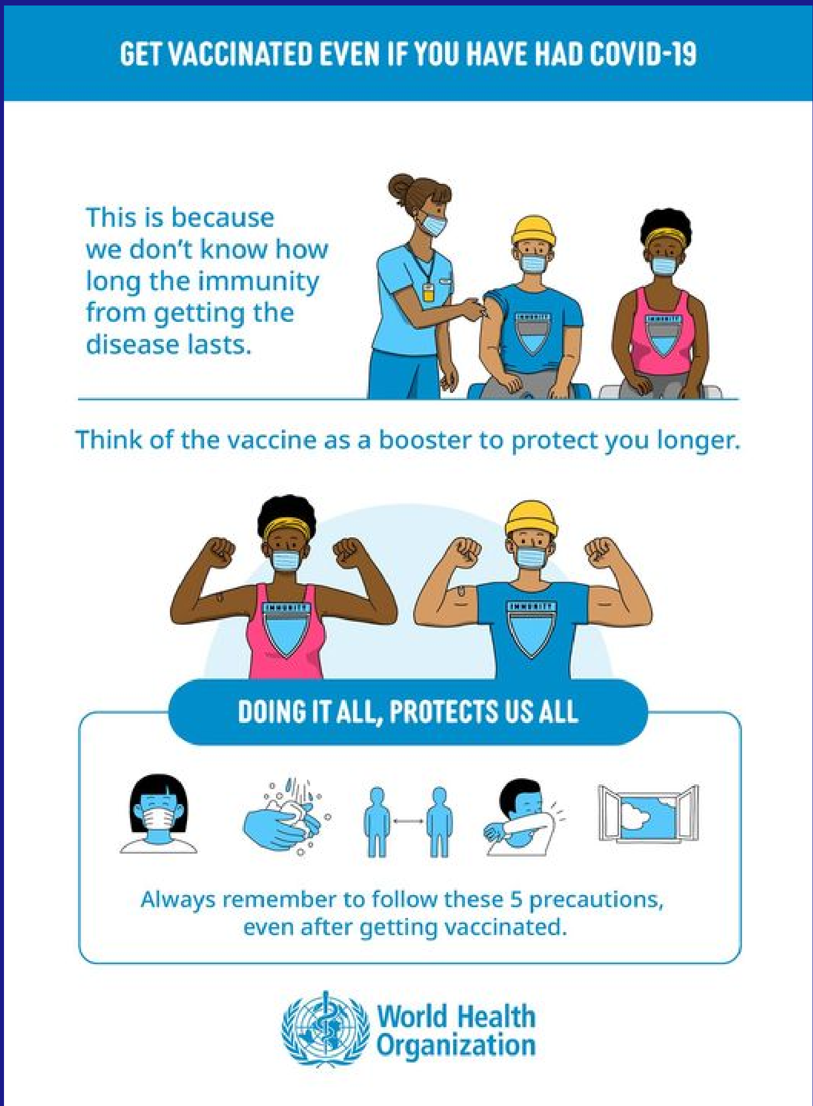
Asia Pacific Journal of Health Management

Volume 16 Issue 2 2021

The Journal of ACHSM & SHAPE

The Best Vaccine You Can Have Is The One You Have Now!



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IN THIS ISSUE

INSIDE THE COVER

Part of the challenge for the Editor and the Production Manager is to select a suitable cover for each issue. We try to reflect in some way the contents and themes arising from the issue. Covid -19, has already featured in the previous issue but the central issue that is before us at the time of publishing this issue is the challenge of vaccinating populations across the world and in our case across the Asia Pacific.

This is the major challenge for all countries and health systems. Hence our cover conveys a simple message of 'The best vaccine you can have is the one you can have now' superimposed with an infographic with copyright recognized to WHO that reinforces that simple message.

In a world overwhelmed with messages and at times conflicting advice it is important that we as health professionals can deliver clear, simple and re-assuring messages to ensure the vaccination stage of addressing Covid-19 is successful.

In adopting this cover, we also recognize the expertise and assistance provided on this occasion by the Hunter New England Central Coast Primary Health Network (PHN), https://thephn.com.au/. This network is typical of organisations created by the Australian Department of Health, the Minister for Health, and the national government to support and develop primary healthcare services across Australia. PHNs have been central, along with other health organisations at State and Federal level in supporting the Australian response to the pandemic and the current vaccination of at-risk groups and communities in general.

PUBLISHING IN THE JOURNAL

We would like to advise you that publishing in this Journal is becoming immensely popular and we thank our authors for their support. This creates a difficulty for us in responding to authors in a timely fashion because in publishing three issues a year and possibly a fourth as a special issue we are likely to publish 50 articles in a year. We currently have more than that number of articles under review at any one time. We are also a small part time editorial and production staff and, like the experience of many journals, locating and utilizing reviewers for each article is also always a challenge.

The good news is that we have some 14 articles in this issue for our readers. In addition, we have agreed to a **Special Issue** to be published in September that records the presentations of the proceedings of the 1st International Healthcare Management Conference 2021 conducted under the auspices of the K J Somaiya Institute of Management, a constituent Institute of Somaiya, Vidyavihar. This University is in Mumbai, India, is self - financed autonomous and recognized by that countries University Grants Commission.

The APJHM is pleased to work collaboratively with all our colleagues from the Asia Pacific and to better facilitate affiliation of likeminded organisations to the Journals parent organisations, the Australasian College of Health Services Management (ACHSM) and the Society for Health Administration Programs in Education (SHAPE).

IN THIS ISSUE

In this issue we commence with a commentary from the Federal President of ACHSM Dr Neale Fong that goes to contemporary issues around leadership and management in the context of the College and then goes on to address the concepts of credentialing and certification and their importance in the profession of health management. Our first article authored by Olley is consistent with the theme of the above commentary and is a narrative review of power and influence theories of leadership. This literature review was part of a mixed method study related to leadership in the aged care sector. This article goes to the concepts of authentic and ethical leadership and contains a description and timeline of the development of these theories. George and Webster follow the focus on leadership with a focus on allied health through a literature review focused on New Zealand.

Victor and Farooq in an India context present research on the use of balanced scoreboard systems and they propose a dashboard visualization for healthcare performance management based on finance, customer perspectives, internal processes and learning and growth. Yao from the Philippines provide research that addresses predictors of counterproductive workplace behaviours of nurses in a tertiary hospital setting in a large metropolitan city. The study was of a descriptive correlational design and the authors conclude that healthcare managers should formulate programs and strategies to improve employee performance and to cope with and reduce counterproductive behaviours. Kiani, Shahsavani and Sarabaad from Iran continue the nursing theme with a qualitative study to improve nurse's performance in drug delivery and the authors conclude that the use of nursing experience and knowledge can play an important role in improving nurses performance and patient safety.

Riaz, Ahmad, Islam and Ali from Bangladesh provide a research article about empowering women using community clinics to improve maternal healthcare and reduce maternal mortality. The study concludes that the utilisation and participation of women in the management of community centres made women imperative to the centre function and empowered them in healthcare development. Sindu Joseph from Kerala, India undertakes research to develop a sustainable model of quality geriatric healthcare delivery, with a focus on service quality.

Simon, Ovais and Kadeer from India provide a research article on the psychological, spiritual, and emotional response to the Covid_19 pandemic experience. These authors conclude that the pandemic experience of people acts as a stressor and affects the spiritual and psychological wellbeing of all. Das and Pal from India also provide a similar article around the impact of Covid_19 pandemic on the general population by demographic profile and the impact of anxiety. Rahman, Hossain, Mozibullah and Afrose from Bangladesh who have provided a review article that asks the question can non-pharmaceutical interventions contain the spread of Covid 19 in the Asia pacific countries? Chauhan and Maheshwari from Indiapresent an article that provides an assessment of potential of Ayurveda during COVID-19 pandemic: An integrative approach for wellness.

Singh, Bala and Janor from India and Malaysia provide an interesting research article on the elasticity of health expenditure on agricultural productivity growth in southeast Asia, this article analyzes world development indicators to suggest that prevailing health expenditure exerts a strong positive effect on agricultural productivity growth.

Aminian, Kruger and Tennant provide a research article on the association between admissions to a tertiary children's hospital and future unplanned dental presentations. The authors suggest that community nurses and social workers can play a role in informing patients about dental care in the primary care sector. Islam and Brennan provide a review article on national oral health policy reform in Australia.

Lari, Komeili, Hajinabi and Riahi from Iran present research findings around the design of a model of medical equipment purchase management in a group of hospitals in Tehran. They propose a model that can best guide buyer institutions to move towards more efficient purchase methods. Alanazy, Fraser and Wark provide our final article, a research article based on the provision of emergency medical services in rural and urban Saudi Arabia from an overview of personnel experience of EMS personnel. They identify overarching organizational factors and gender and training considerations.

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COMMENTARY

MESSAGE FROM THE COLLEGE PRESIDENT – DR NEALE FONG

Dr Neale Fong FCHSM

President of Australasian College of Health Service Management

Leadership and management spawn numerous catchphrases to assert what is important "right now". Resilience. Leaning in, or out. Authenticity. Balance. Agility. As a College for health managers and leaders, our clear challenge is to look past the "right now" and create the best platform to support our members through what we hope will be their lengthy career and positive contribution to the health of their communities.

In the past year the College has introduced a credentialling approach for health leaders which is inclusive of any and all of the latest leadership theories whilst acknowledging that real and substantial contributions to the health of the community is an iterative process requiring the commitment of individual leaders over long careers spanning decades. Our vision is "Better Leadership. Healthier Communities." Our body of services is directed at supporting our members to achieve this vision.

WHY CERTIFICATION?

At the very foundation of the notion of what constitutes a profession is a body of knowledge and skills that requires attainment and continuous improvement. The individual leader is supported by an external body (the College) that describes that body of knowledge and skills and creates a framework for the individual to point to how they personally are committing to lifelong learning and development.

In the health sector certification in a profession is an employment currency that has traditionally excluded the leaders and managers. Through the introduction of these credentials, the College supports members and future members to have their body of knowledge and skills recognised and provides the platform for continuing development.

The role of consumer expectation plays a role in the need for the College credentialling system. Consumers expect a professional and independent recognition of the capability of the senior people who develop, lead, manage and have responsibility for their health facilities and services.

OUR CHALLENGE TO OUR CHM'S AND CHE'S

Implicit in this Certification system is that it is very important that the College's Certified Health Manager and Certified Health Executives use their postnominals in communications within the health sector, talk about the College's work in supporting the profession and "live" the vision of committing to lifelong learning as part of a community of leaders.

Over the past difficult 18 months the College itself has leaned into this attribute of community which goes beyond the triteness of "we are all in this together". I have been proud and delighted to see how many of our members stepped up to support each other during this time and have been glad to harness that collegiate good will in developing both free and more importantly more opportunities for members to come together in small and large groups to listen and learn.

This journal continues to be an excellent and informative part of health leaders' journeys. We are thankful for the partnership with SHAPE and commend members' contributions to this publication; another way to continue the life-long learning that is so necessary in meeting the challenges of the health and community care sectors.

Dr. Neale Fong FCHSM
President Australasian College of Health Service Management

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EDITORIAL

LEADERSHIP AND MANAGEMENT IN THE TIME OF PANDEMICS

DS Briggs AM, Editor in Chief

I proposed that I would start this editorial with the phrase 'that we live in interesting times…'given the ongoing challenge to all is the Covid_19 pandemic. The alleged origin of the phrase is said to be from a Chinese curse 'may you live in interesting times' but is found not to be directly attributable to a Chinese source, but it does use irony to suggest we are living in difficult and challenging times. It was subsequently used by the likes of Joseph Chamberlain and more recently in the 1960s by the then USA President John F Kennedy. [1] Either way most of us know that pandemics, dissent, war, and environmental disasters are not new and recent, but have occurred throughout history and are repeated often enough for most of us to have some experience or memories of those events.

So, our interesting times are now framed by Covid-19, how it occurred, differences within states in countries like Australia and in nation states across the world. Everyone is giving everyone else advice, expert or not, to the extent that we need to now consistently define advice. That is as to that which is evidence based or from informed sources (mostly government), from 'trusted sources' in some cases a media source and the great 'pile on' from social media! We have now entered the vaccination stage of the simple proven stages that are mostly agreed to be social distancing, personal hygiene and self-isolation if required, testing and contact tracing.

The vaccination stage both in Australia and globally is having its moments based on the sheer logistics of supply and on what type of access is available, to what 'at risk' groups and age groups order of vaccinating and, to what type of vaccine we might receive. That advice does and is changing as circumstances change. Our advice at the national level is considered and expert. At the State level that advice is sometimes different and inconsistent with some political and bureaucratic leader's intent on border closures and lockdowns without scientific evidence to support that approach. I will come to that circumstance in a moment, but the advice of this Journal is enshrined on the cover and can succinctly be expressed as:

> 'The best vaccine you can have is the one you have now.'

In Australia we do have the time and space to be measured in our individual responses and if people have individual concerns, they should discuss them with their general practitioner.

I know return to those politicians and bureaucrats that close borders and enact lockdowns at whim and who deprive freedom of access to hospitals, funerals and weddings and lawful employment or business while allowing mass audiences at some sporting events. As I write all these actions are occurring with some rapidity. It seems that only some of our political and bureaucratic leaders, mostly at the national level continue to act with confidence, surety and in a measured way.

I use some quotations that I have kept by me in my professional lifetime, to express some dissatisfaction evident in our communities about the variability of leadership. I also do so with apologies to the politicians and bureaucrats who are doing a god job for us from the centre ground. To the others I quote from a phrase often but incorrectly attributed to Petronius Arbiter 210 BC:

> We trained hard… but it seemed that every time we were beginning to form up into teams, we would be reorganized… I was to learn later in life that we tend to meet any new situation by reorganizing; and what a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency, and demoralization.
>
> Charlton Ogburn 1957 [2]

> It is essential for men of science to take an interest in the administration of their own affairs or else the professional civil servant will step in- and then the Lord help you.
>
> Rutherford, Ernest (First Baron Rutherford of Nelson) [3]

The above phrases are the riposte to those who I think disturb most sensible thinking people. This brings into context the importance of leadership and management in how we might meet and resist challenges to our health systems.

In an interesting promotion of a book entitled 'You don't need an MBA: Leadership Lessons That Cut through the Crap' In the Australian Newspaper of 29th May 2021, the books author Alicia McKay starts by quoting Elon Musk as saying he hires people despite them having an MBA and not because they might have one. He apparently says, 'top leaders spend too much time in front of spreadsheets and at meetings and not enough time thinking creatively and making things happen.' [4]

This is not a new perspective on MBAs and in this Editors recent experience participating in external course curriculum advisory committees at two different Australian universities the MBA Health is again under active consideration. Personally, I think there is a place and space for both MBAs with health context and Master of Health Management (MHM) delivered directly out of Health Faculties however titled. My one caution is that healthcare organisations are relatively unique and different, they are dominated by a vast range of highly skilled health professionals, many of them, working autonomously, yet in the modern world of ageing populations and increased burdens of disease we need them to be proficient team members. Importantly, we also require them to be proficient managers and leaders.

The essential difference between healthcare organisations and other commercially orientated organisations is context and the differences and tensions between the differing logics of each of the professions and that of managers. These differences are significant and that is perhaps why most health management programs are context specific and are located at the tertiary level, in faculties of health and medicine, however described.

McKay [4] emphasises that the 'strategic capacity of our leaders is the single – most important determinant of personal and organisational success.' Importantly, strategic leadership just happens to be 'all about context'. According to McKay [4] this means asking 'What are we not seeing? Being strategic requires five critical skills around being flexible, making good decisions, being a systems thinker, being focused and being an influencer.

In the context of this Editors earlier research on the impact of health reform on senior managers and leaders the findings were enshrined in the SHAPE Declaration [5,6] as being about capability of being:

> Trained and experienced to lead and manage in a range of differing health systems and organisational arrangements. Possessing a deep contextual understanding of health systems, public policy, professional cultures, and politics. Having competency in organisational sensemaking as negotiators of meaning, active participants, constructors, organisers, and persuaders within health systems. Being drawn from a range of backgrounds, both clinical and non-clinical experience and qualifications, demonstrating more than one logic. Leaders and managers need to understand how clinical work should be structured, managed, and work actively with those clinicians and others to deliver coherent, well managed health services.

In this issue, Olley [7] provides a further theoretical contribution to the importance of management and leadership by referencing 'authentic leadership' that which is based on self-awareness, relational transparency. balanced processing and internalised moral perspectives. I encourage you to read the article provided by Olley, particularly that around authentic leadership. You will see some consistency around ethics, values and professionalism in the articles quoted here that is further reinforced in the commentary by Neale Fong [8] National President of ACHSM in this issue.

This discussion is not only important to the health sector but also relevant to the tertiary university sector that appears to be in a contractionary phase following the loss of international students. We should not need to remind them that the greatest challenge to the health system now is a lack of a sufficiently educated, trained, and skilled health workforce. In Australia, one has only to look at the findings of the differing Royal Commissions into aged care, disability, mental health, and suicide to understand the potential for the vocational and tertiary education sectors.

One has only to live in rural and remote communities to experience the paucity of the health workforce.

Let us encourage the education and professional development of health professionals and others towards being both ethical and value based and authentic in meeting the management and leadership challenges of health systems.

DS Briggs AM
Editor in Chief

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REVIEW ARTICLE

A FOCUSSED LITERATURE REVIEW OF POWER AND INFLUENCE LEADERSHIP THEORIES

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ABSTRACT

This Narrative Theoretical Literature Review relates to the evolution and translation of two contemporary leadership theories and anchors these to a leadership theory framework that demonstrates where they fit within the leadership theory body of knowledge.

This literature review was an integral part of the preparation for a mixed-methods study related to leadership in the aged care sector which has successfully concluded and one of the major findings of that yet unpublished study is that the followership is positively influenced in their work performance with a reduced turnover intention if they considered that their leader was authentic and ethical. Authentic and ethical leadership appear to be escalating in importance and translatability to the health and social care environments struggling with unmet workforce demands and high consumer expectations.

The review contains a description and timeline of the development of each of the theories included. This literature review is useful for investigating either or both leadership theories or their application to health and social care or designing leadership training programs or leader performance assessment tools.

KEYWORDS

Leadership; Leadership Theories; Power and Influence Leadership Theories, Authentic Leadership, Ethical Leadership

INTRODUCTION AND BACKGOUND

This narrative literature review places power and influence leadership theories within an overarching framework and categorises them within one section of a grouping framework for leadership theories. Leadership is the ability of an individual to influence, motivate, and enable others to contribute to the organisation's effectiveness and success. [1] Power and influence leadership theories hold at their core that the relationship between a leader, the followers, and the process of influence, enablement, and motivation determines the leader's success. This paper is also an opportunity to articulate a framework for all leadership theories to determine where authentic and ethical leadership theories fit.

It must be made clear that the grouping framework developed to achieve this deliberately omits discussion of

Great Man theories of leadership. The author acknowledges great man theories as early theories of leadership and agrees with Mouton that the theory remains widely in use but is treated with scant respect because it does not drive the course of events in more contemporary times and merely think that they do. [2]

Table 1. is the grouping framework used and identifies notable researchers and authors who have developed and explained the theories, and it provides a broad development timeline.

TABLE 1. GROUPING FRAMEWORK FOR LEADERSHIP THEORIES

THEORY GROUP	EXPLANATION	RESEARCHERS AND YEARS
Trait theories	Effective leaders share some common personality characteristics, which are called traits. Effective leadership occurs when there are publicly exhibited traits of integrity, ethical decision-making, assertiveness and compassion. These traits are behaviours manifested because of the individual's internal beliefs and processes to be necessary for effective leadership. This theory extends an early theory known as 'Great Man Theory', asserting that individuals are born with or without the necessary leadership traits.	Stogdill, 1970s+
Behavioural theories	These theories focus on 'what makes a good leader?' The theory posits that there are three types of leaders: autocratic, democratic and passive avoidant.	Lewin & McGregor Theory X and Theory Y (1960s+) Blake & Mouton (Mid 1960s+)
Contingency theories	It emerged from growing evidence that there is no one correct leader type. The theory posits that leadership style is contingent upon the situation, the people, task, the organisation and other environmental variables.	Adair (Mid 1960s+) Hersey &Blanchard (Mid 1970s +) Tannenbaum & Schmidt (Mid 1970s+) Fiedler (mid 1980s+)
Power and influence theories	Based on French & Raven's Five Forms of Power, it highlights three: legitimate, reward, and coercive. It adds to additional sources of power, those being expert power and referent power. Transformational and transactional leadership theory fits within this group and includes the laissez-faire style.	Burns (1978+) Bass & Avolio (mid 1980s+)

THEORY GROUP	EXPLANATION	RESEARCHERS AND YEARS
	Ethical leadership uses ethical concepts of situational ethics, cultural relativism, professional ethics, value-based ethics, rule-based ethics and fairness-based ethics as a guide to managing subordinates. Ethical leadership is concerned with influencing people through the application of ethical principles.	Rawls, (1971) Greenleaf (1977) Ciulla (1995) Brown and Travino (2006) Walumba and Schaubroeck (2009)

Within the grouping framework shown in Table 1., authentic and ethical leadership fit within the power and influence theories.

Power and Influence Theories

Power and influence are deeply ingrained in human consciousness and fundamental social phenomena. Toffler [3] argues that the human psyche is the product of power and that fascination with power is the basis of politics. [4] Organisational actors seek power to control and determine the future of organisations, the outcomes of interpersonal conflicts, and personal security perception in organisations. [5] Theories of power and influence take an entirely different approach to explain leadership from those previously discussed. Rather than personality traits or environmental factors, these theories consider the various ways that leaders use power and influence to achieve desired organisational outcomes. Mostly, they examine the personal style of the leader. They include the full range leadership model of transactional and transformational approaches to leadership and, by default, laissez-faire leadership. [6] This theory group includes the later developed theories of authentic leadership [7] and ethical leadership. [8] and the prior developed full-range leadership model by Bass and Avolio [6] includes three leadership styles, known as transactional, transformational, and laissez-faire leadership.

Transactional Leadership

This leadership style emphasises the importance of the relationship between the leader and followers. The focus of the theory is on mutual benefits derived from the 'contract'. The contract is how the leader delivers such things as rewards or recognition in return for the followers' commitment and loyalty. Bass and Avolio [6] derived transactional leadership from early work on 'Servant Leadership' first described by Weber [9]. Weber posited that the style focuses on the primary management processes of controlling, organising and short-term planning [10] in contrast to the transformational leadership style, which are more aligned to the charismatic future-orientated transformational style described by Bass and Avolio. [6]

According to the theory, transactional leadership involves motivating and directing followers primarily through appealing to their self-interests. The power of transactional leaders comes from their formal authority and responsibility in the organisation. This theory posits that the leader's primary goal is to make the follower obey their instructions. [10] The leader applies motivation through a system of rewards and punishment. If a follower complies, a reward will follow. If the follower does not comply, punishment follows. According to this theory, there is a transaction between leader and follower to achieve routine performance goals. These transactions involve the observable dimensions between leader and follower of Contingent Rewards (CR) in which transactional leaders link the goal to rewards, clarify expectations, provide necessary resources, set mutually agreed-upon goals, and provide various kinds of rewards for the task's successful performance. [11] Active Management by Exception (MBEA) occurs where transactional leaders actively monitor the deviation and take corrective action to prevent mistakes. [12] Passive Management by Exception (MBEP) occurs when transactional leaders only intervene when unmet standards or performance are not expected. [13] A leader who deploys a transactional leadership style subscribes to a strategy of granting rewards based on employee performance and functions in a heavily

structured environment that encourages employees to achieve their best by applying workplace or team rules. [14]

Transformational Leadership

Transformational leadership theories were first described by Bass in 1985, asserting that, unlike transactional leaders, transformational leaders inspire followers to abandon self-interest for the sake of the organisation and have a profound impact on their followers. Bass found a resulting reduction in staff turnover and increased productivity with higher staff satisfaction levels. [15]

Transformational theories view the leader as a catalyst for a visionary approach while maintaining a strategic view of what needs doing. Transactional leaders value networking and collaboration [6]. These leaders are vigilant in their search for others who can also demonstrate transformational leadership skills. [16] The transformational leadership approach seems to have captured contemporary views on leadership. It appears to be the basis of the current industry preferred leadership capability frameworks relating to health and aged care leadership. [17, 18] Transformational leadership theories assert that people are motivated by the task that they must perform. Those who practise transformational leadership emphasise cooperation and collective action, and individuals exist within the organisation's or community's context rather than in competition with each other. [19]

The Laissez-Faire Leader

Laissez-faire leadership is a leadership style where leaders allow group members to make decisions with disengagement from the team, the organisation's goals, and follower group members, expecting that they will solve their problems themselves. [20] The Laissez-faire leader provides an environment where the leader abrogates responsibilities and avoids making decisions, and therefore the group often lacks direction. A criticism of this part of the theory is that it is sometimes difficult to perceive the difference between this approach and the behaviourist approach described. [21] Authentic and ethical leadership fit into the power and influence groups of theories and are complementary to the transactional and transformational leadership styles of the full range leadership model.

Authentic and ethical leadership do not appear to be a subset of the full range leadership model but complimentary. Findings and conclusions from a recent study completed by the author have been peer-reviewed but not yet published, concluded that a leader's followership is most adversely concerned about leaders who practice with a laissez-faire style than those who practice the transformational or transactional style.

Authentic Leadership

Authentic leadership finds its conceptual roots in positive psychology, and especially so in the concepts of growth and self-fulfilment. [22] Leadership scholars built upon these roots to further develop the construct. Authentic Leadership Theory is a prominent and contemporary theory for which George [7] is considered the primary theorist.
This theory postulates that leadership is composed of four distinct components:

1. Self-Awareness ("Know Thyself"). A prerequisite for being an authentic leader is knowing one's strengths, limitations and values. Knowing what one stands for and what values are critical. Moreover, self-awareness is needed to develop other components of authentic leadership.
2. Relational Transparency ("Be Genuine"). According to George and Sims, [23] relational transparency involves being honest and straightforward in dealing with others.
3. Balanced Processing ("Be Fair-Minded"). An effective, authentic leader solicits opposing viewpoints and considers all options before choosing a course of action. No impulsive action or "hidden agendas" and plans are well thought out and openly discussed.
4. Internalised Moral Perspective ("Do the Right Thing"). An authentic leader has an ethical core. She or he knows the right thing to do and driven by a concern for ethics and fairness.

The roots of authentic leadership come from ancient Greek philosophy that focuses on developing core or cardinal virtues. [24] These virtues are Prudence (fair-mindedness, wisdom, seeing all courses of action), Temperance (being emotionally balanced and in control), Justice (being fair in dealings with others), and Fortitude (courage to do the right thing).

Authentic leaders require a great deal of self-reflection and the courage to do the right thing, often involving a degree of selflessness. Authentic leadership theory has become popular as people search for leaders who exhibit the qualities previously defined. Authentic leaders demonstrate qualities of understanding their purpose, practising solid values, establishing connected relationships

and demonstrating self-discipline. [7] George's Model focuses on an authentic leader's different qualities and asserts that demonstrating these qualities or characteristics promotes the follower group to recognise they are an authentic leader. In response, their followers will display positively, and the organisation will benefit. Each of the qualities espoused by George is associated with an observable characteristic of purpose and passion, values and behaviour, relationships and connectedness, self-discipline and consistency, and heart and compassion.

Authentic leaders display a sense of purpose to their follower group, knowing what is critical and the direction that the follower group should take. The manifestation of purpose is passion. [25] Passionate people are interested in what they are doing, are inspired and intrinsically motivated, and care about the work they are doing. [26] Authentic leadership occurs when individuals enact their true selves in their role as a leader [27]. Those who practise authentic leadership have organisationally known values, know what they are, and do not compromise those values. [7] This quality manifests itself through the leader's behaviour, and authentic leaders act only according to their values. The ability to build relationships with others and have connectedness with their followers is also an attribute of authentic leaders, willing to share their experiences and listen to others' experiences and are communicative with their followers. [26]

Self-discipline and consistency comprise the fourth dimension of authentic leadership. Self-discipline and consistency provide for leader focus and determination and the ability to focus on a goal and move forward towards that goal even in the face of setbacks. Self-disciplined leaders remain cool, calm, and consistent during stressful situations [26]. Importantly, leaders have "heart" and demonstrate this by showing their compassion. They are sensitive to others' needs and are willing to help them. [7, 26]

Acquiring the five dimensions of an authentic leader is not a sequential process; instead, leaders develop continuously throughout their lives. Figure 2 represents the five sections of a circle that blend to form the authentic leader.

Figure 1 - Five Qualities of Authentic Leadership [7]

There is a growing demand for increased transparency, integrity and ethical behaviour within organisations that have led to authentic leadership development. [24] The practice of authentic leadership principles improves follower job satisfaction. [22, 28, 29] The strengths of authentic leadership are that it fills a need for trustworthy leadership, [30-32] and it provides broad guidelines for leaders with an explicit moral dimension. [33] In turn, authentic leaders interact with their follower group in ways that build the team's authentic leadership capacities, such as transparency, morality, ethical dealings, and future orientation. [34-37] Luthans and Youssef [38] describe the emerging authentic leadership development literature succinctly:

> authentic leaders are developed through the concerted contributions of life experiences and stable personality traits, positive psychological states, and a supportive, developmental organisational climate.

There are criticisms of authentic leadership theory that it claims positive psychology as its basis. There are questions relating to the necessity of including positive psychological capacities that focus on confidence, hope, optimism and resilience rather than a preoccupation with repairing the worst of things. [39] While there is ongoing research, some assert that it is not clear how authentic leadership leads to positive organisational outcomes. [40] Some criticisms relate to the relative infancy of the theory and that it lacks a fully developed evidence-based. This criticism implies an insufficient explanation of the moral component, which has led to further exploration of ethical leadership.

Ethical Leadership

Leadership is fraught with ethical decisions and deliberations at every level. These include allocating scarce resources, colleagues and workforce issues, meeting performance targets, improving organisational culture, responsibilities of disclosure and transparency to identify errors or misadventures. While this list of ethical decisions is not exhaustive, the decisions made for these crucial areas in any organisation mean that ethical leadership has increasingly become an important theory of leadership.

Ethical leadership as defined by Brown, Treviño [8]

> The demonstration of normatively appropriate conduct through personal actions and interpersonal relationships promotes such conduct to followers through two-way communication, reinforcement, and decision-making.

There are five principles of ethical leadership, which are respect, service, community, justice and honesty, [7] and ethical leadership draws upon concepts of:

1. Situational Ethics, where the 'right' action is dependent on the context of the situation. [41]
2. Cultural Relativism determines what is 'right', and it is unethical to judge other cultures based on one's own culture. [42]
3. Professional Ethics considers that what is right is determined by a code of ethics of a specific profession that people in the profession should follow. [43]
4. Value-based Ethics in which a person's values should guide their behaviour. [44]
5. Rule-based Ethics where the rules of a specific group or organisation determine what is right. These include the society's rules, religion's rules and an organisation's rules; [44] and,
6. Fairness-based Ethics is a core issue of stakeholder theory in which fairness determines the 'right' actions and behaviours requiring fair and equal treatment of everyone. [45]

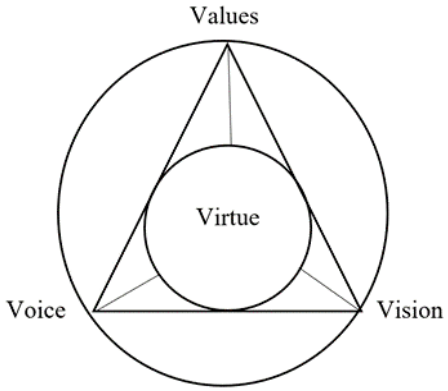
Ethical leadership has trust and the maintenance of good relationships at its core and provides a balance between the wellbeing of the followers, the wider community, and its sustainability or profitability. Modern ethical leadership theory places importance on the idea of service, in that the leader is a 'servant' of their followers. This understanding of leadership emerged from Greenleaf's concept of servant leadership [46], which postulated that the service to others is the primary concern of leaders. More recent literature has made similar claims. [47, 48]

In the modern context, ethical leadership draws upon multiple ethical theories to equip leaders to unpack and consider their work's ethical dimensions through various lenses to arrive at a well-considered decision. Importantly, ethical leadership requires leaders' consistency to act and ethically lead, whether it is apparent to the follower group or not. Ethical leadership requires that the leader's actions be consistent and within an ethical framework integrated into everyday leadership practice.

Ethical leadership is associated with authentic leadership, with May, Chan [37] linking authentic leadership, ethical decision-making and positive organisational behaviour to develop a decision-making model to understand how authentic leaders make morally appropriate decisions. In organisations, ethical leadership centres around respect for others' ethics, values, rights, and dignity. It entails the leader's attributes of honesty, integrity, trust, and fairness in leadership practice by demonstrating respect for ethical beliefs and values and maintaining others' dignity and rights, leading by values, vision, voice, and virtue. [49] It is a form of leadership in which the leader's behaviour sets the standard for themselves and the follower group. Leadership practice is aimed at the common good and composed of being the example to others, championing ethics by their conduct and communicating this to each member of their follower group. Central to ethical leadership is allowing open conversation within the follower group and building camaraderie with individuals among their team and throughout the organisation.

The 4-V Model [50] invites leaders to think about four aspects of leadership (virtues, values, vision and voice) and align internal beliefs and values with the external behaviours to pursue the common good as they apply in a particular context. The 4-V Model has four elements, with Virtue being the centrepiece achieved by Values, Vision and Voice, and is related to trust, honesty, consideration and charisma, as shown in Figure 3.

FIGURE 3. THE V-4 MODEL OF ETHICAL LEADERSHIP



Adapted from: Centre for Ethical Leadership, 2014

There has been considerable discussion on ethical leadership failures in different settings, resulting in an increased interest in exploring ethical leadership in organisations. [49, 51, 52] The study of organisational ethics is an important topic in organisational behaviour and organisational psychology, with increasing research focus on the behavioural and perceptual view of ethical leadership. [51]

Unethical leadership may lead to follower disappointment and distrust, leading to a lack of interest and commitment, consequently negatively impacting patient outcomes and organisational effectiveness. [52] Schaubroeck, Hannah [53] examined how leadership and culture relate to followers' ethical thinking and behaviours. These researchers found that ethical leaders embed shared understanding through influencing ethical culture in follower teams. They also found that ethical leaders positively influence followers' ethical cognition, behaviour and performance. Mayer, Aquino [54] described a similar set of findings demonstrating that employees are less likely to engage in unethical behaviour when the leader models desired ethical behaviours and have less relationship conflict with co-workers. Mayer, Aquino [54] concluded that reinforcing leaders' moral identities may promote ethical behaviours at several organisational levels.

Ethical leadership based on trust, respect, integrity, honesty, fairness and justice promotes positive relationships. Research into the intersection of ethics and leadership remains mostly unexplored, and there are opportunities for further research and leadership practice development. [8] Leadership theories such as transformational leadership and authentic leadership overlap with ethical leadership. [49] They are all ethically principled, share a social motivation and require an engaging leadership style. It has been associated with positive results in organisational commitment from nurses, [55] increasing the retention of the healthcare workforce, [56] engagement of employees [57, 58] and the development of trust in the workplace. [58]

CONCLUSION

This narrative literature review tracked the evolution and synthesised the literature relating to authentic and ethical leadership theory and contextualises them to the power and influence theories of leadership in a grouping framework. The review explored the nexus between authentic and ethical leadership theories and transactional and transformational theories of the full range leadership model developed by Bass and Avolio. [6] The review makes the case that authentic and ethical leadership theories offer a significant opportunity for further research relevant to the health and social care sectors and provides a treatise related to power and influence leadership theories.

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ACHSM Asia-Pacific Journal of Health Management

REVIEW ARTICLE

THE FUTURE OF ALLIED HEALTH LEADERSHIP IN NEW ZEALAND-AOTEAROA: A LITERATURE REVIEW

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ABSTRACT

BACKGROUND:

The allied heath, scientific and technical (allied health) workforce is the second largest workforce in New Zealand, providing diagnostic, therapeutic and preventative services. Increasingly consumers present with complex conditions requiring multiprofessional integrated services and a legacy of profession-focused leadership development is being challenged. [1] Future health and disability systems require leaders prepared to lead complex services, less focussed on their professional background and more on understanding their interprofessional services. [2, 3] The Allied health workforce is well placed to lead these systems, providing interprofessional experience, a biopsychosocial lens and collaborative models of practice.

AIM:

To provide an understanding of the literature and research available that addresses the leadership of healthcare services by allied health clinicians.

METHODOLOGY:

An initial database review was completed using a systematic approach, across CINAHL complete; EBSCO Business; Medline; and EBSCO Health databases from March 2020 to September 2020. An expanded search used Google Scholar and NZ, UK and Australian based government websites to access institutional documents, such as policies, reviews and reports.

RESULTS:

The review identified an emerging pool of research on allied health leadership in Australia and the UK but a paucity of literature on allied health leadership in New Zealand. Three themes were identified and explored within the article: health leadership frameworks, current state and barriers and enablers identified.

CONCLUSIONS:

Literature advocates for a broader scope of clinicians into strategic leadership roles. Despite evidence of strategic allied health roles in New Zealand there remains a dearth of literature on allied health leadership. To foster and sustain the development of allied health leaders in New Zealand it is important to understand the enablers that impact this process.

KEYWORDS

allied health, leadership, health system, disability, New Zealand, Aotearoa

INTRODUCTION

Healthcare is known for its complexity, its workforce diversity and ongoing financial challenges. It also continually presents more adaptive requirements than we can implement solutions to resolve. A health workforce looks to the health and disability system leadership to provide vision, direction and clarity. [1-3] Establishing effective leadership in healthcare across services, systems and the workforce, is key to supporting the provision of high-quality treatment, optimal results and the ongoing development of consumer-focused services. [1, 4-6] As healthcare continues to evolve in response to population diversity, digital technology development and health need, it is suggested the recruitment of the most effective leadership possible is a logical objective.

New Zealand's allied health, scientific and technical collective of professions is a significant proportion of the health workforce. According to district health boards (DHBs)New Zealand [8] the employed workforce number 12,683. This compares with 5,781 Senior Medical Officers and 30,355 Nurses. Allied Health Aotearoa New Zealand [9] report that the allied health collective across both public and private sectors comprise more than 30,000 clinical professionals across 50 different professions, providing diagnostic, preventative and rehabilitative services. This makes allied health the second largest workforce in public health in New Zealand.

This article presents a review of the literature addressing leadership by allied health clinicians within the context of health and disability services internationally, regionally and locally in New Zealand. The themes identified include, health leadership frameworks, current state and the barriers and enablers to allied health leadership.

METHODOLOGY

A narrative literature review using a systematic approach to searching was undertaken to identify relevant literature on healthcare services leadership by allied health clinicians, seeking to gain an overview of the current state of research and empirical evidence available. [7] The search utilised electronic databases between March 2020 to September 2020, specifically: CINAHL Complete (Cumulative Index to Nursing and Allied Health Literature), EBSCO Business; Medline; and EBSCO Health databases. Search terms used were, health*, lead*, manage*, (multiprofessional or multidisciplinary), and (NZ, New Zealand or Aotearoa). Terms were used in combination and with the 'AND' Boolean. Database searches were initially limited to English-only citations published after 2013 to ensure relevancy and utilise the most recent research available. Peer-reviewed literature that addressed leadership methods, processes, case studies, frameworks and theory development were included. Conference papers, books and book chapters on allied health leadership were excluded, as were papers focused on disciplines whose context of practice was external to the public health and disability system, such as sports training or coaching. Due to a lack of research literature available using these parameters, key papers prior to 2013 were included and Google Scholar and NZ, UK and Australian based government websites provided access to relevant institutional documents, such as policies, reviews and reports.

EndnoteX9 software was used to manage the exclusion of duplicates and refine management of the references by keyword tagging and categorisation. Microsoft Excel provided the platform for data synthesis, utilising the headings of author, theme, year, title, topic, methodology, findings, argument, and limitations to find emergent themes, commonalities and differences. The use of coding and identifying direct quotes enabled the researcher to synthesise the literature available according to their outcomes or perspectives. This supported the development of the key thematic areas addressed within existing evidence and an overall understanding of the current context of allied health leadership. The total number of articles found n = 21 are summarised in Table 1.

TABLE 1. A SUMMARY OF THE LITERATURE

AUTHOR	YEAR	COUNTRY	TITLE	TOPIC	FINDINGS
Boyce R et al.	2017	Australia	Allied Health Leaders: Australian Public Health Boards and Top Management Teams	Overview of allied health leadership positioning	AH is underrepresented on Top Management Teams. AH only make up a quarter of the board positions.
Bradd T et al.	2018	Australia	AH Leadership in NSW: a study of perceptions and priorities of AH leaders	Views and perceptions of AH leadership	Identified need to build and grow influence, demonstrate AH contribution, focus efforts on governance, performance, standards and advocacy. To increase scope of AH directors and across profession leaders.
Edmonstone, John	2013	England	What is wrong with NHS leadership development?	Leader development vs leadership development	Principles outlined for leadership development
Forsyth and Mason	2017	England	Shared leadership and group identification in healthcare: the leadership beliefs of clinicians working in interprofessional teams	The leadership beliefs of clinicians in interprofessional teams - are they associated with professional or team identities.	No difference between professions about beliefs in shared leadership. Group identification link to clinician's leadership beliefs.
Fry K	2010	New Zealand	Social Work clinical leadership in allied health	Clinical leadership in social work in allied health in NZ	There are challenges and opportunities to use and develop skills and knowledge and practice to provide ah with unity and direction
Garman et al.	2019	USA	Bridging Worldviews: Toward a common model of leadership across the health professions.	Revising and validating an interprofessional leadership competency model	Competencies all met the criteria for validity, 85% of the competencies also mapped to 5 other professional leadership models. Revised model is able to provide a common language framework for interdisciplinary leadership development
Gifford et al.	2018	Canada	Managerial leadership for research use in nursing and allied health care professions: a systematic review	The association between leadership behaviours and nurse and AHPs use of research	Managers performed a diverse range of leadership behaviours - change oriented, relation oriented, and task oriented. Most common was support for the change.

Gordon et al.	2015	UK	Dimensions, discourses and differences: trainees conceptualising health care leadership and followership	What does leadership and followership mean to medical trainees working in today's interprofessional health care workplace	dominance of individualistic discourse (hierarchy, personality and individual behaviours), context heavily influenced trainee's conceptualisations.
Marinelle-Poole et al.	2011	New Zealand	New Zealand Health Leadership	The comparison of two different approaches to leadership development used in District Health Boards	Two distinct models of approach - no quantifiable outcomes demonstrated.
Markham D	2015	Australia	Allied Health: leaders in health care reform	The potential for allied health workforce to demonstrate leadership in healthcare reform	Health care challenges can be met by allied health workforce actively and effectively.
McGowan et al.	2018	Ireland	Leadership capabilities of physiotherapy leaders in Ireland: Part 2. Clinical Specialists and Advanced Physiotherapy Practitioners	Do Clinical Specialists and Advanced Physiotherapy Practitioners identify with leadership capability	Sample identified capabilities associated with all four domains. Predominance of skills in the human resource frame. Less in political and symbolic frames - same as physio managers
McGowan et al.	2018	Ireland	Leadership capabilities of physiotherapy leaders in Ireland: Part 1. Physiotherapy Managers	Do Physio managers identify with leadership capabilities across the four domains of the Bolman and Deal framework	Sample identified capabilities associated with all four domains. Predominance of skills in the structural and human resource frames. Symbolic frame was underused, fewer examples evidencing communication of vision, demonstrating passion and facilitating positive workforce culture.
McGrath et al.	2019	USA	International interprofessional leadership in	Description of interprofessional training programme,	Self-reported outcomes and in-depth focus on self, team and wider community

			maternal and child health	evaluation and implications	
McKeever and Brown	2019	Australia	What are the client, organisational and employee related outcomes of high quality leadership in the Allied Health professions? A Scoping Review	Qualitative outcomes as a result of high-quality leadership	35 articles. Lack of viable AH research. 4 styles of leadership prevalent, traits of an effective leader identified, specific examples of outcomes relating to client, organisation and employee when leadership is effective.
Mickan et al.	2019	Australia	Realist evaluation of allied health management in Queensland: what works, in which contexts and why.	Which key organisational contexts and mechanisms influenced outcomes for Allied Health Professionals	Identification of mechanisms that work to achieve effective and efficient outcomes
Orton and Hocking	2017	New Zealand	Clinical Governance: Implications for occupational therapists in Aotearoa New Zealand	Exploring the impact of NZ's Clinical Governance (CG) framework on Occupational Therapy practice in NZ.	CG is poorly understood, CG gives therapists responsibility for quality improvement. Expectations for clients to take responsibility may not be achievable by all. OTs need to consider how to respond to CG. CG requires leadership - but due to poor understanding leadership may not be fulfilled.
Scott et al.	2018	Canada	Building Healthcare Leadership Capacity: Strategy, Insights and Reflections	Review and overview of the Dorothy Wylie Health Leaders Institute, Canada.	Leadership is crucial to the success in complex healthcare.
Smith et al.	2018	England	Leadership in interprofessional health and social care teams: a literature review	A review examining how leaders of interprofessional teams are functioning and synthesis identifying factors that contribute to good leadership practice.	Limited literature. 28 papers. 12 domains identified.

Wylie and Gallagher	2009	Australia	Transformational Leadership Behaviours in Allied Health Professions	An evaluation of self-perceived leadership profiles across different Allied Health professions	Significant differences in transformational leadership behaviours between individual AH professions. Radiographers and Podiatrists scored consistently lower, seniority of grade influenced scores, prior training influenced scores.
Edmonstone, J	2020	England	Beyond healthcare leadership? The imperative for health and social care systems	Health and social care systems leadership	Health and social care as a system rather than separate organisations, developed through systems leadership. Leadership not individual leaders.
Faculty of Medical Leadership and Management	2018	England	Review Report: Barriers and enablers for Clinicians moving into senior leadership roles	Clinical Leadership	Progression to leadership roles rarely promoted as legitimate career pathways. Skills and competencies required were not always clearly known. Need to identify and develop leadership talent. Lack of data about the backgrounds and qualifications of senior NHS leaders. The need for more Allied Health leaders identified by existing Allied Health leaders

HEALTH LEADERSHIP FRAMEWORKS

Until July 2022 there are 21 District Health Boards (DHBs) in New Zealand who have a variety of roles at their executive board level. [8] These are led by clinical and non-clinical leaders whose perspective spans clinical and operational systems. Each DHB autonomously creates and shapes their leadership and governance structure according to the perceived need [9] In 2016, the refreshed New Zealand Health Strategy was published providing clear direction to ensuring 'Value and high performance, Te whāinga hua me te tika o ngā mahi' of the health system performing as 'One team, Kotahi te tīma'. The theme 'One team' focuses on building leadership, talent and diversity within the workforce. Reducing fragmentation of services and fostering collaboration are key elements to improving timeliness service provision, access to services and reducing duplication of resource. [10] However, the refreshed strategy only partially achieved the outcomes it sought. A lack of coordinated leadership development across the health and disability workforce emphasised the need to develop leaders early and create deliberate career pathways. [11]

A key aspect of healthcare governance is the empowerment of clinicians into leadership roles. In 2009, The Ministerial Task Group Report 'In Good Hands: Transforming Clinical Governance in New Zealand' [12] was published outlining the transformative changes required to the leadership of clinicians as well as identifying the need to nurture clinicians into roles to lead. The Task Group reported, 'healthcare that has competent, diffuse, transformational, shared leadership is safe, effective, resource efficient and economical'. [12] However, the implementation of their recommendations on clinical governance has not been without its challenges. Orton and Hocking [13] reported that each DHB was left to interpret the recommendations in their own way and develop their own frameworks. This evidence contradicts the intention of a united and shared vision for a standardised approach to clinical governance.

Exploring the implications of clinical governance for occupational therapists in NZ, Orton and Hocking [13] affirmed the benefit it has on quality improvement and service reform and concluded that the proposed advantages that clinical governance brings to the development of leadership and the healthcare system in NZ present opportunities but only when it is fully understood. It is suggested we continue to lack a coherent and easily implemented leadership framework for healthcare and disability services in NZ. While there is evidence of DHBs working hard to implement localised leadership development and training courses, they don't have a single framework to reference for consistent and quality assured competency requirements. [3] Garman, Standish [14] suggests that the use of a universal framework or model provides neutral territory for developing programmes. He goes on to claim there are indeed 'more similarities than differences in the leadership development challenges' faced by health systems within a nation (p.9). Although this claim is supported by Marinelli-Poole, McGilvray [3] their case study included only two DHBs in NZ, a sample too small to confirm the claim across NZ healthcare organisations.

Evidence demonstrates that ineffective leadership leads to poor patient outcomes and is associated with inadequately performing healthcare services. [15] The drive therefore for successful outcomes and positive high-performance measures within healthcare systems has seen a diverse number of healthcare service leadership models and provision frameworks across New Zealand and Australia. Modern healthcare is delivered from within a team-based framework utilising a breadth of skills across professions and a focus on positive healthcare experience, which emphasises the critical elements of consumer engagement and consumer centred care. [2, 10] Examples of leadership programmes developed for the New Zealand health service include; The Leading Excellence in Health Care Programme and Xcelr8 [3], i3 Health Leadership [16] and HELM – Hub for the Essentials of Leadership and Management. [17]

In a world where our populations are presenting with more complex conditions, they typically require an approach that has a broader perspective rather than solely a diagnostic focus. According to McKeever and Brown [18] 'any professional group can improve the quality scores for health services not just medical and nursing'. There is a growing emphasis on interprofessional health teams to lead cohesively to meet the needs of the consumer. [11, 19] In order to facilitate effective interprofessional service delivery it requires leadership with an understanding across agencies and professions involved. Evidence suggests that allied health clinicians achieve successful outcomes where they have a systems leadership role. Improved patient outcomes, reduction in wait list volumes for medical and surgical interventions and the provision of high-quality outcomes are proven results of allied health clinician led services and clinics. [2, 20]

A growing number of institutes around the world are developing health leadership competency frameworks. This is in response to the growing evidence that effective leadership is crucial to a healthcare organisations success in meeting the increasingly complex challenges of a population's health needs. In the United Kingdom's (UK) National Health Service (NHS) report 'High Quality Care for All', Darzi [21] affirms that leadership is a mechanism for change and will enhance the quality of provision to patients where the opportunities are taken up. Leadership is a central component to supporting patients towards optimal clinical outcomes and the accurate assessment of leadership performance plays a vital role in the development and improvement of leadership for healthcare organisations. [14, 22, 23]

In his research of the conceptualisation of health care leadership by medical trainees, Gordon, Rees [24] argues that the individualistic, profession-based leadership model is out of date in its capacity to respond to contemporary healthcare. Where context and educational influence play important roles in leadership conceptualisation, it is now proposed that development of health leadership is more effective than leader development within the healthcare context. [25] Therefore, the individualistic and profession-based leadership model of development is likely to 'self-perpetuate' within an individualistic workplace culture. [24] Where an individualistic profession focus perpetuates siloed leadership programmes, competency in interprofessional leadership cannot be gained. [26] Knowledge and awareness of the interplay between professions is key to leading the contemporary healthcare system and services provided. Leadership in this context is therefore required to not only acknowledge the contributing professions but their culture, identity and unique skill mix. [20]

Leadership across multiple professional groups has never been more critical. As our New Zealand (NZ) health organisations and governance structures look to their service design, effectively led collaboration is essential. [14]

The NHS Improvement [27] report 'Clinical Leadership – a framework for action' emphasises 'collaborative and compassionate' leadership as one of the requirements to meet contemporary healthcare challenges (p.2). Leadership requires good communication and consultation skills to manage diverse teams. Interprofessional leadership can be demanding since it does not rely on the professional credibility as a locus of authority. [28] Recommended leadership competencies extend beyond operational skills to inherent values, behaviours and relationships. Garman, Standish [14] argues that where a leadership model does not include them it reflects a potential 'blind spot'. (P.7) Therefore, where a specialised and technical focus is required for clinical skills a more board perspective and pan-profession orientation is required for leadership. With growing evidence that the future of healthcare reform lies in leadership of interprofessional team's, literature argues it is a disadvantage to staff that their opportunities for leadership and development are not based on an interprofessional model of leadership. [14, 29] There is recognition in the literature that leadership in healthcare transcends professions, Bradd, Travaglia [30] report that allied health staff are well positioned to lead healthcare reform premised on a culture that focuses on being 'holistic, person centred, team based and inclusive'. According to Mickan, Dawber [20] allied health leaders understand the uniqueness of different professions, able to enhance patient care through the delivery of appropriate models of care.

CURRENT STATE

Comparative to the wealth of literature on health leadership premised on medical and nursing professions, there is a paucity of literature on allied health leadership in contemporary healthcare. [18, 30-34] Typically, where research has been conducted on leadership by allied health clinicians it is typically focused on the leadership of a single profession, and addresses a single profession's leadership style, behaviours or related outcomes. [4] Since 2017, Australia and the United Kingdom (UK) have begun to address allied health leadership across professional boundaries. Taking a broader view in their leadership research both Bradd, Travaglia [4], [30] and Boyce and Jackway [35] have researched the leadership experience and capacity of allied health professions across multiple professions. While in the UK, the NHS Improvement forum has recently published reports addressing the current state of Allied Health leadership and designed a framework to support leadership development. [27, 36] The NHS Improvement [36] research collated information from allied health leaders leading allied health professions as well as those in senior leadership they reported to. It provided new information on the lack of organisational governance infrastructure supporting allied health services and the impact it had on delivery and productivity. The study also had a second focus on the 'characteristics, key skills and attributes of effective AHP leaders' and how they had been gained (p.15). Despite this progress little is understood about the barriers or enablers to allied health staff progressing into systems leadership roles.

As evidenced by the literature, Australia and the UK have made significant progress into the allied health leadership research field. [30, 35-37] It is argued that one of their key drivers for research is the lack of established and unified allied health leadership roles. [36] Conversely, in NZ there are strategic allied health leadership roles at every DHB executive board level but a lack of evidence to support the efficacy and impact of the existing allied health leadership. This absence of evidence exists across leadership capability and the requirements for development of future leaders. While the gap in research exists, it is a challenge to understand how to support the leadership of healthcare by allied health professionals and increase their potential for impact at the strategic and health reform level. There are many avenues of research available and key drivers include the current transformational shift in healthcare towards cohesive and integrated services, the recent appointment of a chief allied health professions officer and the predominance of non-allied health staff in governance roles. [11]

Wylie and Gallagher [32] argued that it is vital that allied Health professions develop leaders to fulfil their potential by seizing opportunities presented in the redesign of health care services. They suggested that having the leadership capacity would support allied health leaders in contributing to the services most in need of reform and improvement. This is affirmed by the Australian study of allied health leadership perceptions by Bradd, Travaglia [30] which reports not only is there under-representation of allied health professions in health system change roles but that allied health leaders feel 'powerless to affect health system change compared to their colleagues' (p.2).

There is a lack of empirical evidence regarding the added value of allied health leadership is clear but what there is

identifies a connection between successful health outcomes and effective allied health leadership. [4, 18] According to Markham [2] allied health is 'front seat' to lead changes in health system using leadership, workforce model changes and a focus on prevention and early intervention. Mickan, Dawber [20]'s study reported executives described allied health leaders as 'influential' in the development of new models of care, using collaborative models of service delivery 'adding value' to business and improved outcomes for consumers.

BARRIERS AND ENABLERS

According to Orton and Hocking [13] allied health professionals may not always take leadership opportunities due to a lack of recognition of their own potential. The context in which they practice may also influence their perceptions of leadership. Wylie and Gallagher [32] studied the transformational behaviours in allied health leaders and identified that if new allied Health professional graduates do not receive leadership development training the context in which they practice is likely to make them resistant to change. Conversely Bradd, Travaglia [37] identify that there is success in improving outcomes for healthcare when allied health leadership training is provided, without stipulating timing of provision. Regardless of when the training is provided it is evident that training and development is effective in creating leadership capability. [23] Consideration of context also includes organisational culture. If allied health leadership is not supported within the organisational culture, then there can be a negative impact on organisational performance. [38]

A key report published in the UK [39] identifies a dominance of medical and nursing professionals in leadership roles. This finding aligns with a previous study for New Zealand published by Gauld and Horsburgh. [39] That report [39] made key recommendations to support the increase of clinicians into senior leadership roles, drawing on leadership across 'all relevant clinical professions'. [40] While the recommendations were inclusive the study sample was not and the majority of views were provided by medical and nursing staff, limiting the generalisability of their findings. An indication that medical leaders can be more easily identified, is substantiated by Gordon, Rees [24] who reported in his research that participating trainee doctors saw their role as one which should be taking the lead.

Literature identifies that context and education play significant roles in how leadership is perceived, this suggests that leadership culture change is associated closely with training. [24] Training is required to develop the insights and tools to lead effectively in 'volatile, uncertain, complex and ambiguous situations. [23, 41] Considering context, a lack of professional partnership and interprofessional engagement undermine the ability to contribute to strategic and operational elements of health care planning and service provision. [39] All clinicians, including allied health professions need to be viewed as equals rather than through a hierarchical perspective. Where recruitment is specified to a profession, rightly or wrongly, it does not allow for the employment of the most appropriate person and could lead to the inequity of opportunities for staff to lead. This in turn can lead to allied health professionals feeling disempowered in comparison to their colleagues. [30]

CONCLUSION

The international literature affirms expanding the scope of clinicians in systems leadership roles. [40] The allied health workforce are called to step forward and lead, that they may be understood and use their valued skills to help shape New Zealand's health and disability system. [42] While New Zealand supports allied health clinicians in health systems leadership roles, there remains an inequitable representation across the health and disability system. Contextualised research is required in order to understand what factors, enable or limit allied health clinicians stepping into health systems leadership roles. These research findings could be used to inform the Ministry of Health, senior allied health leaders, health organisations and the allied health community. The information could be used to develop frameworks and policy that will support, develop and sustain allied health clinicians leading across the health and disability system.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

DASHBOARD VISUALISATION FOR HEALTHCARE PERFORMANCE MANAGEMENT: BALANCED SCORECARD METRICS

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ABSTRACT

OBJECTIVE:

The increase in demand for hospitalisation in an environment of financial stress has hastened the quest for more efficient healthcare delivery systems. In the past performance management methodologies in the healthcare sector have been predominantly static resulting in a lack of consistency, comparability and timeliness. To mitigate these shortcomings this research work has attempted to create a conceptual framework in the digital dashboard format.

SETTING:

Of the frameworks presently used, the Balanced Scorecard(BSC) is very popular, primarily because the BSC is a management system (not just a measurement system) that helps an organization highlight its vision and translate them into action.

DESIGN:

The design adopted in this research work is primarily qualitative and exploratory. The methodology includes collating KPIs from published literature, crystallising them using the Delphi Method and applying the Likert-scale to prioritise them. To facilitate visualisation of the prioritised KPIs in the BSC format, the construction of a digital dashboard was envisaged.

RESULTS:

A dynamic dashboard was created in the BSC format with three Key Performance Indicators(KPI) for each of the four perspectives.

1. Financial: Return on assets, Average daily collections and working capital ratio
2. Customer Perspective: Patient satisfaction, lost business – number of appointments not attended and percentage of patients Leaving Against Medical Advice(LAMA)
3. Internal Processes: Billing and collections/posting time, emergency patients triaged within 15 minutes of arrival and patient waiting time
4. Learning And Growth: Empowerment (decision-making & participation), employee satisfaction and strategic alliances/partnerships

KEYWORDS

Dashboard, Balanced Scorecard (BSC), Key Performance Indicators (KPI), Performance Management, Healthcare

INTRODUCTION

The success of an organisation depends upon how its performance is managed. Very often, Healthcare administrators are unable to view with clarity the overall picture of performance. The complicated nature of healthcare operations is a hindrance to managers to effectively support the organization's objectives. The data for healthcare management which exists in a wide variety of forms also needs to be analysed and managed across health service functions and departments. This diversity leads to several challenges in managing healthcare operations to the extent that it is widely acknowledged and described by Gartner Research, a group of IT industry analysts as "data-rich, but information poor." [1] The cause of this poor state could be a combination of the following with varying degrees of influence:

- different software packages used for patient admissions, treatments and discharges.
- financial package variations in billing and claims
- varied data formats for clinical diagnosis, research and laboratory tests

These factors may not provide administrators and managers with a clear view of an organisation's performance. Focus on financial performance alone is grossly inadequate to enhance the overall performance of an organisation. Non-financial measures like customer expectations and internal efficiencies too clearly influence the performance. Over the years, the Balanced Scorecard (BSC) has been frequently applied both in academic and corporate circles as a performance management tool. [2] The BSC has been very successful because of its balanced approach between financial and non-financial indicators of success, internal and external constituents of the organization, and lag and lead indicators of performances. [3]

Using the BSC framework, dashboard visualisations were created for the Christian Medical College and Hospital (CMCH), Ludhiana, Punjab, in close coordination with their administrators during the period 2017-20. Established in 1894, CMCH is one of the leading Medical Colleges in the North of India.

REVIEW OF LITERATURE

DASHBOARD VISUALISATION

The utility of the dashboard has enormously increased due to its ability to enable decision-makers to navigate in the ever-growing complex data environment. Advanced versions of dashboards are interactive and these can drill i.e. help slice and dice, blending with data. [4] Dashboards usher in a wide epistemological and internal realignment in that they introduce new vistas of knowledge for monitoring. [5] Visualisation has its benefits. As Rind suggests, visualization methodologies and tools, ''combine the processing power of modern computers with human cognition and visual abilities to better support analysis task". [6]

The advancements in visual formatting techniques add to the interactive nature of the dashboard. Novel features like drill-down facility, outlier detection and scenario analysis with appropriate high-end visual displays greatly enhance decision-support systems. [7] The primary benefit of dashboards lies in the convenient form they display crucial pieces of data that will lead to quick decision-making, cost reductions and superior confidence levels (8).

In an environment of complex data and emerging technologies, there are certain considerations to be kept in mind while developing high-tech performance management dashboards for hospitals. According to Ghazisaeidi, these issues are, "KPIs development, data sources, data quality, dashboards integration to source systems and data presentation to users". [7] Harrington et al. have inferred that "key performance indicators, balanced scorecards, and sales performance figures are some of the content appropriate on dashboards". [10]

Creating a BSC Dashboard requires defining all metrics after a clear understanding of each metric including its nomenclature, purpose, target values, ranges, measurement units, periodicity of reporting, and sourcing of data. [11] Since the hosting of data is done in different structures, an appropriate architecture can be designed and implemented. This involves managing data delivery, data replication methods, understanding data hosting and query formulation that leads to the construction of effective dashboards. [12]

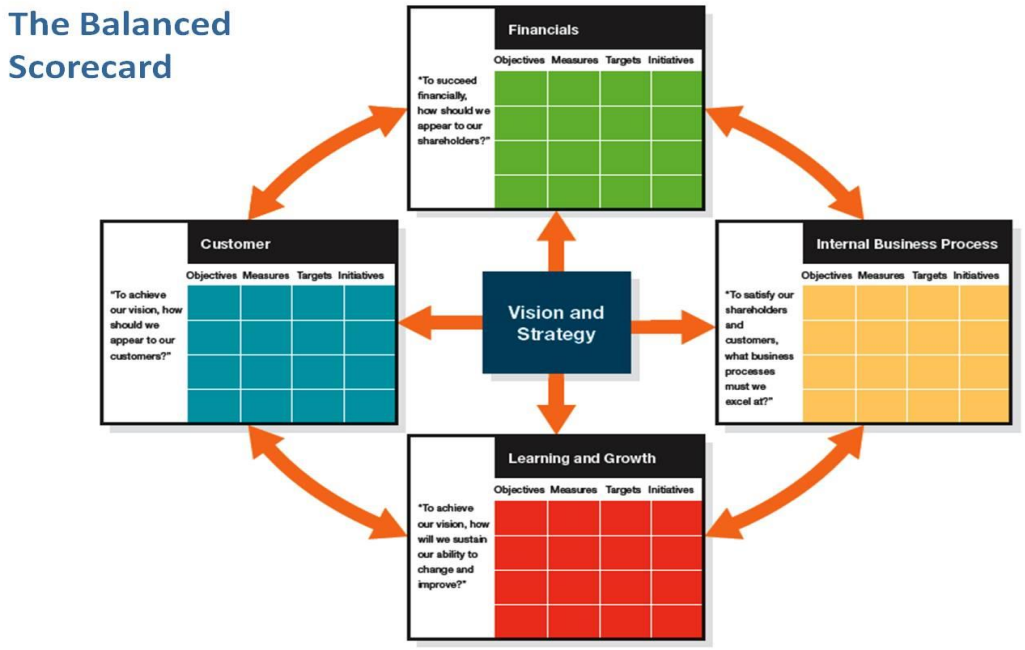
BALANCED SCORECARD

Under Dr. Nolan Norton's leadership, a study was conducted by a consulting company in 1990-1991 to determine what successful companies were measuring. [13] As a result of this study, the Balanced Scorecard was

proposed in its initial form. In addition to this Professor Robert Kaplan (Harvard Business School), was inducted into the research team to provide educational support. The timing of creating and presenting the Balanced Scorecard perfectly suited the quest for performance management systems. Eccles (1991) published the "Performance Measurement Manifesto" in the Harvard Business Review. In this article, he predicted, "a performance measurement revolution will take place in the next five years, during which traditional financial information systems would be replaced by non-financial information systems". [14]

The "Scorecard" comprises of targets and measures for each of the four components of the framework namely, Financial, Customer, Internal Business Processes and Learning and Growth. Each organisation should decide on three or four "Key Performance Indicators (KPI)" based on scientific principles and arrive at target values for the KPIs.

FIGURE 1: BALANCED SCORECARD



Source: Linking the Balanced Scorecard to Strategy (15)

According to a study conducted by Bain & Co., the global consulting firm, 57% of companies had benefited from BSC implementation with a Satisfaction Index of 3.86 on a scale of 5. [16] When the BSC is integrated with the dashboard, it ushers in an innovative way of reasoning and operating that is well suited in enhancing healthcare delivery. The dynamic BSC allows an organization to set targets, link metrics, understand the correlation among metrics, and easily view trends. Ideally, the metrics are linked to an organization's overall strategy. BSC implementations are seen to reduce ambiguities in performance evaluations and increase goal congruence between the various groups within the organisation. [17]

BSC IN HEALTHCARE

Each perspective of the BSC can be applied to benefit the management of healthcare organizations. Looking at the BSC from the healthcare management point of view, Končitíková, Culík and Pavla have given a specific definition as: "How patients perceive an organization (Customer perspective); what are financial situations (Financial Perspectives); what can we do to improve the level of services? (Perspective of learning and growth); what do we want to be the best in? (Perspective of internal business processes)". [18] It enables top-level decision-makers to a have smooth transition from judgments based on experience and intuition to fact-based decisions based on the healthcare BSC.

The BSC and the dashboard combination can be adopted as a model for cost-effective yet credible healthcare delivery. A notable study conducted by Chow provided insight regarding the benefits of using the BSC by healthcare organizations. This study documented the potential of the BSC as a management tool to meet many challenges like "changing demographics, increased customer expectations, increased competition, and intensified governmental pressure". [19]

KEY PERFORMANCE INDICATOR (KPI)

The BSC relies heavily on the concept of Key Performance Indicators (KPI). "KPI is a quantifiable measure used to evaluate the success of an organization, employee etc. in meeting objectives for performance". [20] Operational excellence can be directly correlated with KPIs which enable measuring and monitoring relevant parameters. [21]. The measurement of KPIs can be done at different levels in the organisation to ensure that targets are successfully achieved. High-level KPIs may focus on the overall performance of the business, while low-level KPIs may focus on separate processes that make up for the corporate entity. [22)

KPIs play a crucial role in planning, evaluating and controlling through information support, transparency creation and decision-making support of the management (23). Some of the major benefits of performance measures are in creating action plans and making daily decisions that are linked and aligned to the factors that will bring success to the organization. Overall performance gets enhanced when "Wider ownership, empowerment, and fulfilment are created". [19]

RESEARCH METHODOLOGY

STAGE 1: COLLATION OF KPIS FROM PUBLISHED LITERATURE

In the first stage, many research publications related to Balanced Scorecard in Healthcare settings were studied. This included documented cases of gainful implementation, suggested modifications and identification of successful KPIs. The search criteria were Healthcare Balanced Scorecard, Key Performance Indicators in Hospitals/Healthcare Institutions, Healthcare Performance Management. Institutions with less than 100 beds were excluded.

STAGE 2: USING THE DELPHI METHOD TO CRYSTALLISE KPIS

In the second stage, the Delphi Technique, which is one of the most effective tools used for qualitative research within a specific domain of expertise was used. [25] The minimum number of participants recommended for a Delphi group is five. [26] The criterion of choosing was to include experts who have had several decades of experience in specific fields like Clinical, Finance, Operations etc. All of them had sufficient administrative experience in managing large healthcare facilities. Their details are:

1. Dr. J. Pramod – Ex-Director, CMC Hospital, Ludhiana, Punjab
2. Dr. Sunil Chandy – Ex-Director, CMC Hospital, Vellore, TN
3. Dr. Abraham Joseph – Ex-Director, CIHSR, Dimapur, Nagaland
4. Dr. Lionel – Ex-Medical Suptd. CMC, Vellore, TN
5. Mr. Nandakumar – Internal Audit, CMC, Vellore, TN

The entire list of collated KPIs was presented individually to the Delphi team members. The initial rounds of discussion had queries on a semi-structured format. As part of the preliminary work, healthcare experts identified important KPIs for each of the perspectives. They were encouraged to add or delete KPIs according to their appropriateness. Comments given by the participants were kept in strict confidentiality to ensure non-interference in the opinions. This was followed by the merging and synthesis of opinions to identify the KPIs. To obtain the priority list of KPIs all the experts in the panel participated in a round of short-listing during which they gave their rating of importance on a five-point Likert-scale for all KPIs.

STAGE 3: DASHBOARD DEVELOPMENT

For dashboard development, the cloud-based BSC Designer tool was used. The BSC designer facilitates the preparation of Strategy Maps and Scorecards in the dashboard format. It provides the algorithms for setting and modifying target values for each of the KPIs. Being user-friendly it gives dynamic features like periodic updating and reporting with appropriate visualisations. The inputs required by the BSC Designer are 'business goals', 'KPIs' and figures like 'target value', 'actual value' and 'permissible range'. Display formats available are the gauge, bar chart, pie chart, radar and graph. Data from the IT systems of the hospital are captured and used as inputs into the BSC Designer.

RESULTS

A representative list of researched literature for KPI identification in healthcare is shown in Table 1 along with the salient KPIs identified.

The initial collation identified 128 KPIs which reduced to 42 after the Delphi round. The break-up for each of the perspectives is shown in Table 2

TABLE 1 IDENTIFICATION OF HEALTHCARE KPIS

SL. NO.	COUNTRY/ COUNTRIES	PUBLICATION TITLE	SALIENT KPIS IDENTIFIED
1	CANADA	"Do hospital balanced scorecard measures reflect cause-effect relationships?" (28)	Critical incidents, Commitment to transition planning and follow-up, Patients who would recommend to others
2	CHINA AND JAPAN	"Using the balanced scorecard to measure Chinese and Japanese hospital performance" (29)	Expenditure on medical research, Asset turnover, Outpatients per year per doctor
3	U.S. A	"Bi Application: Dashboards for Healthcare" (30)	In-patient commercial revenue, Patients given fibrinolytic medication within 30 minutes of arrival
4	IRAN	"Key performance indicators in hospital based on balanced scorecard model" (31)	Employee absenteeism rate, Hospital infection rate, Current cost per bed, Bed turnover, Training expenditures per capita
5	MALAYSIA	"Framework for implementing balanced scorecard in hospitals" (32)	Asset turnover, Cost per case, Mortality index, Number of research projects, Outpatient waiting times
6	TAIWAN	"Identifying Key Performance Indicator of Balanced Scorecard by Analytic Hierarchy Process" (33)	Exploring new markets, Reduction in overhead, Activity based costing, Utilization of space, Employee satisfaction, Reduced rate of no-show
7	GREECE	"Strategic performance measurement in a healthcare organisation: A multiple criteria approach based on balanced scorecard" (34)	"Percentage of readmissions, Inventory turnover, Number of projects with other organisations, Decrease of operating expenses, Increase of liquidity"
8	SAUDI ARABIA	"Developing strategic health care key performance indicators: A case study on a tertiary care hospital" (35)	Average length of stay(ALOS), OR Utilization Rate, ER waiting time, Outpatient satisfaction rate, Average bed occupancy rate
9	ITALY	"An integrated approach based on balanced scorecard and analytic hierarchy process for strategic evaluation of local healthcare agencies" (27)	Percentage of patients leaving against medical advise, Pharmaceutical stock turnover ratio, Rate of technical obsolescence

Source: Researcher's compilation

TABLE 2 COMPARATIVE LIST OF KPIS AFTER EACH SHORT-LISTING PROCESS

PERSPECTIVE	INITIAL COLLATION	DELPHI ROUND	LIKERT-SCALE
FINANCIAL	33	10	3
CUSTOMER	11	8	3
INTERNAL PROCESS	59	13	3
LEARNING AND GROWTH	25	11	3
TOTAL	128	42	9

The KPIs that were identified are:

I. FINANCIAL

1. Return on assets: Utilisation of each facility
2. Average daily collections: The revenue arising out of hospital operations
3. Working capital ratio: Total current assets by total current liabilities

II. CUSTOMER PERSPECTIVE

1. Patient satisfaction: Extent to which patients are happy with the healthcare delivery
2. Lost business – Number of appointments not attended: Patients who fail to turn up after fixing appointments
3. Percentage of patients Leaving Against Medical Advice(LAMA): Dissatisfied patients who are determined to leave the facility at their own risk

III. INTERNAL PROCESSES

1. Billing and collections/posting time: The amount of time taken to prepare bills.
2. Emergency patients triaged within 15 minutes of arrival: The speed at which emergency patients are attended to
3. Patient Waiting time: The time taken by the doctor to see the patient

IV. LEARNING AND GROWTH

1. Empowerment (decision-making & participation): Freedom given to the employees to make decisions
2. Employee satisfaction: The employee's overall experience with the work and environment
3. Strategic alliances/partnerships: Partnerships made with niche service providers

The BSC developed for the Christian Medical College and Hospital (CMCH) is shown in Figure 2. For each of the perspectives, three prioritised KPIs with the current values are displayed. Display in the BSC format is a handy tool that gives crucial information on a single screen of the hospital's overall performance. Administrators can initiate corrective action based on dashboard visualisations. Additionally, the software also has a provision for alerts that will be sent to the responsible person automatically by email when a KPI value goes beyond a particular upper/lower limit so that course corrections could be made.

LEARNING AND GROWTH PERSPECTIVE

The relative importance of the three KPIs was calculated and is shown as a Pie Chart in Figure 3. The combined score of the employee-related KPIs is 67.6%, highlighting the importance of human resources. The employee satisfaction level is shown in a gauge format. The green, amber and red zones are shown in the background according to preset limits.

CUSTOMER PERSPECTIVE

For the customer perspective, a sample dashboard visualisation is shown in Figure 4. These covers 'Patients Leaving Against Medical Advice'(LAMA) and 'Skipped appointments'. The blue line indicates the progress which is monitored based on a monthly average. 'Skipped appointments' is shown in the traffic signal format. Since the number of skipped appointments should be as low as possible, the setting is done in the reversed order. A value higher than the set limit is shown in 'red'.

INTERNAL PROCESSES PERSPECTIVE

'Emergency Care' is plotted on a graph showing 'probability' on its X-axis and 'Impact' on its Y-axis. See Figure 5. This is a novel feature that helps administrators to interpret the performance and take appropriate action. This KPI is needed to keep track of how well emergency

patients are triaged within 15 minutes of arrival. It becomes crucial to the success of large hospitals as it influences the perception of care. When patients arriving at the Trauma Centre get immediate care they are satisfied and are likely to become brand ambassadors for the healthcare facility. Since 'Billing Time' should be as low as possible the setting required on the gauge is to be reversed showing green first, followed by yellow, amber and red.

FINANCE PERSPECTIVE

Figure 6 shows the performance of the 'Average Daily Collection' and 'Working Capital Ratio'. Average Daily Collection is shown in a graphical form. The red line indicates the baseline figure, the blue indicates the actual performance figure and the green indicates the target figure. It is notable here that all three figures namely baseline, target and actual performance can be modified and updated as required. Working Capital Ratio is represented as a bar chart based on the historical data entered into the database. The colour of the bar changes according to the preset value. A red bar indicates that corrective action needs to be initiated.

FIGURE 2. BALANCED SCORECARD

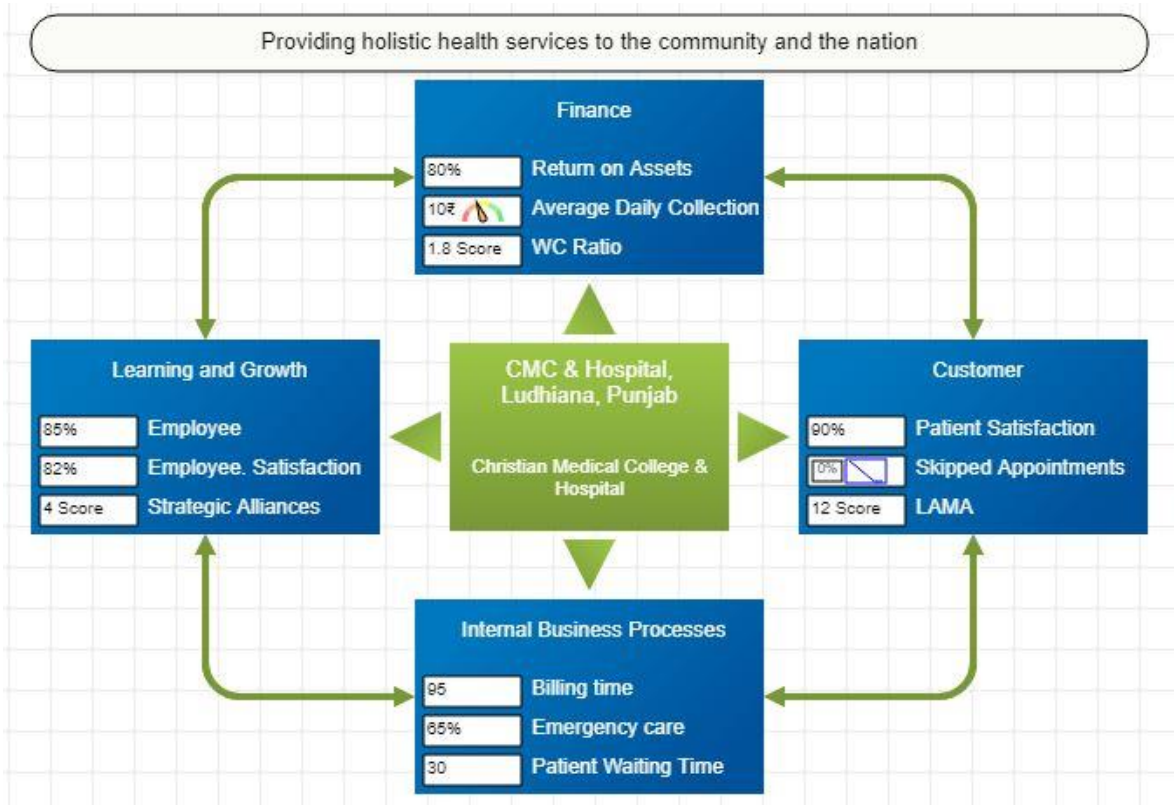


FIGURE 3. LEARNING AND GROWTH PERSPECTIVE

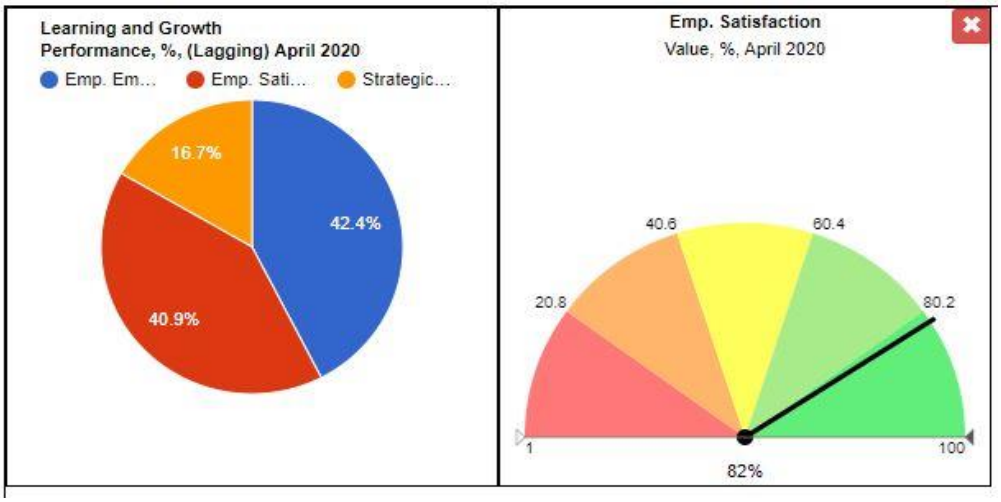


FIGURE. 4. CUSTOMER PERSPECTIVE

FIGURE 5. INTERNAL PROCESSES PERSPECTIVE

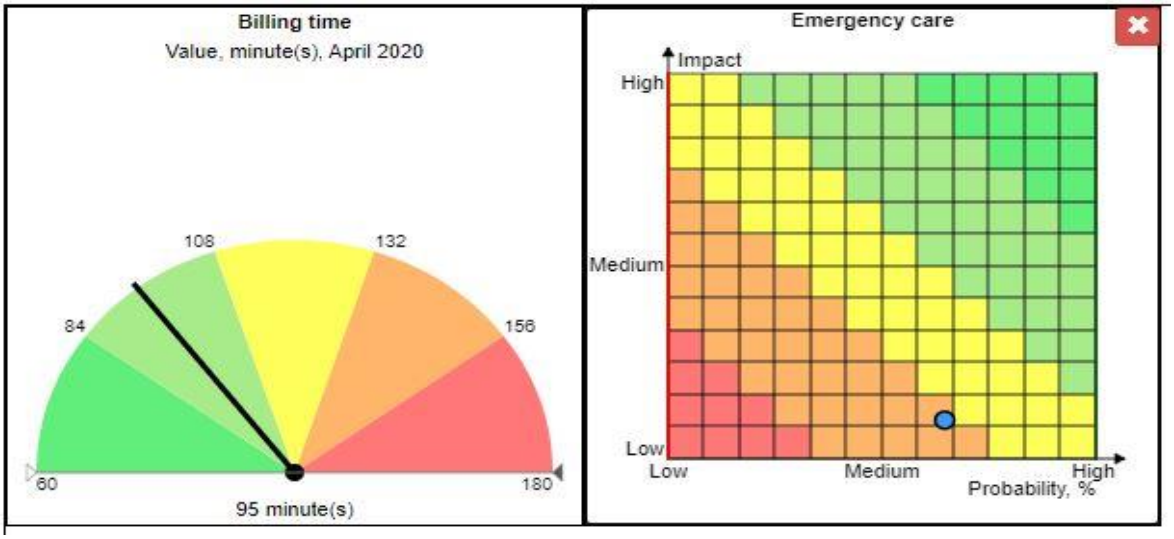
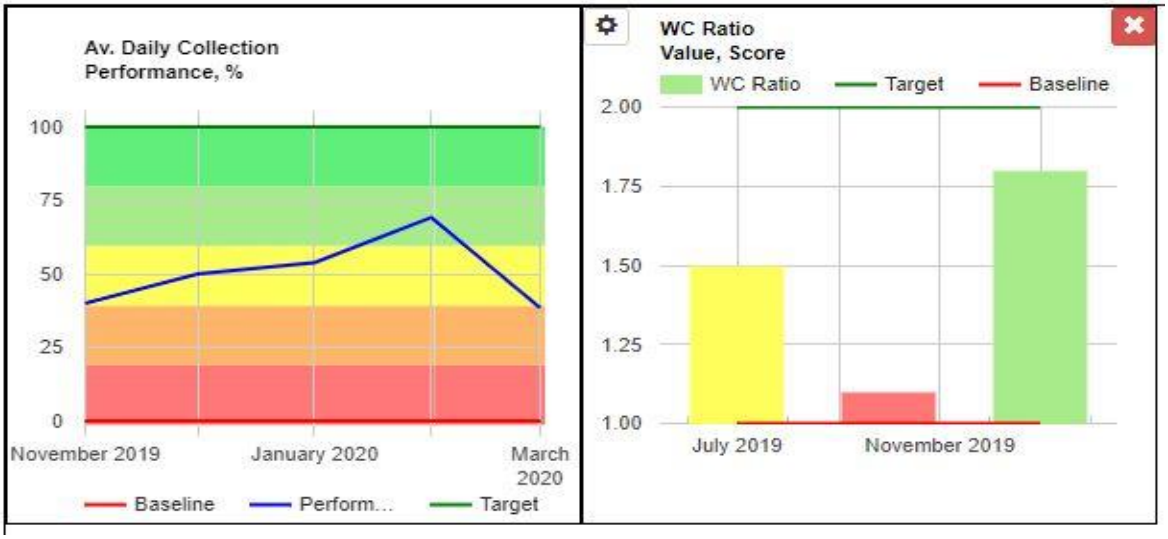


FIGURE 6. FINANCE PERSPECTIVE



DISCUSSION

The World Health Organisation (WHO) has taken an initiative to better health standards through its "Health System Metrics (HSM)". This effort aims to provide users with "a minimal set of core indicators, that are comparable between populations and over time, and identify the key measurement issues and strategies required to report regularly on the status of the health system" (36). The HSM sets the tone for data management and transforming data into useful information. The critical need here is the management and presentation of data when cross-functional needs arise. The research work undertaken has endeavoured to address this important need. The BSC provides an excellent framework that fits this requirement. The Dashboard Visualisation for Healthcare Performance Management using BSC measurement scores over other measurements such as "The Baldrige Excellence Framework (BEF)". The BSC presents crucial decision-aiding information in four different perspectives leaving no gaps in performance parameters while the BEF does not have such classification.

A review of the importance of KPIs will necessitate changes and these changes will require the development of more sophisticated IT systems at the back end. At the front end, dashboards are expected to become more and more user-friendly permitting real-time data updating resulting in more accurate information for decision making. Scope for further research exists in the use of Business Analytics in dashboard applications. This is expected to be helpful in continuous iterative exploration and research of past business performance to gain insight and drive corporate strategy implementations.

LIMITATIONS:

This work covers the perspectives of respondents within a particular time frame. Since the Indian healthcare scenario is very dynamic with changes occurring frequently, the findings of this study need to be reviewed periodically. Fortunately, the developed BSC lends itself to the required flexibility. Furthermore, the primary data collection was completed before the coronavirus pandemic and hence the views of the experts involved in the Delphi process might be radically different now, which may impact the KPIs chosen.

CONCLUSION

Combining traditional research methodologies like literature searches, the Delphi method and Likert-scale with versatile software tools, a user-friendly digital dashboard has been developed. Having many modifiable components, the developed BSC framework can serve as a benchmark for further formulation of specialised models for applications in specific areas like diagnostics, clinical services and facility management. The results of this research are expected to be of significance to hospitals looking for best practices in performance management. The outcome of this research adds to the ever-growing broad literature related to Healthcare Performance Management systems.

CONFLICT OF INTEREST:

The authors declare that there is no conflict of interest.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

PREDICTORS OF COUNTERPRODUCTIVE WORKPLACE BEHAVIOR OF NURSES

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ABSTRACT

Disruptive actions in healthcare settings can cause errors, poor client satisfaction, employee turnover, and bigger hospital expenses. This research investigated the determinants of counterproductive work behavior (CWB) such as work-related proactive coping, autonomy, interpersonal conflict, organizational constraints of hospital nurses in a tertiary hospital in large metropolitan city in the Philippines. A descriptive correlational design was utilized in the study. Nurses from the different clinical areas of the hospital were chosen as respondents for this study. Proactive coping received the strongest weight in the model followed by autonomy and organizational constraints; interpersonal conflicts received the lowest of the four weights. Based on the results of the study, the researcher can conclude that work-related proactive coping, autonomy, interpersonal conflicts, and organizational constraints are determinants of counterproductive work behaviors of hospital nurses. Health care managers should formulate customized programs and strategies that can improve employee performance and coping to reduce counterproductive work behaviors. Lastly, further studies would be conducted on other variables that can predict and mediate with counterproductive work behaviors.

KEYWORDS

counterproductive behavior; disruptive behavior; proactive coping; multiple regression; healthcare management

INTRODUCTION

Every day when workers do not go to work, come late, take money and items, procrastinate on company time, and disrupt the place of work, they are wasting billions of dollars of profits and inventory each year. [1] Collectively all of these are called counterproductive work behavior (CWB) which consists of acts that harm or intend to harm organizations and their stakeholders. [2] Disruptive actions in healthcare settings can cause errors, poor client satisfaction, employee turnover, and increased hospital expenses. [3] Subsequently the major providers in health care are nurses and their roles are also increasing which includes quality improvement activities. [4] It is recognized that no other healthcare professional has such a varied and extensive role. [5] With this in mind, it is important for researchers and managers to focus their attention on them and their impact on health care. Incidentally, nurses' behavior that is detrimental to the organization's effectiveness may lead to low quality patient care and must be dealt with immediately. Healthcare managers must recognize the precursors of such negative actions to decrease its occurrence.

Researchers have stated that employees who experienced job related stressors were more likely to engage in counterproductive work behavior. [6] These would include lack of control, organizational constraints, workload and interpersonal conflict. It is also important to note that while these may be antecedents to such a behavior, presence of these stressors does not guarantee such behaviors. It is now important to know if there is another factor that will affect the behavior. Knowing if positive coping strategies will also have an impact on counterproductive work behavior is key, since stressors are affected by appraisal and coping behaviors of an individual. [7]

This study aimed to determine whether work related proactive coping, autonomy, interpersonal conflicts, and organizational constraints predicted counterproductive work behavior of nurses in the hospital.

METHODS

This study utilized a descriptive correlational design. The study was conducted in one of the tertiary hospitals in a large metropolitan city in the Philippines. It is a 200-bed capacity hospital that serves a minimum of 8,000 patients annually. The study was conducted in the various clinical units of the hospital particularly those from the operating room, delivery room, nursery, medical surgical wards, pediatric wards, obstetrics-gynecology (OB) wards, emergency room, and the intensive care unit. The respondents of the study were the nurses of the various clinical units of the hospital. All of the nurses in the various areas were considered to be included in the study. The nurses must be currently employed in the hospital regardless of employee status (i.e. regular, probationary, trainee). Eligible respondents were consecutively asked to participate in the study over a 1 week period. The total number of respondents who participated in the study was seventy-seven. The mean age of the respondents who participated in the study is 24.86 years old and the mean length of work is 2.75 years. Majority (72.7%) of the respondents are female, have regular employment status (68.8%), and have bachelor's degree in nursing (89.6%).

The study utilized five standardized questionnaires to measure the variables under investigation. The first part of the questionnaire assessed the demographic data of the respondents which includes: age, gender, employment status, educational attainment, and length of employment. The first instrument is the Proactive Coping Subscale, which is one of the subscales in the Proactive Coping Inventory. The instrument consists of 14 items that combines autonomous goal setting with self-regulatory goal attainment cognitions and behavior. Individuals scoring high on the Proactive Coping subscale are seen as having beliefs that are rich in potential for change particularly in ways that would result in improvement of oneself and one's environment. The scale has high internal consistency with a Cronbach's alpha of .80 - .85.

The second instrument to measure perceived control is the Factual Autonomy Scale (FAS) which was designed to minimize subjectivity in the assessment of workplace autonomy by using items that ask about factual information rather than general judgments. The scale consists of 10 items, with 7 following the question "In your present job, how often do you have to ask permission", and 3 following the question "How often do the following events occur in your present job. Internal consistency reliability estimates (coefficient alpha) are available from 3 samples: University support personnel (alpha = .81 incumbents; .82 supervisors); Combination of university support personnel and other private sector employees (alpha = .83 incumbents; .85 coworkers; Employed university students (alpha = .87).

The items of the FAS are statements asking how often someone else has control. Response choices ask how often each item occurs, where 1 = the least frequent response (Never) and 5 = the most frequent response (Extremely often or always, or Every day). The items should be reverse scored. This can be done easily by subtracting responses to each item from 6, and then summing the items after this reversal. Thus, a score of 5 becomes a 1, a score of 4 becomes a 2, 3 remains 3, 4 becomes 2, and 5 becomes 1. This will result in high scores representing high control rather than low control.

The third instrument is the Interpersonal Conflict at Work Scale (ICAWS). Interpersonal conflict in the workplace has been shown to be one of the most frequently reported job stressors. The ICAWS is a four item, summated rating scale designed to assess this construct. Its items ask about how well the respondent gets along with others at work, specifically getting into arguments with others and how often others act nasty to the respondent. Five response choices are given, ranging from less than once per month or never, coded 1, to several times per day, coded 5. High scores represent frequent conflicts with others, with a

possible range from 4 to 20. Internal consistency reliability (coefficient alpha) was to average .74 across 13 studies. [8]

The fourth instrument is the Organizational Constraints Scale (OCS). Organizational constraints are situations or things that interfere with task performance at work. One item assesses each of the 11 constraint areas, and all items are summed into a total score. Respondents are asked to indicate how often it is difficult or impossible to do his or her job because of each item. High scores represent high levels of constraints, with a possible range of scores from 11 to 55.

The fifth instrument is the Counterproductive Work Behavior Checklist (CWB-C) which consists of acts that harm or are intended to harm organizations. They include acts directed toward both organizations and individuals, including aggression (physical and verbal), sabotage, theft, and withdrawal. The Counterproductive Work Behavior Checklist (CWB-C) comes in two versions. The full 45-item was designed to be scored as either overall CWB (all items), or as two subscales (43 items) that are classified into CWB directed toward the organization versus people. Cronbach's alpha ranges from .55 - .90.

Upon approval, the researcher started gathering the data from the different areas of the hospital. Permission from the respective unit managers was secured to distribute the questionnaires to the nurses. The researcher used structured questionnaires in gathering the data. Together with the questionnaires, a written explanation was attached and it was accompanied by a verbal explanation to explain to all the participants regarding the goals and the objectives of the study. The nurses were informed regarding the use of the questionnaires in the study. The researcher reassured the nurses that a high degree of privacy and anonymity will be maintained. All questionnaires were kept in a long-sized expandable envelope, which were accessible only by the researcher.

Descriptive statistics were used to summarize and organize the data collected such as percentages and means. Multiple regression was used to know the relationship of the different variables and were used to be able to make predictions regarding the variables. All data were analyzed and set at a 0.05 level of significance using the SPSS version 17 statistical software.

RESULTS

TABLE 1. PREDICTORS OF COUNTERPRODUCTIVE WORKPLACE BEHAVIOR

VARIABLE	R^2	F	B	SE (B)	B
	.60	26.7***			
Proactive coping			-.485***	.287	-.677***
Autonomy			-.227***	.066	-.642***
Interpersonal Conflict			.098*	.029	.310*
Organizational Constraints			-.122**	.038	-.389**

Note. n = 77. B = unstandardized beta. SE = standard error. β = standardized beta.
*p < .05. **p < .01. ***p < .001.

Table 1 shows the prediction model was statistically significant, F (4, 72)=26.7, p<.000 and shows that the regression model has an R^2 of .60. This means that about 60% of the variability of the dependent variable, which is CWB, is predicted by the independent variables included in the study. The remaining 40% of the variability in the dependent variable is still unaccounted for and may be caused by other variables or external factors that were not included in the study.

Proactive coping, autonomy, interpersonal conflicts, and organizational constraints were used in the regression analysis to predict CWB. Table 1 presents the different predictors of CWB used in the study. The unstandardized

and standardized regression coefficients of the predictors are also shown in Table 1.

All of the predictors have probability values of less than 0.05 which is the level of significance. This indicates that the independent variables – proactive coping, autonomy, interpersonal conflicts, and organizational constraints have significant relationships to the dependent variable, CWB. Proactive coping, autonomy, and organizational constraints have negative coefficients which means that for every one-point increase in these variables there will be a corresponding decrease equivalent to the value of its beta coefficient in the level of CWB. Interpersonal conflict has a positive coefficient which means that an increase or decrease of its value will subsequently increase or decrease the level of CWB, respectively. Proactive coping received the strongest weight in the model followed by autonomy and organizational constraints; interpersonal conflicts received the lowest of the four weights.

DISCUSSION

Results from the multiple regression support the theory of Greenglass' [7] which states that proactive coping can directly reduce negative outcomes by altering how the stressor is interpreted. In the Stressor Emotion Model, perception of a stressor is important in determining if it induces a negative emotion which leads to CWB. People with proactive coping perceive difficult situations as challenges. Coping becomes goal management instead of risk management. Individuals initiate a constructive path of action and create opportunities for growth. It is because of this that the appraisal of being threatening is transformed into being challenging which will result in mastery and personal growth if overcome. Proactive coping strategies and behaviors at work involving mastery or problem-solving are associated with more positive outcomes and decreased distress. This in turn will decrease counterproductive workplace behaviors.

The results also support the study of Greenglass & Fiksenbaum [9] which suggests that proactive coping is a self-regulatory coping strategy that is associated with higher levels of well-being, lower levels of depression, and better psychological functioning. These studies found out that higher levels of proactive coping had lower burnout and anger scores, a greater sense of professional efficacy, perceive more fair treatment at work and experience greater life satisfaction.

Several studies in Canada, Poland, and Germany have found that proactive coping is positively correlated with perceived self-efficacy and negatively with job burnout in different professions. [12] Findings further indicate that proactive coping is significantly associated with lower burnout and higher professional efficacy in employed Canadian adults, [7, 11] and with lower threat and less loss appraisals in German teachers. [10]

In a cross-sectional study of community-dwelling seniors, proactive coping was associated with less functional disability, less depression, and greater perceived social support. [11] In another cross-sectional study with Canadian-Turkish immigrants, proactive coping was associated with greater optimism, greater life satisfaction, and less depression; [12] regression analyses showed that proactive coping accounted for a significant degree of unique variance in depression scores, over and above the variance attributable to trait optimism. [12]

The results show that autonomy is also a significant predictor of CWB. This supports the stressor emotion model of CWB by Fox and Spector [13] which states that perceived control is an important moderator of both perceptions and behavioral reactions. Controllable situations are less likely to be perceived as stressors and therefore will be less likely to result in negative emotions [8]. Also, Allen and Greenberger [14] suggested that perceptions of control are an important determinant of counterproductive work behavior, as non-constructive behavioral responses are more likely when a person perceives low control of the situation. Stressors that people perceive to have little control over will have a greater negative affect on health when compared to those that people perceive as having more control over. Appraisal of a stressful situation can affect the perception of control over the stressor, thus becoming an important part of managing stress efficiently.

For instance, the study of Fox et al. [15] found out that autonomy correlated significantly with organizational CWB. In a study of nurses, those who perceived a sense of control over stressful situations experienced fewer negative effects.[16] Researchers have also found that participants who reported a higher sense of control showed better adjustment after trauma. [17]

The result also shows that interpersonal conflict is a significant predictor of CWB. This supports the Stressor Emotion Model of CWB which states that stressful job

conditions such as having personal conflict at work can induce negative emotion which will lead to CWB. Interpersonal conflict with the supervisor can lead to counterproductive work behaviors such as defiance, undermining, and colluding with coworkers to engage in deviant behavior. Interpersonal conflict with peers can lead to counterproductive work behaviors such as harassment, bullying, and physical altercations. [18] Several studies which included interpersonal conflict also found significant correlations with CWB. [13, 15, 19, 20] The efforts to decrease the incidence of these conflicts can also decrease the incidence of CWBs.

Lastly, organizational constraint is also a significant predictor of CWB. However, it has negative relationship with CWB which is contrary to the theory that states that stressors will cause negative emotions leading to CWB. Spector [21] showed that frustration at work related to self-reported CWB. A self-report measure of constraints correlated significantly with self-reports of several categories of CWB, including aggression, hostility and complaining, sabotage and withdrawal, as well as with feelings of frustration which showed similar relations with CWB. The study of Chen and Spector [22] included measures of role ambiguity, role conflict, interpersonal conflict, and workload along with organizational constraints. All five correlated significantly with hostility, and all but workload correlated significantly with aggression and sabotage.

It may be surmised that one likely reason that organizational constraint is negatively related is that workers will less likely engage in negative behaviors that might lead to more stressful situations. If a worker engages in CWB because of stressors such as organizational constraints, the worker might get punished or disciplined. This makes an already stressful work environment a lot worse. The employee will not think of doing anything that might make the situation much worse than it already is. It is also important to note that the organizational constraints that were perceived in the study are those that are difficult to change by the employee alone such as lack of equipment. This might suggest that the type of constraint may also affect whether or not CWB is exhibited. It might also be futile to engage in CWB if it does not change or eliminate the cause of the stressor. So, the nature of the constraint as being less likely to be changed compared to other stressors such as interpersonal constraints may be a factor of this finding.

Another reason might be due to the mediating effect of proactive coping in the appraisal of the stressor. This is consistent with the theory of Greenglass which states that in proactive coping, people have a vision and see risks, demands, and opportunities in the far future, but they do not appraise these as threats, harm, or loss. Rather, they perceive difficult situations as challenges. Proactive coping will mediate the perception of the stressors positively, and decrease the negative emotions associated with the stressor. This in turn will affect the manifestation of counterproductive work behaviors. [9] This means that even with actual work stressors, the nurses may not appraise them as threatening and instead look pass it and see the opportunity for growth if these obstacles are overcome.

CONCLUSION

In summary, the results suggest that having high levels of proactive coping will mostly likely decrease the incidence of the nurses to engage in CWB. It also noteworthy to state that the presence of interpersonal conflicts will likely increase the incidence of CWB. Moreover, having high autonomy or control in the workplace will decrease the incidence of nurses to engage in CWB. Surprisingly, organizational constraints will decrease the incidence of CWB. This may be a purposeful decision of the nurses to not let a bad situation get worse. Proactive coping may also mediate their perception regarding this stressor and in turn their intentions to resort to CWBs.

IMPLICATIONS

All of these results imply that the presence of stressors, and individual characteristics such as coping styles and percieved autonomy of employees should be considered in the scheme and policies of organizations. This would mean that organizations should be implementing appropriate management practices that enhance employee performance and wellbeing, building a healthy work environment and organizational effectiveness. Employee performance and welfare can be achieved by reducing unnecessary stress and developing proactive coping styles. Ignoring such matters will likely have harmful effects, not only by increasing the chance of CWBs but also by decreasing performance and job satisfaction.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

PROVIDING A TECHNICAL SOLUTION TO IMPROVE NURSES' PERFORMANCE IN DRUG DELIVERY: A QUALITATIVE STUDY

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ABSTRACT

BACKGROUND AND PURPOS:

Technical measures were taken to improve the performance of nurses in the drug delivery process in hospitals affiliated to Zahedan University of Medical Sciences in Iran

MATERIALS AND METHODS:

This study was conducted with a qualitative approach and contractual content analysis method in 2017-18. Participants were 16 nurses and a physician working in different wards of the hospital who were included in the study by purposive sampling. The method of data collection was semi-structured interviews. All interviews were conducted and reviewed and analyzed by contractual content analysis.

RESULTS:

In the present study, 'steps to prevent drug error' as the main category and 'acting professionally' and "providing technical solutions' as two subcategories were extracted from the data.

CONCLUSION:

The results showed that the use of nurses 'experience and knowledge as technical solutions to prevent drug errors can play an important role in improving nurses' performance and increasing patient safetykeywords

KEYWORDS:

Performance Improvement, Drug, Nurse, Qualitative Study

INTRODUCTION

Maintaining the standards and performance of nursing services in quality and promoting patient health and safety is undeniable [1] Every year, medication errors can pose a serious risk to patients' health and pose a threat to their Safety; According to the findings of studies, tens of thousands of patients die annually as a result of accidents and errors of treatment staff in various treatment situations. [2] The American Nurses Association recognizes the roles of nurses in maintaining the health of various body systems, cooperating and coordinating with other treatment

systems, and performing activities based on law and regulations, taking into account the health of the community [3] Nurses, as a manager, have a direct role in ensuring the safety of patients [4] because about 40% of the nurse's clinical activities in the hospital are spent on medication. [5] A professional nurse is a committed and responsible person who acquires the necessary professional skills with special training. [6]

Medication is one of the basic measures of nursing and takes up approximately 40% of the nurse's working time. [7] Studies conducted in Iran on drug error provide different statistics. In their study, Shams et al. stated that nurses' errors were 28.9%. [8] In the study of Mirzaei et al. nurses reported medication error of 79.2%.[9]

Nurses spend most of their time with patients and monitor them throughout the medication process from the time they are admitted to the hospital until they are discharged. [10] Nurses are responsible for the direct care of patients and participate in the process of giving them medication. This can lead to drug errors by them. [11]

Nurses with high moral and professional commitment will strive to achieve professional values, one of the most important examples of which is the reduction of medication errors as one of the most important indicators of patient safety. [12] In the workplace, organizational commitment of employees is one of the important organizational variables that affects their job performance and behaviour. [13] The results of the study by Wolf et al. showed that 20% of all errors that occur in the medical field, including 39% related to physicians' errors in prescribing, 38% related to nurses drug use and and 12% related to pharmacists11% is related to the stage of transferring the doctor's order from the file to the pharmacopoeia. [14] In the study of Mirzaei et al., A review of the literature shows that approximately 65-87% of medication errors occur in the drug delivery process. Although it seems that medication errors are known, we still see medication errors in various forms in clinical wards. Therefore, the present study was conducted with the aim of providing a technical solution to improve nurses' performance.

MATERIALS AND METHODS

STUDY DESIGN AND PARTICIPANTS

This qualitative study was conducted on 17 participants (16 nurses and 1 physician) in an educational hospital of Zahedan University of Medical Sciences from 10 August 30, 2019 to 30 March 2020. This hospital employs 52 nurses. Participants were selected using a purposive sampling method. The maximum variation sampling technique was used for selecting the participants with different experience to collect rich data. The inclusion criteria included having a BSc degree and having 2 years' work experience. The COREQ checklist was used for the study report [7]

DATA COLLECTION

First, the researcher explained the study's aim for the participants. After getting written consent from the participants, the data were gathered by individual face-to-face semi-structured interviews in a comfortable room in a ward at the hospital. For convenience, only the researcher and the participant were in the room. Some of the interview questions were:

1. Describe how medication is prescribed during a shift.
2. What do you do when there is a medication error?
3. What are the factors causing medication errors?
4. How can medication errors be prevented?

Participants were interviewed one at a time and four participants had a second interview to complete the first one. The duration of the interview was 30–60 min. All interviews were tape recorded using a digital voice recorder. Also, data was collected using field notes.

DATA ANALYSIS:

The researchers typed all the recorded interviews for subsequent analysis. Data analysis was conducted using Braun and Clarke's [15] six-stage thematic analysis method. The six stages included: 1. Familiarization with the data, 2. making preliminary codes using systematic analysis with codes having the same meaning placed alongside each other, then collating codes across transcripts, 3. searching for themes with codes having the same meaning categorized under the same theme, then assigning a label, (4) reviewing themes, checking extracted codes and text, considering the need for needed themes, and developing a thematic map of analysis, (5) defining and naming themes with refinement and definition to accurately tell the story, and (6) producing the final report with the clear explication of linked themes. [15] Software MAXQDA V12 was used to manage and code the data.

Transcripts of the interviews were returned to the participants for their feedback. Lincoln and Guba's

trustworthiness criteria were used to ensure the accuracy of findings and include credibility, transferability, dependability, and conformability. To check the credibility the researchers were dealing with the data continuously for about 2 years; also, credibility was checked through member check, long-term interview, immersion into interview data, and consensus of codes between researchers.

To check the data trustworthiness, the data were given to a small group of nurses who were familiar with clinical environments but who did not participate in the present study. So results were shared with them and their feedback were collected. To ensure the dependability of the study, a step-by-step repetition and precise inspection which included accurate investigation of relevant data and documents was done by an external reviewer. Finally, conformability (objectivity) was verified with the use of an external reviewer who followed the audit trail created during the study. [16]

Ethical consideration: This study was approved by the Ethics Committee of Zahedan

University of Medical Sciences in Iran (ethic code: IR.ZAUMS.REC.1395.165). Before data collection, the researcher explained the full details about the study. If individuals were interested in participation, written informed consent was obtained. Participants were also assured that their information will be kept confidential. Audio files were deleted to protect patients' information after taking notes and analyzing them.

RESULTS

Sixteen nurses and one physician participated in this study. Their minimum age was 25 and maximum was 50 years. Their work experience was 3-25 years. 10 were married and six were single.

From the data analysis, two main categories were extracted: a category of 'error prevention steps' with the subcategories of 'acting professionally' and 'providing technical solutions'.

PROVIDE TECHNICAL SOLUTIONS:

"Practicing professionalism" and "providing technical solutions" were identified.

Some nurses believed that medication should be given by an experienced nurse, in which case medication error would be reduced. A nurse who worked in the pediatric ward said:

> 'In the pediatric ward, one should be very careful when giving medicine, for example, the dose of the medicine should not be mistaken. Therefore, the nurse in charge of medicine is an experienced and skilled nurse and inexperienced nurses work with him. For this reason, no error has occurred so far, or before the error occurred, especially in the dosage of the drug, the drug error was prevented.' '... In the CCU, all drugs are injected intravenously. We have no intramuscular drug at all. 'According to the conditions of the patients in this ward, the nurse who is supposed to work in this ward must be instructed in prescribing the medications to prevent the mistake of prescribing the medication' (Nurse No. 10)

In expressing their experiences in the field of drug error prevention, nurses referred to cases that were related to technical solutions and were factors in preventing drug errors. Items such as identifying high-risk drugs, storing some drugs separately, knowing how to prescribe the drug, using a skilled nurse to administer the drug, and paying attention to accreditation and finding solutions to the error were technical error prevention strategies.

> 'According to the list of the Ministry of Health, 20 high-risk drugs have been identified in hospitals and labeled red, such as potassium chloride, magnesium sulfate, sodium bicarbonate, lidocaine' said the experienced nurse in reducing medication errors, especially for dangerous drugs. 'Atropine, epinephrine, sodium heparin, haloperidol, propranolol, etc. These drugs are checked by two nurses. This solution reduces the possibility of error in high-risk drugs' (Nurse No. 3)

> 'Once I took oxytocin instead of neostagmine, but I realized in time. One of the reasons I was wrong was their similarity, but now, to reduce such errors, they have ordered that these drugs be stored separately and possibly, 'said another nurse. 'The error has been reduced to zero.' (Nurse No. 1)

One of the experienced nurses who was in charge of the ward suggested teaching the way to prescribe specialized drugs in the ward as a way to reduce medication errors:

'... In the CCU ward, all drugs are injected intravenously. The ward to the nurse who is supposed to work in this ward must be instructed to prescribe the drugs to be used to prevent the mistake of prescribing the medicine' (Nurse No. 10)

Some nurses believed that accreditation helped prevent many mistakes. One of the nurses said: 'Currently, there is a report of drug error in the accreditation of medical centers in the measurements provided by the Ministry of Health. This means that we comply with the same 8 international drug laws.' 'Assessment has reduced the percentage of medication errors. '

Nurses also suggested error reporting as one of the ways to prevent errors. The nurse said:

'If there is a medication error the nurse should report the error. In fact, when you report the error through the boxes that are installed in each ward of the hospital. The error is detected and the authorities can look for a solution to this problem and offer a solution to prevent that error. For example, one of the nurses with a long history of work said that one of the problems that always leads to mistakes in giving medicine is that with a few medicines that we have drawn and prepared in the room with a syringe, we go over the patient's head and give medicine. Sometimes it is possible that the drug to be injected in the form of an infusion is given to the patient in the form of a bolus and injected directly, which led to complications which was promptly intervened because the patient was in the intensive care unit, was immediately observed complications that had unfortunate consequences.

Next, the nurse suggested that the medicine be prepared on the patient's bedside as much as possible, and when injecting the medicine, it is better to mention the name of the medicine to the patient, as a result of which, firstly, the nurse pays attention and secondly, they are sensitive that it is better for the patient to be informed about the medication he is receiving In this way, drug errors are prevented.' (Nurse No. 16)

DISCUSSION

In this study, the process of nurses' exposure to medication instructions and ways to prevent medication error by nurses were explained. From the data analysis, two main categories were extracted: a category of "error prevention steps" with the subcategories of "acting professionally" and "providing technical solutions".

The findings of this study showed what are the technical strategies to improve the performance of nurses and prevent drug errors, which are discussed in each of the following dimensions.

PAY ATTENTION TO VALIDATION AND FIND SOLUTIONS TO ERRORS

Considering that recently in the monitoring systems, the accreditation performance in hospitals has created a change in the drug process, the nurses' opinions in this regard are examined and analyzed.

Some nurses believed that accreditation helped prevent many mistakes. One of the nurses said: 'Currently, in the accreditation of medical centres, drug errors are reported in the measurements provided by the Ministry of Health. This means that we comply with the same 8 international drug laws. Paying attention to this law in accreditation has reduced the percentage of medication errors.' (Nurse No. 10)

Consistent with this finding, Yousefnejad et al[17] in a descriptive-analytical study on the effects of accreditation in hospitals affiliated to Tehran University of Medical Sciences found that the implementation of accreditation program improves safety culture and reduces medication errors and develops staff capabilities. [18]

The expansion of accreditation programs increases public awareness of medical errors and bridges the gap in the development of patient safety in the health care system. [19] According to studies, accreditation programs improve the quality and performance of organizations. [20] Findings of the study by Dekaran and O'Farrell [19] showed that after the implementation of accreditation programs, there was a significant reduction in hospital complaints about drug accidents. [19] Findings from several studies examining the effects of accreditation programs in hospitals in South Africa, Zimbabwe, Australia, Egypt, and the Philippines indicate the positive effects of accreditation programs on reducing patient complaints from health care providers about drug accidents. [21]

Findings of Mekory et al.'s [22] study showed that the implementation of the accreditation program has significantly reduced medication errors. [22]

READ THE DRUG LABEL:

'Reading drug labels carefully is a way to reduce errors', said an experienced nurse.

> 'Reading drug labels reduces the risk of error, but sometimes it becomes careless. For example, years ago I worked in the cardiology department. Warfarin was placed in the place of TNG medicine because both of them are pink. I only paid attention to the color when using it and I made a mistake. The only way to reduce such errors is the nurse's accuracy' (Nurse No. 8)

These types of errors are also called action-based (or slip-based) errors. For example, removing a box of diazepam tablets from a medicine box instead of diltiazem tablets. Findings of one study showed that most medication errors occur due to carelessness and slipping of the nurse during the administration of routine medications. This error can be reduced by carefully reading the drug label, using identifiers such as barcodes, and writing the drug name on the label with a combination of uppercase and lowercase letters. [23]

Findings from the Berman study showed that over the past year, 33% of drug error reports were related to drug labeling or packaging. [24]

Anderson also found that the use of warning drug labels, with high resolution and quality and with a special colour, significantly reduces the incidence of accidents associated with drug errors. [25]

THE NURSE IS AWARE OF THE LEGAL ISSUES OF MEDICATION ERROR

Awareness of the nurse about the legal issues of error is one of the characteristics of a nurse acting in a professional manner.

Another experienced nurse mentioned that the nurse's knowledge of legal issues was one of the factors that prevented the error:

> 'I have had several medication errors. Once I injected streptomycin intravenously instead of intramuscularly. If I told them what they were doing to me, then I did not tell the head nurse, I just checked the patient regularly, and it was difficult, but if I was familiar with the legal issues of error, I would not have suffered so much. I am now informing the ward nurses about medication errors by holding a class' (Nurse No. 8)

In this regard, the findings of a study showed that one of the ways to prevent medication errors is to encourage employees to report errors; In this way, one can think of a way to reduce the error. [26, 27] Therefore, a professional nurse has no hesitation in detecting the error to protect himself from punishment for medication error. While educating nurses, officials can provide a safe environment for nurses to report as much as possible and reduce medication errors. [28, 29]

Based on the findings of their study, Merlin Jolie suggests that continuing education classes on legal issues of nursing errors and keeping pharmacological information up-to-date are one of the most important necessities for avoiding medication errors. [30]

FREQUENT TRAINING OF PERSONNEL ON THE IMPLEMENTATION OF THE DRUG PROTOCOL

Another nurse, who was the head nurse, made it a priority to reduce medication errors. 'We regularly explain to nurses that they should read the medicine label first and prepare the medicine on the patient's bedside and check it again. We have the rule that the medicine label should be checked 2 to 3 times so that it can be checked' he said. 'We do not have anything to report to the supervisor now' (Nurse 7)

The World Health Organization (WHO) states that one of the effective factors in the incidence of nursing errors in the patient's bed is the lack of knowledge and experience of nurses and lack of participation in in-service training courses. [31] Nobahar in a qualitative study found that having knowledge and skills was one of the factors that enable nurses to prevent medication errors. [32]

Consistent with this finding, Taheri et al. in a qualitative study found that one of the most important strategies for preventing drug errors in their view is educating nurses about common drugs in the ward and drug side effects. The existence of authoritative pharmacology books, access to the Internet to medication information, informing nurses about common errors in the hospital, and increasing awareness of prescription and consonant medications were emphasized. [27]

Many nursing researchers have cited increasing nurses 'pharmacological information as an important strategy to reduce medication errors, and have stated that updating nurses' information about medications, especially new drugs, can be an important factor in reducing medication errors'. [33]

In Iran, the lack of knowledge and awareness of how to implement drug protocols was identified as the most important factor in causing drug errors. [34] To reduce this factor in creating errors, medication information retraining classes can be used for these nurses.

Brady et al. also suggest that in order to calculate the correct amount of medication, teaching mathematics to nursing staff should be considered a necessity. [35]

It seems that by strengthening the curriculum of pharmacology in the undergraduate course, holding continuous training classes and weekly drug conferences within each department according to the specific drugs that are used in each department can increase nurses' awareness of pharmaceutical topics and related equipment.

HAVE ACCURACY

Another nurse who worked in various departments said about reducing errors:

> 'There is always an error related to the similarity of the form of the drugs and the names of the drugs and the dosage of the drugs, and it can only be controlled carefully by the nurse. I have experienced this many times when if the accuracy of the ward nurse decreases, an error occurs and this can only be controlled by increasing the nurse's accuracy' (nurse No. 22)

In confirmation of this finding, Arnson showed that lack of concentration and carelessness in nurses is one of the effective factors in the occurrence of nursing errors. [36] Hashemi et al. 'found that one of the factors associated with the occurrence of nursing errors is individual factors and include unsafe actions arising from Some mental processes of the individual such as forgetfulness, inattention, carelessness and negligence'. [37]

The findings of a study in Australia showed that communication problems with experienced and senior nurses and difficulties in accessing information related to the correct dose of medication lead to knowledge-based errors and errors due to inaccuracy of the nurse. Therefore, the use of a computer system for prescribing drugs, a barcode-based drug system and re-control by other colleagues can reduce the incidence of errors due to inaccuracy. [37]

IDENTIFY HIGH-RISK DRUGS

> 'According to the list of the Ministry of Health, 20 high-risk drugs have been identified in hospitals and labeled with red, such as potassium chloride, magnesium sulfate, sodium bicarbonate, lidocaine, Atropine, epinephrine, sodium heparin, haloperidol, propranolol,' said the experienced nurse in reducing medication errors, especially for dangerous drugs. 'These drugs are checked by two nurses. This solution reduces the possibility of error in high-risk drugs' (Nurse No. 3)

Drugs that potentially harm the patient are called high-alert medicine (HAMs) or high-risk medicine. According to The Joint Commission on Accreditation of Healthcare Organizations, or JCAHO, HAM is frequently associated with serious injury to patients or even death. These drugs are dangerous for the patient even when used correctly due to the low therapeutic index. Therefore, it is better to keep them in a separate place with a label identifying high-risk drugs. [25, 38]

USE A SKILLED NURSE IN MEDICATION

Some nurses believed that medication should be given by an experienced nurse, in which case medication error would be reduced. A nurse who worked in the pediatric ward said:

> 'In the pediatric ward, one should be very careful when giving medicine, for example, the dose of the medicine should not be mistaken for this reason, the nurse in charge of medicine is one of the experienced and skilled nurses, and inexperienced nurses work with him. For this reason, no error has occurred so far, or the drug error has been prevented before the error occurs, especially in the dose of the drug.' (Nurse No. 4)

According to the Institute for Safe Medication Practices (ISMP), monitoring by an experienced person when prescribing a drug reduces the incidence of drug accidents before the drug reaches the patient by 95%. An experienced nurse is responsible for confirming the correct patient, the correct drug, the correct dose and method of prescribing the drug. [25]

In connection with this subtheme, Berman (2004) states that performing at least two independent controls at the time of drug administration can reduce medication errors. [24] Tang et al. found that 37.5% of nursing errors occurred due to novice nurses. [7]

Therefore, it is necessary to think of a plan to use experienced nurses and nurses who have committed less medical errors alongside newly graduated nurses. However, in Iran, as soon as a new nurse is hired, an experienced nurse is hired in another place, such as a nurse supervisor in wards.

FIND SOLUTIONS TO THE ERROR

Another technical solution that the participants emphasized in order to prevent errors was to find a solution to the error. In this regard, the findings of the study showed that it is important to identify the type of medication error and nurses should be encouraged to report the error. [39]

Findings of the study showed that if the causes of error and its identification are discussed with nurses in meetings, it reduces the probability of error and recurrence of medication error in the future. [40]

Another important way to prevent medication errors is the cooperation of treatment team members, especially nurses and physicians. Establishing communication between physicians and nurses and sharing information can help prevent errors. [40] By identifying the error, in addition to preventing its adverse consequences, the way to prevent it can be discovered.

CONCLUSION

The purpose of this study was to explain the technical ways to improve nurses' performance from the data analysis, two main categories were extracted: a category of 'error prevention steps'with the subcategories of 'acting professionally' and 'providing technical solutions' .

The findings showed that there is a possibility of medication error for nurses, but if nurses act professionally in performing their duties and have a professional view of technical solutions and improve the nursing performance of control systems such as accreditation they can reduce the likelihood of medication errors by providing technical solutions related to the profession.

It is recommended that in order to improve the performance of nurses to the technical solutions of nurses' performance of the nurse, in-service training should be held seriously and continuously.

The results of this study can predisposing for quantitative and qualitative studies in the fields of management, treatment and education. In particular, qualitative studies are used to reveal intangible aspects of safe drug administration that cannot be identified by quantitative criteria.

SUGGESTIONS FOR FUTURE STUDIES

Improving the process of prescribing drugs safely in patients: a research action study Investigating the views of nursing managers regarding the methods of safe drug administration by nurses Investigating the views of patients regarding the methods of safe drug administration by nurses Investigating the views of physicians regarding the methods of safe drug administration by nurses

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

COMMUNITY CLINIC IN BANGLADESH: EMPOWERING WOMEN THROUGH UTILIZATION AND PARTICIPATION

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ABSTRACT

BACKGROUND

Community Clinics (CC) has been established to provide basic healthcare services at the doorstep of the community people in Bangladesh. Besides health care, government has taken a development program through CC to improve maternal health care with an aim to reduce the maternal mortality. This study was an attempt to find out the role of community women in the utilization and participation of CC management.

METHODS

This cross-sectional study was carried out in 32 randomly selected CCs from 16 randomly selected districts. A total of 63 service providers, 2238 service users (patients) and 3285 community members were included as the respondents of this study. For data collection respondents were interviewed face to face by using a pretested questionnaire.

RESULTS

The majority of the service providers of the CC were from the local community, and a higher proportion of them were female (52.4%). The providers provided healthcare services both in CC and at community level. A total of 2238 patients visited the 32 studied CCs per day for getting treatment and significantly a higher proportion of them were female (71.2%). Most of the patients (83.0%) expressed satisfaction with the services provided in the CCs and most of them were female (83.8%). Of the total 3285 respondents, 60.3% were the women from the catchment communities. The activities of the CC were known by all of them (98.3%) and they participated in the management of CC.

CONCLUSIONS

The study revealed that because of utilization and participation in the management of CC, the women became an imperative person in the community, thus empowering them in healthcare development.

KEYWORDS

Community Clinic, Community Development, Community Participation, PHC, Service Providers, Women Empowerment, Bangladesh

INTRODUCTION

Women empowerment is an important factor for the development of a country, particularly in developing countries.[1] Empowering women is the control of women over their own lives, develop self-reliance and can take decisions and influence in the society, that uplift them in home and community and in the country's development.[1-3] Women empowerment enable women for participation in various activities at different levels in the society and community development and the participation empower them to establish their right.[1,3] Fifty years ago, Easter Boserup pointed out the importance of the role of women in the economic development and that initiated the momentum of participation of women in the development of a country.[4,5] Women empowerment became a feature of economic development and ultimately the overall development of the country, especially the social and political development. Now worldwide women empowerment is a popular agenda for a sustainable development of a country, especially in developing countries.[3,5-7] The MDG-3 (Millennium Development Goal) is to promote gender equality and empower women, thus influences the countries and international agencies to undertake gender related several programs.[7] In SDG (Sustainable Development Goal) much emphasis has been given to ensure the women in achieving their full potential and rights for participation in the achievement of SDGs. SDG-5 is mainly to achieve gender equality and empower all women and girls.[8]

Bangladesh is a thickly populated country; half of its population is female. But women in Bangladesh are in vulnerable position in the society; they need more social protection, particularly in a rural area. Once in Bangladesh, the women were neglected in the society and their contribution in the family and in the society was not valued. Males both in the family and in the community dominated the women. The position of the women in the society was secondary, like a subordinate. Women's life cycle was influenced by the patriarchal, patrilineal, and patrilocal social system of the society. Women were only considered as the homemaker and most of their life passed in the home under the directives of the male. They had restricted mobility and could not do any work outside; not allowed to get treatment of their own and could not take any decision. They had no or little economic opportunities, though some women worked in the agriculture or in industry, but that was not considered as an economic contribution. However, the attitude of the society towards women has been changed, because of increased female education and the socioeconomic development in the recent decades. The women are now regarded as an important contributor to economic development. [9,10]

Government has formulated goals and strategic objectives in relation to women empowerment and rights; and has adopted the underlying principles for the women's involvement in the mainstream of the overall developmental process. Several Social Protection Programs (SPPs) for the overall development in the community and the development of Community Clinic (CC) has been undertaken. The Revitalization of Community Healthcare Initiative is a program under the Social Protection Schemes. In the National Development Policy 2011 government identified CC for the improved health care of the women all over the country with an aim to reduce the maternal mortality by ensuring proper management of the pregnant mother. [9,11] Establishment of the CCs in the rural areas to provide basic healthcare services in the community is a revolutionary initiative of the government. Besides, basic health care, CCs has brought the family planning and preventive health services to doorsteps of the population. CC has access to 6000 rural people and within half an hour walking distance.

The CC is in a built structure and commonly has two service rooms, one lavatory and a waiting space. The services provided in the CC by the Community Health Care Providers (CHCP) as main provider and other providers are Health Assistant (HA) and Family Welfare Assistant (FWA). To supervise and to support the CC services, there is a community group (CG) and three community support groups (CSG). The members of the community group are selected mainly from the community to ensure the community participation and to own the CC. The CC is the best example of Public Private Partnership (PPP) as the CCs are constructed on the lands donated by community; construction, medicine and necessary logistics and service providers are from government, but the management is done by the CG and CSG. [12-15] The present study examines the pattern of community participation and the service utilization from the CC with emphasis to assess the status of women involvement and their responsibilities as a member.

METHODS

This was a cross-sectional study carried out to assess the women's participation and utilization in the activities and management of CC. The study was conducted in 32 CCs and in the catchment communities of the CCs. From each division two districts were selected randomly, and a total of 16 districts were included in the study. Similarly, from each selected district 2 CCs thus, 32 CCs were selected randomly. A total of 63 service providers, 2238 service users and 3285 community people were included as respondents of this study. Community Health Care Providers (CHCPs), Health Assistants (HAs) and Family Welfare Assistants (FWAs) who were available during the data collection period were included as respondents to service providers. Patients and other health care users who came into CCs on data collection days were also included as respondents for service users. From the community, a member of the household aged ≥18 years irrespective of sex was selected randomly as a respondent, and the particular household was selected by systematic random sampling using the GR (geographic reconnaissance) number of the households. Data were collected through face-to-face interview of the respondents by using a pretested questionnaire.

After collection, the data were cleaned and cross-checked for inconsistencies, as well as for any unusual findings. Frequency, percentage, mean and standard deviation were undertaken for descriptive statistics. Chi-square was performed for inferential statistics, to find out associations between qualitative variables. The p-value <0.05 was considered as the level of significance.

The ethical clearance for the study was obtained from Bangladesh Medical Research Council (BMRC). There was no risk for the study participants and there was no hazardous procedure involved in the study and had no physical invasive procedure with the participants. All the participants were informed about the purpose of the study and informed consent was obtained from each of them before interviewing.

RESULTS

Of the 63 service provider respondents from 32 CCs, 29 were CHCPs, 19 were HAs and 15 were FWAs. Overall female (52.4%) respondents had a significantly ($\chi 2$=18.165; p<.001) higher proportion than males (47.6%). Majority (60.3%) of the respondents had a graduate or higher level of education. The mean age was 35.2±10.03 years and the majority (58.7%) of them were aged 25 to 34 years. (Table-1). Almost all the service provider respondents (95.2%) were found to offer CC based health care services in addition to providing services in the community. Two-thirds of the respondents worked 6 days a week in CC and over 90% worked for 5 to 6 hours per day. The most common services provided at the doorstep were EPI (Expanded Program on Immunization) vaccination and family planning services. (Table-2)

TABLE-1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF SERVICE PROVIDERS

CHARACTERISTICS	SERVICE PROVIDERS			TOTAL	SIGNIFICANCE
	CHCP (n=29)	HA (n=19)	FWA (n=15)		
Sex					
Male	19 (65.5)	11(57.9)	0 (0.0)	30 (47.6)	χ^2= 18.165; df= 2; p <.001
Female	10 (34.5)	8 (43.1)	15 (100.0)	33(52.4)	
Education					
Up to HSC	9 (31.0)	11 (57.9)	5 (33.3)	25 (39.7)	χ^2=3.782; df= 2; p >.05
≥Graduate	20 (69.0)	8 (42.1)	10 (66.7)	38 (60.3)	
Age (years) Mean±SD35.2±10.03					
25 – 34	22 (75.9)	8 (42.1)	7 (46.7)	37 (58.7)	Fisher's Exact =8.105; df=4;p>.05
35 – 44	5 (17.2)	5 26.3)	3 (20.0)	13 (20.6)	
45 – 54	2 (6.9)	6 (31.6)	5 (33.3)	13 (20.6)	

TABLE-2 WORKLOAD OF THE SERVICE PROVIDERS

SERVICES	FREQUENCY	PERCENTAGE
Attend CC every week		
Yes	60	95.2
No	3	4.8
Duration of work per day		
3-4 hours	06	09.5
5-6 hours	57	90.5
Number of working days per week		
6 days	42	66.7
2-3 days	21	33.3
Home visit per week		
<2 days	4	6.3
2-3 days	26	41.3
>3 days	5	7.9
Nil	28	44.4
Service(s) provided by home visit		
DOTS (TB)	12	19.0
FP (Contraceptive) services	21	33.3
EPI (Vaccination) services	30	47.6

It was found that a maximum of 90 patients (service users) visited to one CC per day to receive treatment (78.9%) and FP&MCH (21.1%) services. Among the patients visited, over half (56.7%) were females and one-fourth were children. (Table-3) CCs provided several services, but the common services received by the users were maternal and neonatal services (91.8%), EPI vaccination (86.4%) and treatment of common diseases and first aid (71.8%). (Table-4) A total of 2,238 patients visited the studied 32 CCs in a day, of them 644 (28.8%) were males and a higher proportion (71.2%) were females. Overall, 83.0% of the patients were satisfied with the CC services and female users (83.8%) were found to be significantly ($\chi2=6.778$; $p<.05$) more satisfied than males (81.2%).

The reasons for satisfactions were, prompt service by the providers (85.7%), skilled and qualified service providers (85.6%), and provide adequate advice and health education (84.4%).(Table-5) The respondents also mentioned several reasons to choose CCs for getting treatment and other services. The common reasons were, service was free of cost (97.7%), proper management by the committee (92.8%), less distance and easy communication (79.3%), good behaviour and advice (69.4%), available medicine (67.3%), cleanliness of the premises (63.9%) and less waiting time for getting services (60.0%). (Table-6)

TABLE-3 SERVICES RECEIVED BY THE PATIENTS PER DAY IN A COMMUNITY CLINIC

PATIENTS' CHARACTERISTICS	SERVICES RECEIVED PER DAY					
	Treatment		FP & MCH		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Male	21	30.1	4	21.1	25	27.8
Female	39	54.9	12	63.1	51	56.7
Child	11	15.01	3	15.8	14	25.5
Total	71	78.9	19	21.1	90	100.0

TABLE-4 PATIENTS' KNOWLEDGE REGARDING SERVICES AVAILABLE AT CC [N=2238]

SERVICES AVAILABLE AT THE CC (MULTIPLE RESPONSES)	FREQUENCY	PERCENTAGE
Maternal and Neonatal services	2039	91.8
Integrated management of childhood illness (IMCI)	849	38.2
Reproductive Health services and Family Planning	1205	54.3
EPI (Vaccination) services	1918	86.4
Registration of newly married couple, pregnant mothers, birth and death; preservation of EDD	704	31.7
Nutritional education and micronutrient supplementation	1105	49.8
Health, Nutrition and FP education & counseling	1082	48.7
Treatment of common diseases and problems & first aid for the minor injuries	1595	71.8
Screening of Diabetes, Hypertension, Autism, Club feet and referral to higher facilities	816	36.8
Normal delivery with the availability of trained manpower & other facilities	175	7.9
Identification of emergency and complicated cases with referral to higher facilities	485	21.8
Establishing an effective referral linkage.	348	15.7
Provide Essential Service Package (ESP)	86	3.9

TABLE-5 PATIENTS' SATISFACTION REGARDING SERVICES PROVIDED IN CCS (N=2238)

SEX	LEVEL OF SATISFACTION			TEST OF SIGNIFICANCE
	Satisfied f (%)	Partially satisfied f (%)	Not satisfied f (%)	
Perceived quality of services				
Male	506 (78.7)	125(19.4)	13 (1.9)	$\chi^2 = 2.728$
Female	1298(81.4)	276(17.3)	20(1.3)	df = 2
Total	1805(80.7)	401(17.9)	32(1.4)	p>.05
Availability of medicine				
Male	481(74.7)	147(22.8)	16(2.5)	$\chi^2 = 1.287$
Female	1226(76.9)	330(20.7)	38(2.4)	df = 2
Total	1707(76.3)	477(21.3)	54(2.4)	p>.05
Qualified person provide service				
Male	544(84.5)	80(12.4)	20(3.1)	$\chi^2 = 11.742$
Female	1372(86.1)	205(12.9)	17(1.1)	df = 2
Total	1916(85.6)	285(12.7)	37(1.7)	p<.01
Information obtained from providers				
Male	490(76.1)	139(21.6)	15(2.3)	$\chi^2 = 0.165$
Female	1224(76.8)	336(21.1)	34(2.1)	df = 2
Total	1714(76.6)	475(21.2)	49(2.2)	p>.05
Received prompt service				
Male	546 (84.9)	73(11.3)	25 (3.7)	$\chi^2 = 9.052$
Female	1374(86.2)	192(12.0)	28 (1.8)	df = 2
Total	1919(85.7)	268(12.0)	52 (2.3)	p<.05
Quality health education				
Male	522(81.1)	94(14.6)	28(4.3)	$\chi^2 = 8.229$
Female	1367(85.8)	182(11.4)	45(2.8)	df = 2
Total	1889(84.4)	276(12.3)	73(3.3)	p<.05
Overall				
Male	523 (81.2)	99 (15.4)	22 (3.4)	$\chi2 = 6.778$
Female	1334 (83.8)	232 (14.6)	27 (1.7)	df = 2
Total	1858 (83.0)	331 (14.8)	49 (2.2)	p<.05

TABLE-6 PATIENTS' OPINION REGARDING CC [N=2238]

OPINION OF THE PATIENTS (MULTIPLE RESPONSES)	FREQUENCY	PERCENTAGE
Less distance (near the village, easy communication)	1775	79.3
Better waiting arrangement	1062	47.5
Less waiting time	1343	60.0
Experienced and qualified provider	1101	49.2
Providers good behavior, give necessary advice	1554	69.4
Cleanliness of the premises	1431	63.9
Availability of drugs	1507	67.3
One stop service (Health, FP & Nutrition)	869	38.8
Services is free of cost	2187	97.7
Convenient clinic hour	573	25.6
Provider is known (from locality)	544	24.3
Proper management by the Community people	2076	92.8

Different committees were involved in the management of CCs, and CG was constituted mainly by community people. From the community, 3285 household members from the catchment areas of 32 CCs were included as the respondents. Among the total 3285 community members, majority were females (60.3%). The mean age of the community members was 35.8±10.02 years and two-thirds (74.3%) of them were 19 to 44 years old. Half of the community members (50.5%) were housewife and next to them agriculture (19.5%) was the occupation. Majority of them had education up to primary (36.2%) and secondary level (32.1%) of education. (Table-7) The management committee had several responsibilities for the proper running of CCs, and the majority of the female community members were involved to serve these responsibilities. It was found that almost all (98.3%) the community members knew the activities and satisfied with the behaviors of the service providers. However, less than one-third of them mentioned some problems which were inadequate supply of medicine, in adequate service providers, financial constraint and lack of treatment of non-communicable disease (NCD). (Table-8)

TABLE-7 SOCIO-DEMOGRAPHIC PROFILE OF THE COMMUNITY MEMBERS OF CC MANAGEMENT [N=3285

ATTRIBUTE	FREQUENCY	PERCENTAGE
Gender		
Male	1305	39.7
Female	1980	60.3
Age (Years)		
19 -44	2445	74.3
45 – 59	626	19.1
≥60	214	6.5
Mean ± SD	35.8±10.02 years	

Occupation		
Business	328	10.0
Agriculture	642	19.5
Service	131	4.0
Housewife	1658	50.5
Student	236	7.2
0thers	290	8.8
Education		
Never gone to school	746	22.7
Primary (1-5 years of education)	1188	36.2
Secondary (6-10 years of education)	1055	32.1
HSC	296	9.0

TABLE-8 KNOWLEDGE OF COMMUNITY MEMBERS IN THE MANAGEMENT OF CCS (N=3287)

ATTRIBUTE	FREQUENCY	PERCENTAGE
Know the activities of CC	3229(98.3)	
know about the CG in the management of CC	1989	60.5
Know about the service Providers	2078	63.3
Status of drug supply in CC	1538	46.8
Know about the clinic hours	2275	69.3
Friendly Behavior of Service Providers	3148	95.8
Problems / Constraints		
Some medicine is not available	1078	32.8
Inadequate service providers	1015	30.9
Lack of treatment of NCDs	995	30.3
Financial constraintto running the CC	1078	32.8
Long distance	354	10.8
Irregular or no electricity	260	7.9
Poor constructed building	100	3.0

DISCUSSION

One of the principles of Primary Health Care (PHC) is community participation and involvement. Theestablishment of community clinic in Bangladesh was

based on this principle of PHC. The community participation of CC had been initiated with the donation of land by the community people. The community people actively took part in the management of CC through involvement in various management committees and by getting services from CC. Without maximum utilization of the human resources, socio-economic development of a country is not possible. In Bangladesh women are half of its population, therefore their utilization of services is essential. [13-16] The result of this study revealed that both male and female were the members of the community group (CG), a management committee for operating CC, and almost all members were from the community. However, significantly a higher proportion of the community group members were women (60.3%) who took part in this study and majority of them were housewives. The women were reported to be actively taken part in monitoring, guiding, attending meetings, and giving an opinion regarding management of CC. The management committee had several responsibilities for the smooth running of CC and the women members were found to carry out these responsibilities properly. The management committee identified the various problems for proper running of the CC and realizing these problems, the women members took active part in solving the problems. Most of these problems were also reported in the previous studies conducted on CC. [13,14]

Community group members also raise awareness among the community people regarding occurrence and prevention of various diseases, about the maternal and child health care services, and family planning and other services available in the clinic.[14] The current study revealed that most of the patients knew about the services available in the CC. They mentioned about thirteen different services available in CC, of which women and child health services were more common. It was also important that many people from the local community visited CC every day to receive various services. Most (84.4%) of them were satisfied with the services provided by the CC by receiving prompt health care, services provided by a qualified person, and awareness through quality health education. They also expressed satisfaction with less waiting time and proper seating arrangement for receiving services. The service users in another study also expressed their satisfaction regarding the quality of services and services available in the CC, but differed with waiting time and distance.[15]

A few years ago, the women in Bangladesh, particularly the women from rural areas, did not have easy access to get treatment from a healthcare facility because of various reasons, such as long distance from health care facility, negative decision regarding healthcare by male members, poverty.[17,18] The CC had created the opportunity for community women, providing easy access to receive treatment from CC and significantly a higher proportion of them were getting the services from CC. The factors that made for self-reliance of women and favoured them to obtain services as mentioned by them were, CC being near the village, easy communication and could come alone as needed and, services provider were familiar to them, and the community women were in the management community. The community women not only utilizing services from the CC in addition the women CG members also taking part in the management by giving their opinion freely without any hesitation regarding the services and management of the CC.

Most of the service providers in the CC were from the local community and some of them were also a member of the support committees. On an average the service providers were the young adult (35.2±10.03 years) and a higher proportion of them (60.3%) had graduation or higher education level. The service providers worked for 5-6 hours/day, and most of them (55.6%) did the home visits every week. The service users had the opportunity to meet with the service providers both in CC while receiving treatment and at the village when the providers visited them for doorstep services like DOTS (Directly Observed Treatment Short course), FP (Family Planning) and EPI (Expanded Program on Immunization), and by this meeting, the service providers became familiar with the villagers. More than half (52.4%) of the service providers were female and were involved in the functioning of CC by doing their daily workload and being members of the committee.

This study revealed that in the functioning of CC, the service providers, especially the women were playing an important role through active participation in various CC activities. As a result, the women became a vital person in the

community, especially as a healthcare provider. An approach of socio-economic development in the community is the active participation of women, and without active participation of the women, the socio-development will not be fully achieved. [1,16,19] Therefore, the active participation of the community women through CC activities would result in a proper community healthcare development particularly for women.

Sustainable development of a country without women empowerment is said to be impossible. [20,21] For socio-economic development, women's involvement in the mainstream of the developmental process is fundamental in the developing country. [20,22] In Bangladesh, the government has undertaken various programs and activities for women empowerment. In National Women Development Policy 2011, the aim of empowering women, the government has given emphasis to give equal opportunity to women in education, training, science and technology and technical activities to make them self-reliant.[9] Already government achieved considerable progress on women's development, especially in education and political empowerment. According to 'Gender Gap Index Report' in 2016, Bangladesh stood at the 72nd position among 144 nations in the world, and secured consecutively 2nd times as the top country among South Asian countries.[9,23] However, the implementation of CC by the current government is a program for active participation of rural women in healthcare development as well to improve the health care of the women.[9] This study revealed that the community women actively taking part in the healthcare development in the community through their participation in the operation and management of the CC, and by utilizing the services provided in the CC. Thus, the CC has increased the ability of community women to access into a healthcare facility and to get different services, which increases the self-reliance and the ability to overcome their own subordination leading to empowering them to establish their health care rights. [16,20,24]

CONCLUSION

Community Clinic (CC) is a revolutionary initiative by the government to bring basic healthcare services to the community people. Community people are actively involved with the establishment and management of CC. From the clinic, people get treatment and other health care services, and in the village, they are visited by the service providers for various healthcare programs. This study revealed that a higher proportion of the community women participated actively in the operation and management of CC and getting services from the CC and retaining an important role. Thus, the active participation in the functioning of the CC of the community women has given opportunity to empower them and establish their rights to health care.

CONFLICT OF INTEREST

Authors declare that they have no conflict of interest.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

RELATIONSHIP QUALITY IN GERIATRIC HEALTHCARE DELIVERY: A SUSTAINABLE MODEL

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ABSTRACT

OBJECTIVE:

This study is undertaken to examine geriatric relationship quality in healthcare delivery in Kerala. Drawing the hypothetical relationship, a model for elderly geriatric healthcare delivery to be developed.

METHODS:

This is a cross-sectional study. Structural Equation Modelling (SEM) technique, based on a positivist approach, was employed to analyse the association between relationship quality and geriatric healthcare delivery. The data was collected from 405 elderly people in Kerala, using a survey questionnaire, between June 2020 and November 2020 adopting multi-stage sampling. The latent constructs used for the study were service quality, relationship quality and patient centricity.

RESULTS:

A consistent empirical model of predictive relationships between the hypothesized variables was found, and a geriatric relationship quality healthcare model was developed. It is found that service quality, relationship quality and patient centricity are highly significant in elderly healthcare delivery. Service quality has emerged as a significant determinant of relationship quality. Even though patient centricity is not hypothetically related to relationship quality, it is a significant determinant of service quality.

CONCLUSION:

Geriatric healthcare management must consider relationship quality as a prominent factor while evaluating the quality of healthcare delivery as it includes the outcome of all the structural and procedural aspects.

KEYWORDS

Relationship Quality, Geriatric Care, Satisfaction, Service Quality, Patient Centricity.

INTRODUCTION

In the globalized era, the concept of relationship is very significant in both service and manufacturing industries. It has been conceived as both an outcome and predictor construct. Having perceived as a significant determinant in the customer decision-making process and new product development, relationship quality has also captured the marketers' attention more than ever before.

Relationship quality is an outcome, formed by the interaction between the service provider and the consumer, where the latter derives a positive affective outcome from the relationship and the former, primarily, gets the competitive advantage out of it. However, there is a lack of consensus on the definitions of relationship quality construct. The most widely discussed definition of relationship quality is given by Palmatier et al. [1], which refers to the whole assessment of a relationship's strength. Essentially, the evaluations of the services received by the consumer, the service providers' mentality and attitudes, personal and non-personal communication, service delivery, hospitable, empathetic, and courteous behaviour, and the 'give and take' attitude determine this multi-dimensional construct.

Relationship quality has been widely discussed in the literature in many contexts.[2] Internationally, building and maintaining quality geriatric healthcare facilities have become one of the most important agendas for providing universal health care access to the elderly under the umbrella of Sustainable and Millennium Development Goals (SMDGs). Health conditions worsen when age increases, and consequently, give rise to many psychological, physical, and behavioural issues and disabilities, contagious infections, and chronic diseases. In turn, during the higher healthcare episodes, they go through varied experiences, leaving either impact on their increased wellbeing or negligence, leading to worsened health. To sum up, relationship quality is a significant determinant of health care seeking behaviour where the absence of this may lead to delayed or denied healthcare access.

The measures which encompass the relationship quality construct are inconsistent with the previous studies. Despite having an array of studies on geriatric care, very few studies focus on quality geriatric healthcare delivery and its consequence in fostering relationship quality. To date, there is insufficient evidence that brought out the effect of patient centricity and service quality in enhancing relationship quality in healthcare delivery, particularly among the elderly population. Also, to the best of knowledge, there is no research conducted on geriatric relationship quality dimensions in healthcare delivery in Kerala context, particularly when the Kerala healthcare model has gained global acclaim in preventing the Nipah outbreak in 2018 and COVID-9 pandemic. Thus, this study fills the above gaps by investigating the association between relationship quality with service quality and patient centricity constructs, developing a sustainable geriatric relationship quality model. This study is significant wherein Kerala is the fastest ageing state in India, where about 20 percent of the total population is elderly.[3] This research can help the healthcare facilities to recognize the significant relationship quality variables and focus on effective geriatric care management.

METHODS

This research is based on a positivist paradigm. The data was collected by means of a structured questionnaire from 405 elderly persons in Kerala using a multi-stage sampling technique. The study area was divided into three zones, south zone, central zone and north zone. From each of the zones mentioned above, three districts had been selected randomly. Four panchayats (local self-institutions) from each of these nine districts were selected by drawing lots, making 36 panchayats under study. From each selected panchayat, 11 households with elderly persons were randomly selected. The elderly who received healthcare services from any hospital in Kerala from June 2020 to November 2020 were the study participants. The respondents to the survey questionnaire included any of the resident members above the age of 60, who could respond to the questionnaire. When there were two older adults in one household, it included only one person in the study. The survey questionnaire was filled by the participants themselves except in the case of bedridden elderly.

The study designed a survey tool to collect data. It included two sections. The first section sought demographic information on age, gender, educational level, marital status, employment status, and the reason for hospital selection. Second section included 20 items to assess the relationship quality, patient centricity, and service quality constructs, measured in 5 points Likert scale. The tool was

designed by adapting important models, frameworks, and studies in the related areas. Five dimensions of the SERVQUAL model (Tangibility, Reliability, Responsiveness, Assurance, and Empathy) [6,7,8,10] and structure-process-outcome (SPO) model of Donabedian [22], medical tourism model [10] important previous studies on relationship quality [2,4,5] and patient centricity [7,9,10,23] are imbibed in the chosen constructs. Service quality construct included 12 variables under five domains, relationship quality included five variables under trust and satisfaction constructs and patient centricity included three variables. The validity of the questionnaire was evaluated based on content validity and experts' opinion. A pilot study was conducted, using a survey of 30 participants to make sure that items in the survey questionnaire were correctly interpreted. From the 20 items in the second section of the questionnaire, two questions were omitted, in which respondents generally did not respond and added two more questions relevant to elicit information on the chosen constructs. Reliability test scores of all the constructs were above the guideline value. Service Quality ((Tangibility (α=.801), Assurance (α=.734), Reliability (α=.675), Responsiveness (α=.716), Empathy (α=.724)), Patient Centeredness (α=.807) and Relationship Quality (Trust (α=.730) and Satisfaction (α=.725)).

The survey instrument was originally designed in English and then translated to the local language, Malayalam for better understanding. Each respondent in the study was briefed about the study, and informed consent was obtained. COVID-19 protocol was adhered during the data collection process. The study was carried out as per the guidelines and permission of Indian Council of Social Science (ICSSR), New Delhi.

Descriptive analysis was performed on baseline characteristics, including age, gender, income, marital status, and education with SPSS 2.0. After the process of data screening, a Confirmatory Factor Analysis (CFA) was done using Amos (Version 20.0) to validate the structure of observed constructs to recognize the relationships among the constructs of relationship quality (satisfaction and trust), service quality, and patient centricity. A Structural Equation Modelling (SEM) technique was considered to analyse the relationship between relationship quality and elderly healthcare delivery dimensions.

MEASURES AND CONSTRUCTS

This study developed three primary latent constructs based on literature review and perusal of various related models, such as relationship quality, patient centricity, and service quality. The relationship quality construct was conceived as a composite construct (independent variables) with different interpersonal outcomes of a successful relationship. The most widely accepted aspects of relationship quality are 'satisfaction, trust, and commitment' and hence the study included these three latent constructs wherein 'trust' construct measured 'commitment' as well, to reduce the latent constructs into two with five variables. [2,4,5] Service quality construct in healthcare delivery is measured by using the five dimensions (Table 1) of the SERVQUAL model. [6] Overarching these five dimensions, the construct was measured using 12 variables (Table 1), adapted from earlier studies, suitable to the study context (7, 8). Patient centricity is a complex construct determined by the quality of interpersonal communication between the caregivers and patients wherein an empathetic listening, provision of diagnostic information in patient's language, and spending enough time to answer queries and addressing their worries are imbibed. Cooper et al. [9], perceived the construct through the outcome variables like rapport and patient satisfaction. Empathetic communication and sharing of information on the diagnostic and aftercare aspects are integral factors linked to patient satisfaction. The construct was measured using three variables (Table 1). To address the study objectives, two hypotheses were proposed.

H1: Service quality enhances relationship quality in geriatric healthcare delivery.
H2: Patient-centricity enhances relationship quality.

TABLE1. MEASUREMENT ITEMS

SERVICE QUALITY	RESEARCHER(S)
1) Tangibles: physical facilities, equipment	(6, 8, 10)
2) Reliability: ability to deliver the promised service and privacy of care	
3) Responsiveness: willingness to help, and provide prompt service, waiting time for accessing healthcare	
4) Assurance: knowledge/expertise of the doctor and staff, courtesy of hospital staff	
5) Empathy: personal care, understanding the elderly.	
RELATIONSHIP QUALITY	
Trust Willingness to rely on the hospital again.	(11,12)
Confidence in the hospital services.	(12,13)
Emotional attachment with the hospital.	(5,12)
Satisfaction Overall Satisfaction	(10–12,14)
Meeting expectations.	(10,12)
PATIENT CENTEREDNESS	
Spending enough time to listen concerns	(10,14)
Provision of timely information	(9,10,14,15)
Answers all my questions	(10,14)

RESULTS

SOCIO-CULTURAL VARIABLES

The survey was conducted among 405 older adults in Kerala of which 55.3% were males, and 44.7% were females. Around 50.1% of them were in the 60-69 age category, 31.6% belonged to 70 -79 category, 14.8% belonged to 80-89 category, and 2.2% were above 90 years of age. 77.5% were married, 2.7% were not married, 18.5% lost their life partners, and 0.7% divorced their life partners. The educational status of the elderly showed that 18.3% do not have any formal education, and a large majority (65.9%) has school education and 13.1% has higher education from colleges and universities.

Regarding the mean score of constructs, all variables received a high average score >4 except for 'waiting time,' and 'promptness in service' under the Responsiveness dimension of Service Quality construct (Table 2).

TABLE 2. MEAN VALUES OF THE CONSTRUCTS

CONSTRUCT	VARIABLES	MEAN	STANDARD DEVIATION
Satisfaction	Meeting Expectation	4.2938	0.87035
	Overall Satisfaction	4.3654	0.89265
Trust	Trust in services	4.3235	0.87686
	Revisit	4.3778	0.79166
	Emotional Attachment	4.2914	0.86405
Tangibility	Physical Facilities	4.2568	0.88901
	Modern Equipment	4.2617	0.90687
Assurance	Expertise of the doctor	4.4889	0.77268
	Knowledge of doctors and staff	4.4667	0.76882
	Courtesy of the staff	4.4543	0.75519
Reliability	Privacy	4.3012	0.86352
	Provides the assured service	4.3358	0.82103
Responsiveness	Willingness to help	4.4049	0.75385
	Waiting Time	3.5704	1.42054
	Promptness in service	3.7506	1.40879
Empathy	Personal Care	4.1111	0.92276
	Understanding my needs	4.2691	0.81092
Patient Centricity	Spending enough time to listen concerns	4.5062	0.65104
	Provision of timely information	4.5358	0.67621
	Answers all my questions	4.4963	0.75983

CONFIRMATORY FACTOR ANALYSIS

To achieve the research objectives, a Structural Equation Modelling (SEM) technique was adopted to evaluate the current perceived level of service quality in geriatric healthcare delivery in Kerala and its effect on satisfaction and trust. SEM is a statistical technique to evaluate the relationship between multiple variables simultaneously, consisting of statistical techniques such as regression and factor analysis. SEM consists of a two-step process. First, a confirmatory factor approach is adapted to test the relationship between variables and their constructs. Second, multiple regression techniques are adapted to test the relationship between variables to establish evidence of directionality and the significance of the relationship. The basic assumption in the Confirmatory Factor Analysis (CFA) is that all factors are correlated. However, they are separate constructs. The high correlation of indicators is denoted as convergent validity, and the difference between each construct is denoted as discriminant validity. Ellipses represent the factors or constructs, and their indicators are represented as rectangles.

In the current research, Service Quality, Patient Centricity, Relationship Quality (Trust and Satisfaction) were considered as constructs under the study. The interrelationship between variables and indicators of constructs was evaluated using CFA. The proposed CFA model is presented in Figure 1. A construct under service

quality named 'Responsiveness' and an indicator of Assurance have been removed from the final analysis, as it has low loading with their constructs.

Various fitness indices are used to test the best of the proposed CFA. The fit indices reveal that the final CFA model, after deleting some items on the scale, is acceptable to excellent fit. The model fit of CFA is presented in Table 3.

TABLE 3. FIT MEASURES OF FINAL CFA MODEL

MEASURE	ESTIMATE	THRESHOLD	INTERPRETATION
CMIN	178.264	--	--
DF	67	--	--
CMIN/DF	2.661	Between 1 and 3	Excellent
CFI	0.960	>0.95	Excellent
GFI	0.927	>0.90	Acceptable
AGFI	0.881	0.80	Acceptable
SRMR	0.034	<0.08	Excellent
RMSEA	0.064	<0.06	Acceptable
PClose	0.021	>0.05	Acceptable

Fitness measures such as CMIN/DF, Comparative Fit Index (CFI), and Standardized Root Mean Square Residual (SRMR) show excellent fit. The fit indices like Goodness of Fit Indices (GFI), Adjusted Goodness of Fit Indices (AGFI), Root Mean Square Error Approximation (RMSEA), and the Probability of Close Fit (PClose) show the acceptable fitness. The right fitness allows the researcher to deploy structural models to test the proposed hypothetical relationship between constructs.

STRUCTURAL MODEL

SEM is developed to test the underlying relations stated in the form of a hypothesized relationship among latent variables, based on the theoretical relationship between various variables through a thorough literature review. In the current study, the relationship between service quality, patient-centricity, trust, and satisfaction is measured using SEM. In this research, trust and satisfaction were represented through a second-order latent variable called 'Relationship Quality. Figure 2 presents the resulting structural model.

The result of the hypothesis testing (Table 4) indicates that service quality has a significant positive impact on perceived trust and satisfaction in geriatric care. However, the patient-centeredness does not contribute to the overall relationship quality. It shows that the elderly perceives that geriatric care is not most patient centric. Both the 'trust' and satisfaction together reflect relationship quality. While the 'trust' dimension explains 92 percent of the relationship quality, the 'satisfaction' explains about 73 percent of relationship quality.

FIGURE 2. STRUCTURAL MODEL

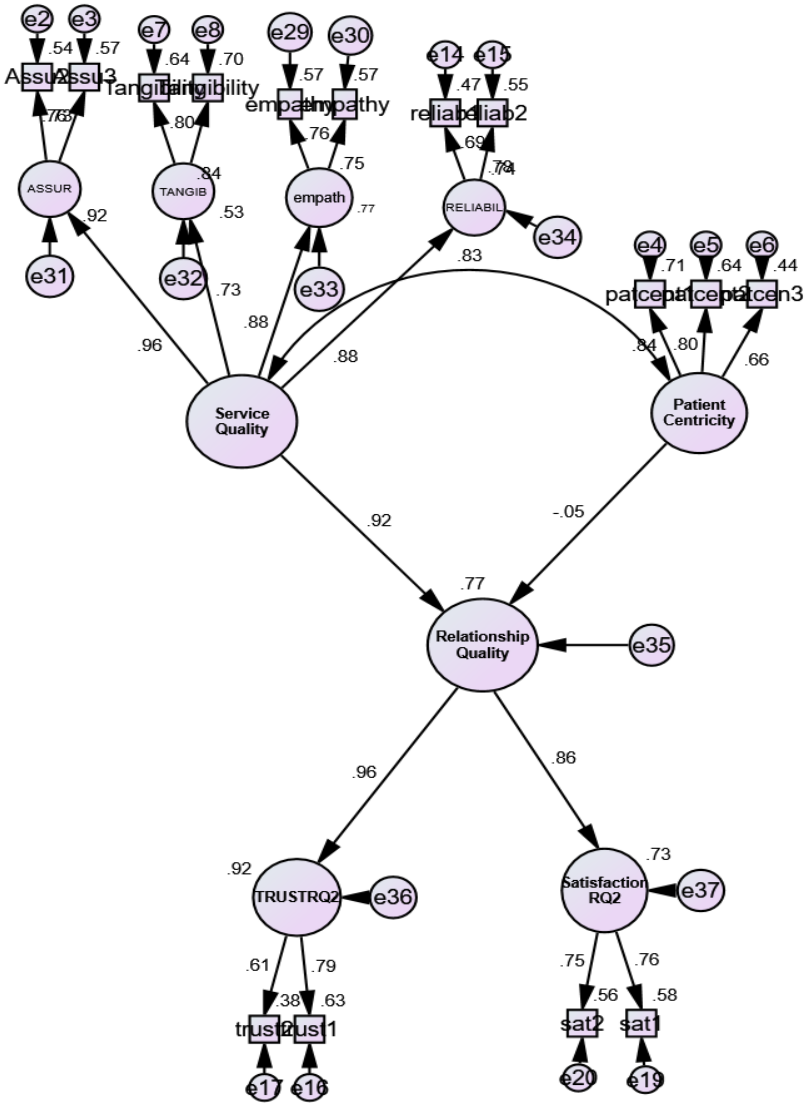

TABLE 4. RESULT OF HYPOTHESIS TESTING

INDEPENDENT VARIABLE		DEPENDENT VARIABLE	STANDARDISED B	T VALUE	SIGNIFICANCE	ACCEPT OR REJECT
Relationship Quality	←-	Service Quality	0.920	6.613	0.000*	Accepted
Relationship Quality	←-	Patient Centeredness	-0.051	-0.437	0.662	Rejected
Assurance	←-	Service Quality	0.958	10.751	0.000*	Accepted
Tangibility	←-	Service Quality	0.728	9.510	0.000*	Accepted
Reliability	←-	Service Quality	0.880	11.093	0.000*	Accepted
Empathy	←-	Service Quality	0.878	12.179	0.000*	Accepted
Trust	←-	Relationship Quality	0.957	11.542	0.000*	Accepted
Satisfaction	←-	Relationship Quality	0.855	11.440	0.000*	Accepted

* Significant at 1 Percent.

DISCUSSION

This study's primary purpose was to assess the quality in geriatric healthcare delivery and thereby draw a hypothetically based and empirically tested relationship between elderly healthcare delivery dimensions. The evaluations on the services received will determine the relationship quality construct from elderly's point of view. The study received high average variable scores that might be due to the improvements in public healthcare infrastructure and the resulted quality in service delivery and the higher quality standards in the private facilities due to the increased competition.

This study shows that inclusion of relationship quality aspects into the healthcare design will bring positive results as the outcome of care and relationship between the caregivers and the patients is coherent. It is evident that service quality in elderly healthcare delivery leads to trust and satisfaction. The developed model shows that service quality with all its tangibility, reliability, assurance, and empathy dimensions leads to relationship quality. The findings are in line with the previous study results [10,15-17] and validates the previous study that satisfaction depends on both patient as well as situation-related facets.[18] Similarly, Lee et al. [19] found that patients' value 'physicians' care more than any other situational attribute. This finding is highly significant when the elderly expects a good relationship quality level from the health care setting and will transform their perceptions into continued doctor consultation, eventually, become a significant determinant of healthcare-seeking behaviour.

The study is substantial as per the finding of Huang et al. [20], that the relationships among satisfaction, patient centricity, trust, and service quality in a post-treatment scenario become significant as it contributes to a profound understanding of the relationship between the physician and patient. The study shows that an improvement in service quality contributes significantly to enhancing relationship quality, while patient-centricity does not contribute to relationship quality, though it has a direct relationship with service quality. According to Herzberg's two-factor motivation theory, satisfaction and dissatisfaction are produced by various factors where specific predictors create satisfaction, while the absence of these predictors may not dissatisfy them.[21] The study findings confirm Herzberg's theory that patient-centricity affects service quality even when it does not contribute to relationship quality. The absence of patient centricity will negatively impact service quality perception of the elderly, affecting their relationship quality perception. However, this finding is incongruent with the previous finding. [22]

Despite having an excellent average score for satisfaction and patient centricity, the absence of a hypothetical relationship between them may be explained that the elderly expects personal care and hence, affective reactions from the healthcare providers are equal or more vital than the cognitive reactions and the healthcare outcomes. Coyle & Williams [23] found that dissatisfaction results in a dehumanized, objectified, disempowered, and devalued situation. Similarly, Avis et al. [24] found that, in healthcare delivery, satisfaction may not be so pertinent based on the outcome, predominantly, in contexts where patients get to know about "bad news" or to adjust to debilitating health conditions, but often stay positive on the way they get care. This is consistent with the finding of Dawson et al. [25], who conducted a study among cancer patients, that the majority of them were satisfied with the treatments, though they knew the severity of their disease..

This study supports the findings of Sofaer & Firminger [26], who summarized the seven essential dimensions of healthcare, which are particularly overarching the variables of service quality and patient centricity. Further, the developed model confirms Donabedian's Structure-Process-Outcome (SPO) model [27], where the structure and process aspects of the theory underpins the service quality and patient centricity constructs of the present study, consequently leading to the outcome construct, relationship quality. This model further confirms the Kano model, that minimum quality expectations of patients such as physicians' high-quality communication are taken for granted and lead to dissatisfaction if not satisfied, yet they may not create satisfaction, even though it is present.

There has been a growth in the number of healthcare facilities, both in Kerala's public and private healthcare industry. It is a misconception that the number of healthcare facilities contributes to effective healthcare delivery and results in affective consequences such as satisfaction, trust, and service quality. In the extremely competitive healthcare industry, a sustainable establishment will ensure a close physician-patient bond, provide better medical treatment-related services, and strengthen patient outcomes.[20] In a situation when Non-Communicable Diseases (NCDs) and infectious diseases converge and become a significant threat for the elderly population in Kerala [28], improving the quality of

healthcare delivery based on relationship must be prioritized.

Positioning a healthcare system around patients' needs and preferences will increase satisfaction and their consequent health outcomes and perhaps contribute to efficiency enhancement of any healthcare management system.[29] A healthcare system's sustainability mainly depends on patient experience. [30] Hence, to create and sustain a competitive advantage in geriatric healthcare delivery, the variables in the present model are significant and will positively address the need for quality healthcare access demand.

This research is a pioneer and novel diagnostic tool that identified the determinants of relationship quality in geriatric care. The outcome of this study will give insights to the stakeholders, including healthcare providers and policymakers in implementing effective geriatric healthcare delivery and will enable them to analyse the functional efficiency, competitiveness, and quality improvement in geriatric care. The model developed from the study can apply to any other healthcare scenario by adjusting the relevant variables. The study has reproducibility and makes a meaningful contribution to the health management literature in terms of empirical knowledge.

The study has its limitations. First, this study was conducted in Kerala, and therefore, the results may not be suitable in an international context. Second, this study has been carried out among the elderly regardless of their choice of the type of healthcare facilities. Third, the survey was carried out during COVID-19 pandemic, which might have affected their responses. Future research has scope in a larger context, including public, private, tertiary, secondary, or primary healthcare settings.

CONCLUSION

This study proposes a model of relationship quality in geriatric healthcare delivery based on relationships among service quality, patient centricity, trust, and patient satisfaction. Between the two cognitive constructs, service quality, and patient centricity, the former has emerged as a significant determinant of relationship quality. The elderly perceived relationship quality as a significant concern while accessing healthcare, and therefore healthcare organizations should consider the construct diligently. Being one of the major determinants of health-seeking behaviour, relationship quality must be integral to geriatric care management system in a progressed society like Kerala.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

PSYCHOLOGICAL, SPIRITUAL AND EMOTIONAL RESPONSE TO COVID-19 PANDEMIC EXPERIENCES AND INTERVENTIONS MADE

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ABSTRACT

SUMMARY:

The outbreak of Corona Virus in December 2019, in Wuhan placed a novel challenge in front of mankind. COVID-19 has affected every country in different magnitudes. The absence of vaccine and changed lifestyle suddenly imposed upon masses affected their functioning as well. Those victimized by the virus have their own problems while others also have had their own sufferings.

OBJECTIVES:

Amidst all trials and tests for cure, this paper is an attempt to understand the psychological, spiritual and emotional response to COVID-19 and Government Interventions in India. It also tries to assess the differences in experiences across age, gender and educational qualifications.

DESIGN:

The study adopts a mixed approach and is an exploratory cross-sectional study. For the purpose of the study, a shortened version of Czech SWSB, RYFF's Psychological Wellbeing 18 point scale and STAI scale were customized for pandemic times, administered towards the end of Lockdown 1.0 in India. After reliability and validity tests, established scales are used to study the variable in the research. For the analysis of data Smart PLS SEM 3.3.2 is used.

SETTING:

General masses of India were a part of the study. A cohort of 100 respondents willing to participate in the survey during the initial 21 days lockdown in India was studied which was selected using snowball sampling.

MAIN OUTCOME MEASURES:

The study measures the association of psychological, spiritual and emotional response to covid-19 pandemic experiences and also the response to interventions made.

FINDINGS:

The results show that there is trivial relation of age, education and gender to the experiences of COVID-19. It was also found that Psychological Wellbeing and Spiritual Wellbeing were significantly related to the experiences of COVID-19.

CONCLUSION:

Extreme external factors like covid-19 pandemic act as stressors and affect the psychological and spiritual wellbeing of all.

KEYWORDS

COVID-19 pandemic experience, Psychological wellbeing, Emotional wellbeing, Spiritual wellbeing, Intervention, India

INTRODUCTION

Covid-19 pandemic created a lot of chaos across the entire globe. Different countries adopted different means to address the situation. Amongst such situations, when most of the research studies were directed towards finding vaccine for coronavirus, less attention was paid to the other aspects of health. The World Health Organization defines health as 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'. [1]

COVID-19 PANDEMIC- THE BEGINNING

Coronaviruses (CoVs) are a large family of viruses mostly affecting the respiratory systems in humans. This has resulted in high mortality with the variants of SARS-CoV and MERS-CoV both of which had animal origin and were novel in nature. While SARS-CoV is thought to have originated in civet cats, MERS is believed to have its origin in bats and transmission to camels to humans. The first case of SARS-CoV (severe acute respiratory syndrome) was identified in 2003 in China with its first appearance in November 2002 in Guangdong province of southern China. Its spread has been to Toronto, Hong Kong, China, Singapore and Viet Nam. MERS (Middle East Respiratory Syndrome) was identified in Saudi Arabia in 2012. Its largest outbreaks were seen in Saudi Arabia, United Arab Emirates and Republic of Korea. Though MERS did not have any repeated major outbreak, SARS has reappeared 3-4 times in Singapore, Chinese Taipei and southern China.[2], [3]

By 31st December, the Chinese Government had reported an influx of cases of pneumonia with an unidentified reason and, [4] later it was identified as Novel Corona Virus Influenza.

INTERVENTION STRATEGIES

Though, globally speaking, the preventive strategy adopted for COVID-19 is same as John Haygarth's 18th-century 'rules of prevention'. [5] It is believed that the Covid-19 outbreak is a stark reminder of the ongoing challenges of emerging and re-emerging infectious pathogens invoking need for constant surveillance, prompt diagnosis, and robust research to know basic biology of new organisms, our susceptibilities to them, and development of countermeasures. Several scientific research studies have been undertaken to find the vaccine and also to search for the right measures and strategies to be adopted in pandemic times. [6] Ambikapanthy & Krishnamurthy in their mathematical model suggested a lockdown period of up to 42 days for a significant reduction in the number of COVID-19 cases in India along with contact tracing and community screening. [7]

Chakraborty & Ghosh [8] suggested the following measures that the Government should adopt to reduce Case Fatality Rate (CFR).

1. Enforcing social distancing strategies.
2. Number of people of age group > 65 years should be specially taken care of and isolated.
3. Lockdown time period should be extended if the country faces a sharp increase in the number of cases and or deaths.
4. The number of hospital beds should be increased by making special health care arrangements.

The COVID-19 pandemic is a global concern that demands for extensive research. India also needs to take effective strategies for handling the present and the projected future outbreaks and problems posed by the pandemic. Keeping in view the COVID-19 pandemic situation, nationwide lockdown was announced by Shri Narendra Modi, the Prime Minister of the nation on 24th March 2020 (Lockdown 1.0) which further was extended on 15th April (Lockdown 2.0) by 19 days to end up on May 3rd, On May 4th the country entered Lockdown 3.0 till May 17th, whereby certain relaxations were given in red, orange and green zones, different guidelines were issued by the Ministry of Home Affairs, on May 18th India entered Lockdown 4.0 which would end by May 31st. In Lockdown 4.0 intra-state and inter-state movements of passenger vehicles and busses were permitted with the consent of the concerned states. The step was taken to secure the physical health of the citizens and stop the spread of the virus.

EFFECTS OF THE PANDEMIC & LOCKDOWN

While the direct effect of pandemic is seen in terms of number of people getting infected and projected with death tolls, the effects are not limited to just the physical health aspects. A sudden lockdown in the country caused unrest and panic situation reported across various news channels and newspapers.

Kumar, Nayar & Koya [9] discussed the adverse effect of lockdown on the migrant rural communities in terms of

employment, education and emotional turmoil. Many densely populated north Indian States are facing shortage of doctors, hospital beds and equipment. [10] Healthcare services across India have to meet the challenges of workforce shortage, poor infrastructure, absenteeism and quality of care. [11]

The Pandemic was effective enough to bring social, psychological and emotional turmoil. Somewhere, these consequences can be attributed to factors like age and economic status, yet they also were a result of the undeveloped health and emergency services and unpreparedness to address such novel situations.

There were long queues and hustle in the market spaces as the essential supplies were missed. Many had witnessed chaotic situations in the stores and there were many with an out of stock as people rushed to obtain their essentials. [12] With time, problems and panic increased amidst the masses. Be it the essential groceries or medicines, education or examinations, problems of migrants or daily wage earners, everybody had witnessed a change which had an impact on the other aspects of one's health.

The paper attempts to explore 3 aspects of health – psychological, emotional and spiritual constructs. Mental health includes our emotional, psychological, and social well-being. It affects how we think, feel, and act. It also helps determine how we handle stress, relate to others, and make choices. The World Health Organization defines mental health as 'a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community' Good mental health is integral to human health and well-being.

The four dimensions of psychological health include - mental, spiritual, social and physical health. The elements of mindfulness, namely awareness and nonjudgmental acceptance of one's moment-to-moment experience, are regarded as potentially effective antidotes against common forms of psychological distress – rumination, anxiety, worry, fear, anger, and so on – many of which involve the maladaptive tendencies to avoid, suppress, or over-engage with one's distressing thoughts and emotions. [13], [14]

The construct of emotional wellbeing lies within the broader framework of psychological health. Emotional health is a person's ability to accept and manage feelings through challenge and change. Emotional health includes both emotional intelligence and emotional regulation. When the subjective experience of emotions is appropriate over a sustained period, emotional health is thought to be present. Positive affect will be apparent in mundane, daily activities. [15]

Research studies suggest that positive emotions can be the result of certain cognitive or behavioural processes or their cause. Also, involvement in one's community is associated with higher level of happiness and life satisfaction. [16]

It was elaborated that though there is no universally accepted definition of spiritual health, generally people define it with the dimensions of religion, individualism and material-world orientation. It was found that one's spiritual health affects their physical, mental and social health. [17] Spiritual health is not about spirituality but about the connection with self (personal dimension), others (social dimension), the nature (the environment) and the God (transcendental dimension).[18] Many researchers view spiritual health as a key component of health. [19] Spiritual health has a significant positive relation with mental health [20] and physical health. [21]

OBJECTIVES OF THE STUDY

The current paper is an attempt to compare and contrast the psychological, spiritual and emotional response to pandemic experiences in general and also across different age groups, gender and educational qualifications. It tries to understand the problems faced by the respondents and their response towards the interventions made by the Indian Government during the times of Pandemic.

METHODOLOGY

It is a mixed study. India where, people are believed to have a strong connection with God and religion, so the researchers wanted to measure and investigate the interplay of these three aspects of health during the times of pandemic.

The study followed a cross-sectional approach whereby Google form was administered using snowball sampling. Starting from the known contacts of the researchers, the respondents were requested to circulate the link of the form next. The process was stopped at the end of

Lockdown 1.0. i.e., on 15th April, 2020. Eliminating the repeated and incomplete entries, a total of 100 respondents became a part of the study.

Tool for Data Collection

Self-designed questionnaire was used for the purpose of data collection, which was administered as a Google form. For the purpose of the study, shortened version of Czech SWSB, RYFF's Psychological Wellbeing 18 point scale and STAI scale were customized for pandemic experiences which was administered towards the end of Lockdown 1.0 in India. The tool comprised of 6 sections – Demographic details, COVID-19 Pandemic Experiences, General Psychological Wellbeing, Spiritual Wellbeing, Emotional Wellbeing, and Response to Intervention.

FIGURE 1: TOOL FOR DATA COLLECTION

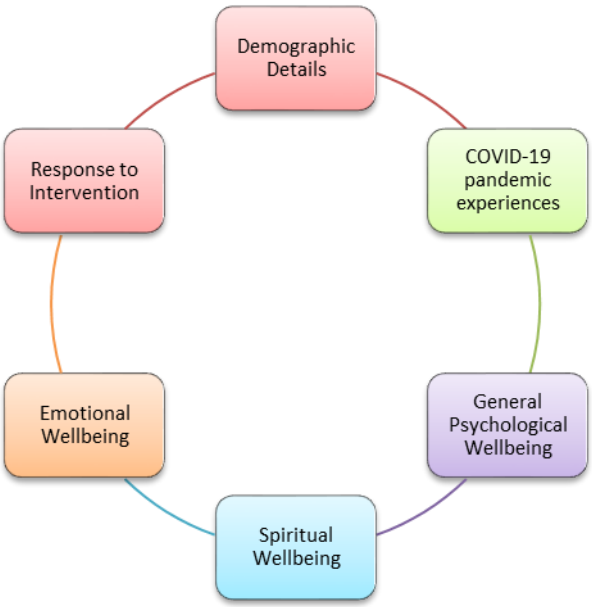
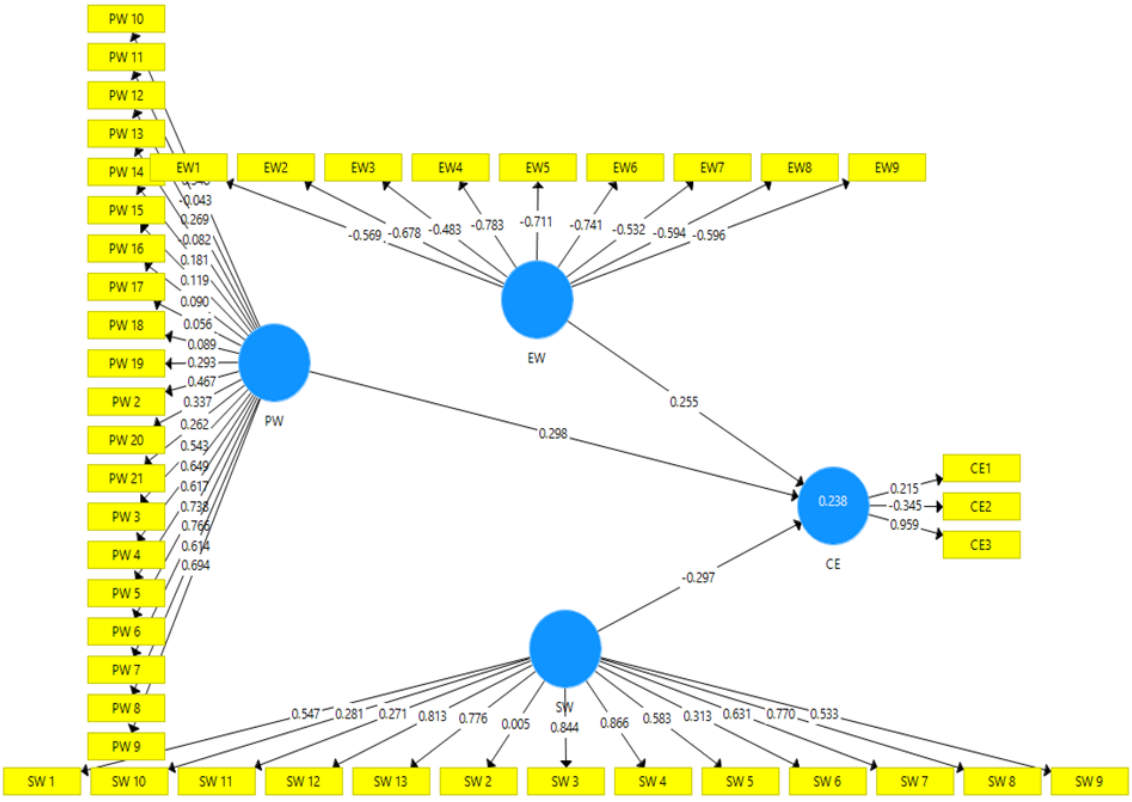


FIGURE 2: PRELIMINARY CONSTRUCTS AND INDICATORS OF THE STUDY



HYPOTHESES

- H1: Emotional wellbeing is significantly related to COVID-19 experience.
- H2: Psychological wellbeing is significantly related to COVID-19 experience.
- H3: Spiritual wellbeing is significantly related to COVID-19 experience.
- H4: Age is significantly related to COVID-19 experience.
- H5: Gender is significantly related to COVID-19 experience.
- H6: Educational Qualifications is significantly related to COVID-19 experience.

The study is based on four constructs namely Covid-19 pandemic experience, emotional wellbeing, psychological wellbeing and spiritual wellbeing. For the purpose of data analysis Smart PLS Sem 3.3.2, the latest software developed by Ringle et al was used. [22] The four constructs were having a total of 45 indicators. After preliminary analysis the items, reliability and validity analysis were conducted and the items with lower loadings were removed. A total of 20 items remained.

FIGURE 3: FINAL CONSTRUCTS AND INDICATORS OF THE STUDY

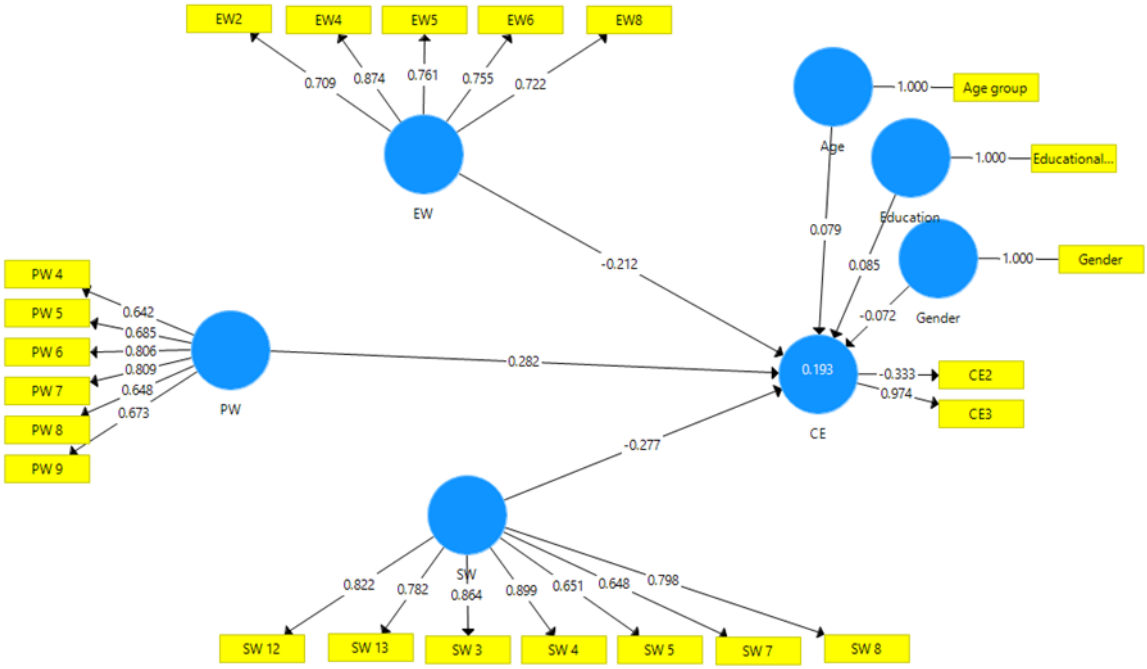


TABLE 1: RELIABILITY TEST

	CRONBACH'S ALPHA	RHO_A	COMPOSITE RELIABILITY	AVERAGE VARIANCE EXTRACTED (AVE)
CE	-0.247	0.659	0.352	0.523
EW	0.837	0.852	0.882	0.6
PW	0.813	0.827	0.863	0.514
SW	0.894	0.906	0.918	0.617

According to the chronbach alpha the score of CE were less than the threshold value of 0.7 as stated by Hair et al. [23], but a closer look at other reliability analysis method pf Rho A , Composite reliability and AVE the scores are as per the stated limits [24]. All the variables under the study met the stated criteria of acceptability. As such the constructs are meeting the reliability test and further analysis can be undertaken. The value as pre the test of Dijkstra and Henseler's rho A are in accordance with the limit stated that is higher than 0.6 [25]. As the values of AVE are under the limit generally accepted that is 0.5 the results show that convergent validity exists. [26]

RESULTS AND DISCUSSIONS

The discriminant validity of the study was undertaken to analyse that the constructs under study are different from each other and on the basis of which further statistical analysis can be undertaken or not. Discriminant validity analysis was done by Fornell and Larker criterion and HTMT criterion, the results of which are presented in the tables given below. The figures showed that the constructs under study are different to each other and not overlapping.

TABLE 2: VALIDITY TEST DISCRIMINANT ANALYSIS – FORNELL & LARCER

	CE	EW	PW	SW
CE	0.723			
EW	-0.115	0.775		
PW	0.263	0.16	0.717	
SW	-0.274	-0.195	-0.191	0.785

TABLE 3: VALIDITY TEST – DISCRIMINANT ANALYSIS HTMT

	CE	EW	PW	SW
CE				
EW	0.288			
PW	0.61	0.194		
SW	0.559	0.264	0.206	

TABLE 4: VIF

	VIF
CE2	1.012
CE3	1.012
EW2	1.61
EW4	1.811
EW5	2.253
EW6	1.848
EW8	1.519
PW 4	1.515
PW 5	1.662
PW 6	1.994
PW 7	1.707
PW 8	1.521
PW 9	1.614
SW 12	2.665
SW 13	2.063
SW 3	3.544
SW 4	4.915
SW 5	1.593
SW 7	1.785
SW 8	2.342

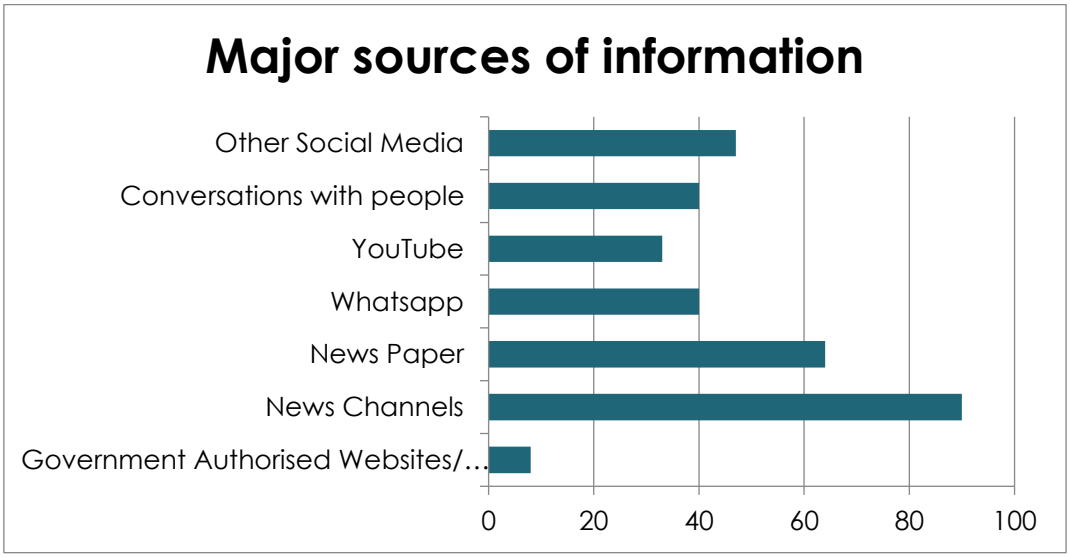
TABLE 5: PATH COEFFICIENT

	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	STANDARD DEVIATION (STDEV)	T STATISTICS (|O/STDEV|)	P VALUES	2.50%	97.50%
Age -> CE	0.079	-0.006	0.204	0.388	0.698	-0.408	0.317
EW -> CE	-0.212	-0.065	0.24	0.883	0.377	-0.389	0.345
Education -> CE	0.085	0.117	0.141	0.606	0.545	-0.132	0.417
Gender -> CE	-0.072	-0.071	0.095	0.755	0.451	-0.245	0.134
PW -> CE	0.282	0.294	0.104	2.704	0.007	0.07	0.476
SW -> CE	-0.277	-0.243	0.139	1.992	0.047	-0.423	0.229

TABLE 6: TOTAL EFFECT

	ORIGINAL SAMPLE (O)	SAMPLE MEAN (M)	STANDARD DEVIATION (STDEV)	T STATISTICS (|O/STDEV|)	P VALUES
Age -> CE	0.079	-0.006	0.204	0.388	0.698
EW -> CE	-0.212	-0.065	0.24	0.883	0.377
Education -> CE	0.085	0.117	0.141	0.606	0.545
Gender -> CE	-0.072	-0.071	0.095	0.755	0.451
PW -> CE	0.282	0.294	0.104	2.704	0.007
SW -> CE	-0.277	-0.243	0.139	1.992	0.047

FIGURE 4: SOURCES OF INFORMATION FOR COVID-19



The above table shows the total effect on the constructs under study. From the data analysed it was found that education and gender are relatively more related to the experiences of Covid-19, than age. However, they are trivial. It was also found that psychological wellbeing and spiritual wellbeing were significantly related to the experiences of Covid-19.

The table below shows R square value which is 0.193. The statistics indicate that 19.3 percent variability in the independent variable is due to the dependent variable.

TABLE 7: R2

	R SQUARE	R SQUARE ADJUSTED
CE	0.193	0.145

The summary of the model fit criteria is given below. To generalise the findings of the data the SRMR value should be below 0.08. The statistical value derived is slightly more than the stated conservative limits.

TABLE 8: MODEL FIT

	SATURATED MODEL	ESTIMATED MODEL
SRMR	0.085	0.085
d_ULS	1.989	1.989
d_G	0.695	0.695
Chi-Square	386.143	386.143
NFI	0.669	0.669

MAJOR SOURCES OF INFORMATION DURING LOCKDOWN

During the lockdown period, most of the respondents relied on the information shared through news channels and newspapers, yet very few relied on Government authorized websites and WHO.

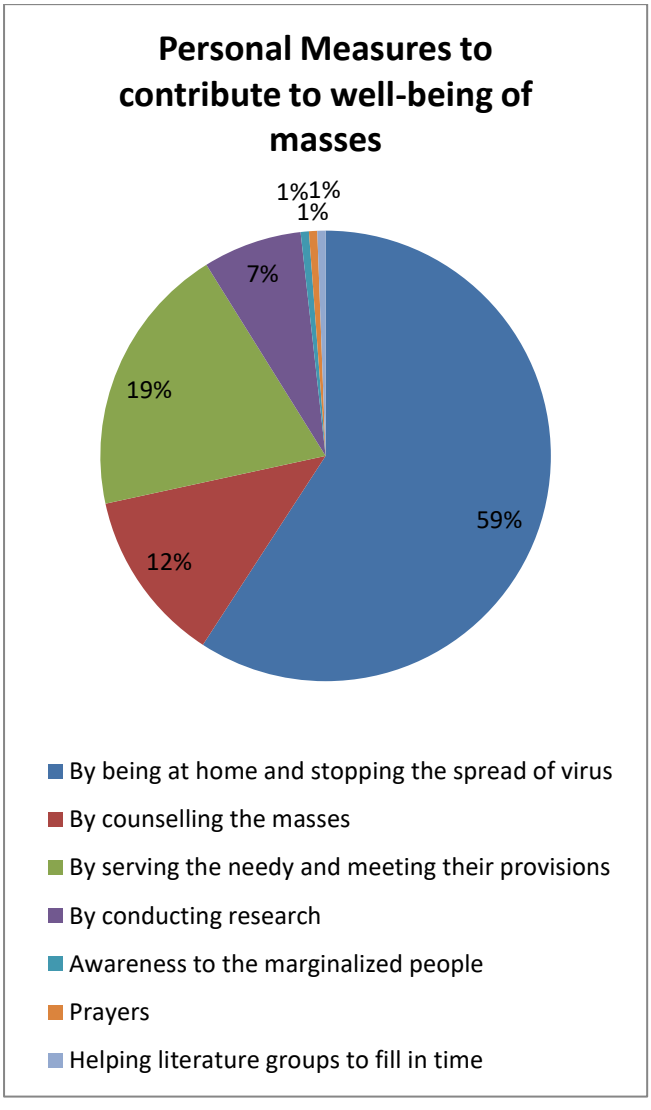
PROBLEMS FACED BY THE MASSES DURING THE TIMES OF COVID-19 PANDEMIC

Most of the respondents faced problems due to no or less mobility. Some faced financial issues and were adversely affected with shortage of groceries. Medical issues like the inability to consult doctors for treatment and unavailability of medicines also prevailed. Respondents were disturbed due to sudden change in lifestyle and experienced stress, emotional turmoil and fear. The extra caution of washing hands, using sanitizers and social distancing with almost no socialization was a little stressful for few respondents. Some even faced difficulties in stopping herd mentality in their families where their family members believed every message on social media platform like whatsapp to be true. Few respondents had strained family relations. The daily wage earners had their own troubles and felt helpless in the times of COVID-19 pandemic.

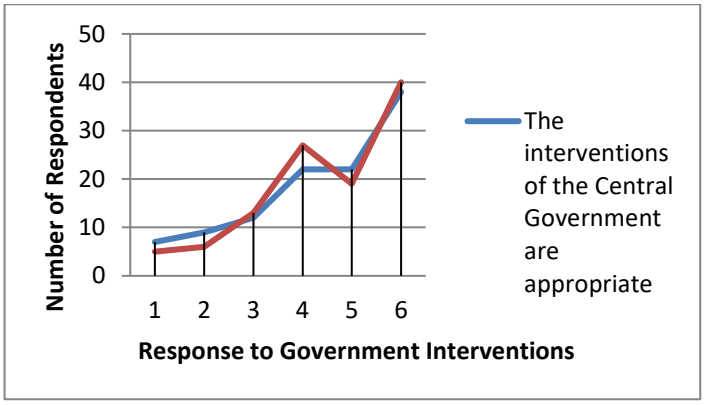
PERSONAL MEASURES TAKEN BY THE RESPONDENTS

Figure 5 depicts that majority of the respondents were engaged in wellbeing by staying at homes.

FIGURE 5: PERSONAL CONTRIBUTIONS TO WELLBEING OF MASSES



RESPONSE TO GOVERNMENT INTERVENTIONS DURING COVID-19 PANDEMIC



From figure 6 it is clear that majority of the respondents were highly satisfied with the steps taken by the central and state governments with respect to COVID-19 pandemic. Meager 5% respondents felt that the steps were not apt.

SUGGESTIONS TO MANAGE THE PANDEMIC

The respondents appreciated the steps taken by the Government like National Lockdown, usage of sanitizers and masks, social distancing of at least 6 feet, and promotion of hand wash for 20 seconds. Some more suggestions as received were:

1. Excessive supply of PPE kits and large scale testing for COVID-19
2. Provision of door to door sanitization, food and medicines.
3. Faster production and supply of ventilators.
4. Creation of more isolation units with proper medical and food provisions.
5. Heavy fines to be imposed upon those who break the social distancing norms which could be used for meeting the safety needs of frontline workers.
6. Ensure all safety equipment for all front line workers.
7. Proper counseling of the masses so that distress can be handled effectively.
8. Providing the labours with social security and helping them to reach their hometown.
9. Strict rules by cyber cell to stop the spread of fake news.
10. Boycotting and discouraging all public meetings.
11. Follow South Korea method and in future give importance to educated ministers and ministers should also work in developing education field and should develop better medical facilities.
12. Not to mix politics with health issues.
13. Stopping of black marketing by shop owners and keepers.
14. Emphasis on exercise, balanced diet and other measures to boost immunity.
15. Taking advice from economists for improving the financial condition of the country.

CONCLUSION

Covid-19 experiences however disturbing they were projected and felt. The study denotes that age, education and gender were not significantly related to the experiences of COVID-19. Thus, the experiences did not vary across these factors, and though the individual experiences may be different yet statistically it was found that age, gender and educational qualifications could not differentiate the felt experiences. Also, emotional wellbeing was not found significantly related to COVID-19 experiences. However, in the study it was found that psychological wellbeing and spiritual wellbeing were significantly related to the experiences of COVID-19. Therefore, it can be said that the circumstances of lockdown as a result of COVID-19 pandemic strongly affected psychological and spiritual wellbeing. Thus, it can be said that the results are in harmony with the study done by Hilton and Child. [20] Again, as depicted by Hayes & Feldman [13], Kabat-Zinn and Miller [14], spiritual and emotional health are the constructs of psychological health. Thus, even though the emotional wellbeing was found not to be significantly related to covid-19 experience directly but indirectly.

Even when turbulences of lockdown were felt by everyone, most respondents were satisfied by the efforts of the Government, the results are in accordance with the findings of Helliwell and Putnam [16] where involvement in one's community is associated with higher level of happiness and satisfaction. India being a collectivist country, the response to the interventions were appreciated and the responsibility was equally shared by individuals and organizations. Most respondents appreciated the Government steps and denoted the similar concerns as opined by Chakraborty & Ghosh. [8]

It is suggested that further studies can be taken to explore the social aspect of the health, and different time and space zones can be explored for an enriching research experience.

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RESEARCH ARTICLE

DO SOCIO-DEMOGRAPHIC AND CORONA REASSURANCE-SEEKING BEHAVIOUR PREDICT CORONA ANXIETY? - A STUDY AMONG INDIAN POPULATION

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ABSTRACT

INTRODUCTION:

The COVID-19 pandemic has caused severe anxiety and affected mental and psychological health of the people. Virus related anxiety is thought to be affected by several socio-demographic factors, individual's risk-perception, and personality.

OBJECTIVE:

The objective of the study was to investigate the predictors of corona virus-related general anxiety and death anxiety during the COVID-19 outbreak in India. More specifically, the study examined the COVID-19 related reassurance-seeking behaviours, neuroticism, health anxiety, and risk perception among the adult population.

DESIGN:

A survey methodology was adopted to collect data from the general adult population (N=550) in India between October 29th to November 10th, 2020. Data analysis was carried out using multiple regression analysis in SPSS to examine the significant predictors of general anxiety and death anxiety of the participants. The analysis used the incremental validity of Corona reassurance-seeking behaviours in the multiple regression model.

SETTING:

The study was conducted among the Indian general population.

FINDINGS:

Major significant predictors of general anxiety related pandemic included demographic factors like being female, being young, and less educated. Simultaneously, we observed common predictors of virus-related general anxiety and death anxiety, Corona reassurance-seeking behaviours, health anxiety, and neuroticism. The participant's risk perception predicted the participant's death anxiety but not the general anxiety during the pandemic.

DISCUSSION:

The present study's findings will help the policymakers handle pandemic related stress in a better manner.

KEYWORDS

COVID-19; risk perception; anxiety; death anxiety; neuroticism; corona reassurance-seeking behaviours

INTRODUCTION

Life has not been the same ever since the World Health Organisation (WHO) declared Coronavirus (SARS-COV-2; COVID-19) as a pandemic in March 2020. India soon figured among the top three most affected countries in the world causing chaos in every sphere of life existence. High-risk perception [1] of the pandemic created aggravated fear [2,3] – better coined as 'Coronaphobia' [4,5], anxiety [5–7], and emotional distress [8] among all sections of the population affecting physical and psychological health and well-being.

Fear is a negative emotion and is an adaptive defense mechanism, and excessive fear is associated with an anxiety disorder [3]. The fear of the virus infection arising out of perceived risk with the pandemic, disruptions to life, work and economy, social isolation, and loneliness are creating a 'perfect storm' for emotional distress [8] and a breeding ground for psychological consequences. [9] The COVID -19 fear is associated with increased anxiety, aggravated depression, thoughts of suicide, hopelessness, and other psychological consequences. [5,6] Besides, the relatively high mortality rate of the COVID-19 pandemic compared to the previous pandemics is also found to cause death anxiety among individuals. [5]

Individuals who are vulnerable to negative emotions (neuroticism) and health anxiety, exhibit higher emotional distress. [5,10] Individuals with higher vulnerability also perceive symptoms of common flu and illness associated with COVID-19 and tend to seek reassurance [5] from friends, relatives, doctors, medical staff, and self-checking to relieve their anxiety. Hence, perceived risk associated with the pandemic related vulnerability factors of neuroticism, health anxiety, and reassurance seeking behaviour may predict coronavirus anxiety and death anxiety among general populations.

While examining Italian community-dwelling adults' demographic characteristics on perceived emotional problems due to COVID-19, Somma et al. observed that females and age significantly contributed to the clinically relevant emotional issues. [11] Similarly, young female adults reported a higher risk perception than males in a study of emotional distress during the pandemic on young adults in Zurich, Switzerland. [12] In a previous study of risk perception among European and Asian countries during SARS flu influenza, de Zwart et al. observed that Asia perceived a higher vulnerability than Europe. [13] They found that comparative vulnerability was lower in women than in men, but higher among less educated. In a study during the 2009 Influenza A (H1N1) pandemic in the Netherlands, Bults et al. observed that with an increase in perceived risk and high vulnerability, people with higher age, and higher anxiety took to preventive measures. [14] Hence socio-demographic factors such as gender, age, education level, and family type may determine individuals' risk perception and affect psychological well-being. However, past studies indicate mixed results. Exploring this in the collectivistic Indian society may throw new lights.

Negative emotions and feelings during a pandemic continue for a long time affecting long-term psychological well-being. While there have been observations of behavioural changes among people [15], there are reported observations of anxiety and stress disorders [2,3,5–7,16] during COVID-19 pandemic. In a recent study in Poland, 50.1% reported high to very high perceived-risk, and 58.8% believed the long-term consequences of COVID-19 to be severe to very severe. [17]

While Lee et al.'s study focused on the population in the USA, the rationale of this study was to explore the effect of risk perception and vulnerability factors on corona anxiety and death anxiety in India. More specifically, the objectives of this paper are: 1) to examine the socio-demographic impacts on corona anxiety and death anxiety during the COVID-19, 2) to explore the effect of risk-perception, neuroticism, health anxiety, and reassurance seeking behaviours on corona anxiety and death anxiety, and 3) to explore corona anxiety exclusively in India when the COVID-19 infection in India was at its peak. Lee investigated the cognitive, behavioural, emotional, and psychological aspects of COVID-19 and validated Corona Anxiety Scale (CAS) for research use. [6] We, therefore, used CAS in the Indian context. We believe that perceived risk and associated fear, anxiety, and death anxiety might throw new light into emotional well-being and their effect on participants' demographics, age, gender, education, and family type. These findings may help in designing specific measures to address the people's psychological needs by the service providers.

METHODS

PARTICIPANTS AND PROCEDURE

We have collected the data in the first week of November 2020 on a pan India basis. A convenience sample of 550, out of which 346 males and 204 females participated in this study. The mean age of the participants was 37 years and SD = 0.98; range 18-66. The participants were required to give their consent and had to be 18 years of age. We used the participants' socio-demographic factors like gender, age, education background, and family type (joint or nuclear family). We did not consider employment status as we believed industry specific job might have different outcomes. Instead, we focussed on the general population. Most of the participants are living in joint families (69%), had earned at least a bachelor's degree or above (73%), and did know someone with COVID-19 (64%).

MEASURES

For operationalisation of the construct vulnerability factors, we considered the pandemic related three vulnerability factors described by Taylor in his book "The Psychology of Pandemics". [10] The personality trait of neuroticism is considered as the variable depicting the vulnerability of individuals having tendency for negative emotions and is measured with the eight items scale developed by John and Srivastava. [18] The participants rated their responses on a five-point Likert scale, where 1 stands for 'disagree strongly' to 5 for 'agree strongly.' One example of the scale's survey items includes, 'I see myself as someone who gets nervous easily.' The Cronbach's alpha for this scale is .70.

The second vulnerability factor, health anxiety (worrying too much about health) of participants during COVID-19 was measured using the Patient Health Questionnaire (PHQ 9) developed by Kroenke et al. [19]. It is a self-administered version of the Prime MD, e.g., 'over the last two weeks, how often have you bothered by feeling down, depressed or hopeless.' Each of these nine questionnaires of PHQ was rated as '0' (not at all) to '3' (nearly every day). The internal consistency of this PHQ 9 is .90.

The third vulnerability factor, Coronavirus reassurance-seeking behaviours (CRSB) was measured using the Lee et al.'s scale [5]. CRSB was developed by Lee et al. to measure the tendency of individuals seeking reassurance that they are not infected with the virus. It is a five-point Likert scale where 0 = 'not at all' to 4 = 'nearly every day for the last two weeks'. The participants need to express how often they experience each activity in the previous two weeks, a sample questionnaire, e.g., 'I spoke with other people about my symptoms to see if I was infected with the coronavirus disease.' The scale reliability was .85.

We used Dryhurst et al.'s six items risk perception scale specially designed to measure the Coronavirus/COVID-19 risk. [1] It is a self-assessment scale measured on a seven-point Likert-scale ranging from 1 = 'not at all worried' to 7 = 'very worried.' Out of the six items, four items measured risk perceiving towards self, and two items measured risk perceiving towards others. An example item includes: 'How worried are you personally about the following issues at present Coronavirus/COVID-19?' The internal consistency (Cronbach's alpha) for the scale was .73.

Corona Anxiety was measured using Lee's five-items Corona Anxiety Scale (CAS), where participants rated on a 0 (not at all) to 4 (nearly every day over the last two weeks) scale [6]. One of the scale items, for example, includes, 'I felt dizzy, lightheaded, or faint when I read or listened to news about the coronavirus'. The internal consistency of the scale was .85. The second outcome measure 'death anxiety' was measured using Abdel-Khalek's single item death anxiety scale [20], the statement of the scale 'I am afraid of death'. Participants rated the extent to which they agreed on a 1 (disagree strongly) to 5 (agree strongly) scale.

RESULTS

DESCRIPTIVE STATISTICS AND PARTIAL CORRELATION

The descriptive statistics reveal that a significant number of participants experienced Corona anxiety and death anxiety. The partial correlation demonstrated that corona reassurance-seeking behaviour was significantly associated with age (r = -.16), education (r = .18), family type (r = -.09), COVID-19 factors (r = -.17), risk perception (r = .29), neuroticism (r = .29), physical health (r = 0.52), corona anxiety (r = 0.59), and corona related death anxiety (r = .37) (Refer Table 1). The socio-demographic variables, COVID-19 factors, vulnerability factors, and outcomes variables were also intercorrelated. We included all these variables in the regression analysis.

TABLE 1: DESCRIPTIVE STATISTICS AND INTERCORRELATIONS AMONG VARIABLES

VARIABLES	MEAN	SD	CAS	CRSB	RISK PERCEPTION	NEUROTICISM	HEALTH ANXIETY	DEATH ANXIETY
CAS	.52	.71	-	.59**	.22**	.41**	.62**	.40**
CRSB	.85	.88	.59**	-	.29**	.29**	.52**	.37**
Risk perception	4.07	1.06	.22**	.29**	-	.31**	.24**	.43**
Neuroticism	2.57	.81	.41**	.29**	.31**	-	.52**	.41**
Health anxiety	.55	.65	.62**	.52**	.24**	.52**	-	.41**
Death anxiety	2.80	1.56	.40**	.37**	.43**	.41**	.41**	-

Notes: CAS: Corona Anxiety Scale; CRSB: Coronavirus Reassurance Seeking Behaviours.

** Correlation is significant at the 0.01 level (2-tailed); N=550

INDEPENDENT SAMPLE T-TEST

Gender: Men vs. Women

Independent samples t-test compared the general anxiety measures between men and women. There was a significant difference in Corona anxiety scores between men and women, t (550) = 2.45, p < .01. Specifically, these results suggest that women report more significant anxiety than men, even in the time of the COVID-19. But we found no gender difference in death anxiety among the participants.

Family: Joint vs. nuclear family

The second independent sample t-test compared CAS scores and death anxiety scores between participants from a joint family and nuclear family, (t (550) = 1.41, p = NS) and (t (550) = 1.42, p = NS). There was no significant statistical difference in the Corona anxiety and corona death anxiety in participants from the joint and nuclear family.

Education: Graduate vs. less than graduate

The third independent sample t-test compared between CAS scores and participants educational background (t (550) = -3.89, p < .001). It gives a clear picture that less educated people (participants with an education level less than a graduate) have higher corona anxiety. There is no difference in death anxiety (t (546) = 3.69, p = NS) among graduate or less than graduate participants.

We took the first one-way ANOVA to find out the role of age in CAS, and we found a statistically significant difference between the age of the participants (F (3, 546) = 3.96, p < .001). A Tukey post hoc test clearly shows that participants of 25 years or less have a significant difference than participants in the age bracket of 41 to 60 years in their CAS (p < .01). There was no statistically significant difference between the other age groups in their CAS scores. We also found there is a significant difference in death anxiety scores of different age groups (F (3, 546) = 4.65, p < .01).

HIERARCHICAL MULTIPLE REGRESSION ANALYSIS

After screening the data, we found no issue with singularity, multicollinearity, the dependence of errors, normality, linearity, or homoscedasticity as suggested by Tabachnick et al. [21] We used the Hunsley and Meyer's approach for two separate multiple regression analyses. [22] For further analysis of the present study, we used risk perception and the vulnerability factors of neuroticism, health anxiety, and CRSB as the predictor variables and corona anxiety and death anxiety as outcome variables (see Table 2 and Figure 1). We used the stepwise regression method in the first step of the regression analysis included the socio-demographic variables age, gender (1 = female, 2 = male, 3 = others.), education (1= graduate and above, 2= less than a graduate), and family type (1 = joint family, 2 = nuclear family). The second step added the COVID-19 factors like personal knowledge of someone with COVID-19 or personally diagnosed (1 = yes, 2 = no). In the third step, we have added psychological distress during a pandemic: neuroticism, health anxiety, and risk perception related to COVID-19 pandemic. In the fourth step, we used corona reassurance-seeking behaviours. The outcome variables are corona anxiety and corona death anxiety (see Table 2 for regression summary).

In the first regression analysis, Corona anxiety was the outcome variable. In the first step, age (β = -.09, p < .05) and formal education (β = .13, p < .01) as the socio-demographic variables that were significant predictors in the model, R^2 = .04, F (4, 544) = 6.27, p < .001. In the second step, when the COVID-19 factor is included, again age (β = -.09, p < .05) and formal education (β = .12, p < .01) were significant predictor variables (R^2 = .04, F (5, 543) = 5.04, p < .001). In the third step, when the vulnerability factors were included, neuroticism (β = 0.10, p < .01), health anxiety (β = .54, p < .001), and risk perception (β = .07, p < .05) were significant in the model (R^2 = .40, F (8, 540) = 45.33, p < .001). In the final step, when corona reassurance seeking behaviours was included, 'knowledge of someone with COVID-19' (β = .06, p < .05), neuroticism (β = 0.11, p < .01), health anxiety (β = .37, p < .001), and corona reassurance seeking behaviours (β = .38, p < .001) were the only significant predictor variables in the model (R^2 =.50, F (9, 539) = 59.91, p < .001) . These results support the incremental validity of corona reassurance seeking behaviours in explaining 10% more variance in corona anxiety symptoms above socio-demographics, COVID-19 factors, and vulnerability factors.

TABLE 2: HIERARCHICAL MULTIPLE REGRESSION

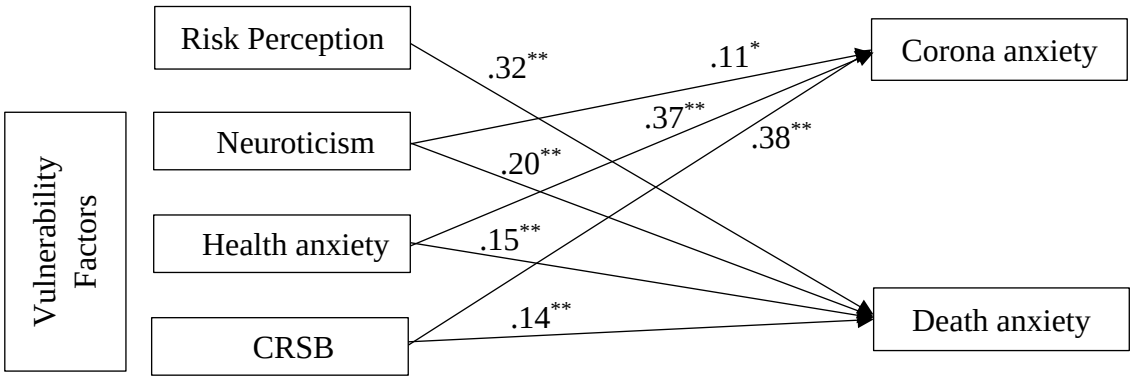
PREDICTORS	CORONA ANXIETY		DEATH ANXIETY	
	BETA	T	BETA	T
Gender	-.01	-.38	.05	1.30
Age	.06	1.74	.03	.80
Education	.01	.37	.07	1.86
Family type	.01	.38	-.01	-.44
Do you know someone previously with COVID-19	.06	1.98*	.09	2.69**
Risk perception	.00	.13	.32	8.15***
Neuroticism	.11	3.09**	.20	4.69***
Health anxiety	.37	9.22***	.15	3.33***
CRSB	.38	10.29***	.14	3.41***
R^2	.50		.34	
Change in R^2	.10		.01	
Significant F Change	p < .001		p < .001	

Notes: CRSB: Coronavirus Reassurance Seeking Behaviours.
* p < .05; ** p < .01; *** p < .001

In the second regression analysis death anxiety was the outcome variable. In the first step age (β = -.13, p < .01) and formal education (β = .08, p < .05) as the socio demographic variable that were significant predictor in the model (R^2 = .03, F (4, 544) = 4.90, p < .001). In the second step when the COVID-19 factor (e.g., knowledge of someone with COVID-19) was included again age (β = -.13, p < .01) and formal education (β = .08, p < .05) were both significant predictor variables (R^2 = .03, F (5, 543) = 4.19, p < .001). In the third step, when the vulnerability factors were included, COVID-19 factor (β = .08, p < .05), neuroticism (β = .20, p < .001), health anxiety (β = .22, p < .001), and risk perception (β = .34, p < .001) were significant in the model (R^2 = .32, F (8, 540) = 32.67, p < .001). In the final step, when vulnerability factor of CSRB was included, COVID-19 factor (β = .09, p < .01), neuroticism (β = 0.20, p < .001), health anxiety (β = .15, p < .001), risk perception (β = .32, p < .001), and coronavirus reassurance seeking behaviours (β = .14, p < .001) were the significant predictor variables in the model

(R^2 =.34, F (9, 539) = 30.90, p < .001). These results modestly support the incremental validity of corona reassurance seeking behaviours in explaining 1.4% more variance in death anxiety symptoms above socio-demographics, COVID-19 factors, and vulnerability factors.

FIGURE 1: EFFECT OF PREDICTORS ON OUTCOME VARIABLES



Notes: CRSB: Coronavirus Reassurance Seeking Behaviours.

* p < .01; ** p < .001. Only significant coefficients are shown.

DISCUSSION

The purpose of the study was to find the predictors of corona anxiety and death anxiety during the COVID-19 pandemic in India. The result of two multiple regression analyses suggests that Corona reassurance-seeking behaviours, health anxiety, and neuroticism are the common predictors of corona anxiety and death anxiety during the COVID-19 pandemic in India. From the independent sample t-test it is clear that the level of CAS among women respondents are higher than the male respondents during the COVID-19 pandemic, which is supported by previous studies [23–26]. Younger and less educated group of participants are experiencing higher anxiety, which is also supported by the previous work of Taylor et al. [25]

Health anxiety is a function of how likely and how severe society perceives the illness. [27] This study is unique in its finding that the health-related anxiety concern during the pandemic and neuroticism are significant predictors of both Corona anxiety and death anxiety, which is alien based on the previous research findings. [24,28] First used in this pandemic, the Corona reassurance-seeking behaviour was a significant predictor of Corona anxiety and death anxiety among Indian respondents, which contradicts the result of Lee et al. [5,25] studied in western settings.

Next, in the current study, participants' risk perception towards COVID-19 predicts the participants' death anxiety but not corona anxiety. People overestimate the risk of adverse outcomes due to excessive emotional stress. To our knowledge, this was the first time the risk perception scale of Dryhurst et al. was tested among Indian participants and found as a reliable measure of risk perception during the COVID-19 pandemic.

Past research and media reports show that old age increases the COVID-19 related infection and mortality rate. In our study, the younger participants have higher COVID-19 general anxiety and death anxiety than the older respondents, supported by an Iranian research. [29] The implication of the findings of this study is that the policy makers may plan effective proactive measures to mitigate the anxiety, mental, and emotional stress among Indian population during pandemic situations.

Few limitations need to be considered before interpreting the result. Before interpreting the results, we must consider the limitations. First, these data are cross-sectional and solely based on the self-reported online responses, which

may not be free from the socially desirable responses. Future research may work on longitudinal data related to a pandemic to understand corona anxiety and death anxiety. Second, we used convenience sampling for data collection due to the ongoing pandemic situation. Therefore, replication and extension of this research may overcome by using a more diverse sample. Third, we have studied the health anxiety of the participants without knowing their previous long-term health issues. The participant's pre-COVID-19 health issues may influence their health anxiety responses.

CONCLUSIONS

This study used corona reassurance-seeking behaviours by Lee et al. [5] and risk perception in India's collectivistic culture. In a collectivistic society, group harmony and group relationship play a significant role in social interactions. Future research should examine whether culture plays a role in responding to a pandemic. This study is unique in the Indian context to explore the incremental validity analysis of the corona reassurance-seeking behaviours construct developed and validated in the United States of America. The study provides significant findings which can be used by policy makes and health-care providers to plan effective measures to address people's psychological aspects during a pandemic.

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REVIEW ARTICLE

CAN NON-PHARMACEUTICAL INTERVENTIONS CONTAIN THE SPREADING OF NOVEL CORONAVIRUS SARS-COV-2 IN THE ASIA PACIFIC COUNTRIES?

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ABSTRACT

A novel coronavirus, namely SARS-CoV-2, has emerged rapidly and overspread worldwide, causing a pandemic disease, COVID-19. Until now, no pharmaceutical interventions specific to the COVID-19 infection has been proven effective. In these circumstances, non-pharmaceutical interventions, for example, banning local and international flights, national lockdowns of cities, social distancing, self-isolation, home-quarantine, the closure of schools and universities, closure of government and private offices, banning of mass gatherings would play a vital role in minimizing the basic reproduction number (R0) in expected level. Many Asia Pacific countries, Bangladesh, China, India, Iran, Nepal, New Zealand, Pakistan, and Vietnam, adopt, practice, and implement those non-pharmaceutical interventions and have success stories. Thereby, non-pharmaceutical interventions can contain the virus's spreading, which further reduces long waiting for the healthcare system's hospitalization and burden.

KEYWORDS

Novel coronavirus, SARS-CoV-2, non-pharmaceutical interventions

INTRODUCTION

The novel coronavirus SARS-CoV-2, which causes COVID-19, challenged the world. [1] In December 2019, COVID-19 had been emerged rapidly in China and later all over the world. Due to the overspread globally, the World Health Organization (WHO) declared COVID-19 infection as a pandemic disease. Without vaccines and restricted medical capability to treat the disease, non-pharmaceutical interventions (NPI) are the most crucial strategy to put down the pandemic. [2] Within a short period, the universe has seen an unprecedented infection and mortality rate in some countries, especially in Brazil, France, India, Italy, Spain, UK, and the USA. Because of a devastating infection rate, the policymakers, the leaders, and the governments could not decide which intervention would be effective earlier. Few Asian countries like Hong Kong, Singapore, South Korea, and Taiwan have previous experience handling infectious diseases such as SARS virus-mediated infection. That is why they responded

immediately and took proper steps to contain the novel coronavirus from spreading. They were successful in preventing the spread of this novel coronavirus to a great extent. The countries who successfully contain the spreading of the novel coronavirus initiated and implemented various non-pharmaceutical interventions, for example, banning local and international flights, regional and national lockdowns of cities, social distancing, self-isolation, home-quarantine/institutional quarantine, the closure of schools and universities, closure of government and private offices, banning of mass gatherings, public events, meetings, conferences, and indoor party, etc. These interventions are aiming to minimize the basic reproduction number (R0). Furthermore, the hospital will not be overwhelmed with many COVID-19 patients, reducing the mortality rate.

MATERIALS AND METHODS

We searched different research-based websites to find out relevant information. The top searched engine was Google Scholar, PubMed, and Science direct. During searching, we included Novel coronavirus, SARS-CoV-2, non-pharmaceutical interventions, and reproduction number keywords. We gave recently published articles emphasis.

DISCUSSION

The Covid-19 illness caused by SARS-CoV-2 is overwhelming health care systems globally. [3,4] So far, person-to-person transmission from the infected individual with no or mild symptoms has been demonstrated. [5,6] That is why, to manage a viral infectious disease, usually pharmaceutical interventions such as vaccines, antiviral drugs, and investigational drugs play an important role in containing and prevent the spreading and treatment of virus infections. However, non-pharmaceutical interventions can also crucially help in a crisis, proved during the pandemic of novel coronavirus SARS-CoV-2. The following interventions would be recommended to any country as a standard non-pharmaceutical approach to contain the virus spreading.

BANNING LOCAL AND INTERNATIONAL FLIGHTS

Commercial airlines play a vital role in spreading viral infection during pandemics. During the first phase of the pandemic, several countries benefited by banning local and international flights. The number of infectious people that travel inside a country enforced travel abridgments in the Wuhan city of China. [7] New Zealand is the most prominent for doing this intervention. [8] The US president also canceled flights carrying non-US citizens from the Schengen Area, the United Kingdom, Ireland, China, and the Islamic Republic of Iran. [9] An example from the Newfoundland province of Canada showed that banning international flight is a more effective intervention than fully reopening and quarantining the incoming population in managing the pandemic situation. [10]

IMPOSING LOCKDOWNS OF CITIES

The best example of a locking city is Wuhan, China, where the novel coronavirus spread worldwide. The town was locked so that no one can enter or leave the city. [11] Likewise, Germany's government has strictly announced restrictions as one of the lockdown measures so that people cannot make a group of 3 or more in a public place. [12] As a result, the death rate in Germany was less than her counterparts.

ROLLING LOCKDOWN

Sometimes intermittent lockdown could contain viruses spreading in local cases. For example, Pakistan is a densely populated country. For opening the economy, they need to resume everyday life and imposed lockdown again, recommended by the WHO. [13] Bangladesh also implemented this type of strategy for economic revitalization. [14]

SOCIAL DISTANCING

In the past disease epidemics, social distancing has been efficient for suppressing human to human transmission and mitigating morbidity and mortality. [15,16,17,18,19,20] A control strategy simulation suggested that tightly regulated social distancing can reduce the number of cases during peak time. [21] Both New Zealand and Australia have reduced COVID-19 spreading by a government-driven social distancing strategy. [22] On the other hand, Sweden's government is not tightly recommending a social distancing strategy. [23] However, the number of infected people is increasing day by day. Thus, enforcement and adherence to tighter control of social distancing may decrease the spread of COVID-19 in the upcoming days. [24]

CLOSURE OF SCHOOLS AND UNIVERSITIES

As part of non-pharmaceutical interventions, most schools, colleges, and universities all over the world closed during the early outbreak of the COVID-19 disease. But Australia and Sweden did not complete their school's closure. [25] However, closing schools' policy saves many students from

being infected and thereby helps reduce reproduction numbers.

CLOSURE OF GOVERNMENT OFFICES

Some countries encourage home offices, whether others increase the holidays to contain the spread of the virus. As a preventive measure, Bangladesh's government took immediate action by declaring the offices' public holidays for a certain period. [26] This intervention curbed the reproduction number to a great extent in the densely populated countries in the world.

BANNING OF MASS GATHERINGS

According to WHO, a mass gathering could spread a disease that is a threat to public health. [27] Some European countries such as France, Germany, Italy, and Spain imposed strict restrictions to stop mass gathering. In contrast, Portugal, Switzerland, and the UK partially restricted the mass gathering. [28]

TABLE 1: NON-PHARMACEUTICAL INTERVENTIONS MEASURES TAKEN BY THE DIFFERENT COUNTRIES.

TYPES OF NON-PHARMACEUTICAL INTERVENTIONS	NAME OF THE COUNTRY	REFERENCE
Banning/Suspending local and international flights	New Zealand, US, Hubei province (China), Vietnam, Nepal	[8], [9], [11], [29], [30]
Imposing lockdowns of cities	New Zealand, Hubei province (China), Nepal	[8], [11], [33]
Rolling lockdown	Pakistan, Bangladesh	[13], [14]
Social distancing	Hubei province (China), New Zealand, Vietnam, Italy	[11], [22], [29], [34]
Closure of schools and universities	New Zealand, Hubei province (China), Vietnam, Italy	[8], [11], [32], [34]
Government public holidays	Bangladesh	[26]
Limiting of mass gatherings	New Zealand, Hubei province (China), Vietnam, Italy, Nepal	[8], [11], [29], [31], [34], [35]

CHALLENGES FOR GLOBAL NORTH AND SOUTH COUNTRIES FACING THE WAVES OF COVID-19

After successfully containing the first wave of COVID-19, many countries face the outbreak of a second or third wave. The policymakers are cautious now for the economic losses taking place during the first wave. One of the main features of the second wave of COVID-19 is that the infected population's average age is lower than the first wave of infections. [36] Nevertheless, non-pharmaceutical intervention plays a crucial role in containing novel coronavirus spreading. In the case of Australia, social distancing curbed the rate of infection in the state of Victoria. However, a quarantine breakdown among family gathering speeded further infection into the community during the second wave. [37] This incident indicated that early social distancing intervention could reduce the rate of infection. An analysis said that the second wave would pose new challenges for the African countries because of the emergence of more contagious strain in South Africa and the UK. The surge will be dangerous for the resource-constraint African countries due to a lack of capacity for testing the novel coronavirus. [38] The global north countries, for example, Italy, faced a harsh economic consequence during the first wave of COVID-19. However, governmental, and non-governmental approaches to overcome the monetary crisis were possible due to hand allocation. [39] On the other hand, the global south, including most African countries, cannot respond like Italy because of fewer resources.

SIGNIFICANCE OF THIS REVIEW WORK

Non-pharmaceutical interventions are powerful strategies to contain the spreading of novel coronavirus SARS-CoV-2. We have seen far fewer infections and death in the Asia Pacific countries than in other parts of the world. The genetic difference, as well as cultural behavior, is responsible for making it possible. Typically, in Asian countries, kissing, hugging, and handshaking is absent in public functions. It could have some impact on reducing the rate of infections. The interventions described here can be implemented in any country to contain the COVID-19 diseases in the community, minimize hospitalization cases, and, most importantly, decrease the mortality rate.

CONCLUSION

At the time of writing no COVID-19 specific antiviral drugs have been approved by the US Food and Drug Administration (FDA). However, some antiviral drugs have emergency use authorization from the FDA. In these circumstances, non-pharmaceutical interventions could be a remedy for all countries around the globe. Moreover, when the vaccine is available in the market, many developing and under-developing countries may not afford it or will not be available in their hands within the expected time. In the meantime, they can adopt and implement non-pharmaceutical interventions to minimize R0 numbers, which the Asia Pacific countries have done. Thereby, they can contain the spreading of the novel coronavirus, which further reduces long waiting for hospitalization and the healthcare system burden.

COMPETING INTEREST

The authors declare no conflict of interest. The authors are solely responsible for the writing and content of this article.

FUNDING SOURCES

This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

AN INTEGRATIVE APPROACH FOR WELLNESS: AN ASSESSMENT OF POTENTIAL OF AYURVEDA DURING COVID-19 PANDEMIC

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ABSTRACT

The integrative approach for wellness has become an arena where integrating the indigenous practice with the dominant bio-medical system has activated a transformation process.Further, a debate characterized by fundamental dichotomies of health/wellness is there to find an approach in agreement with holistic wellness. The limitations of protocol-driven medical science and avoiding the patient behind the patient have again compelled us during this pandemic to explore holistic health.

This paper presents an analysis and explores the feasibility of Ayurveda as an integrative system to wellness and tests the Ayurveda concept of holistic wellness against three such dichotomies: 'health' vs wellness, 'body' vs 'mind,' and 'curative vs. preventive,' where the current medical model can be said to represent the first elements in the three dichotomies.

Keeping the current Covid-19 pandemic as a critical incident, researchers tried to justify that the synergistic confluence will act as a complementary/supportive knowledge in humanity's struggle against the pandemic. For synergistic confluence of Ayurveda and medical Science, the scientist's temperament and evidence-based medical science approach should be applied to validate the principles and therapies of Ayurveda.

KEYWORDS

Holistic Wellness, Ayurveda, Synergistic Confluence, Integrative approach of Wellness, Covid-19 Pandemic

INTRODUCTION

Covid-19, pandemic compelled us to ponder over the essence of life. The crisis has prompted the foundations and settled ways of living life and remedies for managing the situation. Further, it has aggravated the need to relook, reassess, and reappraise the prevalent customs and systems, as specific ways of crisis management are no longer appropriate for sustaining our very existence.

In this context, highly qualified practitioners from bio-medical science are trying to address the pandemic through an evidence-based medical approach. A systematic approach wherein the best available research evidence with clinical expertise and patient values are reviewed for problem-solving. As a result, the knowledge generated by the bio-medical system is reliable as well as reproducible, which provides the substantial groundwork for identifying new health technologiestreatments that have led to longevity and quality of human life.

The scientific community's efforts to fight against COVID are mechanical as they are protocol-driven and algorithmic.[1] However, to manage a crisis of this magnitude, we need to develop a holistic approach involving social, psychological, medical, physiological, administrative, and even integrative intelligence for the human victory over the virus. [2] Here the researchers are not defying the truth that medical science has not collected a comprehensive repository of knowledge about the impact of COVID-19 on human life. Still, the efforts are embedded in physiological nourishment, i.e., body only. A holistic view that stimulates body, mind, and spirit is not yet emphasized while evolving measures to manage this crisis. At this juncture, when the high intensity of psychological distress directed by the pandemic is all-pervasive, [3] we need to recalibrate our ways to manage the crisis. The psychological distress generated during the crisis can potentially enhance the vulnerability to viral upper respiratory infections. [4] This requires a rational approach to find ways to minimize pain to improve immunity so that chances of infection can be reduced. [5]

Medical science is an evidence-based curative approach and more inclined towards the elimination of diseases. Medical science focuses on diseases, diagnostics, and medicines rather than the patient as a person in the treatment process. The body is merely appreciated in science rather than the complete perspective necessarily being comprised of body, mind, and spirit. It is appropriate to mention here that the absence of disease is no guarantee of health. Human helplessness has created a need for an integrative approach where along with evidence-based functioning, experience-based systems like Ayurveda, Yoga can also be adopted.

The underlying meaning of Ayurveda is "knowledge (Veda) of life (ayur)."It is an Indian system of life sciences that is based on predictive and personalized medicine.

While advocating this health and wellness wisdom of ancient India, we have no intention to degrade reductive medical science; instead, we promote the synergistic confluence of these two sciences. Integrative intelligence is helpful for disease prevention and curative care. The COVID pandemic is an opportunity to explore this integrative approach to fulfil our unmet needs and unresolved challenges. Further, the integrative approach postulates the active involvement of individuals in maintaining health which is always required to minimize the passive dependence on medical treatments. [7]

THE OBJECTIVE OF THE STUDY:

1. To strengthen the advocacy that Ayurveda is based on holistic wellness principles.
2. To explore the possibility of synergistic confluence of medical science and indigenous Ayurvedic practices.
3. To reinforce the perspective that the indigenous system can support the effort of medical science against the Covid-19 pandemic.

Building on this background, the current research reviewed the existing literature to understand the possibility of synergistic confluence of medical science and indigenous Ayurvedic practices. Though both medical science and indigenous Ayurveda differ epistemologically, their philosophies are not significantly different.

Further, keeping the current pandemic as a critical incident, researchers tried to justify that the synergistic confluence can act as a complementary/supportive knowledge to the medical science. Finally, to provide evidence to our advocacy that Ayurveda is based on holistic wellness principles, the impact of Ayurveda's interventions, including immunity boosting measures for self-care during the COVID-19 crisis was reviewed.

The approach of Ayurveda comes from the indigenous practices adopted by Indian communities, and it is ongoing, creating a solid premise of experience-based healing therapy. We begin by arguing that the curative approach is not sufficient for wellbeing and then tried to elaborate that Ayurveda has tremendous potential for synergistic confluence.

METHODOLOGY

Ayurveda's philosophy and theories are advocated through a literature review as a holistic approach to wellness. In our advocacy, we do not make any extreme position, either bio-medical or Ayurveda; instead, we suggested that synergistic confluence of Ayurveda and biomedical systems may be possible through integrative approaches for holistic wellness. Individually, they are not the complete package for health, but their synergistic confluence can help the world suffering from incurable diseases and illness.

To strengthen our perspective regarding the potential impact of Ayurveda on psycho and physical immunity, taking COVID as a critical incident, different initiatives

taken by state governments and practitioners who have a firm conviction for Ayurveda and followed the guidelines of the Indian government during the pandemic was reviewed. Finally, we discuss ways to progress for the synergistic confluence of Ayurveda with bio-medical science by collecting wisdom from this pandemic. The presented data is collected from several published reports, Ayurveda's classical scriptures, and books on Ayurveda, one of the indigenous sciences of life. The methodological approach combines the concepts and philosophy of Ayurveda with as many different sources as possible: written sources, scriptures, and discussions.

Holistic wellness and the dichotomies of health-wellness, body-mind and cure vs care as constructed

Wellness is considered the holistic integration of the energies of body, mind, and spirit where the body is stimulated, the reason is engaged, and nature is cherished rather than physical health.

Nurturing physical, intellectual, emotional, vocational, financial, social, spiritual, and environmental mutually supporting dimensions is a must for holistic wellness, as neglect of any of these can affect individuals' wellbeing.
In contrast to holistic wellness, the therapeutic approach of the healthy body is defined only in mechanistic terms. [8] Therefore, it prompts that mechanized and engineered interventions can sort out health issues. [9] Thus, illness is caused by specific conditions and organisms, for which remedial action is proposed bothregulatory and eliminatingthe illnessin a particular manner. [10] This way, it is postulated the health and disease are directed by physical, chemical, and biological laws. So, the cause-effect is established in the linear relationship between the body as a system and its interaction with discrete entities. [11]

In a contrary sense holistic wellness recognizesthe integrated impact of body, mind, and spirit on health, which in principle differs from the dichotomies of health-illness and body-mind as constructed in medical science. Under holistic wellness and the predictive and preventive approach, it is essential to follow personalized and participatory medicine for complete wellness. The systems approach can help demystify diseases and democratizing health care [12], but holistic wellness is a proactive approach to eliminating illness.

In the contemporary context, when medical science struggles to sort out the puzzle of Covid-19, the alternative/complementary/integrative systems needs to be explored. In this context, keeping the principle of holistic wellness in premise, this paper explores the feasibility of Ayurveda as an integrative system for welfare.

This paper tests the Ayurveda concept of holistic wellness against three such dichotomies: health vs wellness, body vs mind, and curative vs. preventive, where the current medical model can be said to represent the first elements in the three dichotomies.

Health versus wellness dichotomy

In biomedical science, health is accepted as the absence of illness, injury, disease, and health care, ensuring to regain the state where there is no illness. On the contrary, in indigenous studies, wellbeing is not just physical health, but preventative health carewhich is more important. Further, in indigenous discussions 'substantial knowledge often has been trivialized in favor of more scientific, objective ways of knowing'. [13]

World Health Organization in 1946 states that –health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity – lendingitself well to the focus of holistic wellness (WHO 1946). This definition favoursthe view that the indigenous definition and measurement of the health of communities can be referred to while focusing on holistic wellness.

Body versus mind dichotomy

Under biomedical philosophy, the body is taken as a machine. That is why it is defined as a functional, mechanical, physical, and systematic thing. Elaborating on the body as a machine, [14] identified three critical dimensions, being the body is the sum of its parts means it can be reducible to organ, tissue, and cells. Like machines, it can be understood from the outside without emphasizing emotions and mood. Third, thebody is not guided by values. From this narrative, the disinterest of biomedical science is apparent towards the spirit or mind.

Indigenous management defines the mind as a controller over the five sense organs and works as a motor organ-enabling activities through speech and other organs. The body is represented as a realm of molecules, while the mind is a field of thoughts. That's why indigenous management postulates that whatever affects the brain has its effect on memory and vice-versa. It implies that

wellness can't be achieved just by adopting the functional/bodily measures rather, a holistic approach assimilating body, mind, and spirit is needed. [15]

Curative versus preventive dichotomy

Curative medicine is a branch of medical science aiming to restore and maintain health once individuals fall ill. In contrast, Preventative medicine is a proactive approach that ensures that people do not fall sick in the first place. Therefore, preventive medicine targets the disease-free state, a proactive approach, while curative medicine targets the diseased state, a reactive one.

Most of the prevalent disease of this century, like lifestyle disorders, HIV/AIDS, Ebola, Cancer, Corona, take a longer duration to aggravate before changing into life-threatening conditions. Therefore, preventive strategies make better sense for them.[16] It is not advocated here that treatments should be avoided, or preventive strategies are enough for eradicating disease; instead, early diagnosis and prevention are needed, which can be accessed through indigenous methods.

Holistic wellness, according to Ayurveda.

The underlying meaning of Ayurveda is "knowledge (Veda) of life (ayur)."It is an Indian system of life sciences that is based on predictive and personalized medicine. Based on the severity, stage, and subtype of the disease, pathogenesis, etiological factors, clinical features, therapeutic modalities can be described under Ayurveda. [17] This is different from medical science as an individualized approach and is followed with a thorough examination of the deceased individual. In addition, Ayurveda proliferates the gifts of nature in maintaining healthy and happy living. [18]

Healthcare-related quality standards, as well as all regulatory procedures, are well documented in Ayurveda. Ayurveda's extensive knowledge base on preventive care derives from the concepts of 'Dinacharya'(daily regimes) and 'Ritucharya' (seasonal systems) to maintain a healthy life. This refers to seasonal changes rendering the body profoundly vulnerable to one or different disorders if the body is not synchronized with the weather, which makes up the external environment. As adjustments are the key to endurance, the information on Ritucharya (routine for different seasons) is, therefore, significant. Further, Ayurveda emphasizes 'Samadosha' (balances of psychological elements), 'Samadhatu' (balances of tissues), 'Sama-indriya' (balance of sensory organs) 'Prasannatma' (nurturing soul),' Samagnischa' (proper production of energies), 'Malakriya' (proper elimination of waste). [19]

Integrative approach considering body, mind, and spirit for managing wellness

The logical and reasonable synthesis of Ayurveda (rooted in scientific and rational concepts of the Indian philosophy) defines health as fulfilling continuous physical, mental, and spiritual happiness by striking a balance between psyche, spirit, and physical system. It elaborates those relationships need to be nurtured with fellow creatures and nature as a whole, including the universe and ourselves. Charaka Samhita describes wellbeing as a 'disease-free state' to be followed for the accomplishment of 'virtue, wealth and gratification'. [20]

Ayurvedic principle of three-body humours (TriDosas) viz.- Vata (the energy of movement) Pitta (the energy of digestion and metabolism) Kapha (the energy of lubrication) are the bases on which treatment is defined combining diet, herbal remedies, detoxification, whenever disequilibrium exists between the physical, mental and spiritual energy than this disequilibrium generates imbalanced Agni which brings illness [19]. Ayurveda advocates that personal indulgence for monitoring, managing, and maintenance is required for nutritional status.

Effective interventions that are natural and less invasive

The fundamental precept of Ayurveda talks about the relationship between the microcosm (Pind) and the macrocosm (Brahmand). It elaborates that both the 'being' (Pind) and cosmos/outside world (Brahmand) interacts, and the cosmos influences the being. In simple words, that is a unity between macrocosm and microcosm. This dictum is extended on the ontological basis of the five-element theory (Panchamahabhuta). [21] On these lines, Ayurvedic approach emphasizes health promotion by interconnecting the environment and personal's characteristics. It can be postulated that everybody has the potential of self-healing by knowing the state of his or her body, mind, and spirit. [19]

Ayurveda promotes the usage of materials as medicines that are readily available in Indian households. Simple, self-driven, but effective health practices- such as lukewarm water, drinking Kadha (Decoction) during sickness, scraping the tongue, gazing at a flame to improve

eyesight, gargling for maintaining the health of the throat - are natural and less invasive interventions.

Further, to withstand the agents causing diseases, the most natural healing therapy, 'Yoga' and Dhyana(meditation), has been prescribedto enhance physical strength, emotional resilience and control the nervous system.

The TrayodosaAgni - Thirteen types of digestive fires like- Jatharagni (gastric fire) are narrated in Ayurveda. Ayurveda highlights that the malfunctioning of these fire (Agni) causes most of the diseases. This is how in a natural way, body functioning is explained, which stresses that several diseases can be controlled by systematically managing over 'Ahar' (Food),'Achar'(Routines)'Vichar' (Thoughts) and 'Vihar' (Recreation)' [22]

Individualized approach: addresses the person's unique conditions, needs and circumstances.

Ayurveda differentiates every individual from others based on Prakriti (Constitution). That is why each patient will not get the same treatment in Ayurveda though having a similar disease. Ayurveda accepts that each personality consists of TriGunas (three fundamental universal energies):–that is Satva (power of balance), Rajas (power of fire or motivation), and Tamas (energy of rest or slothfulness), and all individuals have mixed amounts of the three, the predominant Guna(energy) determines an individual's Mansa Prakriti (Mental Constitution). In equilibrium, the three Gunas (energies) preserve the mind (indirectly the body) and different types of mental disorders. [23]

Knowing this classification of personality helps to understand the responses of patients in pathological and stressful situations. Dietary prescription to the patients is also natural to prescribe based on Satvik (foodwhich is usually fresh, seasonal and locally grown like fruits, vegetables, leaves, grains, cereals, milk, honey) Rajsik, and Tamsik Prakriti.

Even the Ayurvedic classification of body tissues, which is done under the principle of SaptaDhatu(Seven types of body tissues), is very helpful in understanding the anatomy of the body and the related causes of disease. [24]

Prevention reduces the need for treatment:

Ayurveda propounded the theory of PancaMahabhutas (Five essential elements) viz.-Akasha (space), Vayu (air), Teja or Agni(fire), Jala(water) and Prithvi (earth). This theory helps the physicians understand the body's essential elements to detect illness, which further helps to identify the real cause of the disease. [25]. Ayurveda stresses mind, body, and spirit wellness, and all these are interconnected, but the spirit has the power to govern the other. The knowledge of Ayurveda empowers individuals to understand a person and generates energy to establish the equilibrium of body, mind, and spirit as per the individual's Prakriti (constitution). The prescribed non-pharmacological approaches from yoga, meditation, and lifestyle play a significant role in treating mental and physiological disease and suggest ways to prevent diseases and protect health. [26]

Inquiry-driven: patient and practitioner are partners in the healing process:

This philosophy of 'our health in our hands' is practiced in Ayurveda, which advocates that all the diseases can be considered as the result of 'mithya,'ahara,' and 'vihara' follow. These three vitiates Agni, are from which conditions are derived. If an individual practices yogic posture and incorporates meditation in their daily routine, it will help strengthen inner strength to handle health challenges. [27] Ayurveda also counts the psyche of the patients and allows them to participate actively in the healing process.[28]

Ayurveda does not consider individuals a system consisting of organs but a well-coordinated network of relationships that define the functions. Eventually, the roles become impaired; that is why the Ayurvedic concepts are more appropriate for wellness. The individualized approach isemphasized in Ayurveda, enabling individuals to recognize their bodily strength, limitations and continuous self-assessment to give them an accurate picture of their immunity strength. Further, every purpose results from the mutual efforts of several parameters in the body ranging from structures biochemistry, electrical and magnetic, mental and emotional, and physiological parameters. This shows that the functional model of Ayurveda is inclusive.

Assessment of Ayurveda Principles during COVID-19 Pandemic

COVID-19 could be a rapidly changing and progressing situation. In this context, Ayurveda has enough potential and possibilities for prevention and an adjunct treatment option for COVID-19.

Based on the Ancient Ayurvedic literature and proved indigenous practices, the Ministry of Ayush, the government of India, recommends certain practices for holistic wellness

(immunity boosting). Similarly, Patanjali research institute, known for its Ayurvedic medicines in collaboration with the National Institute of Medical Science, Jaipur invented the Corona Virus medicineCoronil (a combination of Giloy, Tulsi, and Aswagandha).

Segregating an ailing member of a family as a household chore in a member's demise are still followed across India. These efforts are similar to those we have started taking up as self-isolation measures to prevent the spread of the flu to other family members or within the community if we are afflicted with the COVID-19 virus. [29]

In infectious disease, it is imperative to prevent further progress, which helps control the disease, and various methods can be used for immunity building and recovery. [30] Through Ayurvedic medicines, multiple symptoms associated with COVID-19 like high fever, severe cough, and body pain can be cured, and further progression of these symptoms can be stopped. [30], During COVID-19, un-precedent usage of Ayurveda's medication is an opportunity to explore the possibility of synergistic confluence of Ayurveda and medical science.

Synergistic confluence of Ayurveda and medicalscience

The current pandemic has created a need to understand health and wellness from different lenses rather than just the reductionist health approach. We need to negate the silos approach and find a more objective, integrative, comprehensive, and holistic approach to wellness.

The limitations of protocol-driven medical science and the avoidance of the person behind the patient have again compelled us during this pandemic to explore new ways for wellness and avoid such pandemics in the future. At the same time, Ayurveda cannot just rest on the glory of ancient indigenous methods but must understand the role of the evidence-based scientific temperament of health and resolve the queries/objections of medical science. The flexible approach of both systems can pave the way for confluence, a massive success for humankind.

Integration through thecoherence of philosophies, concepts, and scientific and professional rigours of both systems must be reassessed. The scientist's temperament and evidence-based medical science approach should be applied to validate the principles and therapies of Ayurveda to generate an integrative approach, which will be the complete health solution.

This integration should be unbiased and should be an effort to do the rebalancing of health philosophy. The approach needs to move from reduction to holistic, from prevention to protection and from body to body-mind-spirit. The definition of health determinants needs to be extended from drug to food, lifestyle, and attitude towards life. Environment, Prakriti' and concepts of holistic wellness need to explore for the integrative health approach. To alter the pluralist approach, it is essential that the insights and perceptions contributed by holistic wellness concepts need to be referred to. We need to focus our attention on the attributes of individuals and their context so that a person-centric health approach can be developed.

CONCLUDING REMARKS

The current pandemic and the limitations of medical science have instigated the need to explore an integrative approach. The discussion under the three paradoxes showed that Ayurveda has enough potential and possibilities to prevent and cure the diseases. [30] In contrast to the medical approach, where the body is considered a composition of cells, tissues, and organs, Ayurveda's approach is more holistic. Ayurveda's principles were compared with the holistic wellness principles, and it was found that they agree with the laws of a holistic wellness approach.

Consequently, we suggested an integrative approach where Ayurveda and evidence-based medical science will help to shift from generalized to person-centric treatment and illness to wellness.

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GLOSSARY

S.NO.		
1.	The Tri Doshas	Three Body Humours
2.	The Trayodosa Agni	Thirteen types of digestive fires
3.	The Tri Gunas	Three Fundamental universal energies
4.	The SaptaDhatus	Seven types of body tissues rasadhatu (plasma), raktadhatu(blood), mamsadhatu (muscle), medadhatu (fat), asthidhatu (bone), majjadhatu (nervous tissue), and shukradhatu (male reproductive tissue) or artavadhatu (female reproductive tissue).
5.	PanchaMahabhutas	Five basic elements Space (Aakash), Air(Vaayu),Fire(Agni),Water(Jal),Earth(Prithvi)
6.	The Tri Malas	Three types of Body Wastes Faeces (Purisa), Urine (Mutra), Sweat (Sveda)
7.	Sattva	A substance, experience, or mental state infused with the qualities of light, clarity, intelligence, compassion, and wisdom.
8.	Rajas	A substance, experience, or mental state infused with the qualities of kinetic energy, movement, passion, and action.
9.	Tamas	A substance, experience, or mental state infused with the qualities of inertia, darkness, heaviness, slowness, sleepiness, and decay.
10.	Rasayana	A substance that nourishes and tones the entire body; the Ayurvedic practice of rejuvenation therapy (also known as rasayanachikitsa)—a specific process of offering deep nourishment to the cells, tissues, and organs of the body in support of their healing, renewal, and regeneration; this practice is indicated in a number of different situations (e.g., after a deep cleanse like panchakarma) and is believed to enhance immunity, stamina, and longevity.
11.	Vata	It is predominated by the ether and air elements and governs movement and communication; it is light, cold, dry, rough, mobile, subtle, and clear.
12.	Pitta	It is predominated by the fire and water elements, and it governs transformation; it is light, sharp (or penetrating), hot, oily, liquid, and spreading.
13.	Kapha	It is predominated by the earth and water elements and governs structure and cohesiveness; it is heavy, slow, cool, oily, smooth, dense, soft, stable, gross, and cloudy.
14.	Kadha (Decoction)	Decoction is a method of extraction by boiling herbal or plant material to dissolve the chemicals of the material, which may include stems, roots, bark and rhizomes.

15.	ManasPrakriti	The mental constitution; each individual's unique proportion of sattva, rajas, and tamas in the mind; manasprakriti is established at conception, but can change over time, reflecting our capacity to develop more (or less) evolved states of consciousness over the course of our lives.
16.	Prakriti	Constitution: the unique ratio of vata, pitta and kapha established at conception and resulting in a personally unique set of physical, emotional, and mental tendencies, strengths, and vulnerabilities.
17.	Dinacharya	A daily routine: an important part of an Ayurvedic lifestyle that helps to align our bodies with the daily rhythms of nature; the traditional dinacharya includes a wide variety of daily self-care practices including a rich personal hygiene routine, exercise, spiritual practice, meals, and sleep.
18.	Ritucharya (rtucharya)	A seasonal routine: similar to the concept of dinacharya, but also accounting for the cycle of the seasons; rtucharya encourages us to adapt our personal routines to align more closely with the rhythms of the natural world, introducing practices and qualities that naturally promote balance all year long

ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

THE ELASTICITY OF HEALTH EXPENDITURE ON AGRICULTURAL PRODUCTIVITY GROWTH IN SOUTHEAST ASIA

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ABSTRACT

BACKGROUND:

Recently, agricultural productivity growth has experienced a sharp downward turn across the countries of Southeast Asia partly due to population ageing, increasing pace of urbanization, and industrialization.

OBJECTIVE:

To provide empirical evidence to the elasticity of prevailing health spending as a proxy of human capital stock on agricultural productivity growth in Southeast Asia.

METHODS:

This study analysed the data obtained from the World Development Indicators for 2000-2016 using panel data regression models.

RESULTS:

The empirical evidence suggests that prevailing health expenditure, though statistically significant, exerts a strong positive effect on agricultural productivity growth. Therefore, a unit rise in prevailing health spending relative to GDP would increase agricultural productivity growth by 28% across countries of Southeast Asia, all else constant.

CONCLUSION:

The trend of rapid agricultural productivity declines in Southeast Asia could be altered by augmenting investment to the prevailing health spending as an indicator of human capital stock.

POLICY IMPLICATIONS:

The governments of Southeast Asia should increase investment in prevailing health spending relative to GDP, to stimulate more growth in agricultural productivity, greatly improved human capital stock, and eventually increase economic growth

KEYWORDS

Health expenditure, productivity growth, human capital, Southeast Asia, SDGs.

INTRODUCTION

The Sustainable Development Goals (SDGs) 3 emphasized on promoting good health and well beings for all people across age groups globally by the year 2030. [1] However, it has been understood that all the other 16 SDGs are centrally related to health and thus achieving the health target indirectly implied attaining the overall ambitious contemporary development targets, pertinent to all economies and regions of the world. The health target of SDGs accentuates the relevance of human capital as a catalyst to propelling economic development as argued by the endogenous growth models. [2] Accordingly, health is seen as an indispensable determinant of economic growth and development; higher productivity levels could be derived from a healthier population, and thus higher income per capita in the country. [3] The importance of health spending on economic growth and overall betterment of the well-being of population stems from the health-led growth hypothesis. [4] The hypothesis regards health as a crucial asset; and therefore, increasing total health spending in the economy would boost labor productivity, raise income per capita, and overall lead to improvement in the population living standards.

In many developing countries, agricultural productivity growth has accounted for the substantial share of GDP and in many instances, it's the mainstay of their economies. Thus, the comprehensive share of agricultural productivity growth relative to GDP has been declining over the years due to population ageing, the growing pace of industrialization, and urbanization in many contexts. Yet, the contribution of agriculture to the economic growth and development of many low and middle-income countries can never be overemphasized. Improving agricultural productivity remains a key priority in promoting sustainable development for developing countries. Liu and colleagues have highlighted that the growth of agricultural productivity in Southeast Asia has experienced a sharp downward turn, posing serious threats to sustainable agricultural growth in the region. [5] Hitherto, there have not been enough studies on the rapid declines in agricultural productivity growth in the region in relation to human capital stock which depreciates with age and time. Therefore, greater investment is needed for improving human capital stock and in turn productivity improvement over time.

The aim of the current study is to estimate the elasticity of prevailing health care expenditure relative to GDP on agricultural productivity growth measured in value-added per worker across the countries of Southeast Asia. However, this study contributes to the literature by providing empirical evidence to the concerned authorities of Southeast Asia on how to revamp the declining trend in agricultural productivity growth measured in value-added per worker through augmenting human capital investment and its far-reaching positive economic externalities.

LITERATURE

The relationship between human capital stock, partly proxy as total health spending, and overall economic performance or economic growth has been established in the literature of economics over the years. For instance, in Pakistan, Ullah and colleagues have used the ARDL model and documented that an improvement in health status by 1 percent would result in 13.39% increase in the productivity of workers, among other factors that affect overall productivity levels considered in the model. [6] Golkhandan uses Granger Causality Test coupled with other statistical tests and established a statistically significant causal link between macroeconomic health indicators and the level of labour productivity in Iran. [7] Wang and colleagues have estimated the optimal health expenditure in a developing economy using GMM for the OECD countries over a period of one decade. Their empirical evidence shows that an increase in health spending, all else held constant, stimulates greater economic growth given that the share of health expenditure relative to GDP is below the optimum amount of 7.55%. [8] Raghuphathi and colleagues have explored the association of health spending and economic performance in the US during the time of 2003-2014. They found that health care expenditure has a strong positive correlation with overall economic performance and labor productivity. [9]

Similarly, Bloom and colleagues have constructed a panel model of countries for over three decades and estimated the impact of the level of human capital on aggregate economic productivity using a production function model. They found that the state of the health of the population has a positive strong, albeit statistically significant impact on overall economic performance, assuming that workforce experience is held constant. [10] Ozturk and

colleagues have used the panel ECM model and analyse the association of the level of health spending and economic productivity of G8 countries, spanning 1995 to 2012. Their findings suggest the presence of growth hypothesis and growth detriment hypothesis in the short run and long run respectively. [11] Piabuo and colleagues have studied health spending relations with economic growth between central African countries in comparison with other five African countries using panel OLS. Their empirical evidence shows that health expenditure has a statistically significant positive impact on growth during the study period. [12] Oni and colleagues have examined the relations of health expenditure on growth and their degree of causality. Their result indicates that total health spending, among other macro indicators, is statistically significant in promoting economic growth in Nigeria. [13]

Moreover, Arora investigates the impact of health on the patterns of the economic performance of ten industrialised economies over the span of a hundred to a hundred and twenty-five years. He documents that improvement in the stock of population health leads to an increase in their rate of growth by 30 to 40 percent, causing permanent change to their growth paths.[14] Brempong and colleague's comparative study used an expanded Solow growth model to examine the relations of the stock of human capital on per capita income growth rate between Sub-Saharan Africa and the OECD countries. Their findings highlight that the rate of per capita income growth is influenced positively by the share of human capital investment. [15] Aghion and colleagues have used panel data for the period of 1960-2000 and estimated the impact of health spending economic productivity in the light of the endogenous growth model. They concluded that improvement in the health of the population, though statistically significant has a positive correlation with per capita GDP growth in OECD countries. [16] Bedir studies the impact of health spending on the economic performance of developing economies using a modified version of the Granger causality test over the period of 1995-2013. Their empirical result shows that the income level of a country is a crucial factor in explaining the cross-country's variation in health expenditure. [17] Feng and colleagues have analysed the impact of public health spending on the productivity of labour in China, using panel data during 2007-2013. They have documented that public health expenditure is central to agricultural labour productivity betterment and also statistically significant in promoting even non-agricultural labour productivity. [18]

This is the first-panel study that investigates the elasticity of prevailing health spending relative to GDP on agricultural productivity growth measured in value-added per worker across the countries of Southeast Asia. The study has the following structure. Section two reviews the literature. Section three details the methodology and section four presents the empirical results. Finally, section five concludes the study.

MATERIAL AND METHODS

This study uses data obtained from the World Bank Development Indicators to examine the elasticity of prevailing health expenditure relative to GDP on agricultural productivity growth measured in value-added per worker across the countries of Southeast Asia for 2000-2016 periods. The period of the study was chosen by making optimum use of the available data. The baseline model seeks to investigate whether health spending relative to GDP has a statistically significant effect on agricultural productivity per worker. The model is given in logarithmic form as:

$$lnAPG_{it} = \alpha_i + \beta\ ln\ (PHE)_{it} + \varepsilon_{it} \qquad (1)$$

where $lnAPG_{it}$ indicates agricultural productivity growth and $ln\ (PHE)$ represents the share of prevailing health expenditure relative to GDP across countries of Southeast Asia. The *i* accounts for the cross-sectional differences for both health expenditure and agricultural productivity growth per worker across the countries for the period *(t)* 2000 to 2016, α_i is a constant and ε_{it} indicates the error term.

RESULTS

This section begins with analysing the trends in prevailing health expenditure and agricultural productivity growth in Southeast Asia followed by the identification of the right model for estimating the results.

Table 1 presents the pattern of both prevailing health expenditure and agricultural productivity growth measures in terms of value-added per worker. The trend shows a declining pattern of -0.2%, -0.46%, and -1.92% in Brunei, Cambodia, and Laos respectively. Whereas, in other countries included in the study, the pattern of health expenditure exhibits a positive trend during the span of

sixteen years. Concurrently, the volume of agricultural productivity per worker grew substantially among nine out of the ten countries of Southeast Asia. However, it was only in Singapore that the volume of agricultural productivity growth per worker has exhibited a cumulative decline of -296.531 units. This exceptional case of Singapore may not be surprising because it is the only developed country among the Southeast Asian block.

TABLE 1: TRENDS IN PREVAILING HEALTH SPENDING RELATIVE TO GDP AND AGRICULTURAL PRODUCTIVITY GROWTH IN SOUTHEAST ASIA (2000-2016)

COUNTRY	PHE_{2000}	PHE_{2016}	CHANGE	APG_{2000}	APG_{2016}	CHANGE
Brunei	2.54	2.34	--0.2	44061.65	58437.38	14375.73
Cambodia	6.54	6.08	-0.46	577.5902	1570.317	992.7268
Indonesia	1.92	3.12	1.2	1785.04	3464.768	1679.728
Laos	4.28	2.36	-1.92	584.9252	777.1161	192.1909
Malaysia	2.56	3.80	1.24	11353.23	17303.64	5950.41
Myanmar	1.84	5.09	3.25	665.4933	1623.918	958.4247
Philippines	3.15	4.38	1.23	1733.693	2284.082	550.389
Singapore	3.35	4.47	1.12	6608.918	6312.387	-296.531
Thailand	3.10	3.71	0.61	1735.088	3036.178	1301.09
Vietnam	4.85	5.66	0.81	569.1754	1099.078	529.9026

Source: World Bank Development Indicators

Further, Figure 1 illustrates the trend in prevailing health spending relative to GDP in Southeast Asian countries from 2000 to 2016. An increasing trend is noticeable in Vietnam, Thailand, Singapore, and the Philippines particularly from 2008 onwards, though at the successive years included in the study the expenditure trend portrays a steady movement. In spite of the cumulative decline in prevailing health expenditure in Brunei, Cambodia, and Laos, there were no significant spikes in the trend of health expenditure in Brunei compared to what is observed in Cambodia and Laos during the sample period.

FIGURE 1: TREND IN PREVAILING HEALTH SPENDING RELATIVE TO GDP IN ASEAN COUNTRIES (2000-2016)

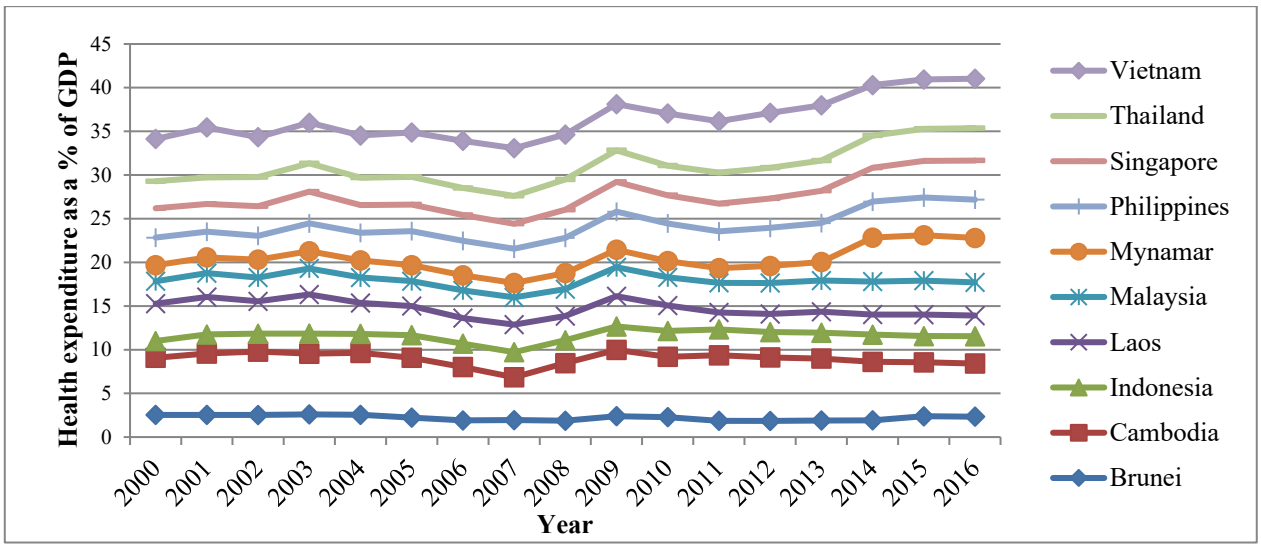

Figure 2 portrays the trend in agricultural productivity growth in terms of value-added per worker at 2010 constant prices in USD for Southeast Asian countries for the 2000 to 2016 study period. Overall, it shows an increasing trend from the beginning of the sample and slightly changed the pattern of growth with more fluctuations after 2004 onwards until it reaches a peak in 2014 and eventually wanes in absolute terms, across the region.

FIGURE 2: TRENDS IN AGRICULTURE, FORESTRY, AND FISHING, VALUE-ADDED PRODUCTIVITY PER WORKER (CONSTANT 2010USD) IN SOUTHEAST ASIAN COUNTRIES (2000-2016)

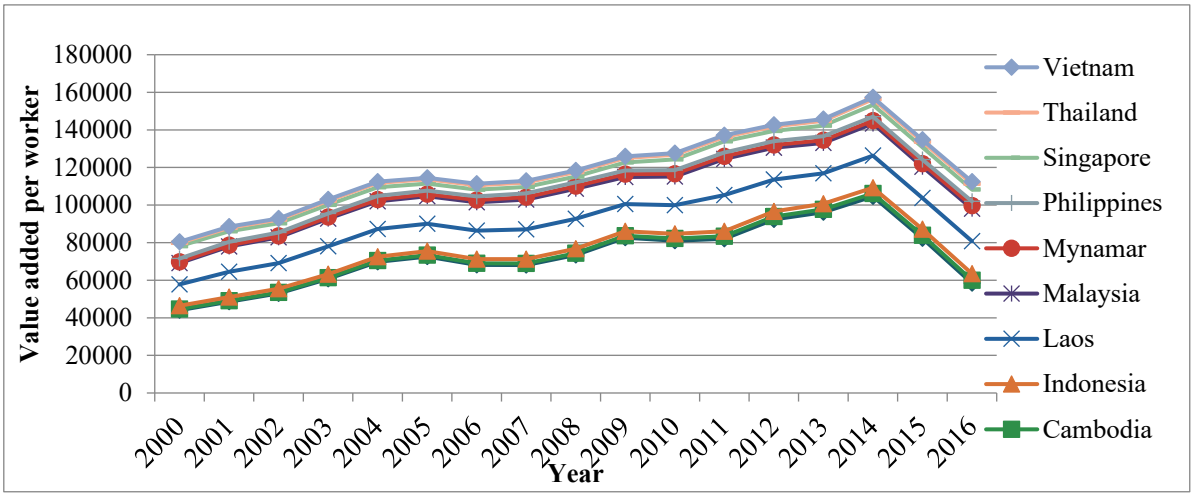

TABLE 2: ESTIMATES OF THE PANEL DATA MODELS

PARAMETERS	POOLED REGRESSION MODEL		FIXED EFFECT MODEL		RANDOM EFFECT MODEL	
	Coefficient	**St. Err.**	**Coefficient**	**St. Err.**	**Coefficient**	**St. Err.**
lnCHE	-1.476***	0.258	0.289***	0.091	0.277***	0.092
Constant	9.760***	0.329	7.611***	0.113	7.625***	0.446
R^2	0.163		0.059		0.163	
F	32.836		9.967		---	
Chi-square	----		----		9.098	
Akaike crit.	571.364		-45.095		------	
Bayesian crit.	577.636		-38.824		------	
Observation	170		170		170	
Countries	10		10		10	
Time	16		16		16	

Three models are considered as candidates for selection based on panel data regression analysis models – the pooled regression, the fixed effect, and the random effect model. Moreover, preliminary diagnostic checks have assisted in identifying the suitable model and the panel data regression estimates are reported in Table 2. The Breusch and Pagan Lagrangian multiplier test for random effects is used to select the appropriate model between the random-effects model and ordinary least square regression. Therefore, the LM test null hypothesis is that there is no variance across the Southeast Asian countries. The LM test produced a Chi-square value of 1115.08 and a p-value

of 0.0000. Thus, this analysis rejects the null hypothesis and concludes that there are significant differences across countries, and hence random effects model is the appropriate model other than the fixed effect and the pooled OLS models. Also, to select the appropriate model between the fixed and the random effect models, this analysis conducts the Hausman specification test. Thus, the Hausman test gives a statistic of -2.11 and a p-value of 0.9540, and therefore, there is little evidence to dismiss the null hypothesis that the random effect model is the suitable model to be considered for the analysis.

Table 2 depicts the panel data regression estimates consisting of pooled OLS, the fixed effect, and the random effect models. Although the parameters are statistically significant in both the fixed and the random effect models, the LM test statistic favoured the random effect model as the suitable model to obtain unbiased estimators. Further, the analysis performed diagnostic checks to examine the presence of cross-sectional correlation in the chosen model by applying the Pesaran test which gives a statistic of 16.907 and a p-value of 0.6290, and hence, confirmed that the chosen model does not exhibit contemporaneous correlation in the residuals. However, it was clear that the parameters have the expected signs and are statistically significant in both the fixed and the random effect models. This suggests that prevailing health spending relative to GDP has an elasticity coefficient of 0.28, suggesting that a unit increase in prevailing health spending relative to GDP would trigger agricultural productivity growth by 28% across the countries of Southeast Asia, all else constant.

CONCLUSION

The estimate of the model shows that prevailing health expenditure relative to GDP albeit, statistically significant, has a strong positive elasticity on agricultural productivity growth across the countries of Southeast Asia during the study period. Moreover, this result is consistent with the theoretical argument of the health-led growth hypothesis as put forward by the endogenous growth theory, that health is crucial to economic growth and development. It, therefore, shows that a unit rise in prevailing health spending would substantially stimulate agricultural productivity growth by 28%, across countries of Southeast Asia, ceteris paribus. This result shows that prevailing health spending has comparatively higher elasticity, implying that raising health expenditure directly would greatly increase agricultural productivity growth apart from its indirect effects on boosting per capita income and raising the levels of living across the countries of the region. Therefore, this result clearly supports the notion that augmenting investment in human capital for the promotion of health and economic outcomes simultaneously. This finding is also in agreement with the empirical evidence of previous studies on the study of human capital on productivity growth. It's consistent with the findings of Piabou's comparative panel study between African countries [12] , also in agreement with the study of Arora on ten industrialized economies [14] and that of Aghion's panel study on OECD economies. [16]

Apart from the theoretical consistency of this study's empirical finding, it's pertinent to note that, the result is also vital to monitoring the health target of SGDs across the countries of Southeast Asia. Most countries of Southeast Asia with the exception of Singapore are developing economies with a larger segment of the population employed by the agricultural sector where the vast majority of the unskilled and semi-skilled labourers are actively engaged. Therefore, improving the stock of human capital in the form of sustaining investment in total health spending could improve productivity growth and subsequently better the population's overall living conditions. Notably, the rapid declines in agricultural productivity growth in these countries could be substantially altered by further developing the stock of human capital through improvement in the state of their population health, inter-alia.

However, as agricultural productivity faces rapid declines in ageing populations with a high burden of chronic diseases, more evidence is needed on the right strategy for the governments to scale up their health spending to align with the current SDGs agenda.

However, factors like climate change, natural disasters, and technological advances may have also accounted for the signs of a decline in agricultural productivity per worker. This may serve as the major limitation of the current study. Future studies should consider estimating a more complex model, possibly with the proxy of these variables to give better policy advice.

AUTHORS' CONTRIBUTIONS:

SS and MMB conceptualise and designed the proposal of the study; MMB and HJ collected the data; SS and MMB defined the methodology, analysed, and interpreted the results. MMB drafted the manuscript; SS critically revised the manuscript finally completed the proof-reading. All authors read and approved the final manuscript.

ACKNOWLEDGMENTS:

We would like to acknowledge the SRM University-AP for providing the database access and research software required for the completion of this study. In addition, a special thanks to Dr. Nishant from Amity University for his critical analysis and proofreading of the research work.

COMPETING INTERESTS:

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

ETHICAL APPROVAL:

This study does not require any ethical approval.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

THE ASSOCIATION BETWEEN ADMISSION TO A TERTIARY CHILDREN'S HOSPITAL AND FUTURE UNPLANNED DENTAL PRESENTATION

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ABSTRACT

OBJECTIVE:

Dentistry should aim to prevent rather than focus on end-stage treatment which is more costly and less effective. This study investigated the association between unplanned dental presentations and any previous admissions at a tertiary hospital for children.

DESIGN:

A retrospective analysis of 351 unplanned dental presentations at PCH was performed.

SETTING:

A tertiary children's hospital, the Perth Children's Hospital (PCH).

MAIN OUTCOME MEASURES:

Reasons for unplanned presentations (infection, trauma, others) and the history of any previous admissions at PCH were analysed.

RESULTS:

Dental infection and trauma were the main reasons for the unplanned dental presentations. More than half of those who presented due to dental infection had at least once previous admission at PCH due to other reasons. Patients who presented with dental infection were more likely to have previous visits by community nurse or social worker, while those who presented due to trauma, were more likely to have had previous visits at orthopaedic or fracture wards of the same hospital.

CONCLUSIONS:

Community nurses and social workers can possibly play a role in informing patients about dental care options in the primary care sector.

KEYWORDS

Children, Tertiary Hospital, Dental

INTRODUCTION

Paediatric dental health is an essential aspect of general child health and development. Dental caries is one of the most common chronic and costly diseases in children. [1] Although the proportion of children with dental caries has declined in Australia during the last 2 decades [2], hospital presentations for treatment of dental problems still have a considerable impact on Australian society. [3] Dental caries is a time-evolving condition, and chronicity is required for the condition to become significant enough to warrant hospital inpatient treatment. [4] Consequently inpatient treatment under general anaesthesia at a tertiary hospital can have a significant impact on the child (and family), society, and at a substantial cost to the health system that may have been prevented. Therefore, investigation of strategies for managing dental caries on a population level, and avoiding hospital presentation, is an important area of dental public health research.

The Perth Children's Hospital (PCH) is the only specialist paediatric hospital and trauma centre in Western Australia (WA). It is the major referral centre for children in WA. [5]

In Australia the public dental service provides limited dental care only for eligible parts of the population, and waiting times can be lengthy. [6] Private dental care is costly for patients, and not an easy option for all, especially for those who do not have private health insurance. Additionally, some individual patients might postpone simple dental treatment due to procedural anxiety. [7] The cumulation of potentially preventable dental diseases terminates into a complex dental disease which in turn results in delayed access to tertiary care, a larger reliance on public tertiary hospital care, and putting a preventable burden on the health system. When public health resources are limited, mitigation strategies are needed to manage disease burdens on society.

The objective of this retrospective study was to examine the histories of patients attending for emergency dental care at a specialist paediatric hospital to determine if there were previous admission at the same hospital, that may provide opportunities to intervene, and prevent the costly unplanned dental emergency presentations. The finding can facilitate innovative early intervention strategies and possibly reduce health system costs. Anecdotal evidence suggests that many child dental emergency patients have had recurrent admissions to a hospital prior to the dental emergency presentation. The null hypothesis of this study was that there is an association between acute unplanned dental presentation and having a history of previous admission at the hospital.

METHODS

Exemption from Ethics for this study was obtained from the Ethics Committee at the University of Western Australia (RA/4/20/5497) after the study was approved as a Quality Activity Study at the hospital (Number 33241).

De-identified retrospective patient data (n=351) were obtained and analysed. The convenience sample data were collected from the first sequence of the day list of records of patients who had an unplanned presentation at the Perth Children's Hospital's dental department. In this study, unplanned dental presentation means patients who visited at PCH dental department (In-patient or Out-patient) without having an appointment including the patients who were referred from the emergency department of PCH or who had a referral from outside of the PCH. Data were collected in 2017 and in 2019, but not in 2018, as the hospital moved physical sites in that year, and any effects of the move on patient attendance was thus avoided. Data collected for this study included presentation date, the dental reasons for presentation, age, gender, Indigenous status, and a summary of previous admission at PCH (any previous admissions to the hospital, and to which wards/departments were the previous visits/admissions).

Data storage and statistical analyses were conducted by Microsoft Excel (Version XX, Microsoft Redmount USA). Significant differences were based on P value<0.05. MedCalc software was used for comparison of proportions. [8]

Comparisons were also made between unplanned dental presentation due to dental infection (which could be preventable) and dental trauma (which is difficult to prevent).

RESULTS

The sample of unplanned dental presentations at PCH were included 159 (45.3%) girls and 192 (54.7%) boys. Out of 185 cases who presented because of dental infection there were not significant difference in gender, while

among 148 dental trauma cases 64.9% (n=96) were boys and 35.1% (n=52) were girls (P=0.0011<0.05). 18 cases were reported discomfort for reasons other than infection or trauma.

190 (54.1%) cases presented directly to the emergency department of the hospital and 161 (45.9%) of them were referred by another health care services. The dental treatment of more than three-fifth (64.1%) of patients had been accomplished under general anaesthesia. 11.1% of them had Indigenous status and almost 80% were from Perth metropolitan area.

The age of the patients ranged from 10 months to 19 years; with the average aged 5.8 years. The most frequent presentation age was 4 years old.

Of 351 cases, almost half (47.6%) of them had at least one previous admission to PCH (Table 1). Previous admission means visited as an In-patient to any departments of the hospital, not only dental. For analysing purposes, two categories were created: those who had a previous admission (n=167), and those with no previous admission (n=184) . There were no significant differences in reason for unplanned dental presentation between the two groups (previous admitted and no previous admitted) (Table 1).

The main reasons for unplanned presentation were dental infection and dental trauma. Of all the presentations, 52.7% had a problem resulting from dental infection, 42.2% experienced dental trauma, and 5.1% presented for other reasons.

The study found that 50.8% of patients with dental infection had at least one previous admission to PCH (for other medical issues), and 43.9% of patients with dental trauma had a previous admission to PCH (Table 1).

TABLE1: PREVIOUS ADMISSION AND REASONS FOR UNPLANNED DENTAL PRESENTATIONS

UNPLANNED DENTAL PRESENTATION	NO PREVIOUS ADMISSION	AT LEAST ONCE PREVIOUS ADMISSION
Infection Reasons (185)	49.2% (91)	50.8% (94)
Trauma Reasons (148)	56.1% (83)	43.9% (65)
Other Reasons (18)	55.6% (10)	44.4% (8)
Total (351)	52.4% (184)	47.6% (167)

Children who had previous medical admission to PCH, attended at various wards of the hospital before the unplanned dental presentation (Table 2). Some patients attended several (different) wards previously. The most common "wards" of the hospital previously admitted by dental patients were Ear, Nose and Throat (ENT & Audiology), General Medicine (General & Paediatric Medicine), Surgeries (General & Paediatric & Plastic Surgeries), Orthopaedic (Plastic, Orthopaedic, Fracture), Community Nurse and Social Work.

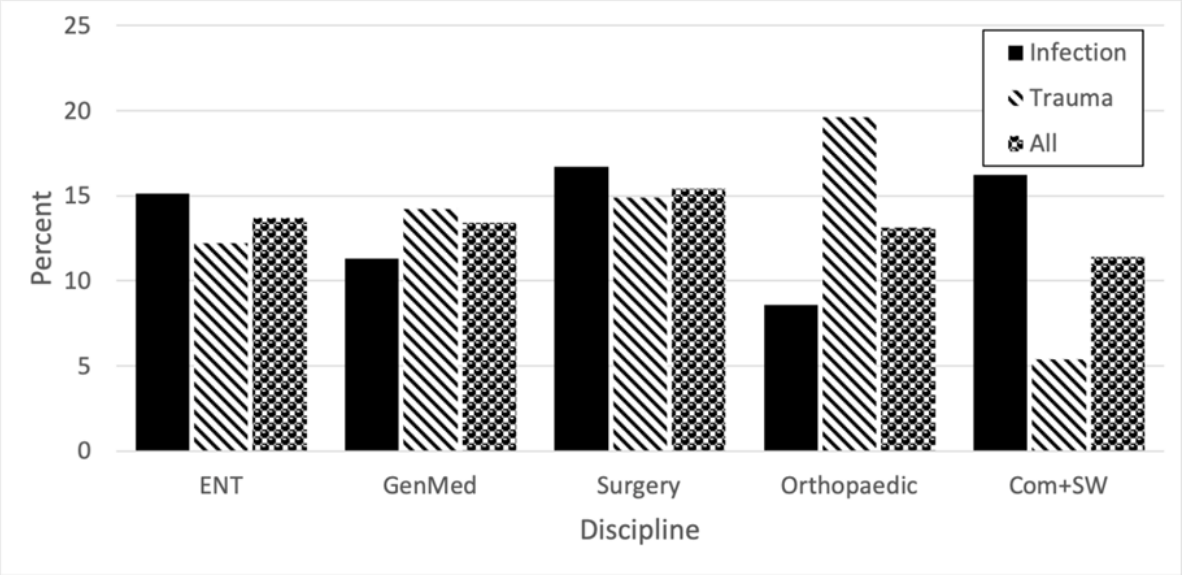
In total the proportion of dental patients who had previously been admitted to ENT and Surgery were slightly more than other parts of the hospital (Table 2).

In this study, the patients who had visited community nurses or social workers were more likely to have unplanned dental presentation because of dental infections. Patients who had a previous admission to the orthopaedics or fracture ward at PCH, were more likely to present at the dental department as a result of dental trauma (rather than dental infection) (Table 2, Figure 1).

TABLE 2: PREVIOUS WARDS VISITED AND REASONS FOR UNPLANNED DENTAL PRESENTATIONS

EMERGENCY REASONS / MEDICAL WARDS	ORAL INFECTION 185	ORAL TRAUMA 148	OTHER ORAL PROBLEMS 18	TOTAL NUMBER 351
ENT	28(15.1%)	18(12.2%)	2(11.1%)	48(13.7%)
General Medicine	21(11.3%)	21(14.2%)	5(27.8%)	47(13.4%)
Surgeries	31(16.7%)	22(14.9%)	1(5.6%)	54(15.4%)
Orthopaedic	16(8.6%)	29(19.6%)	1(5.6%)	46(13.1%)
Community Nurse & Social work	30(16.2%)	8(5.4%)	2(11.1%)	40(11.4%)
Physiotherapy	5	3	0	8
Respiratory	8	2	1	11
Ophthalmology	8	6	1	15
Cardiology	3	4	1	8
Renal	4	3	0	7
Speech therapy	5	2	0	7
Occupational therapy	5	3	0	8
Others	45	30	12	87

FIGURE 1: PROPORTION OF UNPLANNED DENTAL PATIENTS DUE TO INFECTION VERSUS TRAUMA BY PREVIOUS WARD ADMISSIONS.



There was a significant statistical difference in presentation due to dental infection compared to dental trauma in patients who had previous visits to the Orthopaedics wards, or with Community nurses and social workers (P value<0.05) (Table 3).

The proportions between those who presented with infection versus trauma is different between the groups of patients who have had previous admission to ENT, general medicine and surgery wards at PCH, but they were not statistically significant (P value> 0.05) (Table 3).

TABLE 3: DIFFERENCES BETWEEN TWO GROUPS (PRESENTATIONS FOR INFECTION AND PRESENTATION FOR TRAUMA), BY PREVIOUS WARDS VISITED

MOST COMMON PCH WARDS HAD BEEN VISITED BY UNPLANNED DENTAL PATIENTS	ENT	GENERAL MEDICINE	SURGERY	ORTHOPAEDIC	COMMUNITY NURSE & SOCIAL WORK
Infection(185)	28(15.1%)	21(11.3%)	31(16.7%)	16(8.6%)	30(16.2%)
Trauma(148)	18(12.2%)	21(14.2%)	22(14.9%)	29(19.6%)	8(5.4%)
P*	0.4466	0.4286	0.6558	0.0036	0.0021

P<0.05 deemed significant, Chi-square tests between categories.

DISCUSSION

In this study, dental Infections and trauma were the most common reasons for unplanned dental presentations at the tertiary children's hospital. A study from the US also showed that the main reasons for dental attendance at the emergency department of a hospital were trauma and dental caries (51% trauma, 40% caries, 9% other reasons). [9]

There were no previous studies in the literature investigating if child emergency dental patients had any previous admission to a tertiary children's hospital.

Prevention of acute dental infection in children would not only improve the general and dental health of children, but at the same time also reduce the burden on tertiary hospitals. Dental trauma due to accidents is difficult to prevent, but dental infection is usually the result of untreated dental caries, and takes a while to progress to a point where hospital treatment is unavoidable. Strategies to identify children at high risk for dental caries, and subsequent prevention in the primary sector, might prevent later unplanned dental presentation and hospitalisation for dental treatment. The results of this study have shown near to half of the unplanned dental patients (47.6%) have had a previous admission to the Perth Children's Hospital for different issues. About half of those who presented with dental infection (50.8%) had at least one previous admission to the hospital. Therefore, about half of the high risk group had already had some contact with the health system, and available to receive possible intervention strategies for prevention of dental infection.

The results have shown that the patients who had been visited by community nurses or social workers are more likely to present for an unplanned dental presentation because of dental infection (Table 3, P<0.05). Community nurses mainly monitor growth indices, developmental milestones, give advice on nutrition, mental health for mothers and children. Social workers look after family well-being, domestic violence, housing, transportation, disability resources, NDIS registration and paperwork. They also can advocate for the patients and their families to get funds and have their registration, pension cards, or schooling issues. Consequently, it can be presumed those underprivileged children or probably patients with socio-community problems, are more likely to visit community nurses or social workers. The strong association between socio-economic disadvantage and poor oral health among Australian children has been well-established. [10] Therefore, community nurses and social workers can be helpful as a point of contact and refer to primary dental services.

In addition, this study has shown that patients who had a previous admission to orthopaedic or fracture wards at PCH, were more likely to present with dental trauma or a dental injury. It seems that some children might be more accident prone. Although the aetiology of dental trauma

cases was not investigated in this study, previous studies indicate that dental trauma in children is most likely caused by falls, sport, traffic accidents, violence, inappropriate use of teeth or biting a hard item, and others depend on population type, age, culture, region in the world and environment. [11, 12, 13] It is possible that certain sports or ages are more at risk of dental trauma. Based on our findings it might be suggested that children admitted at orthopaedic or fracture wards at hospital, be provided with advice on the use of helmets or sport mouth guards when they are playing sports or riding. In this study, there was a significant difference between boys and girls for a dental trauma accident ($p<0.05$). Other studies also have reported that boys experienced dental injures more often than girls. [9,11,13]

Many children who had unplanned dental presentations at PCH have had previous admission to this tertiary hospital because of surgery, ENT or general medicine problems so they visited a paediatrician. Hence, paediatricians potentially could be helpful for prevention of dental disease. The analysis of national survey data in the U.S revealed that more than 90% of paediatricians agreed about their valuable role on the promotion of oral health and counselling families on the prevention of dental problems, however they reported lack of previous training in dental health issues during their academic education. [14] Increasing the information of paediatricians about preventive dental care could be another recommendation in order to reduce unplanned dental presentation.

Previous works found a connection between middle ear or respiratory tract infection in early childhood and increasing chances of severe dental caries in the future. [15,16] Some studies have also shown that frequent infectious diseases in early childhood can be associated with enamel hypoplasia, leading to increased susceptibility for dental caries. [17] In this study, although ENT was one of the most common wards in which the unplanned dental patients had a past history of admission, there was no significant association between unplanned dental presentation and previous ENT admission to the same hospital. Nelson et al. (2005) also reported that there is no relationship between ear infections and dental caries in preschool-aged children. [19]

A New Zealand study showed that Early Childhood Caries (ECC) among preschool children was not associated with admission for other medical conditions but it was closely related to injury admissions. This association could have other contributory factors, such as social factors, including underprivileged children from poor residential environments, large families, and inexperienced young mothers. [20] In addition, the study in New Zealand found that the most deprived children had higher prevalence of early childhood caries. [20] This study however was difficult to compare with our findings, due to a different study population (age), different health system and different methodology used.

One of the limitation of this study was to obtain a larger sample size, and lack of some available data due to ethical and privacy concerns. Future study with a bigger sample size in which looking for other different underlying variables could be useful.

CONCLUSION

Dental infections and trauma lead to a significant burden of unplanned dental presentations at the tertiary children's hospital in Western Australia. As dental infections is a preventable condition, preventive and timely general dental care could avoid unplanned hospital presentations. Dental caries could have been managed by general dentists, if the patients are treated in the early stage of the disease. Health workers at hospitals, such as paediatricians, social workers and community nurses can be helpful in increasing awareness about dental care and/or referral for dental treatment, as many children are likely to have contact with these services prior to dental problems developing. Effective effort is necessary to develop dental care policies and programmes targeted to high-risk children.

This research did not receive any specific funding.
The authors declare no conflicts of interest.

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ACHSM Asia-Pacific Journal of Health Management

REVIEW ARTICLE

CAN NATIONAL ORAL HEALTH POLICY REFORM BE SUCCESSFULLY TRANSLATED INTO PRACTICE AND REDUCE THE BURDEN OF DISEASE IN AUSTRALIA?

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ABSTRACT

BACKGROUND:

The discrepancy between policy makers decisions, current research and clinical practice is of huge significance to the health industry and the Australian community.

AIM:

Evaluate of translational research frameworks and policy formulation within the Australian oral health context.

METHODS:

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a focused systematic search was conducted using an electronic search of the CINAHL database, including Medline, Cochrane and Scopus. A combination of key terms including "oral health", "prevention'', 'translational research', "public policy", were used for the searches.

RESULTS:

The initial literature search found 561 abstracts in CINAHL database. Review against the inclusion criteria and removal of duplicates yielded 129 abstracts; further reviewed against the inclusion criteria resulted in 35 included in the review of translational research models. Across the 35 papers 8 different frameworks for translation of research evidence into policy and practice were utilised across the literature. The results reported in these studies show that the PARiHS framework depicts successful translation as a function of the relationship between evidence, context and facilitation. These interplays of elements are particularly of relevance to oral health due to the complexity of the sector. Context (current and historical) and facilitation (including governance/regulation) are the foundational drivers of successful implantation of evidence into practice.

CONCLUSION:

The PARiHS framework for implementing research into practice is an appropriate model for oral health. Universal access is a feasible step in addressing the current inequities of access to oral health care.

KEYWORD

oral health, policy reform, policy solutions, evaluation, practice, translational research, Australia.

BACKGROUND

Many dental conditions are preventable and there are numerous evidence-based activities that are known to prevent oral disease and enable early detection and intervention. [1] Despite this available evidence the burden of oral disease within Australia is continually increasing. [2, 3] Since the introduction of the Australian Dental school scheme 1973 there have been several Commonwealth government initiatives that have been unsuccessful or abolished in addressing this issue. [4,5]

In Australia, the burden of oral disease is continually increasing. In 2011-12 the cost to the economy was $8.3billion [2] and increased to $9.9billion in 2015-16. [3] Oral health has historically been left out of overall health there is currently an increasing body of evidence linking the impact of poor oral health on whole body health, including mental health. [6] This siloing from the rest of health has resulted in additional complexity for policy solutions implementation and success.

Oral health has recently gained attention on the political agenda. In response to this attention high level policy makers and influencers are formulating policy solutions ideas including the proposed introduction of universal access to oral health care. [7] The discrepancy between policy maker's decisions, current research and clinical practice is of huge significance to the health industry and the Australian community. Within the Australian context lifestyle factors, low health literacy levels, socio-economic factors, access to services, inconsistencies in the implementation of public health initiatives are all identified as contributing factors to the current poor oral health status of Australians. [3,5,6] There has been a historical marginalisation and siloing of dental health services and this has resulted in a primarily privatised sector and a disjointed emergency treatment focused public sector with extensive waitlists. [5]

The negative impact of poor oral health has on both the individual and the economy has also been extensively researched. Poor oral health is associated with lack of participation, reduced productivity, and avoidable hospital presentations. [3,5,6,] At the individual level poor oral health can impact on an individual's ability to eat, speak and self-image. [2,8] The body of evidence on the implications of poor oral health and systemic health are extensive and continuing to grow with established likes between diabetes, cardiovascular disease, pneumonia and mental health. [3,5,6]

There has been a long-standing evidence base for oral health maintenance and disease prevention. At an individual level this involves simple, inexpensive oral hygiene activities such as tooth brushing and interdental cleaning, and dietary choices. [6,9] Water fluoridation has a long-standing evidence base of being a cost-effective public health initiative to reduce the prevalence and severity of oral disease. Within the clinical setting topical fluoride application and fissure sealants are also well-established preventive techniques. [8,9] The advances in dental research and treatment are such that we understand the disease process to enable early disease detection and interventions that arrest and reverse the disease process are highly successful. [5,6]

While we have seen many advances in the understanding and treatment of oral health and diseases, in Australia there has been little progress in a policy sense to translate this evidence successfully to reduce the burden of oral disease. [3,5] Oral health and public dental waiting lists have recently gained media attention [7] which has led to an increased amount of political attention and rise on the political policy agenda. [10] When national policy is successfully and appropriately translated into clinical practical practice not only does it result in efficient and effective use of public funds, it also leads to sustainable practices within the policy area. For example, the national immunisation strategy, since implementation in 1997 has been attributed the continued poliomyelitis (polio)-free status of Australia and to the successful elimination of endemic measles, in 2014 and rubella, in 2018. [11]

Despite the increased attention only a few studies have attempted to identify and synthesise evidence of the burden of oral disease within Australia. A preliminary search of literature showed that no systematic review has been conducted to appropriately translate high level policy into practical application. Therefore, the present study will be conducted to synthesize and critically appraise literature on the evaluation of translational research frameworks and policy formulation within the Australian oral health context.

METHODS

A mixed method approach was taken to evaluate the translational research frameworks and policy formulation within the Australian oral health context. Due to oral health policy being a complex area, expanding across both primary and public health systems as well as the limited availability of current peer reviewed literature within the Australian context. A systemic literature review was conducted, and the results of this review were then utilised as a part of the critically appraised topic. [12]

RESEARCH PROTOCOL

The PRISMA statement [13] was used as a framework for the literature component of the research.

INFORMATION SOURCES

A focused literature search was conducted using an electronic search of the CINAHL database, including Medline, Cochrane, and Scopus. Key words used included oral health, prevention, translational research, and public policy. Additional searches were conducted utilising recognised authority websites in this area including the Grattan Institute, professional dental bodies, State and Federal government agencies. Recent Australian media coverage on this topic was also reviewed to capture the current Australian context. Other sources used included identified studies after reviewing the reference list of identified articles.

STUDY ELIGIBILITY CRITERIA

Sources identified using the CINAHL database had to be from an academic peer reviewed journal and available in full text. Included studies were published in English between 2009 and 2018, and described frameworks, models or theories associated with research translation.

RESULTS

The initial literature search found 561 abstracts in CINAHL database. Review against the inclusion criteria and removal of duplicates yielded 129 abstracts; further reviewed against the inclusion criteria resulted in 35 included in the review of translational research models. Across the 33 papers 8 different frameworks for translation of research evidence into policy and practice were utilised across the literature.

FIGURE 1: THE PRISMA STATEMENT RESULTS

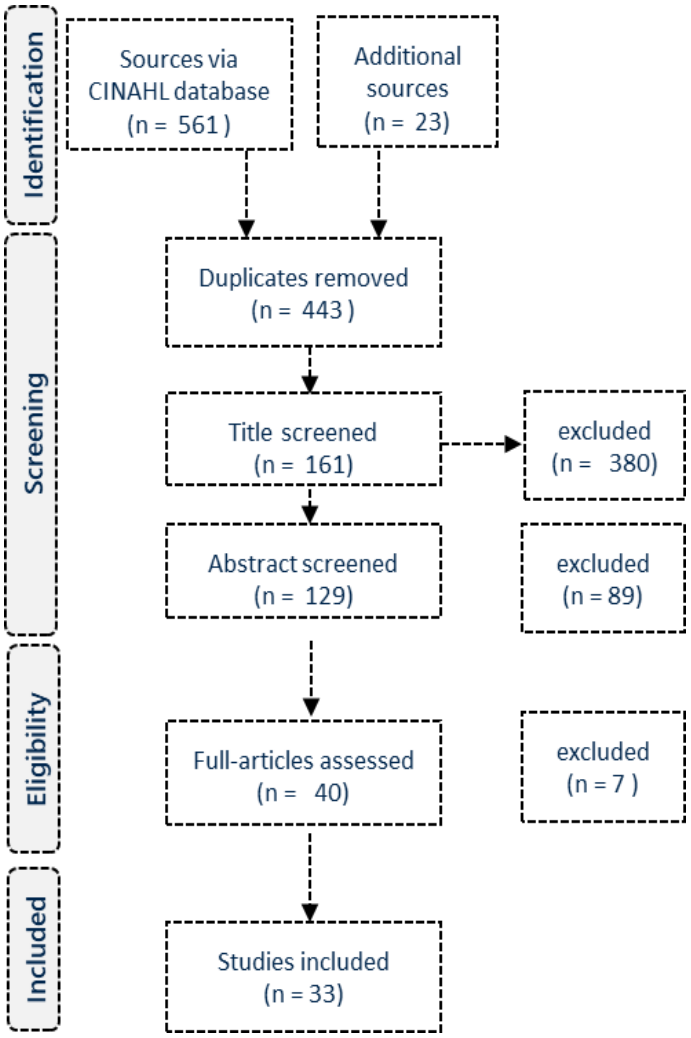


TABLE 1: 9 OF THE INCLUDED PAPERS UTILISED THE RE-AIM (REACH, EFFECTIVENESS, ADOPTION, IMPLEMENTATION, AND MAINTENANCE) FRAMEWORK

STUDY OR ACADEMIC PAPER	METHODOLOGY AND FINDINGS OVERVIEW
Bakken and Ruland, 2009 [14]	Validation of RE-AIM across 2 case studies. Outcomes concluded the framework as valid in real world scenarios.
Glasgow, Dickinson, Fisher, Christiansen, Toobert, Bender, et al. 2011 [15]	Use of RE-AIM to develop a multidimension health assessment tool that enables and guides patient-centred holistic interactions in management of common chronic illness seen in adult populations within the primary care setting.
Shubert, Altpeter and Busby-Whitehead, 2011 [16]	Use RE-AIM framework to assess effectiveness of exercise-based research intervention within the community setting. Results Partnerships between community and healthcare providers are key to successful implementation of falls prevention interventions.
Weiss, Jones, Lopez, Villar-Loubet and Chitalu, 2011 [17]	Utilisation of "train the trainer" strategy, and the Glasgow RE-AIM models to guide and develop implementation strategies of research. Identifying stakeholder involvement and engagement (scientific, community, political) as key success factor.
Kim, Towers, Renaud, Zhou, Shea, Galvin and Volpp, 2012 [18]	Intervention reach and efficacy assessed individually and combined. Data collection via telephone interviews and focus groups. Results: context and real-world constraints contribute to variance in impact across sites.
Almeida, Pardo, Seidel, Davy, You, Wall, et al. 2014 [19]	Development of a trial utilising the RE-AIM framework, in order to assess the effectiveness and cost of 3 different interventions. RCT conducted with outcomes measures at baseline, 6, 12, and 18 months.
Sweet, Ginis, Estabrooks and Latimer-Cheung, 2014 [20]	Use of each element of RE-AIM as a component of an operationalised framework for multi-sector partnerships. Result has enabled the RE-AIM framework to be applicable to multi-sector partnerships to assess their public health impact.
Matthews, Kirk, Macmillan and Mutrie, 2014 [21]	A systematic review with the aim to report the findings of physical activity promotion interventions included during routine diabetes care utilising the RE-AIM framework for their process data. Results were limited with inconsistencies with intervention duration and reporting data.
Altpeter, Gwyther, Kennedy, Patterson and Derence, 2015 [22]	Use of RE-AIM framework to develop a multi-step mid-course assessment of the REACH II community translation project. Data collection involved quantitative (survey) and qualitative (discussion group) components. Results enablement of all stakeholders to have a voice via the assessment framework.

TABLE 2: 6 OF THE INCLUDED PAPERS UTILISED THE TRANSLATION RESEARCH CONTINUUM OR 'T' MODELS

STUDY OR ACADEMIC PAPER	METHODOLOGY AND FINDINGS OVERVIEW
Khoury, Gwinn and Ioannidis, 2010 [23]	Literature review into the applications of epidemiology into translational research via 4 phases (T1-T4). Finding there is an increased recognition of the role epidemiology plays in successful TR implementation and evaluation
Glasgow, Vinson, Chambers, Khoury, Kaplan, Hunter and National, 2012 [24]	To address the vast gap between current knowledge and practice in the area of dissemination and implementation research suggestion implementation of 5 core values: rigor and relevance, efficiency, collaboration, improved capacity, and cumulative knowledge is required
Drolet and Lorenzi, 2011 [25]	Literature review concluding whilst the 'translation continuum' is an appropriate description of translational research into practice, the current model is ineffective placing too much on translational research limiting the scope of the model and not accounting for all relevant factors.
Callard, Rose and Wykes, 2012 [26]	Literature review on translational research and medicine the authors propose a linear model is not appropriate and an 'interlocking loop' is a model which service user and other stakeholder involvement feed into each of its elements.
Spoth, Rohrbach, Greenberg, Leaf, Brown, Faga, et al. 2013 [27]	Assessment of identified challenges to the furthering of T2 translational research "*(1) building infrastructure and capacity to support systems-oriented scaling up of evidence-based interventions, with well-integrated practice-oriented T2 research, and (2) developing an agenda and improving research methods for advancing T2 translation science.*" Concluding there is potential to enhance the health and well-being of future generations with refinement to the current T2 models used.
Rubio, Robinson, Gilliam, Primack, Switzer, Seltzer and Kapoor, 2014 [28]	Interviews, assessing the usefulness of translational models. Concluding use of multiple models can assist with educators and mentors to guide investigators enabling increased productivity translational research.
Atchan, Davis and Foureu, 2014 [29]	Investigation to identify an appropriate theory and model to identify gaps and barriers between evidence and practice in the uptake of the BFHI in Australia. Knowledge translation theory and the research to practice pipeline models most appropriate. Concluding commonality of issues and barriers identified in this field in both the Australian and international context the knowledge translation theory and the research to practice pipeline model is of practical value to examine barriers.

TABLE 3: 5 OF THE INCLUDED PAPERS UTILISED THE KNOWLEDGE TO ACTION (KTA) FRAMEWORK

STUDY OR ACADEMIC PAPER	METHODOLOGY AND FINDINGS OVERVIEW
Field, Booth, Ilott and Gerrish, 2014 [30]	Citation analysis and systematic review of studies applying the KTA framework to implementation projects finding the framework utilised across numerous settings and contexts with varying degrees of completeness. Concluding further research is required to explore and assess the true value of the KTA Framework.
Straus, Tetroe and Graham, 2011 [31]	Narrative review outlining what knowledge translation is and a framework for its use. Finding key decision makers failing to use research evidence to support decision making is no uncommon there is numerous identified gaps within the literature including the need to develop valid strategies for assessing the determinants of knowledge use and for evaluating sustainability of knowledge translation interventions.
Licskai, Sands, Ong, Paolatto and Nicoletti, 2012 [32]	Utilisation of the KTA framework to develop an interdisciplinary asthma management program delivered across regional Canada at multiple sites. Concluding the KTA framework was appropriate in guiding multi-level organizational change and delivers cost effective outcomes.
Kastner and Straus, 2011 [33]	Descriptive analysis of applications of the KTA in conjunction with additional frameworks in the development of clinical tools. Concluding combined frameworks utilisation assists with addressing potential barriers and anticipating how knowledge will be sustained and disseminated.
Sood, Manns and Nesrallah, 2014 [34]	Systematic review of the use of KTA to describe the planned Canadian knowledge translation strategy for improving knowledge and practices pertaining to the timing dialysis initiation. Concluding use the KTA assists with identification of barriers and variation in practice.

TABLE 4: 2 OF THE INCLUDED PAPERS UTILISED THE PROMOTING ACTION ON RESEARCH IMPLEMENTATION IN HEALTH SERVICES (PARIHS) FRAMEWORK

STUDY OR ACADEMIC PAPER	METHODOLOGY AND FINDINGS OVERVIEW
Stetler, Damschroder, Helfrich and Hagedorn, 2011 [35]	Systematic review of PARIHS framework conclusion that the current model could be strengthened and developed a guide as a companion recommending both to be applied prospectively and comprehensively.
Bergström, Peterson, Namusoko, Waiswa and Wallin, 2012 [36]	A qualitative study conducted in a district of Uganda, data collection via focus group discussions and semi-structured interviews utilising the PARIHS framework. Concluding "*further development of the context assessment tool, assessing factors for successful implementation of evidence in low-income settings-resources, community involvement, and commitment and informal payment-should be considered for inclusion.*"

TABLE 5: 2 OF THE INCLUDED PAPERS UTILISED THE EVIDENCE BASED PUBLIC HEALTH (EBPH) MODELS

STUDY OR ACADEMIC PAPER	METHODOLOGY AND FINDINGS OVERVIEW
Jacobs, Jones, Gabella, Spring and Brownson, 2012 [37]	Review of EBPH models finding Key elements of EBPH are engaging the community in assessment and decision making; using data and information systems systematically; making decisions on the basis of the best available peer-reviewed evidence (both quantitative and qualitative); applying program-planning frameworks (often based in health-behavior theory); conducting sound evaluation; and disseminating what is learned.
Hess, Eidson, Tlumak, Raab and Luber, 2014 [38]	Review of EBPH to develop an EBPH approach climate change concluding with modifications the EBPH is appropriate to, support climate change adaptation activities. There is however limited regarding successful interventions and knowledge translation, specifically in predicting future health impacts and outcomes.

TABLE 6: 5 OF THE INCLUDED PAPERS UTILISED THE STAGES OF RESEARCH PROGRESSION (ROCKET MODEL)

STUDY OR ACADEMIC PAPER	METHODOLOGY AND FINDINGS OVERVIEW
Milat, Monger, Smith, Bauman, Redman and Goodger, 2011 [39]	Descriptive paper of the practical application of the "Nutbeam and Bauman Stages of Research and Evaluation Model" within the Australian context.
Milat, Bauman, Redman and Curac, 2011 [40]	Systematic review of physical activity interventions in preventing falls finding limited intervention studies concluding moving towards replication and dissemination studies has a greater potential for improving population health.
Rissel, Laws, St George, Hector, Milat and Baur, 2012 [41]	Use of a scoring criterion applied within the five stages of an 'evidence-building' framework concluding the framework assisted in the identification of research and evaluation opportunities.
O'Hara, Phongsavan, King, Develin, Milat, Eggins, et al. 2014 [42]	Evaluation of a population-based telephone service within the Australian context in order to identify improvement opportunities concluding "*Translational formative evaluation is a necessary intermediate step, following efficacy studies and a precursor to population-wide implementation of public health programmes.*"
Rychetnik, Bauman, Laws, et al. 2012 [43]	Review of the variations across the literature of the definition 'translation' within public health finding 4 district translational areas

TABLE 7: 2 OF THE INCLUDED PAPERS EXPLORED THE INTERACTIVE SYSTEMS FRAMEWORK FOR DISSEMINATION AND IMPLEMENTATION (ISF)

STUDY	METHODOLOGY AND FINDINGS OVERVIEW
Flaspohler, Lesesne, Puddy, Smith and Wandersman, 2012 [44]	A descriptive article on ISF evolution and current applications
Chambers, 2012 [45]	A reflective article on the profession of ISF with discussion on the framework strengths and weaknesses

TABLE 8: 1 OF THE INCLUDED PAPERS REVIEWED THE UK MEDICAL RESEARCH COUNCIL (MRC) FRAMEWORK

STUDY	METHODOLOGY AND FINDINGS OVERVIEW
Barley, Haddad, Simmonds, Fortune, Walters, Murray, et al. 2012 [46]	Systemic review of the use of the Medical Research Council (MRC) guidelines for developing and evaluating complex interventions concluding that is an appropriate framework to use in the development of a depression and cardiac disease management program.

TABLE 9: EVALUATION OF FRAMEWORKS

FRAMEWORK	KEY FINDINGS	EVALUATION (WITHIN AUSTRALIAN ORAL HEALTH CONTEXT)
RE-AIM framework	Framework may assist in policy comparisons and impact estimations at a public health level. Utilisation of the framework during policy planning and development has been attributed to success of policy implementation and integration with other existing strategies.	Components of this model are particularly of relevance with the successful integration of oral health prevention strategies into general health promotion. The highlighting of the maintenance of implementation is specifically relevant in oral health as has been attributed to previous policy failings.
Translation research continuum or 'T' models	The model has evolved from a 2-step model to a 5-step framework. Utilisation can assist in identifying interventions that are likely to be successful at a larger scale.	This model has the strengths in enabling successful scaling of interventions. The model is limited in its approach to addressing all factors causing the gaps between research translation into practice
The KTA framework	This conceptual framework can assist in identification of barriers and variation in practice across different contexts.	Limitation in identifying the full extent of success barriers and practice variations across the diversity of settings within Australia.

Promoting Action on Research Implementation in Health Services (PARiHS) framework	This frame work proposes that there is an interplay between evidence context/environment and method or way in which the process is facilitated. With an emphasis placed on context	The strength of this framework is the identification of the key elements that are needed to be considered to determine success. There is limited evidence of success outside of the organisational level. This frame does however highlight key areas that have been identified as areas of failure in past oral health policies within Australia
EBPH models	This framework places an emphasis on public health impact and funding effectiveness	The strength of this framework is the consideration to funding effectiveness and quality of evidenced used to formulate policy. The limitation is accounting for the historical complexities of oral health within Australia and the how this framework would translate across the private sector.
The stages of research progression (rocket model)	This model has key focus on evaluation and development of research questions.	Utilisation of this model could be used throughout the evaluation development of future policies but has limited usability for oral health policy in the current Australian context, as there is already an extensive evidence base.
The ISF	This framework can be used to identify priority areas and understand need and barriers. ISF proposes systems to bridge the gap between research and practice recognising implementation approaches utilising partnerships are preferable over top-down approach.	There is already an extensive body of research outlining need, priority and barriers to good oral health within Australia. This model could be utilised in future oral health policy development and assessments.
The MRC framework	Provides the guidelines to develop clinical programs that account for multiple factors and promote sustainability.	Not relevant in the Australian context

DISCUSSION

Currently in Australia there is jurisdictional variation in the eligibility, costs and type of oral health services provided by the public health sector, for example Victoria & SA have a co-payment system, NSW & QLD a free dental system. [47,48,49,50] There are a number of national programs including the Child Dental Benefits Scheme [51] that can be utilised by eligible patients across both public and private dental providers. This is a relatively new initiative in comparison to other health initiatives provided by the government. [4,5]

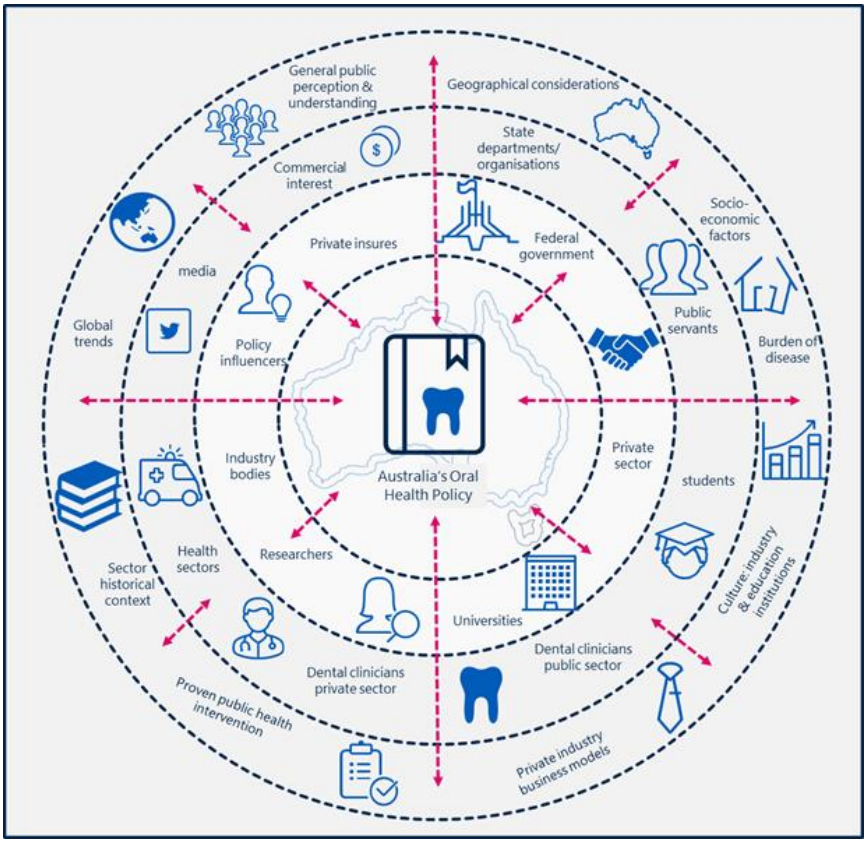
Oral health has historically been separated from the remainder of the healthcare system both within Australia and internationally this is despite dentistry being one of the oldest medical professions, dating back to 7000 B.C. [52] Oral health has since significantly evolved in the way in which it is practiced, clinical staff are educated and the understanding of the important role oral health plays with an individual's systemic health.

Within Australia this evolution of the sector has resulted in a primarily privatised industry of tertiary trained clinicians,

influential professional bodies, and a rapidly growing cosmetic component to oral health practices. The business models used in some of the sector has been subject to ethical practice questions and rorting of governmental payment systems contributing to policy failures. [5]

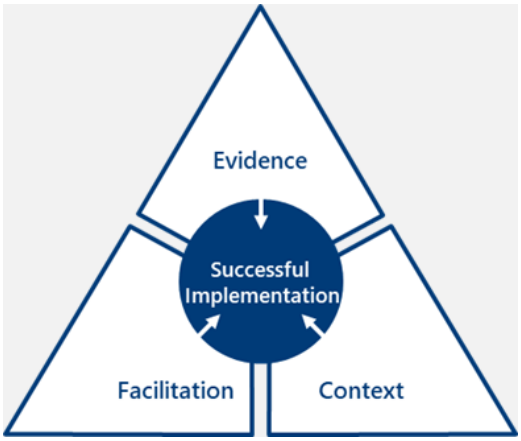
The identified skilled workforce shortage in 2010 led to the establishment of an additional three dental schools. The number of graduates has almost doubled, this influx of skilled workforce has not as intended filled the workforce gaps but instead contributed to the growth in the private practice component of the sector and significantly impacted on the culture of the sector.

FIGURE 2: THE SECTOR HAS DEVELOPED INTO A HIGHLY COMPLEX AREA WITH NUMEROUS FACTORS, STAKEHOLDERS AND CONTRIBUTORS THAT NEED TO BE CONSIDER IN DEVELOPMENT OF POLICY AND IMPLANTATION STRATEGIES



Generally, across the Australian healthcare system there is a continual generation of evidence for practice and patient outcome improvements. Closing the 'gap' between this current research and translating into policy and practice is an ongoing challenge. [43] Successful public policy implementations have a multi-platformed and staged approach including a change management strategy [53,54] and place-based policy. These strategies are of importance in the Australian context due to the variation in the population profiles and service availability across the jurisdictions. [54]

There are several models that have been developed in numerous fields that suggest pathways to address and close this gap between the research, policy, and practice. [53]



The PARiHS framework (Kitson, Harvey & McCormack, 1998) [55]

The PARiHS framework [53] depicts successful translation as a function of the relationship between evidence, context, and facilitation. These interplays of elements are particularly of relevance to oral health due to the complexity of the sector. Context (current and historical) and facilitation (including governance/regulation) are the foundational drivers of successful implantation of evidence into practice. These elements have both been identified as key factors to failings of previous policies.

RE-AIM framework has elements that can be utilised to compare and evaluate policy solutions. The highlighting of the maintenance phase of policy implementation is specifically relevant in oral health as has been attributed to previous policy failings.

[24] EBPH model elements can assist with development of policy solutions that deliver value for public funds and delivery of care in an equitable manner as it emphasises the use of high-quality evidence to support policy formulation. [38] The limitation of both the PARiHS and RE-Aim frameworks have been validated at an organisational level rather than a national level. Within the literature there is limited evidence on frameworks that have been successfully utilised across different settings and jurisdictions and achieved long term sustainability and success.

In March 2019 the Grattan Institute published "Filling the gap: A universal dental scheme for Australia" [5] a report outlining the current shortcomings of the Australian oral health system and funding models, suggesting universal coverage scheme would improve the oral health of Australians through removal of current financial barriers in a number of jurisdictions and populations. There are several levers such as funding that can be used to drive change and reform in the sector. [5,56]. There are currently numerous royal commissions occurring across health system. [11] As this is the highest form of inquiry within Australia, they provide policy makers and regulators with the evidence and levers to enact systemic policy reform and increase governing and regulatory body powers. [57]

CONCLUSIONS

The current Australian context of previous policy failings and the recommendations of recent Royal Commissions indicate a need for stronger governance and a regulatory framework to strengthen the industry. There is an opportunity for significant policy reforms, tightened governance and increased regulatory capabilities in the current Australian context and policy makers should be emboldened by of the findings of recent of Royal Commissions.

Oral health education and prevention strategies needs to be integrated into general health initiatives and health practitioner training. Past government initiatives have not been developed in manner that adequately addresses the context, culture, and business models of the private sector. Components of the PARiHS framework for implementing research into practice is an appropriate model for oral health, in particular the emphasis on context considerations. Elements of the RE-AIM framework can be utilised to strengthen integration of oral health prevention strategies into general health promotion and maintenance of policy implementation. Successful and sustainable national policy implementation needs to include strong governance and regulatory frameworks to ensure compliance and to strengthen the industry.

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ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

DESIGNING A MODEL OF MEDICAL EQUIPMENT PURCHASE MANAGEMENT IN HOSPITALS OF TEHRAN UNIVERSITY OF MEDICAL SCIENCES

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ABSTRACT

OBJECTIVE:

Medical equipment plays an effective and vital role in the diagnosis and treatment of diseases. Each society dedicates a plethora of health resources to these facilities. Since prioritizing and resource allocation are crucial in low-income countries with limited health resources, understanding and improving the purchase management of medical equipment in hospitals is a primary key for preparing high -quality health services. The aim of this study was to design a model for medical equipment purchase management at hospitals affiliated with the Tehran University of Medical Sciences.

METHODS:

The statistical population for the present applied study, consisted of 623 people and the research sample was comprised of 420 people, which was selected using the stratified random sampling method. Data was collected using a researcher-made questionnaire whose variables were extracted from comparative studies and whose validity was measured by the relative content validity coefficient, content validity index and Cronbach's alpha coefficient. The SPSS 18 and AMOS were employed for analyses.

RESULTS:

The most and the least effective aspects of medical equipment purchase management in the studied hospitals were found to be decision-making (path coefficient of 1.244) and organization respectively (path coefficient of 0. 845).

CONCLUSION:

It is crucial to take factors into consideration when using the facilities and capacities available in health and treatment centres. The proposed model can best guide buyer institutions to move towards efficient purchase mentioned in upstream policy documents.

KEYWORDS

Purchase Management; Medical Equipment; Hospital

INTRODUCTION

Today's rapid and continuous technological evolution, which affects most production sectors, also involves healthcare. Indeed, healthcare technologies have become an essential part of the provided services, as they play increasingly significant roles in the diagnosis and treatment of patients. [1,2] The equipment represents a

very dynamic and rapid group of health technology innovations, which annually was allocated a large proportion of health and treatment resources to the purchase, repair, maintenance, and replacement of such equipment both inside and outside country. [3] The growing number of equipment is making a significant contribution to the mounting healthcare costs making it contradict the emphasis of making healthcare affordable. [4] Stewart reported that the number of medical equipment increased by 62% over the past 15 years while the average utilization rate of mobile equipment is only 42%; thus, increasing hospital's acquisition budgets and maintenance cost. [5] According to surveys conducted by Ably, the annual growth rate of these costs is increasing by 15% to 20%, accounting for about 45% of the operating budget of hospitals [6, 7], in which the costs of medical equipment play a significant role in the health expenditure growth. [8]

Due to the fact that health centres are usually faced with constrained resources that must be distributed carefully, policymakers across high _and middle _ income countries have grown interested in the role that accurate purchasing could theoretically have in optimizing the cost-effective provision of healthcare services while simultaneously maximizing population health. [9-10] On the other hand, given the growing wave of expectations in updating equipment and technologies in the last decade, it seems that now is the time to consider purchase management of medical equipment in today's world economic conditions. Purchase management of medical equipment has a critical and important role; with clearly defined Purchase management organizations can explain to their employees what purchasing is and how it should be conducted in that specific organization. It also helps employees to quickly grasp the main purchasing processes and activities and can be used for problem-solving and decision-making. [10, 11]. It is facing a growing pressure to provide visibility and traceability of the purchase, to reduce fraud, to improve flexibility and to ensure communication between everyone involved.

The complexity of the technological assets and medical equipment found in healthcare facilities, in terms of number and diversity, is reflected in the complexity of purchase management, which must be efficient so that the equipment can always be used safely and appropriately. Therefore, Due to lack of funding, health care managers struggle to maintain a balance between patients' access to modern health services and the economic stability of these centres; they also try to select and buy the most cost-effective medical equipment which ultimately affects the development of every country on a national level. [12-14] the uncertainty that comes with purchasing medical equipment make it especially important to select management that can manage the limited organizational resources effectively; these decisions must be made in the changing environment of health policies; patients' demands and hospital competition with other medical centres. [15 -18]

Management policies on the efficient hospital purchases of medical equipment are key to providing high-quality health services. [19-21] this paper reviews the studies conducted on hospital management around the world and presents a well-organized and systematic effort to make fundamental decisions in the field of medical equipment purchase management.

METHODS

This descriptive-analytical, cross-sectional and applied study was carried out in 2018 at hospitals affiliated with Tehran University of Medical Sciences. It was conducted in two phases (Figure 1). The first phase consisted of a library study and a literature review. Data was collected from a series of references including databases, reference books, published reports and information banks such as Medline, PubMed, and other sites related to the Ministry of Health and other authorities including governmental and non-governmental organizations, documents from the Medical Equipment Department of the Ministry of Health, treatment and medical education, documents from the medical equipment offices of Iran Universities of Medical and theses available at the National Library, Tehran University of Medical Sciences and Islamic Azad University (Science and Research Unit) (2006-2017). Comparative tables were used to analyze the collected data.

Comparative tables were used to analyze the collected data. Making use of similarity and difference points shown in the comparative table, 66 variables were identified. The variables were weighted using the Shannon entropy method. Experts were then asked to assign appropriate weight to each of the necessary indicators, the importance, and the relationship of the known components with the management purchases of medical equipment using the Shannon entropy method. Finally, the

variables were ranked and 38 variables were finalized with the opinion of experts.

Bagheri et al. In their research said purchase management is a process including decision-making and implementation of written plans to prepare and meet the organization's needs at the right time, with the desired price and quality from reliable and dependable sources according to the capability. The organization's facilities and in the framework of the rules and standards governing the organization know that according to this definition and making use of similarity and difference points shown in the comparative table, and expert comments the research initial model was presented in five dimensions including planning, decision-making, organizing, leadership, and control. [22]

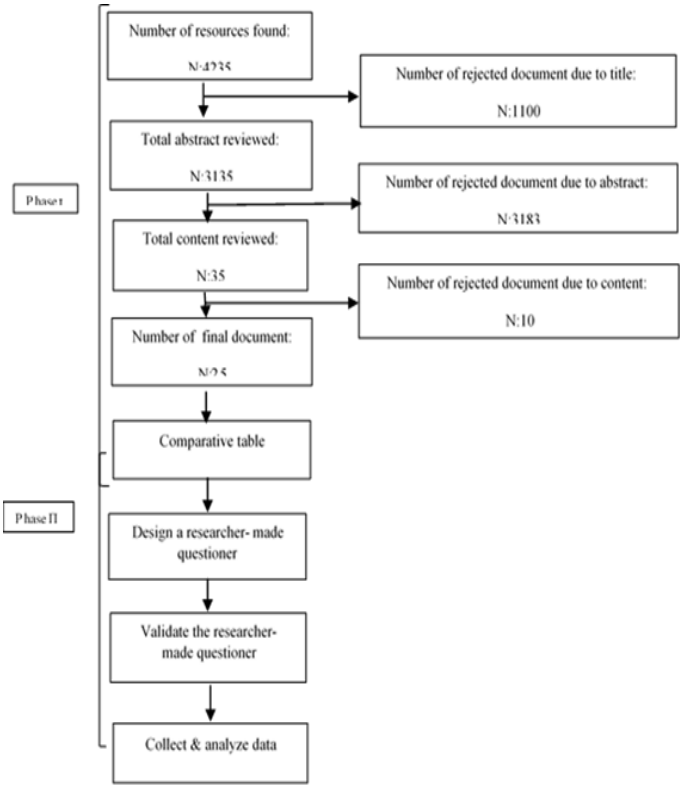
Then, a researcher-made questionnaire was designed according to the initial model and the tools used in studies by Ivelve, Jones, and Tourani. [3, 8,18]

In the second phase of the research, the researcher-made questionnaire along with a schematic outline of the suggested pattern and a description of the model dimensions were given to 20 experts to validate the model. Among the experts were hospital managers, managers and authorities from the Medical Equipment Office of Tehran University of Medical Sciences and the Medical Equipment Unit of the affiliated hospitals; All experts had Ph.D. or M.A. degrees in the fields of either Health and Treatment Service Management or Medical Engineering. The face and content validity of the questionnaire was confirmed in two phases. The first phase was performed using the Delphi method and the second phase was of content type. The Cronbach's alpha coefficient was used to examine the reliability of each studied dimension, first separately and then together. The Likert 5-point scale was used to measure each item on the questionnaire (1 = very low, 2 = low, 3 = moderate, 4 = high, and 5 = very high).

The statistical population of the study consisted of hospital managers, nursing managers, bosses and supervisors of diagnostic and treatment wards and medical equipment units of all hospitals of Tehran University of Medical Sciences as well as managers and experts of medical equipment units of the universities (N=623). They were selected using the stratified random sampling method. The inclusion criteria were the individuals' organizational posts and their employment in management units, medical units and medical equipment units.

In structural equation modeling methodology, sample size determination is more experimental. Bentler and Chou present a minimum of 5 and a maximum of 10 samples for each parameter. [23] Habibie and Adanvar in their research said the sample size can be determined between 5 and 15 observations per measured variable. [24] In this research, a researcher-made questionnaire has 38 variables. According to experts, 11 views are provided for each variable. Therefore, a total of 420 samples are considered. The number of samples in class was determined according to as follows; hospital managers 35 samples, nursing managers, bosses, and supervisors of diagnostic and treatment wards 352 samples, medical equipment units of all hospitals 26 samples and managers and experts of medical equipment units of the university 7 samples. To complete the sample size (the probability of non-cooperation or omission of incomplete questionnaires), 450 questionnaires were distributed. Finally, 420 completed questionnaires were collected.

FIGURE 1: ARTICLE FLOWCHART



Data was analyzed using descriptive statistics, confirmatory and exploratory factor analysis and SPSS 18 and AMOS. The results provided the suggested purchase management model of hospitals affiliated with Tehran University of Medical Sciences. Ethical considerations in this study included observing ethical principles in the use and dissemination of scientific texts. Moreover, the authors had

no conflict of interests in the various stages of this research. The samples voluntarily entered the study and were all assured that their questionnaire information would remain confidential. This research is part of a doctoral dissertation entitled "Designing a Purchase Management Model of Capital Equipment and Medical Consumables of Hospitals affiliated with Tehran University of Medical Sciences" and has the code of ethics no. IR.IAU.TMU.REC.1398.042.

RESULTS

Of the 450 questionnaires distributed, 431 were fully completed and returned. Among which 34 (8%) were completed by managers and nursing managers, 364 (84%) were completed by ward supervisors, 26 (6%) were completed by medical equipment managers and experts of hospitals and 7 (2%) were completed by medical equipment managers and experts at the university headquarters. 101 (23%) of the respondents were male, and 330 (77%) were female. The highest number of respondents was in the age group of 40-50 years, and the lowest was in the age group of over 50 years. Concerning academic certificates, most respondents had bachelor's degrees and only a few had PhDs or higher. Most respondents had clinical certificates, while a few had studied in the field of management and accounting. Also, most respondents had 20-25 years of service experience, while only a few had 0-5 years of service.

Most of the questions in the measurement model used in this research had the factor load of less than 3, and most of the fit indices were lower than the standard limit; thus, some questions were deleted to improve the fit index. The results of these modifications (deleting some questions with a low factor load and creating three co-variances between three pairs of errors) improved the model fit index. Table 1 illustrates the mean variance coefficient extracted for the main studied variables and represents the CR> AVE condition in managing the medical capital equipment purchase.

TABLE 1: MEAN VARIANCE COEFFICIENT OF THE MAIN STUDIED VARIABLES

CR>AVE	COMBINED RELIABILITY COEFFICIENT (CR)	AVERAGE VARIANCE OF EXTRACTION (AVE)	VARIABLE
√	0.72	0.56	Planning
√	0.70	0.51	Decision
√	0.79	0.60	Organization
√	0.75	0.55	Leadership
√	0.79	0.68	Control

After examining the measurement model and confirming its indices as well as confirming the construct validity indices, the structural model or the main model was examined in the final step. The same final measurement model was used for this stage, except that the covariances among the endogenous latent variables were deleted and a residual error was left for the endogenous latent variables. The software output showed a suitable fit of the study model (Table 2). After confirmation, the path coefficients and their significance were examined (Table 3, included in appendix 1). In the standard mode, the P-value was significant for all paths.

According to Table 3 in the appendix, "decision making" (path coefficient of 1.244) had the highest impact, while "organizing" (path coefficient of 0.845) had the lowest effect on the purchase management of medical capital equipment. The second most effective aspect was "planning" (path coefficient of 1.238), followed by "leadership and control" (path coefficient of 1.151 and 0.973 respectively).

TABLE 2: STRUCTURAL AND MEASUREMENT MODEL FIT

STRUCTURAL MODEL	MEASUREMENT MODEL	STANDARD RATE	INDEX
1.09	1.08	3>	X2/df
0.017	0.016	0.08>	RMSEA
0.5	0.5	0.5<	PNFI
0.936	0.937	0.8<	GFI
0.922	0.922	0.8<	AGFI
0.474	0.5	0.9<	NFI
0.909	0.915	0.9<	CFI
0.91	0.925	0.9<	IFI
0.407	0.41	0.9<	RFI

DISCUSSION AND CONCLUSION

Due to the increasing use of services in public hospitals, especially hospitals affiliated with Tehran University of Medical Sciences (because most of them are referral hospitals) and since we are currently faced with serious resource constraints, it is crucial to make optimum use of the available facilities. The planned purchase of medical equipment is especially important towards achieving productivity, safety, ease of operation and reduced personnel workload and probable risks.

The findings of the present study showed in the hospitals of Tehran University of Medical Sciences, the decision-making (path coefficient of 1.244) is the most important aspect of purchase management and strongly affects, market and price competitiveness. Owing to the variety of services and products and the hospital's authority to choose products proportional to its needs, understanding the factors influencing decision-making in a competitive environment and using scientific methods to select a product or service in healthcare institutions are of particular importance.

In health centres, evidence suggests that standard medical equipment should be purchased at the lowest prices to increase purchasing power. To achieve this, competitive advantages must be applied and competitive and agreed prices must be taken into consideration. [25-26] The findings of the study of Liyanto et al. also imply that selecting the most reliable supplier in public or private sectors is based on rational purchasing policies and active competition between different providers over quality and price. [25]

Boyer et al. emphasized competitive prices in the Chinese medical equipment market. [27] In a study conducted in India, Blarjan et al. Stated that to avoid high healthcare costs, the Indian government attempted to set a price ceiling for medical equipment. [28] In the present research, respondents paid more attention to the variable "exchange market". Amerion et al. in their research also suggested that price changes often lead to an increase in the cost of the required equipment and parts which would ultimately result in increased maintenance costs. [29] The political atmosphere, sanctions and exchange rate fluctuations in Iran have worsened Iran's access to the medical market and cannot easily be compared with that of the other studied countries.

While the current economic crisis has made industrialized countries of the world wary of using costly technological devices, the application of advanced medical technology is increasing in developing countries, which is associated with wasting enormous economic resources and actual technological power. [30] In this regard, Isaco states that the most important factor causing the waste of resources is purchasing sophisticated equipment, which is underutilized or ignored due to the lack of maintenance and operation specialists. The purchasing of sophisticated equipment often led to about 20 to 40% in losses. [31]

A well thought out plan for purchasing medical equipment can help us achieve balance in budgeting different needs. According to studies conducted in many developing countries, the medical equipment substitute plan has led to a significant reduction in normal costs. The traditional method in healthcare centres for purchasing and using new medical equipment is usually based on the physicians whose main concerns revolve around patient health and income. [32] In their research, Pauli and Burns stated that physicians' concerns included the treating of patients and income, so, they often sought to use newer technologies to treat their patients. [33] Boots and other researchers argue that health centres are faced with resource constraints and need to have a realistic analysis for acquiring a new device. [31]

The findings of the study of Saleh et al. imply that if a purchase is made without paying attention to its requirements, the purchased items may fail in meeting actual hospital needs. [30] Ozmir, Kumar, and Chakravaddi et al in their researches stated that rapid technological advances in the Turkish healthcare sector, particularly in recent years, have led to an increase in the use of high-tech medical devices, which is mainly due to the government's lack of political commitment to plan and prioritize the purchase of medical equipment. [34-38] While, Mazloum Vajari imply that developing countries such as Iran have limited capital, so it is important to ensure that any investment in medical care technology is made properly. As appropriate management practices create a sustainable environment for medical care technology, strong plans are needed for replacing and purchasing medical equipment. [18]

Concerning leadership, bargain power is useful in many pricing systems to achieve lower agreed prices. In their research, Liyanto and Preker stated that in Canada and Germany, pricing is determined by negotiations between buyers and providers, so the agreed price depends directly on the effectiveness of the service providers' negotiations. [25-26] In a study conducted in Turkey, Gurcanli et al. stated that staff participation in making decisions to purchase medical equipment is completely technical-based. Employee participation rates can vary from non-participation (where supervisors make all purchasing decisions) to full participation (where anyone can participate in the decision-making process). [39] Amerion et al. stated that medical equipment should be purchased after consultation with all staff and specialist members and with the majority of votes. [29]

Regarding governmental aids and interventions, Salehi et al. suggested that if the government increased the purchasing power of medical centres by providing loans and facilities, these centres could be more willing to support purchases of their necessary medical equipment. [40] Chakravaddi et al. stated that in India, the most expensive and modern medical equipment is purchased through loans obtained from the World Bank. [41] Chakravaddi et al. imply that in recent years, India's private sector invested heavily in the purchase of medical equipment by participating in equipment management [38]. In their research, Boyer and Lio stated that in China, medical equipment is procured from the state budget. [27,42]

Concerning the control aspect, many governments have passed national policies and laws for the production, distribution, purchase and maintenance of medical equipment to ensure the effectiveness, safety, and rational use of these devices. [43] Dolan et al. stated that in the United States, agencies such as the US Food and Drug Administration and the European Union's Medical Device Directive have made stricter laws to control and enforce appropriate medical devices for humans. In Canadian hospitals, the technical standards of medical equipment, which are international standards, are regularly updated by national and local organizations in this country. [44]

Chen et al. in their study stated that the Chinese government has begun to formulate and apply laws and policies in this field since 2006. [45] Oner et al. stated that drug and medical equipment regulations in Turkey are formulated in association with the Insurance Fund of Social Security Institute and the Drug and Medical Devices Administration; some of the laws approved in the EU have also been applied in this country. [46] Nevertheless, Tiryakioglu et al. stated that unclear purchase rules, unawareness of organizational strategies, shortage of communications amongst users, lack of organizational knowledge about potential capabilities of suppliers, and lack of purchasing skills are factors leading to purchase management deficiencies in Turkey. [47] In their research, Potel & Chakravaddi stated there are a few standards and regulations in India for the production, import and sale of medical equipment. Currently, medical equipment in this country is considered a part of drug laws and its regulations are approved accordingly. [41, 48]

In terms of organization, respondents paid more attention to the legal requirement of new building constructions,

hospital ward developments, compilation of its plans with regards to concerns about up-to-date equipment and the creation of new wards in health centres, all of which are aimed for the patients' well-being. In their research, Tiryakioglu et al. stated that the National Health Transformation Initiative and the Import Dependency Reduction Program have assisted Turkey's hospitals and enabled them to expand to thousand-bed hospitals, which can result in higher costs. [47] Also, Chakravaddi et al. stated that the Indian Government also pays particular attention to the modernization of its health centres and the purchase of medical equipment; it employs experts in these fields so as to improve decision-making tasks and processes. [41]

As The findings of the present study showed, several components affect the purchase management of medical equipment, which their determination and review, as well as the integration and summarization of the results, make purchase management a specialized and sometimes complex matter. Insufficient attention to the issues raised in this field due to the limited level of information and expertise or one-dimensional perspective has led to an inappropriate summary of data, which causes decision-making to be made incorrectly.

Despite pressure from physicians and patients to use new and expensive technologies and equipment that have not been proven effective; healthcare centres must have appropriate plans and make the right decisions in buying efficient medical equipment. Therefore, attention must be paid to scientific advancements and consequently medical equipment in order to meet the needs of stakeholders and the specific and non-specific hospital revenues in medical equipment purchase management.

Price realization, playability, bargaining power and proper, and sufficient after-sales services are prerequisites of efficient purchase management, especially in Iran where exchange rate fluctuations, sanctions, and economic pressures are more evident.

Up-to-date equipment and the use of new methods of purchase in medical centres that are all for the well-being of patients and increasing the service of the hospital; need efficient supply process equipment under the close supervision of managers hospita.

This can be done by bargaining with managers appropriate procurement contracts and communication with NGOs receive government assistance, develop guidelines and clinical guidelines and make them available to all providers service, guaranteeing the development of a comprehensive educational, cultural, and bedding package to raise the level of awareness of people and service providers, align by forming treatment economics working groups to justify and sensitize practical clinical groups.

ACKNOWLEDGMENT:

The authors thank all staff members and managers of the hospitals affiliated with the Tehran University of Medical Sciences who supported and contributed to this research.

CONFLICT OF INTEREST:

The authors had no conflict of interest in the various stages of this research.

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APPENDIX

TABLE 3: REGRESSION COEFFICIENTS IN STANDARD MODE

PATH COEFFICIENT	P-VALUE	CRITICAL RATE	STANDARD ERROR	ESTIMATE	HIDDEN VARIABLE	PATH	QUESTION
1.238	0.019	2.769	0.587	1.389	Management	<---	Planning
1.244	---	---	---	1	Management	<---	Decision
0.845	0.014	2.447	0.536	1.312	Management	<---	Organization
1.151	0.017	2.378	0.567	1.349	Management	<---	Leadership
0.973	0.008	2.647	0.529	1.099	Management	<---	Control
0.149	0.052	1.943	0.254	0.493	Planning	<---	S3
0.258	0.003	2.941	0.256	0.752	Planning	<---	S4
0.285	0.006	2.726	0.233	0.636	Planning	<---	S5
0.294	0.001	3.187	0.291	0.926	Planning	<---	S6
0.153	0.048	1.979	0.254	0.503	Planning	<---	S8
0.296	---	---	---	1	Planning	<---	S9
0.228	0.031	2.013	0.38	1.3	Planning	<---	S10
0.368	---	---	---	1	Decision	<---	S11
0.162	0.042	2.035	0.424	0.862	Decision	<---	S13
0.254	0.011	2.558	0.275	0.704	Decision	<---	S14
0.325	0.002	2.058	0.36	1.1	Decision	<---	S15
0.187	0.027	2.21	0.463	1.023	Decision	<---	S16
0.218	0.017	2.387	0.539	1.287	Decision	<---	S17
0.168	0.038	2.076	0.393	0.817	Decision	<---	S18
0.215	0.009	2.611	0.41	1.069	Organizing	<---	S20
0.22	0.016	2.4	0.436	1.046	Organizing	<---	S22
0.269	---	---	---	1	Organizing	<---	S23
0.213	0.012	2.52	0.337	0.848	Organizing	<---	S24
0.259	0.004	2.915	0.383	1.118	Organizing	<---	S25
0.218	0.01	2.573	0.369	0.95	Leadership	<---	S26
0.328	---	---	---	1	Leadership	<---	S28
0.311	0.003	2.995	0.494	1.479	Leadership	<---	S29
0.198	0.003	2.972	0.366	1.087	Leadership	<---	S30

0.302	0.003	2.535	0.426	1.325	Leadership	<---	S31
0.202	0.021	2.3	0.453	1.041	Leadership	<---	S32
0.301	0.004	2.346	0.584	1.256	Control	<---	S33
0.211	0.003	2.365	0.45	0.925	Control	<---	S34
0.287	0.012	2.505	0.287	0.719	Control	<---	S35
0.268	0.003	2.914	0.469	1.125	Control	<---	S36
0.298	0.004	2.854	0.327	0.879	Control	<---	S37
0.305	---	---	---	1	Control	<---	S38

ACHSM Asia-Pacific Journal of Health Management

RESEARCH ARTICLE

PROVISION OF EMERGENCY MEDICAL SERVICES IN RURAL AND URBAN SAUDI ARABIA: AN OVERVIEW OF PERSONNEL EXPERIENCES

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ABSTRACT

OBJECTIVE:

Pre-hospital emergency medical services (EMS) are a vital component of health management, however there are disparities in the provision of EMS between rural and urban locations. While rural people experience lower levels of pre-hospital care, there has been little examination of the reasons underpinning these differences through discussion with the providers of EMS, and particularly in countries other than the USA, UK and Australia. The purpose of this paper is to provide an overview of the lived experience of EMS personnel in Saudi Arabia regarding the key issues they face in their work practice.

DESIGN:

This research focussed on frontline workers and middle-level station managers within the Saudi Arabian EMS system and adopted a hermeneutic phenomenology design to better understand the factors contributing to observed disparities between rural and urban areas in Riyadh region in Saudi Arabia. A semi-structured interview approach was used to collect data reflecting realistic experiences of EMS personnel in both urban and rural locations.

RESULTS:

20 interviews (10 each with rural and urban personnel) were undertaken. Data analyses identified three primary thematic categories impacting EMS delivery: EMS personnel factors; patient factors; and 0rganisational factors. Underpinning each category were sub-themes, including working conditions, stress, education and training, and resources, amongst others.

CONCLUSIONS:

The quality and efficiency of EMS services, in both rural and urban areas, was affected by a number of over-arching organizational factors. Implementing major policy shifts, such as recruitment of female EMS professionals, will be critical in addressing these challenges, but is acknowledged that this will take time. Quicker changes, such as improving the advanced training options for rural EMS staff, may help to remediate some of the issues. Public awareness campaigns may also be effective in addressing the identified misconceptions about the role of EMS in Saudi Arabia.

KEYWORDS

Emergency Medical Services; Health services management; Intensive and critical care; Rural; Urban

INTRODUCTION

Pre-hospital emergency medical services (EMS) are an integral component of the overall health management system. They deliver a vital stage in treating patients, with this provision of care resulting in reduced mortality and limiting ongoing health co-morbidities. [1] However, it is known that there is a disparity in the provision of EMS, with rural people in some countries experiencing lower levels of pre-hospital health care when compared to their metropolitan peers. [2] This is particularly problematic when recognizing that EMS may be the only guaranteed health support for individuals who live in remote rural areas. [3] It has been identified that EMS in rural locations have worse outcomes relative to metropolitan sites in some key areas, such as the response and duration time, patient outcomes and operational factors. [4-7] As an example, cardiac arrest patients in rural areas are reported as having lower survival rates prior to hospital admission compared to urban patients. [8] Rural areas have reduced access to specialist EMS service options [4] which are in turn likely to have additional access issues, such as considerable geographic distances and poor road conditions, not similarly experienced in urban areas. [4, 9]. However, most of this research has been undertaken in a small number of countries, such as the USA and Australia [4], with little previously known about urban and rural differences in countries including the Kingdom of Saudi Arabia. Equally, while urban / rural disparities in EMS performance have been identified, there has been little examination of the perceived reasons underpinning these differences through discussion with the actual providers of EMS care.

This paper is part of a larger study looking at the provision of EMS in both rural and urban areas of Saudi Arabia. It specifically builds on the knowledge gained through earlier quantitative work that examined EMS service provision in rural and urban locations in Saudi Arabia [Authors, 2020a; 2020b]. This paper provides an overview of the lived experience and direct insights of EMS personnel in Saudi Arabia regarding the key issues that staff face in their day-to-day work practice and identifies factors that may lead to differences between rural and urban areas. The purpose of this paper is to overview the major findings and conclusions, with further papers which provide more detailed analyses under current development.

METHODOLOGY

The project was formally approved by the (HREC details provided after blind review).

Study Design

This research recognizes frontline workers (paramedics and emergency medicine technicians) and middle-level station managers within the Saudi Arabian EMS system as being well positioned to provide information regarding the day-to-day challenges of delivering EMS across rural and urban locations. From this starting point, the project adopted a hermeneutic phenomenology design to examine and better understand the factors that contributes to the observed disparities in EMS between rural and urban areas in Saudi Arabia [Authors, 2020a; 2020b]. The selection of hermeneutic phenomenology was informed by the need to collect data that both explains and demonstrates the particular concerns and challenges encountered by different stakeholders responsible for the provision of EMS care. One of the benefits of adopting a hermeneutic phenomenology research design involves understanding the context of organizations providing EMS, and through this, allowing for a reflective assessment of service delivery experiences. [10, 11] With these considerations, a semi-structured interview approach was deemed most appropriate for ensuring collection of data that reflects the realistic experiences of EMS personnel in both urban and rural locations.

Materials

Using the findings from quantitative data collected from the earlier stages of the project [Authors, 2020a, 2020b], a semi-structured interview guide was established by the research team prior to this stage of the research commencing. It should be clearly noted that the purpose of these interviews was specifically to identify areas of improvement for EMS in rural and urban Saudi Arabia, and therefore the resulting data from this stage does not reflect overall satisfaction with the EMS work environment.

Two participants were involved in a pilot of the interview guide, with a goal of ensuring the questions were relevant, understandable, and addressed the specific issues of interest [12, 13]. The data from these interviews were not specifically analyzed or included in the final dataset. Instead, the research team discussed the questions with the pilot participants and evaluated the effectiveness of each question through open discussion. Minor changes to improve clarity of a few questions were identified through

this piloting of the interview guide, and these amendments were incorporated into the final version.

Research study Environment

The study was done within Riyadh region of Saudi Arabia and involved EMS personnel participants from both rural and urban areas. The population of Riyadh region is approximately 8 million people, including the capital city of Saudi Arabia, Riyadh city. Riyadh region forms one of the thirteen administrative regions within the Kingdom, incorporating a diverse range of both urban and rural settings, and is geographically located approximately in the centre of Saudi Arabia.

Participants

Participants for the interviews were sourced from Saudi Red Crescent, which is the leading provider of EMS services in Saudi Arabia. [5] All potential participants had been involved in the previous stages of the study and at that time expressed their willingness to undertake a follow-up personal interview. Eligibility criteria for inclusion in this interview stage included that the participant must have current employment with Saudi Red Crescent in defined roles as emergency medicine technician (EMT), paramedic, or EMS facility manager. To ensure a suitable level of practical knowledge, participants were also required to have a minimum of five years of experience with the EMS.

An expression of interest was sent to all individuals that had agreed to a follow-up interview and met the eligibility requirements for inclusion in the study. Participants were arranged based on first responders and continued until data saturation was reached. A pre-determined figure of 8-12 interviews was proposed for rural EMS personnel in conjunction with another 8-12 interviews for urban EMS personnel so as to purposively sample staff in both types of location.

Data Collection Procedure

The interviews were conducted between October 2019 and July 2020. Data collection occurred in two phases; the first phase involved physical face-to-face interview within Riyadh region, while the Zoom platform (an online technology) was employed in a number of follow-up interview sessions. All interviews were undertaken in Arabic and recorded (with prior consent). These interviews were then transcribed verbatim and translated into English. Most participants were multi-lingual in both English and Arabian, and they were provided with both the transcript and translation to confirm the content. A small number of participants were not English speakers and therefore only their Arabic transcripts was shared. Once participants indicated their satisfaction with the transcription, the interviews underwent a process of certified translation in order to validate the contents. Following initial analyses by the research team (see below), a second interview phase was undertaken on Zoom to clarify any issues or statements that were considered unclear.

Analysis

The analyses of interview data involved the use of thematic analysis methodology St. John [x] and was undertaken in accordance with the framework of Braun & Clarke. [y] This process involved assigning a unique identifier for every interviewee, years of experience in the EMS, and individual location in either a rural or urban region. The first stage of analysis involved each member of research team independently reading the transcripts to initially establish preliminary key themes. This was followed by a series of group meetings to create an agreed coding structure through an iterative process, and which was informed by these preliminary thematic areas. Discussions on the observed themes resulted in determination of the agreed coding structure in this stage through group consensus. This process was followed by the coding of each of the English translations of the transcripts in line with this agreed coding structure. This process also identified specific thematic areas that were considered worthy of clarification or further exploration, and this was undertaken through follow-up interviews using the 'Zoom' on-line application.

RESULTS

Participant Demographics

20 interviews were undertaken: 10 with rural EMS staff and 10 with urban EMS staff. The known demographics of EMS providers in Saudi Arabia meant that all the participants were male. Rural participants had a mean age of 35.25, with 11.5 years of experience, while the urban participants had a mean age of 32.5 years with 9.9 years of experience. With respect to their job roles, there were 10 EMTs (6 rural and 4 urban), 3 paramedics (0 rural and 3 urban) and 7 station managers (4 rural and 3 urban). All station managers had previously worked in EMS delivery.

Thematic Categories and Sub-Themes

The purpose of the interviews was to identify possible barriers and facilitators of EMS delivery, either specific to a

geographic location or generally for the entire system. The following data should not be read as reflecting participant' general satisfaction or dissatisfaction with the overall performance of the Saudi Red Crescent.

The analysis of the interview transcripts identified three primary thematic categories that impacted on EMS delivery in Saudi Arabia. These three categories were EMS personnel factors; patient factors; and, organisational factors. Underpinning each of these three categories were a number of sub-themes including issues such as working conditions, stress, education and training, and resources, amongst others. The following results are presented in terms of each of the three over-arching categories, with separate tables outlining the sub-themes.

EMS Personnel Factors

The participants identified a number of issues relating to their role as an EMS staff member, and how job satisfaction, support and career progression can all play a key role in the successful delivery of EMS, or, equally, how they can impede it. The participants noted a number of positive areas of work, including the personal reward they feel in providing care, along with the financial security the job brings. They also specifically commented on the positive working environment, and the support they receive from their colleagues. However, there were also a number of negative issues identified, including a lack of training and ongoing education opportunities in rural areas, with the absence of female EMS staff across both rural and urban areas recognised as a significant problem when attempting to support female members of the public.

TABLE 1: EMS PERSONNEL FACTORS

SUB-THEME	EXAMPLAR QUOTES
Caring role	***Rural EMT*** What I love most about my job is that I will get the reward from God for saving lives
Work conditions	***Rural EMT*** I earn a good salary from it which helps me sustain my family. ***Urban manager*** I think that I am in the best organisation that provides the pre-hospital care in the kingdom. ***Urban paramedic*** I also really like the work environment, as it is really comfortable, and my colleagues are really nice and we cooperate with each other
Work stress	***Rural EMT*** Well, I hate that we have physiological effects due to the cases we see in the scenes and the administrative pressure. What I mean by administrative pressure is that they don't give us the flexibility to switch shifts. ***Urban paramedic*** I really hate that we have a lot of calls that are out of our coverage area so sometimes we end up covering a big area and that translates to a longer response time from us.
Training and education	***Rural EMT*** I think that we need a mandatory training for all the EMS workers so that it's going to be part of our annual evaluations.

	I think Red Crescent needs to promote the EMTs to be paramedics based on their level of experience. Also, we need to get the necessary support to advance our studies. ***Rural EMT*** We should also create a scholarship chance for the EMT to continue their education to become paramedics. ***Rural EMT*** Sometimes our employees would not provide high standard care to the patients because we need to have updated training and courses which is sometimes difficult for us who are working in the rural area because most of the courses are only available in the main cities and we need to travel to access them.
Skills base	***Rural manager*** On the scope of practice, a paramedic can give a medication and do an advanced intervention. EMT on the other hand cannot give medication and an advance intervention. It would be better for patients to receive the definitive care by a paramedic.
Female EMS	***Urban manager*** As Saudis, we have sexual separation concept in our culture. So sometimes female patients request for female nurse or female paramedic so they can get the treatment directly from them. In my opinion, it would help if we had female paramedics for the female patient cases. ***Rural EMT*** I think in terms of population, there are more female patients located in the urban area unlike in the rural area. Personally, I have not encountered female patients refusing transport in my area. I am afraid that female paramedics won't provide the services like the male paramedics. As I mentioned before, we rarely encounter female patients refusing transport because we are male, in fact I can't remember any instance.

Patient Factors

There were a number of patient factors that were identified as affecting EMS service outcomes. Again, the lack of female EMS staff across the region was identified as an issue, with some patients noted as refusing treatment due to the lack of female personnel. For rural EMS staff specifically, one of the key problems was geographic distance, with the location for providing assistance often a long way from the station. However, rural participants also identified an inability to sometimes even find the patient due to a lack of clear directions and signposting in rural areas. Both rural and urban participants noted some patients as having unrealistic expectations of how EMS operate, and this resulted in dissatisfaction for both EMS staff and the patient. An example of this issue was cited as pressure from patients to be taken to a specific hospital, rather than simply the closest suitable healthcare facility, which would result in longer transportation times and delays for subsequent callouts. Concerningly, some participants were worried about the potential for both physical and verbal abuse from patients. On a positive note, the EMS staff believed that these concerns could possibly be successfully addressed through widespread public awareness campaigns aimed at educating the general public about the role of EMS.

TABLE 2: PATIENT FACTORS

SUB-THEME	EXEMPLAR QUOTES
Unrealistic patient expectations	***Urban Paramedic*** Some patients refuse being transported to the nearest hospital by the ambulance just because they want a specific hospital which may be so far from their location.
Patient awareness	***Rural EMT*** I recommend increasing public awareness so that people can only call us when they really need us. This is because sometimes we receive a call just for checking the vital signs and while attending to that, we end up leaving our area uncovered.
Demand for female EMS	***Rural EMT*** I think the culture play role because I encountered some cases when I used to work in the urban station. When we reached the scene, the female patient refused to be treated and transported by us.
Location of patients	***Rural EMT*** Of course, with the longer travel in the rural area we take a longer time to reach our patients. Sometimes we face difficulty locating the patient as we cover an area which we are not fully familiar with, for example we may receive a call from 50 kilometres away from our station. Also sometimes we need to ask for backup from the fire-fighters when we face difficulties reaching a location by our regular ambulance car, for example a patient in an area that's need a 4*4 car.
Patient / Family violence	***Rural EMT*** I think it is because sometimes the callers are not the patients themselves (relative), so when we arrive the patients refuse to be transported. I think we need more protection from the verbal and physical violence.

Organisational Factors

It is not surprising that organisational factors were identified as critical in improving EMS services in both rural and urban areas. Participants commented positively about working for Saudi Red Crescent in general and noted the supportive environment for staff. However, there were also a number of factors identified, many specific to rural areas, that were considered barriers to effective EMS. One participant observation was the fact that rural areas supported more patients as a result of trauma, compared to more medical conditions callouts occurring in urban areas, which supported quantitative findings from previous stages of the wider project [Authors, 2020a; 2020b.

TABLE 3: ORGANISATIONAL FACTORS

Disasters	***Urban Manager*** In addition, we need more ambulance stations and crews so we can cover more areas in case there is a disaster. All the areas of the Kingdom are almost covered by Red Crescent but in case of any disaster we need more resources and crews as well as more stations.
Coordination with other services	***Rural EMT*** We need more coordination with the Ministry of Health ambulances because each hospital has their own ambulances so when their chronic patients need to be taken to their hospital they can transport him/her.
Medical Versus Trauma Cases	***Rural EMT*** Most of our cases in the rural area are trauma while the urban cases are medical.
Hub and spoke model	***Rural EMT*** We need to establish a small trauma centre in every 100 km^2 area so that we do not have to travel for long with the patients. Also, we need more ambulance stations and flight medics. Therefore, more work needs to be done by all the health organisations in the kingdom.
Resources (human and physical)	***Rural EMT*** I think the vehicles we have are not suitable for the rural area. More so, they are outmoded and should therefore be replaced with modern ones equipped with the modern equipment which is suitable for a rural area. ***Rural EMT*** I think increasing the number of the ambulance crews and stations for both rural and urban will help. Also, we need to establish new stations for the packed areas. ***Rural EMT*** The EMS services in the rural area differ from those in urban area. Urban area EMS services have more resources, equipment and brand new cars compared to the rural areas. Also, the types of trauma injuries are usually more severe in rural areas compared to those in urban areas.
Location, local knowledge, access	***Rural EMT*** The rural areas take longer duration time. Sometimes we travel 50 km to reach the patients, then spend some time at the scene and finally we have to travel back 50 km. These combined takes too much time. Yes. Also, the information given to the dispatcher affects the response time. For example, sometimes the caller could not give us the right location, so it would take us too long to reach the scene.

DISCUSSION

The purpose of this study was to examine the lived experiences of EMS personnel in Saudi Arabia. Through this approach, it was possible to identify key issues that staff face in their day-to-day work practice and ascertain factors that may lead to service disparities between rural and urban areas. The thematic analysis of responses indicated that there were a number of differences that may explain the existing disparities in the provision of emergency medical services in rural and urban regions. Three key thematic areas were identified, and these were EMS personnel issues; patient factors; and organizational factors. However, it is worth noting that within each theme there were often a number of areas of similarity, and that urban areas regularly faced similar problems to rural locations. The following discussion section will focus on the key problem areas identified and suggest possible solutions that could be easily implemented, and which do not require substantial financial or infrastructure changes.

Work Conditions

The responses indicate that both urban and rural staff have an incomplete understanding of the overall EMS system across both areas, which led to potential confusion regarding issues outside of their direct daily involvement. However, they were generally very positive about working for Saudi Red Crescent. One of the emerging issues involved stressful work conditions linked to the handling and performing certain medical procedures. Workplace stress arising from patients interactions and cultural conflicts had an impact on EMS staff, with it known that EMTs who experience verbal and physical assault may develop low self-esteem. [14] The cultural factors in service provision can bring challenges for a health care provider. [15] Addressing the problem requires EMS staff to undergo training on cultural competence skills to help in the realization of a holistic prehospital care. [15, 16]

One of the factors contributing to improvement of EMS professional efficiency involves the ability to have integrated coordination and effective decision making process. Such operating conditions is important in enhancing productivity of EMS teams in dispatch and patient evacuation. [17] However, the gender of staff was a major issue influencing patient perception of EMS performance. As noted by Alharthy et al, female patients show a preference to be attended to by female paramedics in critical care situations where the presence of male staff is often perceived to cause inconvenience. [18]

Patient Factors

Patient factors, such as unrealistic expectations, awareness levels regarding EMS services and aggressive behaviours, were identified as influencing the efficiency of the service. For example, paramedics would decide on the dispatching a patient to closest facility depending on the level of injury [19], but patients may express a wish for another option that was perceived to be superior. Patient behaviours, such verbal and physical violence and resistance due to cultural factors, made it difficult for the EMS paramedics to perform certain health procedures without respecting cultural or religious beliefs of the patients. [14] Navigating these factors could be a challenge, especially in sharing patient information, to ensure successful delivery of medical care. [20].

The Organizational Factors and EMS service

In recent years, Saudi Arabia has seen great advances in the provision of EMS. [21] Among the positive changes is the adoption of the Anglo-American model of EMS which facilitates rapid transport of patients to an emergency department by clinically competent paramedics, with Saudi Red Crescent providing a comprehensive EMS service throughout the country. [21] However, in spite of this expansion and investment, participants perceived that the lack of adequate human resources and medical equipment contributed to lower quality of EMS in the rural areas. Reduced access to advanced medical equipment in the rural areas made it difficult for EMS teams to handle conditions such as fractures, bleeding and cardiac arrest. In addition, some skills shortages in performing certain medical procedures and on-scene drug administration contributed to the limited inefficiency and poor quality EMS services.

Within rural areas, there is a challenge for EMS organizations to provide training incentives for EMTs to acquire hands-on skills on management and delivery of advance pre-hospital services [8]. Retaining of employees for EMS organizations is also a critical challenge for EMS organizations in rural areas, with some EMS teams found to be dependent on volunteers in attending to rural populations. [3] Further, EMS organizations in rural areas have cited difficulty in providing continuing education programs in rural areas to EMS and burn-out as a contributing factor to staff retention problem. [22]

Having common operating standards across all locations would enhance quality and improve patient outcomes in rural areas [23], with their implementation essential for ensuring effective workflows and community delivery of EMS services. [24] EMS staff working in rural areas should be provided with local hands-on training that reflects the predominant types of injuries and conditions affecting rural regions and help to reduce disparities in care. [25]

The large area of coverage by rural EMS organizations is reflected in increased response times, which in turn have a negative impact on recovery time for patients. [3] The lack of a reliable functional communication network also makes it difficult to reach patients within the shortest time which poses risk to patients in critical conditions. [15] Few designated traumatic centres and the increased severity of trauma injuries in rural areas also complicated patient transportation and admission for immediate medical intervention. [26]

CONCLUSIONS

The quality and efficiency of EMS services, in both rural and urban areas, was affected by a number of over-arching organizational and patient factors, and the level of infrastructure. Implementing major policy shifts, such as recruitment of female EMS professionals, will be critical in addressing challenges resulting from cultural and patient attitudes, but it is acknowledged that this will take time. Quicker changes, such as improving the skills and advanced training options for rural EMS staff, may help to remediate some of the serious injuries and other types of trauma injuries evident in those areas. Public awareness campaigns may also be effective in addressing the identified misconceptions about the role of EMS in Saudi Arabia.

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