Asia-Pacific Journal of Health Management

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EDITORIAL:
Coronavirus COVID-19…

The Issue Features:
- **Mapping isolation**
- **Access barriers**
- **Aged care**

…….and much more

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IN THIS ISSUE

David Briggs

In this issue we start with an editorial that addresses the Corona virus COVID-19, a difficult task given the fast-moving nature of this pandemic. The editorial attempts to draw some lessons for us to consider from our experience of this event.

Our first article is from Osama Majeed Butt and colleagues from Pakistan, Germany and Malaysia who examine the critical success factors of Six Sigma hospitals, in a preliminary study in hospitals in Pakistan. The analysis suggests that employees were unaware of the quality initiatives and six-sigma.

Our next article is provided by Rafael Carneiro de Mesquita and Ian Edwards who have undertaken a systematic review of the My Health record system that was introduced into the Australian health system some time ago. There has been little empirical evaluation of this initiative and the review concludes that there is insufficient evidence that any outcomes have been achieved relating to any of the objectives. The authors suggest further research is required to determine whether the system has achieved the objectives set for it in the legislation enacted for that purpose.

In the next article Cindy Pham Ngoc and colleagues provide a unique and interesting article that examines the 'servicescape' elements of an elderly home in Texas USA. They use a multidimensional model to suggest improvements and publish in the hope that the approach and findings might be generalisable in the Asia Pacific healthcare services.

Sasan Rasi provides a research article that examines the impact of cultural and linguistics as factors that impede access and act as barriers to creating an effective relationships between immigrant patients and health professionals and the study concluded that language barriers hindered access to healthcare services. Dinesh Arya then provides an article that emphasise the use of quality management tools and methods in supporting effective governance of healthcare organisations.

Gillian Jean and colleagues provides an article that examines job vacancy data for dentists in Australia as an indicator of unmet need of workforce supply and concludes that job vacancy data might inform dental workforce planning. Finally, in this issue Ronald Larsen provides a research article that suggests the need to include stakeholders when implementing new technologies. The author draws on radio frequency identification technology in applications in two medical and two non-medical applications in the USA.

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ACHSM Asia-Pacific Journal of Health Management

EDITORIAL

CORONA VIRUS (COVID – 19)

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It is difficult while writing an editorial, at this time, to ignore the extensive impact of the Corona virus (COVID-19) and it is probably important for us, as health professionals to give it some considered thought, outside the immediacy of current activity. I say this as someone recently returned from work related overseas travel, with my travel not meeting the government-imposed return deadline by some seven hours. This required my quarantine and/or isolation for some two weeks. After my first week of exclusion from most of my family, friends and working remotely and online it seems that the rest of Australia has caught up with my circumstance, many stood down from work, many businesses closed, a massive effort by the health system and economic rescue or support packages being implemented by government. It seems that I will have little opportunity to relax and celebrate with others at the end of this week.

So, what does this experience of the virus mean for us all and what are the lessons we might need to take from this experience?

Firstly, the arrival of the virus has been very recent, and the speed of its spread has been extremely fast. Secondly, it confirms that we are indeed part of a global economy and that our perspective on healthcare and health systems must be from a global view. It is important to remember that it is now 'world views' that shape our understanding and learning. We need that world or global view to understand our contemporary context and to better understand the strategies that we and other governments are implementing. While thinking globally we need to adapt those strategies to act locally.

During my sojourn overseas I was asked to make a short contribution to another Journal [1] about this same subject but given to the limited timeframe I drew on recent substantive literature to highlight some 'lessons learned', rather than attempt to think through the issues and attempt analysis at that time. The amount of peer review material published in the last two months is extensive and, gives us comprehensive data and analysis from across the world. Starting with an international lesson we are advised that the initial response in China was inadequate and that we had not learnt from prior epidemics, that this virus has surpassed the Severe Acute Respiratory Syndrome (SARS) in cases and severity and that 'human to human transmission has been confirmed'. [2, p.2]

I am reluctant to go into the technical issues of the virus, its progress, treatment and mitigation as it is not my area of expertise. However, a useful, recent and readable article by Roy Anderson and colleagues from the Department of Infectious Diseases Epidemiology Centre for Global Health at the Imperial College London does that admirably and I recommend you read that article. [3] It is recorded that the first 'person to person transmission was reported on February the 21st 2020.' [4, e49]

By the 20th February 634 people from 28 counties were tested positive for the COVID-19 on the cruise ship Diamond Princess cruise ship, Diamond Harbour, Yokohama, Japan. Subsequently cruise ships were disembarked in Sydney Harbour without testing and these types of ships continue to be problematic as they attempt to make a landing across the world. It is understood that those persons are now subject to contact utilising Defence personnel and have become a matter of continuing public media debate.[5] Sawano and colleagues [6] in their

commentary suggest that the response by Japan was problematical, that quarantine in a cruise ship may not be effective in 'preventing the contagion of the virus in Japan' and in fact, 'could accelerate a contagion of the virus'. Third the care for passengers and crew members was poor. The fact that the health system must respond quickly and effectively to the challenges of the virus also presents us with opportunity for health reform, particularly with the greater use of digital technologies. The government has extended the use of telehealth to a broader range of conditions at least for those over the age of seventy. We all should be working to ensure that this innovation is nor short lived and, in fact access is widened over time. This is particularly the case for rural, regional and remote communities.

Interestingly and understandably there has been a high degree of anxiety amongst the general population and communities. This is more so than the impact of the recent drought and fires were people while anxious were more resilient and focussed. This in part may be because the virus remains unseen and requires a great deal of faith in us for those with health expertise. It is probably also due to the significant economic adversity that is a consequence of the virus impact. Despite daily press conferences and social media, government and health officials have struggled to make ground. There equally has been significant misinformation or misinterpretation of the ongoing context which, of course, is changing daily.

Despite these circumstances a recent YouGov virus response poll [7] suggests that the government response to the virus has been effective. Irrespective of the media headlines and social media, it is yet again satisfying to see that the majority of the 'quiet Australians' remain positive and steadfast even as many now face significant economic uncertainty. Irrespective of this is that the level of anxiety means we need to be vigilant and active in the delivery of mental health support. In fact, the uncertainty about individual economic certainty may present mental health challenges of some magnitude.

The tension within a Federation, as in Australia, that was also obvious from the period of widespread drought and fires became evident again in responses to the COVID – 19 virus. It is difficult where we have divided responsibility between levels of government, and it suggests that the general public is not interested in that context but want clear and decisive action mostly at the Federal or national level. It is to the governments credit that the establishment of a national cabinet and other bodies, inclusive of State and Territories government mostly addresses this obvious challenge. Perhaps after this matter is resolved we should revisit the structural arrangements that our past colonial forebears gifted us.

Recently, the word stoic came to my attention and I recall that this word reminded me of my parents and grandparents time of experiencing a world war and an economic depression. I reflect that in my lifetime events did not require us to be as stoic as then! This word 'stoic' suggests quiet acceptance and a strong determination to accept what is before us, something that doesn't fit easily in a quick changing world, dominated by rapid change and social media. It is also a form of philosophy, the history of which probably is worthy of revisiting. The word resilience also has some similarity to being stoic and has some contemporary resonance as a strong component of leadership. I suspect that modern education does not traverse the wisdom of earlier philosophers nor does it extend to an understanding in a modern young generation that epidemics, infectious disease are part of our history from which we have much to learn.

In most countries, including Australia we are fortunate that we have good government and significant health and economic expertise to guide us all through this impact of a virus. They deserve our respect and support.

DS Briggs AM
Editor in Chief

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RESEARCH ARTICLE

ROLE OF CRITICAL SUCCESS FACTORS (CSF) IN THE IMPLEMENTATION OF SIX SIGMA IN HOSPITALS: A PRELIMINARY STUDY IN PAKISTAN

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ABSTRACT

Six sigma can enable us to determine the possible solutions to most of the problems which are being faced by the healthcare system of Pakistan. Six sigma is a viable way to make healthcare rapid and proficient. It is already being successfully utilized around the globe in service as well as manufacturing sector. This research is a preliminary study; conducted, in an attempt, to highlight the issues in healthcare like scarcity of medicines, inefficiency of medical staff, insufficient beds and low doctor/patient ratio in hospitals of Pakistan. A proposal is proposed for a viable solution in the form of six-sigma. For this study, six-sigma identify the potential issue by involving all employees of the targeted sectors. Collection of primary data was done from employees at quality departments in hospitals and via survey. The importance of critical success factors in the public and private hospitals of Pakistan was determined by the aforementioned survey. Critical analysis pointed out that most of the employees were unaware of the quality initiatives and six-sigma.

KEYWORDS

critical success factor, healthcare, six-sigma, total quality management

1. INTRODUCTION

Human capital is determined by the health conditions in any country. [1] The health systems research has been a neglected area. More than three decades back, private health insurance was introduced in Pakistan, but no importance was given to this matter. According to WHO World Health Report Pakistan was listed as one of the 57 countries with critical workforce deficiency. [2] Three most common cited reasons of malfunctioning in healthcare sector of Pakistan are: (1) lack of availability of medicines, (2) uncooperative staff, (3) Inaccessible facilities. And the total availability of beds in these hospitals is very low. Most of the people go directly to the secondary or tertiary healthcare hospitals. Pakistan is one of those countries which under-utilizes its healthcare facilities. [3] Healthcare sector of Pakistan needs special attention. According to UNICEF, "despite significant improvements over the past two decades, Pakistan ranks towards the bottom among other countries when it comes to infant and neonatal mortality". [4] The healthcare system of Pakistan shows a high population growth rate. The indicators that show this rate are not even comparable with countries of South Asia. Over the last years, investments that have been made in health sector are low. [5] The healthcare expenditure in Pakistan is determined by its socio-economic factors. [1] In order to provide solutions to the above mentioned

problems a perspective study has been conducted which may be helpful in implementing six sigma at hospitals in future. [6, 7] The aim of this research is to find out the service quality levels of hospitals in Pakistan. Whether they have any idea about Six Sigma or not? What quality initiatives they have taken so far? Are their employees trained for quality or not? How do they measure their service quality? The inclusive objective of the research is to enhance the understanding of quality practices of hospitals and find out about critical success factors that may be helpful in implementing this concept which may help in order to reduce waste and improve service quality. The objective of the study is to determine CSF (Critical Success Factors) which are important for the implementation of six-sigma in private and public hospitals of Pakistan.

1.1 EVOLUTION OF SIX-SIGMA

"Six sigma is highly disciplined approach used to reduce the process variation to such a great extent that the level of defects is drastically reduced to less than 3.4 per million processes, product or service opportunities. The approach relies heavily on statistical tools which, though known earlier, were primarily limited to use by statisticians and quality professionals" [8]. It was initially launched by Motorola in late 1980s. [9] In 1986, Bill Smith, an engineer and scientist who worked at Motorola's Communication Department, introduced the concept of Six Sigma. Bill Smith is known as "Father of Six Sigma". Six sigma roots can be traced back to tools and techniques used by quality Gurus. [8] The concept of TQM "Continuous improvement" can be achieved through 6σ. [10] Six sigma evolved from TQM. It is a rigorous method which involves proven quality techniques which are integrated from the work of many quality pioneers. Statisticians use the Greek letter σ, to measure variability in any process. And to measure the performance of any organization sigma level is used. [9] Six sigma uses standard quality techniques which are part of TQM. It is a management strategy actually which focuses on reducing variation and causes that was responsible of defects in first place. [10] The aim of six-sigma is to eliminate variation on the basis of customer definition of quality. [11] During the last two decades six sigma has been approached by many companies around the world. Six sigma's main objective is to remove variation in processes or products produced and to achieve quality levels of less than 3.4 defects per million opportunities (DPMO). [8, 12] Because improved process leads us to customer satisfaction, increased market share, increased yield, increased profitability. [13]

1.2 SIX-SIGMA APPROACH TO SERVICE INDUSTRY

Six Sigma could be very useful to find solutions of healthcare problems because it utilizes statistical tools and proper management framework to identify the root cause of the problems rather than jumping to abrupt solution. [14] The main reason to implement Six Sigma in service industry is that customers feel "process variability". It can also improve customer satisfaction and service performance. [13] In healthcare system patients are the customers. Quality is now playing major role in healthcare sector as patients are able to choose their healthcare providers based on the quality treatment they get. [15-17] At the same time it has now become a culture to ask patients perspective about service quality they receive in order to organize their staff and for the sake of continuous improvement. [18]

1.3 SIX-SIGMA APPROACH TO HEALTH-CARE INDUSTRY

A supreme amount of benefits can be achieved through six-sigma in healthcare sector. If six-sigma technical strategy is combined with the cultural strategy only then success can be achieved because there is lot of human elements involved in patient care as compared to machine elements. [19] In healthcare system patients are the customers. Quality is now playing major role in healthcare sector as patients are able to choose their healthcare providers based on the quality treatment they get. At the same time, it has now become a culture to ask patients perspective about service quality they receive in order to organize their staff and for the sake of continuous improvement. There are three approaches to improve the customer (patient) satisfaction:

1. Measurement of patient's point of view.
2. Improving the outcome of patients.
3. Use of six sigma approach [20]

2. METHODOLOGY

In 1979 Rockart popularized the idea of Critical Success Factor. [10] These factors are necessary for the success or failure of six-sigma. In order to achieve certain level of quality management these critical success factors are important. Traditionally most studies were about Total Quality Management critical success factors. CSFs are actually those key aspects as shown in figure 1 of any organization that are critical to achieve its goals and produce satisfactory results. They are the key factors to achieve organization's vision and to attain customer

satisfaction in order to provide quality service. According to recent literature there is tremendous interest in implementing six sigma in service sector. [10]

FIG. 1 CRITICAL SUCCESS FACTORS OF AN ORGANIZATION [10]

2.1 SURVEY DESIGN

For the research conducted, population chosen for the survey was highly educated and professionals, like people who are doctors but working in the quality departments of hospitals or at administrative departments. Data has been collected from private and public hospitals of Pakistan. The survey responses were apprehended from different cities in Pakistan including Lahore, Islamabad, Rawalpindi, Gujranwala, Peshawar, and Multan. The responses were distributed among respondents in soft as well as in hard form. Questionnaire design was targeted to know about the quality conditions in hospitals and whether they are inclined towards quality or not? Some questions were asked about quality certifications and trainings, so that an idea can be obtained about how quality driven they are. The questionnaire utilized Likert type scale, where respondents could choose from five options including Very important, important, neutral, and not so important to not important.

The analysis of data was acquired through survey is based on descriptive as well as inferential analysis. T-test and Pearson correlation test were used to analyse the data of this study.

2.2 HYPOTHESIS TESTING USING INDEPENDENT SAMPLE T-TEST

Independent sample t-test, it exhibited statistical evidence that there is a significant difference in the means of two groups or not and to determine which group grant more significance to a factor on which hypothesis testing was performed. The CSFs are analysed by Independent sample t-test. Independent sample t-test is used to compare the means of two samples from the same population. Grouping variable in this case is sector (Public/private). Both samples are independent and cannot affect each other. The comparison is between two sets of values from one variable. Each variable has a hypothesis and on the basis of the t-test result hypothesis is rejected or accepted. Following are the hypothesis based on factors in Fig 1.

H1 = Mean scores of "involvement and commitment of top management" variable in public and private sector does not vary.

H2 = Mean scores of "organizational infrastructure" variable in public and private sector does not vary.

H3=Mean scores of" vision & planning" variable in public and private sector does not vary.

H4 = Mean scores of "linking quality initiatives to employees" variable in public and private sector does not vary.

H5 =Mean scores of" linking quality initiatives to patients" variable in public and private sector does not vary.

H6 =Mean scores of" project management skills" variable in public and private sector does not vary.

H7 =Mean scores of" information technology and innovation" variable in public and private sector does not vary.

H8= Mean scores of "communication" variable in public and private sector does not vary.

H9 = Mean scores of "Team work" variable in public and private sector does not vary.

H10 = Mean scores of "cultural change" variable in public and private sector does not vary.

H11 = Mean scores of "education & training" variable in public and private sector does not vary.

2.3 PEARSON CORRELATION TEST

Pearson Correlation test was performed to show which factors were more connected. A correlation coefficient represented the strength and direction among all CSFs. If correlation coefficient is greater than 0.5, the relationship is considered strong and greater than 0.8 is considered very strong. The table 1.3 shows the correlations among CSF of six-sigma. All the descriptive analysis of introductory questions in the survey are shown in table 1.

TABLE 1 DESCRIPTIVE ANALYSIS

DESCRIPTIVE ANALYSIS OF RESPONSES	PUBLIC (%)	PRIVATE (%)
Percentage of responses collected:	58	42
Doctor/Patient ratio:		
Ratio 1/10	26.4	15.9
Ratio1/15	10.3	57.1
Ratio 1/20	8	3.2
Ratio 1/25	21.8	3.2
Other	33.3	20.6
Measure, check and control the variations & failures in following concepts:		
Cost	39.1	98.4
Time	31	69.8
Quality	37.9	96.8
Earned Value	40.2	90.5
Labor productivity	12.6	92.1
Hospital performance	37.9	61.9
Customer Satisfaction	14.9	58.7
Employee Complaints	17.2	57.1
Supplier performance	19.5	88.9
Wastage	19.5	85.7
Quality initiatives that has been implemented:		
Six sigma	0	0
Total Quality Management	9.2	50.8
ISO 9001:2008	2.3	3.2
In process of obtaining ISO	0	0
In-house quality system	6.9	34.9

ISO 14001:2004	9.2	1.6
OHSAS 18001:2007	11.5	0
ISO 10002:2004	0	0
No initiative undertaken	63.2	38.1
No initiative but interested to know about 6σ	63.2	38.1
ISO certified but interested in 6σ	14.9	39.7
Quality department in hospitals:	20.7	69.8
Quality trained employees:	29.9	49.2
How often essential trainings opportunities are provided to employees?		
No training	73.6	50.8
Monthly	11.5	4.8
Semi annually	6.9	1.6
Annually	8	42.9
Types of trainings available to employees:		
Process Management	23	69.8
ISO 9000	2.3	1.6
Total Quality Management	16.1	11.1
Six sigma	0	0
Labor law	5.7	0
Quality circles	2.3	4.8
Management system problem solving	8	25.4
Techniques management improvement	26.4	0
Program benchmarking	4.6	0
How customer satisfaction is measured?		
Not measured	47.6	63.2
Questionnaire survey	3.2	4.6
Face-to-face interview	4.8	12.6
By the number of complaints	12.7	21.8
Follow up reports	42.9	10.3
Factors that hinder the implementation of six sigma:		
Lack of knowledge of the system to initiate	74.7	98.4
Cost	39.1	68.3
Complacency	25.3	46
Other competing quality issues such as ISO	17.2	46

3. RESULTS

3.1 HYPOTHESIS TESTING USING INDEPENDENT SAMPLE T-TEST

Group statistics and independent sample t-test results are shown in the table 2. When there is no significant difference in the mean of two groups hypothesis get accepted otherwise get rejected. It is assumed that variances are equal. H1 got rejected. Private sector (M=4.61) consider "involvement and commitment of top management" more important than Public sector (M=4.17) hospitals. H2 get accepted. Private sector (M=4.21) and Public sector (M=4.06) hospitals consider "organizational infrastructure" variable equally important CSF. H3 get accepted. Private sector (M=4.17) and Public sector (M=4.11) hospitals consider "vision & planning" variable equally important CSF. H4 get accepted. Private sector (M=4.11) and Public sector (M=4.01) hospitals consider "linking quality initiatives to employees" variable equally important CSF. H5 get accepted. Private sector (M=4.27) and Public sector (M=4.06) hospitals consider "linking quality initiatives to patients" variable equally important CSF. H6 get rejected. The respondents working at Public hospitals have given "project management skills" more importance than Private sector. H7 get rejected. The respondents working at Private hospitals have given for" information technology and innovation" more importance than Public sector. H8 get accepted. Private sector (M=4.33) and Public sector (M=4.31) hospitals consider "communication" equally important CSF. H9 get accepted. Private sector (M=4.33) and Public sector (M=4.31) hospitals consider "Team work" equally important CSF. H10 get rejected. The respondents working at Private hospitals have given "cultural change" more importance than Public sector. H11 get rejected. The respondents working at Private hospitals have given "education & training" more importance than Public sector.

3.2 PEARSON CORRELATION TEST

It is evident from table 3 that "vison and planning" and "organizational infrastructure" has positive strong relationship. It means occurrence of one factor has strong positive affect on the other. "Linking quality initiatives to employees" factor has strong positive relationship with "vision and planning" factor. "Linking quality initiatives to employees" has strong positive relationship with "Linking quality initiatives to patients". "Project management skills" have positive affect on "linking quality initiatives to patients". "IT & innovation" is strongly linked to "involvement of top management". "Communication" is strongly and positively linked to "IT & innovation". "Team work" has strong positive relationship with "communication". "Cultural change" is strongly and positively linked with "involvement of top management". "Education & training" has positive strong relationship with "IT & innovation".

TABLE 2 INDEPENDENT SAMPLE T-TEST (EQUAL VARIANCES ASSUMED)

CRITICAL SUCCESS FACTOR	LEVENE'S TEST		T-TEST FOR EQUALITY OF MEANS						
	F	SIG.	T	DF	SIG. (2-TAILED)	MEAN DIFFERENCE	STD. ERROR DIFFERENCE	95% CONFIDENCE INTERVAL LEVEL	
								LOWER	UPPER
Involvement & commitment of top management	20.088	0	2.874	148	0.005	0.431	0.15	0.135	0.727
Organizational infrastructure	23.058	0	1.058	148	0.292	0.149	0.141	-0.129	0.427
Vision & planning	22.593	0	0.411	148	0.682	0.06	0.145	-0.227	0.346

Linking quality initiatives to employee	19.207	0	0.682	148	0.496	0.1	0.146	-0.189	0.388
Linking quality initiatives to patients	13.675	0	1.431	148	0.155	0.212	0.148	-0.081	0.506
Project management skills	5.219	0.024	-2.486	148	0.014	-0.376	0.151	-0.675	-0.077
Information technology & innovation	23.484	0	2.903	148	0.004	0.394	0.136	0.126	0.662
Communication	3.477	0.064	0.164	148	0.87	0.023	0.14	-0.254	0.3
Team Work	5.542	0.02	0.172	148	0.864	0.023	0.134	-0.241	0.287
Cultural Change	39.612	0	5.011	148	0	0.745	0.451	0.451	1.039
Education & training	30.789	0	2.745	148	0.007	0.328	0.12	0.092	0.565

TABLE 3 PEARSON CORRELATION

CSFs	Involvement of	Organizational	Vision & Planning	Linking Quality	Linking Quality	Project Manage	IT & Innovatio	Communication	Team Work	Cultural Change	Education & Training
Involvement & commitment of top management	1										
Organizational infrastructure	0.626	1									
Vision & planning	0.6	0.825	1								
Linking quality initiatives to employee	0.7	0.618	0.6	1							
Linking quality initiatives to patients	0.484	0.66	0.647	0.743	1						
Project management skills	0.172	0.563	0.523	0.337	0.556	1					
Information technology & information	0.695	0.623	0.609	0.469	0.517	0.451	1				
Communication	0.642	0.627	0.655	0.671	0.669	0.58	0.759	1			
Team Work	0.557	0.668	0.603	0.648	0.638	0.609	0.698	0.834	1		
Cultural Change	0.666	0.545	0.544	0.573	0.557	0.262	0.589	0.599	0.534	1	
Education & training	0.653	0.587	0.613	0.45	0.467	0.352	0.828	0.676	0.665	0.588	1

4. CONCLUSION

From the initial questions of the survey, it has been pointed out that most of the hospitals in Pakistan have not taken many initiatives regarding quality and most have their own in-house quality system. However, hospitals have shown interest in knowing more about six-sigma. This survey also pointed out that quality training is not very common among the hospital employees. CSFs were ranked differently by both sectors; based upon their resources and short-term strategic objectives. It is evident from t-test results that the top three CSFs were: Education and training, Team Work, and IT & innovation. However, contrary to the literature review, involvement and commitment of the top management, which is one of the most important CSF, was not ranked among the top three CSFs by the employees of both sectors. And it was observed from correlation test that factors with correlation coefficient greater than 0.8 have strong and positive relationship. Thus, the need of the hour is to spread awareness about the benefits and ensure knowledge transfer of six-sigma so that it may get accepted as a new quality system. Healthcare system of Pakistan is in need of special attention and six-sigma could be one of the methods applied to resolve its problems in the long run.

5. RECOMMENDATIONS

Data collection was the main obstruction which was dealt with. Face to face interviews could be more helpful rather than a questionnaire. But it will require more time and resources. Due to limited time sample size is kept limited and instrument used was questionnaire. And before face to face interviews employees must be briefed about six sigma and CSFs of six-sigma. The respondents were actually briefed about six-sigma in the very beginning of the questionnaire, but it wasn't enough as perceived from the respondents' feedback. This study can be helpful in understanding the culture prevailing in healthcare system of Pakistan and what measures they have taken in order to improve or maintain service quality and how inclined they are towards six sigma implementation. What level of knowledge they have about six-sigma. This research can also be helpful in further practical implementation of six-sigma in hospitals.

6. LIMITATIONS

It seemed that measurement of customer satisfaction is difficult in the service sector due to human behavioural interaction. People are more resistant towards change in a service-focused environment as compared to manufacturing setting. This research was carried out with few constraints such as number of hospitals is few from few cities. The scaled questions used in the survey have disadvantage that it wasn't known why a certain response was chosen by respondent.

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RESEARCH ARTICLE

SYSTEMATIC LITERATURE REVIEW OF MY HEALTH RECORD SYSTEM

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ABSTRACT

BACKGROUND

On 2010 Australia launched a personally controlled electronic health record (PCEHR) later renamed and augmented by the My Health Record Act 2012 Cth. The main goal of the present systematic literature review was to assess if the system has improved Australia's healthcare system according to the objectives stated by the federal government in the My Health Record Act 2012 Cth.

METHODS

The methodological approach taken in this study was a Systematic Review based on nine peer-reviewed articles of the last five years using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA).

RESULTS

Despite the MyHR system being available for seven years, there is limited empirical evaluation regarding its progress in achieving the stated goals. The results were segregated in four themes: (1) health information fragmentation, (2) Health information quality and management, (3) adverse medical events and duplication of treatment and (4) coordination of care. Regarding theme 1, it was evidenced that the system could reduce health information fragmentation; however, gaps in the workforce adoption were identified as a problem. About topic 2, improved access to information and possible misinterpretation were found. Theme 3 lacked research and theme 4 presented contradiction in the results.

CONCLUSION

The My Health Record (MyHR) system is founded on four key objectives. However, there is insufficient evidence that any outcomes have been achieved relating to any of the objectives. Research is required to determine whether the MyHR system helped improve Australia's healthcare system according to the objectives stated in the Act 2012.

KEYWORDS

My Health Record, MyHR, personally controlled electronic health record, PCEHR, Act 2012

INTRODUCTION

The Personally Controlled Electronic Health Record (PCEHR) system was introduced in Australia in May 2010 by the Minister of Health and Ageing, Nicola Roxon, who allocated AU$ 466.7 million for the project; this figure has since risen to AU$ 2 billion as at 2016.[1, 2] The expected net benefit was estimated in AU$ 11.5 billion over 2010–25.[3] In 2012 the system was launched as a shared database where patients' information could be stored and accessed online. The system provides the healthcare workforce with a tool to amalgamate information about medications, adverse drug reactions, allergies and immunisation history to be used in better clinical decision-making.[4] The underlying concept of the system is that it would improve patient safety and healthcare delivery and reduce waste and duplication.[1]

In 2016 the system was renamed My Health Record (MyHR) and significant legislative changes referring to the privacy of the data were undertaken. However, despite the government's efforts in building a secure and reliable

system, it has not been widely accepted by the population.[5] Due to slow acceptance by the Australian public and the relatively low number of general practitioners (GPs) using the system (less than 10% of the 80% of GPs registered as at 2013)[6], it was changed from opt-in to opt-out in January 2019. This alteration resulted in 9.9% of eligible people in Australia voicing their decision to opt-out.[7] Although concerns remain regarding the privacy and security of information[8, 9], research in 2017 indicated a positive result about individuals' health information availability across health providers.[5, 10] In relation to the government objectives, it is time to identify what has been achieved since the launch of the MyHR system. The objectives of the system were defined in the My Health Records Act 2012 (Cth) (hereafter known as the Act 2012) by the Australian government as follows:

The object of this Act is to enable the establishment and operation of a voluntary national system for the provision of access to health information relating to recipients of healthcare, to:

- 1. Help overcome the fragmentation of health information; and
- 2. Improve the availability and quality of health information; and
- 3. Reduce the occurrence of adverse medical events and the duplication of treatment; and
- 4. Improve the coordination and quality of healthcare provided to healthcare recipients by different healthcare providers.[11] (Part 1, Section 3, page 2)

This paper has been divided into four sections. The first section is this introduction. The second section deals with the methods used for this paper; the third section presents the results of the articles reviewed, focusing on the four key themes — health information fragmentation, health information quality and access, adverse medical events and duplication of treatment and coordination of care, which corresponds to each of the Act 2012 objectives. The fourth section discusses the results. The findings should make a relevant contribution to the community by presenting the current progress of the objectives stated by the government and indicating questions that required research.

QUESTION

Have the My Health Record system objectives stated in the Act 2012 been accomplished, therefore improving Australia's healthcare system?

In this systematic literature review, improvement of Australia's healthcare system is defined as better access to and better quality of health information, less health information fragmentation, less duplication of treatment and occurrence of medical events and better management of care.

SCOPE

The scope of this paper was to assess if the MyHR system succeeded in its proposed objectives. These objectives are to:

- 1. Help overcome the fragmentation of health information.
- 2. Improve the availability and quality of health information.
- 3. Reduce the occurrence of adverse medical events and the duplication of treatment.
- 4. Improve the coordination and quality of healthcare provided to healthcare recipients by different healthcare providers.

METHODOLOGY

The present systematic literature review of the scientific literature was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[12]. The peer-reviewed articles were located using five high-ranked health-related electronic databases. The databases were selected considering their scope of knowledge (medical, biomedical and multidisciplinary) and region (American, European and International), as listed in Table 1.

The search was conducted using each database website and search engine. The search string contained the following words and Boolean operators: "My Health Record" OR MyHR OR "personally controlled electronic health record" OR PCEHR. The author decided to not use the Boolean operators "AND" and "NOT", which would restrict the number of results, because it was already short due to the topicality — 150 papers over the five databases. The words used correspond to this paper's objective of study. To be included in this search, the article title or abstract needed to contain the words presented.

TABLE 1. DATABASE SELECTION CRITERIA

DATABASE	DISCIPLINE	REGION
Embase	Biomedical	European
Medline	Medical	American
ProQuest	Multidisciplinary	International
PubMed	Biomedical	American
Scopus	Multidisciplinary	International

Listed in Table 2 are the inclusion and exclusion criteria that focused on (1) identifying articles corresponding to the Australian personally controlled electronic health record system, (2) studies about the system and not clinical data, which includes but are not limited to legal aspects and analysis of the system and people's experiences and (3) studies that are relevant in time, because technological features tend to change constantly. Research about the users' expectations and possible barriers were excluded because the purpose of this work is to identify the current situation. Implementation of the system, adoption rate and improvement suggestions were also excluded. The author acknowledges the importance of these topics and their influence on the objectives studied in this work. However, a standalone analysis of each topic is appropriate. Further, duplications were removed and titles and abstracts were screened by the author.

Additional analysis of the paper selection process applied the Standard Quality Assessment Score (SQAS) [13] qualitative for primary research papers. The scoring system was developed to evaluate the quality of primary research papers from different fields and contains ten questions (see Table 3). For the evaluation of the literature review papers, the author used the Quality Assessment Tool (QAT).[14] This evaluation system was specifically developed for the healthcare area, and contains ten questions (see Table 4). The SQAS and the QAT require the division of the papers' score for the maximum score possible and present the results in decimal numbering; the closer the number to one (1), the better the results, with one being the maximum.

Regarding the evaluation of the four objectives, there were no practical constraints. There was no need to appraise each individually because the number of articles found about the topic was modest. Few studies have investigated the topic due to it being so contemporary.

TABLE 2. INCLUSION AND EXCLUSION CRITERIA USED TO SCREEN IDENTIFIED ARTICLES

INCLUSION CRITERIA	EXCLUSION CRITERIA
Articles published between January 2014 and April 2019	Electronic personal health record system other than the Australian My Health Record
Articles and Reviews	Clinical data
Peer-reviewed/Refereed journals	Potential benefits
Articles published in English	Barriers to potential use
Australia	Improvement suggestions
	Implementation / Adoption studies

TABLE 3. STANDARD QUALITY ASSESSMENT SCORE FOR QUALITATIVE PRIMARY RESEARCH PAPERS

	CRITERIA	YES (2)	PARTIAL (1)	NO (0)
1	Question/objective sufficiently described?			
2	Study design evident and appropriate?			
3	Context for the study clear?			
4	Connection to a theoretical framework/wider body of knowledge?			
5	Sampling strategy described, relevant and justified?			
6	Data collection methods clearly described and systematic?			
7	Data analysis clearly described and systematic?			
8	Use of verification procedure(s) to establish credibility?			
9	Conclusions supported by the results?			
10	Reflexivity of the account?			

Source: Kmet et al.[13]

TABLE 4. QUALITY ASSESSMENT TOOL – REVIEW ARTICLES

	CRITERIA	YES	NO
1	Did the authors have a clearly focused question [population, intervention (strategy), and outcome(s)]?		
2	Were appropriate inclusion criteria used to select primary studies?		
3	Did the authors describe a search strategy that was comprehensive? Circle all strategies used: health databases handsearching psychological databases key informants social science databases reference lists educational databases unpublished other		
4	Did search strategy cover an adequate number of years?		
5	Did the authors describe the level of evidence in the primary studies included in the review? Level I → RCTs only		

	Level II → non-randomized, cohort, case-control Level III → uncontrolled studies
6	Did the review assess the methodological quality of the primary studies, including: (Minimum requirement: 4/7 of the following) Research design Study sample Participation rates Sources of bias (confounders, respondent bias) Data collection (measurement of independent/dependent variables) Follow-up/attrition rates Data analysis
7	Are the results of the review transparent?
8	Was it appropriate to combine the findings of results across studies?
9	Were appropriate methods used for combining or comparing results across studies?
10	Do the data support the author's interpretation?

Source: Health Evidence[14]

RESULTS

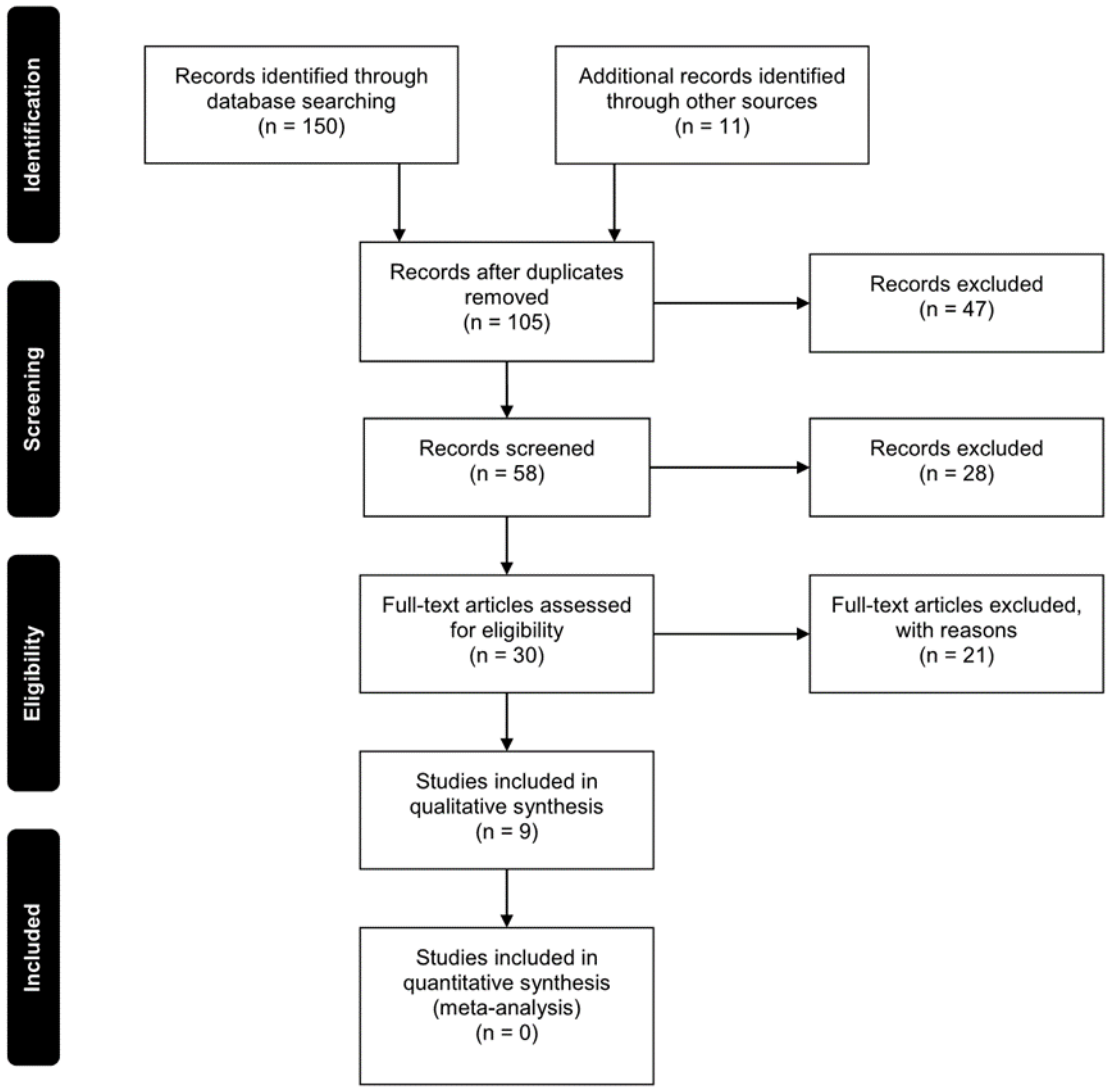
The search for peer-reviewed articles was conducted according to the PRISMA methodology, and the results are illustrated in Figure 1. After searching in five selected databases, 150 articles were retrieved. All articles were combined in EndNote X8 and duplications were removed, with 105 papers remaining. Subsequently, titles were screened, and 58 appeared to be relevant to this work.

Further examination of the abstracts eliminated 28 pieces of research, and full-text assessment eliminated a further 21. Another eleven articles were manually located by browsing titles in the reference list of the nine remaining articles; however, after consultation on EndNote X8, it was concluded that they had been already screened and removed in earlier parts of the process. No quantitative study was found after the full-text screening. The inclusion and exclusion criteria were applied at all levels of this methodology.

Table 5 summarises the number of evidence-based articles for each database per process assessed in this study. It is observed that PubMed and Scopus retrieved a considerable number of papers, but after the screening process, few were compatible with the inclusion and exclusion criteria delimited by the scope of this work.

The four established themes identified by the author are intrinsically linked to the objectives established in the Act 2012. Table 6 organises the articles by theme and author. It is noteworthy that more than one author can be found in different themes. The main findings of each research study are summarised in Table 7 and discussed in the following section — the Discussion. In Table 7, the score calculated through the SQAS and SQT methodology is also shown for each paper. The score results perform an important role in the discussion section when comparing articles

FIGURE 1: PREFERRED REPORTING ITEMS FOR SYSTEMATIC REVIEWS AND META-ANALYSES (PRISMA) DIAGRAM



Source: Kmet et al. [13]

TABLE 6. RESULTS OF ARTICLES BY THEMES AND AUTHORS

THEME	NO. ARTICLES	AUTHOR
Health information fragmentation	3	Hemsley et al. [8] Kariotis et al. [15] Mendelson et al. [16]
Health information quality and access	7	Hanna et al. [10] Hemsley et al. [8] Hemsley et al. [17] Kariotis et al. [15] Mendelson et al. [16] Pearce et al. [18] Walsh et al. [19]
Adverse medical event and duplication of treatment	2	Hanna et al. [10] Kariotis et al. [15]
Coordination of care	4	Almond et al. [20] Hanna et al. [10] Van Kasteren et al. [21] Walsh et al. [19]

TABLE 7. MAIN FINDINGS

AUTHOR	YEAR	THEME	METHODOLOGY	MAIN FINDING	SCORE
Almond et al. [20]	2017	4	Qualitative study with 21 participants with two or more complex chronic diseases (CCC) recruited from three Australian rural areas. Data were collected at three different time points in 2015: pre-adoption, adoption and post-adoption of MyHR. Interviews were conducted in phases one and three and group sessions were held in phase three.	The key topics found were (1) MyHR is an enabler of equitable, person-centred and integrated healthcare for people with CCC, and (2) MyHR can be an access point to more extensive healthcare provision.	0.80
Hanna et al. [10]	2017	2,3,4	Qualitative descriptive study used semi-structured individual interviews from twelve patients of Barwon Health (regional health service in Australia) to identify the patient's perspective about MyHR.	The study found that 50% (6) of patients were active users of MyHR; the remaining 50% were registered but not using it. The main findings reflected on (1) improved quality of care through improved communication, patients perceived advantages in having one single repository of accurate information, which removes patient recall bias and unnecessary investigations or appointments. It also enables better decision-making, especially in first GP or specialist consultations or emergency events. Also, the findings reflected on (2) increased patient autonomy, which translates into the possibility to better coordinate care with or without health providers.	0.94
Hemsley et al. [17]	2015	2	Three qualitative studies including interviews, observation, survey and focus groups. Overall, 27 people participated, 13 with severe communication impairment and 14 healthcare professionals. The studies were conducted in 2014 and 2015.	In one study, a young adult with severe cerebral palsy and severe communication impairment, and using a wheelchair, was asked to retrieve her health records at home. To accomplish the task, she required the help of her carer. However, she was able to access the digital medical records with the assistance of assistive technologies. Therefore, the finding suggests that MyHR could benefit people with severe communication impairment.	0.77

AUTHOR	YEAR	THEME	METHODOLOGY	MAIN FINDING	SCORE
Hemsley et al. [8]	2018	1,2,4	Literature Review about information exchange for people with communication disability. Two articles were retrieved due to the lack of research in the area.	The study found (1) a lack of information about the system and (2) that the exchange of information was poorly carried out.	0.80
Kariotis et al. [15]	2019	1,2,3	Qualitative descriptive study used in-depth semi-structured individual interviews from eleven participants in regional and remote areas of Tasmania to identify clinicians' perceptions about MyHR.	The study found that 100% (7) of the General Practitioners' (GP) sample was aware of the MyHR System. However, only 71% (5) used it. The figure for psychologists was the opposite; none of the four was aware of the system and consequently did not use it. The main findings reflect two themes: (1) medication management, seen as helpful and (2) mental health information, expressing concerns about sharing sensitive material. Other concerns relate to the missing information shared by the patient, which might impact their treatment.	0.87
Mendelson et al. [16]	2016	1,2	Qualitative analysis of the My Health Record *Act 2012* (Cth) document covering legal and technical aspects.	The objectives in the *Act 2012* have not been accomplished because (1) the health information accessed at the moment of consultation by the healthcare provider cannot be trusted once the system allows the owner of the information to change or remove data that could be vital without showing any trail or history to the healthcare provider, and (2) most private hospitals and specialists in private practice are not included in the system, which leads to information fragmentation.	0.90
Pearce et al. [18]	2014	2	Qualitative study about the design and structure of the MyHR System as at 2014.	The most important findings from the research are (1) the Health Record Overview (MyHR website initial screen) shows relevant information, (2) clinical results are usually written using medical jargon, and health literacy levels vary in the population, which leads to incomprehension or misinterpretation of data, (3) information collected is not necessarily fit for sharing, and (5)	0.80

AUTHOR	YEAR	THEME	METHODOLOGY	MAIN FINDING	SCORE
				veracity and completeness of information are contestable because the consumer can input wrong data or hide it.	
Van Kasteren et al. [21]	2017	4	Literature review included twelve articles about consumer perspectives on MyHR. Three papers collected data before the launch of the system, seven after the launch and one after the revision of the system. One study discussed digital medical records, not MyHR.	The literature review found low levels of awareness of and engagement with the system among individuals with chronic diseases, communication impairment and elderly patients; groups that would most benefit from the coordination of care.	0.80
Walsh et al. [19]	2018	2,4	Qualitative inductive analysis using 80 sources to analyse the quality of MyHR content from the consumer perspective.	The study found (1) poor information readability for the public, (2) information was not targeted to priority groups, and (3) important information about how patients can engage with healthcare professionals was not provided.	1.00

DISCUSSION

The findings were organised into four themes, as illustrated in Table 6, and will be discussed in the same order: (1) health information fragmentation, (2) health information quality and access, (3) adverse medical event and duplication of treatment, and (4) coordination of care.

HEALTH INFORMATION FRAGMENTATION

Among the three authors [8, 15, 16], the findings were unanimous: the system has the potential to overcome the health information fragmentation identified in 2019 (date of the most recent research). However, there remain gaps. In Mendelson et al.'s[16] research conducted in 2016, it was stated that most private hospitals and specialists were not registered. As at 31 January 2019, the statistics from the MyHR website revealed that 186 private hospital organisations were registered of the total 630 existing private institutions [7, 22]. Therefore, only 29% of private hospitals were registered, supporting Mendelson et al.'s [16] finding.

Additionally, while GPs were aware of the system, only 71% used it. However, the author of this paper suggests that the trend of GPs usage has grown over time due to increased awareness of the system. Also, the figure for psychologists was exceptionally low, with all respondents reporting that they were not aware of the system and did not use it. Additionally, the concerns about sharing sensitive information on mental health are prominent among this group.

HEALTH INFORMATION QUALITY AND ACCESS

Several authors [8, 10, 15-19] in this area discussed both positive and negative issues of the system and information quality and access. The positive outcomes are that the health information stored in several repositories can be accessed by one system through an interface that shows relevant information on the first website page, which eliminates the reliance on patients remembering facts about their health during medical appointments. It also helps impaired and disabled people who might require help to gather their reports. Therefore, for this aspect, the system improves health information access. [8, 10, 17]

However, the use of that information requires caution. Three authors [15, 16, 18] emphasised problems with the veracity and completeness of the data. Mainly, this viewpoint is based on two problems. Firstly, the patient can

remove, hide or block access reports without doctors' approval. In this case, important information could be omitted and so lead to flawed decision-making. Secondly, patients can create notes and reports that might be incorrect, regardless of the patients' intention. The government also warns about this aspect. For medico-legal reasons, the change logs can be tracked if required and, in case of an emergency, GPs can override access and see essential data, but not the blocked information.

Another perspective is that not all patients have access to the MyHR (e.g., residents of aged care facilities) and, therefore, cannot review and update their information.[10] Additionally, some segments of the Australian community are unable to access and navigate the MyHR system (e.g., elderly citizens).[19] This inability could result in erroneous data that increases the likelihood of risk and harm.

Health literacy was also found to be a concern, with varying levels of knowledge related to the regions in Australia. [8, 18, 19] In addition to this, while the public might understand the system's language, minority groups might not. It was also identified that medical jargon could lead to misinterpretation of information, and not all data is fit for sharing, for example, laboratory results.

ADVERSE MEDICAL EVENTS AND DUPLICATION OF TREATMENT

While only two studies discussed this area, both have a robust SQAS score. However, the sample size (eleven [15] and twelve [10] participants) and the geographical area (regional Tasmania [15] and other regional areas of Australia [10]) does not allow for generalisation to the broader community. Overall, positive results were found.
In the research conducted by Kariotis et al. [15], accessing patients' medication and other treatments record improved GPs' decision-making and avoided adverse medical events (e.g., drug interaction). In Hanna et al.'s [10] study, fewer duplication of investigations and appointments were experienced by patients because doctors could access their information from the MyHR system and see records of examinations and procedures undertaken in different facilities.

COORDINATION OF CARE

Four pieces of research were found in this area; two stated positive results and two stated negative results. It is noted that these papers are supported by contemporary, rigorous research. However, the findings contradict each other, and conclusions could not be drawn.

Almond et al. [20] state that the MyHR system supports person-centred and integrated healthcare, and that it works as an access point to more extensive healthcare provision. This system's outcome can positively affect the coordination of healthcare that involves a higher number of health professionals, prescribed medications, and healthcare costs, especially for patients who suffer complex chronic conditions. Van Kasteren et al. [21] also states that individuals with chronic diseases, communication disabilities, and older people would benefit most from the system. However, the author's literature review indicated that low levels of awareness and engagement were apparent among these group and the reasons may be in part attributable to poor engagement with and promotion of the MyHR by healthcare providers and services.

Hanna et al. [10] identified that the health providers' usage of the system assisted in coordination and improved healthcare due to the holistic and historic view presented by the system. The study also suggests an increase in patients' empowerment and interaction with physicians. However, Walsh et al. [19] analysed the content of the MyHR system and contradicted that finding. The authors hold the view that relevant information about how patients can engage with healthcare professionals was not provided.

CONCLUSION

The systematic literature review undertaken as part of this research article aimed to examine the progress of achieving the four objectives declared by the government in the MyHR Act 2012. While the system could reduce health information fragmentation, it still lacks the participation of most private hospitals and specialists.

The second significant finding was about health information access and quality. Although it was found that the MyHR system improved access to information, several problems were also identified. These variable levels of health literacy were found in different regions within Australia, [8, 18, 20] and while the general public might understand the system language, minority groups might not. It was also found that medical jargon could lead to misinterpretation of information, and therefore not all data is fit for sharing (e.g., laboratory results).

There is limited research regarding adverse medical events and duplication of treatment. While two articles discussed positive outcomes in this area, they were located in remote areas of Tasmania and other regional areas of Australia. It would be premature to generalise these findings to the whole country. Contradictions in the research into the coordination of care were found. This prevented any clear conclusions being drawn.

Overall, the empirical findings in this study provide a perspective of the MyHR system and how much has been accomplished in the last seven years in relation to the objectives proposed. This study was limited to nine refereed pieces of literature, so it lacks deeper insight into each theme. More information on healthcare providers and patients' usage of the MyHR system would help to establish a higher degree of accuracy.

FURTHER RESEARCH

It was evident in this work that the four themes require further research. In relation to the health information fragmentation, it is suggested an investigation be conducted into the barriers faced by private hospitals and specialists and how to enhance their participation.
More information on MyHR users' and healthcare workers' experiences related to health information quality and access and management of care would help to establish a higher degree of accuracy on these matters. Another area for research may be understanding the barriers for patients and specific society segments accessing their MyHR (e.g., aged care residents). Further experimental investigations are needed to estimate the association between adverse medical events and duplication of treatment and the MyHR system.

COMPETING INTERESTS

The authors declare no conflicts of interest.

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RESEARCH ARTICLE

SERVICESCAPES IN HEALTHCARE: A QUALITATIVE STUDY ON THE ELDERLY'S PERCEPTION OF AN AGED CARE FACILITY

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ABSTRACT

OBJECTIVE

The paper aims to understand how the elderly perceive the healthcare services of their aged care facilities. This paper explores different dimensions of servicescape elements, which ultimately affect the development of healthcare services.

DESIGN

Both naturalistic observations and in-depth interviews were conducted to discover the perceptions servicesape elements.

RESULTS

The authors discovered that servicescape elements rely not only on physical, social and socially symbolic dimensions but also on cultural dimensions.

CONCLUSIONS

This study uses the elderly home context in City of Harlingen, Rio Grande Valley, Texas, USA, and finds support to Rosenbaum and Massiah [1]'s multidimensional model and suggests improvements in servicescape elements. We found that factors such as ambience, signage, layout, and socially symbolic structure at the aged care facility, were highly appreciated by the elder residents. Other factors such as privacy, quiet environment, and social interactions among patients via group activities require improvements and further attention. Findings of the study can be generalized in other similar social contexts, particularly in improving Asia Pacific region's healthcare services.

KEYWORDS

healthcare service, servicescapes, elderly, aged care, Rio Grande Valley (RGV)

INTRODUCTION

The number of older Americans has increased steadily in accordance with global phenomena. By 2030, American senior citizens will make up 20% of the nation's total population, up from 12.4% in 2000. By 2050, approximately 21 million Americans will reach an age of 85 and over. [2] Public funding for the healthcare of older citizens is now more critical than ever. In 2014, total expenditures were $549.1 billion under the Medicare Program, which provided health insurance for 48.7 million people. [3] These figures have now increased to $710 billion for 58.4 million American beneficiaries. [4]

The growing ageing population and public funding create business opportunities in the aged care industry, from medical support with minimal levels of care (e.g. in-home care) to medium levels (e.g. assisted living facilities) to full services (e.g. nursing homes). [5] Nursing homes for the elderly turn into a promising industry that will cater to various needs of the elderly people. Approximately 1 million elderly Americans were using nursing home services in 2015, and it is projected that about 2 million elderly Americans will use this service in 2030. [6] Considerable research has been conducted in nursing homes to improve their services as well as facilities. For example, Schüssler et al have [7]

noted current problems in nursing homes for dementia patients and recommend an increase in the patients' independence with incontinence care.

To survive and thrive in the competitive aged care industry, servicescapes can be considered to positively influence patients' perceptions of the care center. Servicescapes topics range from Bitner's model [9] which analyzes the impact of physical surroundings in service development, to Rosenbaum and Massiah's which goes beyond the physical element to analyze three more factors: social, socially symbolic and natural factors. [1] The concepts of servicescapes in Bitner [9] and in Rosenbaum MS, Massiah C [1] are the backbone for this research paper.

A servicescape is the physical surroundings including ambience; spatial layout and facilities; signs, symbols, and artifacts in which organizational activities occur. [9] Three main research groups are found in the servicescape literature: the classical group, the mutual-interaction group, and e-servicescape group. [10]

The classical group evaluates the impact of only one element of servicescapes on consumers' perceptions or behavior. [11] For instance, consumer spending (money and time) at a store increases if music and the store environment are compatible. [12] Scent also affects the consumers' favorable perception on the mall environment and product preference. [13] In addition, the appearance of gold coloring in a service atmosphere (such as restaurants) initiates consumers to tip more. [14]

The mutual-interaction group analyzes the mutual relationships between two cues and the impact of many cues on consumers' perceptions and behaviours. [10] For instance, a consumer will find more enjoyment while shopping in a store during the Christmas season, if the store uses both Christmas music and Christmas scents (e.g., cinnamon). [11] If the music and scents are inconsistent, the scents may have no impact on consumers' perceptions and behaviors, or even cause negative impact. [12]

The e-servicescape group focuses on new research in cyberscapes or the combination of bricks and clicks environments. [11] In e-servicescape, consumers' trust and attitude towards a website impact four main factors: visual appearance, financial security, application and customization. [17] Visual appearance can also increase the percentage of customer interaction. [18] Therefore, if servicescapes are deliberately developed, they can help service organizations operate more effectively and efficiently. [19, 20]

Though many authors try to explore servicescapes from different points of view, servicescapes in aged care have not been rigorously examined. This research is particularly interested in exploring how elderly people in the aged care facility perceive servicescape elements. Hence, this research paper addresses the question below:

HOW DOES THE ELDERLY IN AN AGED CARE FACILITY PERCEIVE THEIR HEALTHCARE SERVICESCAPES?

Focused on the context of the US, we believe this study will add more insight in the servicescape elements and thus the whole healthcare service industry. Moreover, findings of this study have theoretical and practical implications in healthcare service literature and establishments, particularly in elderly care facilities. Importantly, we can understand the elderly care facilities from the perspectives of the users. Hence, this understanding helps healthcare service providers to design their offering in different social contexts.

This paper is organized as follows: we first discussed the importance of this study and try to find the research gap. We then described the theory that is used and rigorously examined healthcare servicescape literature. Methodology, findings and implications of this study are also delineated.

THEORY USED

1.Rosenbaum and Massiah theory on servicescapes is the main theory applied for this research paper. [1] This theory is comprised of four main elements including: physical, social, socially symbolic, and natural/environmental. Similar to Bitner [9]'s concept, the physical element has several main components: ambience, spatial layout and functionality, and signage, symbols, and artifacts. The social factor includes four elements: customers, employees, social density, and displayed emotion of others. The socially symbolic dimension consists of three main elements: ethnic signs and symbols; and ethnic subjects and artifacts. The fourth dimension – natural/environmental - includes three elements: being away, fascination, and compatibility Rosenbaum and Massiah work contributes to the effective management of natural settings on consumers' health and well-being enhancement [1] multidimensional model has been applied in many hospitals to enhance the living

conditions, but its application in the health care context is still rare, especially in the aged care field.

HEALTHCARE SERVICESCAPES LITERATURE

When evaluating and choosing a service, consumers depend more on intangible attributes for a high-class level, and more on tangible attributes for a lower-class level. [21] Sag, Zengul and Landry [22] finds that servicescapes affect significantly in healthcare services, including both intangible and tangible attributes (e.g. satisfaction, emotions, and perceptions). Consumers may even evaluate a service organization's capacity by just assessing tangible factors. [23] For instance, patients feel comfortable, sitting and relaxing in gardens, which are situated inside hospitals. [24] In addition, staff, physical surroundings, atmospheric environment and wayfinding positively affect consumers' experience, loyalty and willingness to spend more for healthcare services. [25]
Likewise, social interaction also plays an important role in healthcare services. [26, 27] Social activities can help cancer patients distract themselves from their disease [26] or allow elderly people to resolve their illnesses or negative feelings (i.e. lonely or isolated feelings).

METHODOLOGY

Ethnographic research method is popularly used in marketing research methodology. [31][37] We chose to use this methodology in this study. Ethnography research method entails in-depth interviews, observation, narrative textual analysis, to derive individual opinions, emotions. [38] Naturalistic observation also helps to understand the normal activities of the respondents. [39]

PROCEDURES

To explore servicescape elements at an aged care facility, a purposive sampling technique is used. One specific nursing home is chosen in Harlingen City, RGV (the Valley), Texas, US. The researchers set up two meetings with the informants over the one-week period: the first meeting was a relatively short appointment to make initial contact, get demographic information, brief the informants, and help them feel at ease. Moreover, the elderly was told that we would take photos of them in the daily activities for the first three days. Also, we observed the daily activities of these participants and their interactions with the facilities, healthcare staffs and other housemates.

From the fourth day to the seventh day, after making the informants comfortable, the interview (second meeting) began with the researcher presenting the photographs (which had been printed in the interim) one at a time in chronological order to the informant and prompting them with broad, non-directive statements such as "Describe this photograph to me" or "What do you see here?" "What did you think at this moment". Follow-up questions were used to clarify meaning, for example, if an informant used the word "home" we would ask what that word meant to them. Before the interviewer move on to the next photograph, we ask "Is there anything else you would like to tell me about this photograph?" The interviewers avoided leading the informant as much as possible and did not suggest ideas or favor a particular line of thinking. Questions consisting of "What do you think about it (i.e. a facility, an equipment, an activity) right now?" were included. These participants were interviewed while the observations were still taking place.

Each interview lasted around 30-45 minutes. We recorded audio and video interviews with participants' consent, preserving anonymity. We also achieved triangulation when different authors checked the recorded texts and accorded on the same meaning.

This aged care has a total of 16 patients, with two males and 14 females, all who live there full-time. Eight participants (two males and six females) agreed to join this research.

THE SETTING

The aged care facility in this study is one story tall, with one kitchen, one large dining room, 16-bedrooms, eight full bathrooms (either shared or private), two half bathrooms, one office, one activity room, and one laundry room. The kitchen has three large two-door refrigerators, four connected dining tables, and three floor-to-ceiling windows facing the backyard. The kitchen provides enough space for more than 18 people to dine simultaneously. The dining room and the kitchen look bright, sunny, and full of natural light, thanks to the floor-to-ceiling windows.

Within the 16-bedrooms, there are two suites. The suites have one small living room, one bedroom, and one private built-in bathroom. The other 14-bedrooms provide either single room or double room occupancy; double rooms are divided by a room divider or mingle. The patient's room arrangements are based on availability, financial ability,

and personal interests at the time of arrival. This facility has one on-site medical team but does not provide an in-house nurse or video surveillance. External medical professionals are provided for those who need extra care.

This aged care facility provides long-term shelter, food and personal care services for low-income individuals. The residents of this facility are mostly Medicaid and Social Security recipients who are unable to complete the tasks of transferring, eating or toileting, etc.

NARRATIVE TEXTUAL ANALYSIS

The audio and video recordings of the interviews were transcripted by two graduate students from the University of Texas Rio Grande Valley. Narrative textual analysis provided in-depth understanding of the way participants 'mean and interpret the world around them'. [31][40][36] We first listened and observed the recorded interviews to make sense of the participants' responses and then interpreted what the participants meant. Finally, authors accorded participants' concerns about different servicescape elements. Then the narrative textual analysis was conducted by three researchers.

We asked participants "what" they liked and "how" they create meanings from different elements in the aged care facility. By asking "what" questions, we try to learn about the different facilities in the aged care facility. "How" question tries to capture how participants' create different symbolic meanings in the physical setting. While doing this, we also cross-checked different interview transcripts and made sure meaning similarities across participants.

FINDINGS

This research explores how elderly people perceive the servicescape elements in the context of nursing home. While presenting the findings, we discussed the participants' quotes. Findings are presented below:

CULTURAL DIMENSION

The participants claimed that they wanted to live independently at home. Since they could not take care of themselves, they had to move into this nursing home. This decision was made by the participants' family or their physicians based on the participants' health situations, availability of local healthcare services, and their family's

financial conditions. For example, Angela commented:

"One of the loneliest places is nursing home or hospital." (Angela)

The participants also claimed that the medical team gave them sleeping pills, so they are likely to sleep more than usual and be inactive, although they sometimes walk or participate in games.

We found this dimension closely related to the cultural traditions of the elderly. Many Hispanic families are reluctant to use the aged care services as shown in this study, which is similar with Asian-Americans. [28] Results of this study is congruent with the findings from Australia [29] and Vietnam [28] which show that elders would prefer to stay in their own homes rather than stay in aged care facilities. However, the ageing population forced some communities to establish assisted living facilities and nursing homes. [28]. The conflict between the willingness of the elders and the increasing need for the aged care services raised an interesting cultural dimension for further investigation, in addition to the four dimensions mentioned by Rosenbaum and Massiah. [1]

PHYSICAL DIMENSION

The agreed participants were long-term residents, bringing more in-depth contributions to the study. Participants share an area that includes a large living room, a multifunctional dining room and an activity room, where the residents can read, watch TV, and socialize with one another. They expressed mixed feelings regarding the shared room. Ms. Linda, a regular reader in the common area, commented that dim lighting in the activity room reminded her of her childhood house.

"The light is good. Seems peaceful. Reminds me of the old time." (Linda)

Other seniors also expressed a positive feeling when talking about the peace, warmth, and safety of the nursing home. For instance, the shared area is brightened up by natural light going through large windows and glass panel doors. The combination of natural light with the interior wall and ceiling paint creates a cozy atmosphere.

Nonetheless, some residents shared a different thought; especially those who lived independently before. Among those is Marlyn who constantly complained about the noise during the night.

"Lots of noise at night. Yelling… One patient yelled all night last night" (Marlyn)

More importantly, the nursing home has a very practical spatial layout, which results in the easy execution of daily activities and social interactions between patients and staffs. The living room provides traditional decorations and furniture and is the most popular gathering place in the house. The walls are painted in dark orange, a popular color of many houses in the RGV area in Texas and Mexico. This creates a familiar environment for the residents, as well as visitors. In addition, Marlyn stated that her room, like other bedrooms at the residence, has easy access to a restroom, shower, other parts of the house, and provides a view outside through a large window.

"I can see the sun, cars, people outside from my room window…I can just sit on my bed and see outside via this window" (Marlyn) (pointed at the large ceiling window in her own room)

Additionally, the emergency system provided here is well designed and maintained on the regular basis, ensuring the safety of the residents. Signage is also located everywhere in this facility. For example, exit signs are placed directly on the doors to the backyard will light up in case of emergency. Emergency lights will flash, indicating evacuation routes. Most importantly, systematic speakers will be used to notify everyone everywhere in the home in case of emergency.

SOCIAL DIMENSION

Residents have varying opinions of the staff working at the nursing home. Some claimed that healthcare and support workers are active, caring, and thoughtful. Flora said she received immediate attention every time she rang her bell. Marlyn also agreed that the healthcare staff in this facility is willing to meet the residents' individual requirements or needs.

"The girls [staffs] are wonderful. They know what I like, what I don't like. They go out of their way to make sure I have what I like. They know I like bananas. If there is no banana in the kitchen, they would bring bananas from their home for me." (Marlyn)

However, other participants thought that the support services in this facility could be improved. Ms. Nancy had previous negative experiences and complained:

"No. They don't give me care all the times…They don't come whenever I need…I have to wait. Wait until they get to me." (Nancy)

Similar situations happen in patient-to-patient interactions. Ms. Linda complimented the friendliness and kindness shared among the residents, while others gave examples of disputes that occur amongst themselves.

"We sing and enjoy each other's company…We have a really good time…Everyone here is like family." (Linda)

"She [roommate] is telling others about me and so she has her say and I have my say." (Nancy)

"I don't have any friends here. The lady next door does not want to talk about anything. We are very quiet. That is the only problem; too quiet. They are too old. See, that's why I am not happy here. I don't have anybody my age." (Flora)

SOCIALLY SYMBOLIC DIMENSION

The iconic architecture of RGV is interwoven within the design of the facility. A backyard provides a relaxing environment with flowers, plants, and a lawn, all in good care. A brick patio and small stone pathways are lined with several southern-style benches, which provide a great place for the residents to rest. All windows facing the backyard are mostly made of glass and provide residents with the feeling of being close to nature. These windows also make it convenient for the staff to take care of several patients simultaneously.

The socially symbolic dimension within this facility was also evident with the various artifacts observed within this facility. Some residents are Catholic, and some are Baptist. Christian beliefs of the residents are indicated by the Catholic crosses and Anglican statues found in participant bedrooms.

NATURAL/ENVIRONMENTAL DIMENSION

The nature elements of the nursing home receive great support and appreciation from the residents. All participants believe that the best part of this place is its well-cared front and back yards along with several large oak trees.

"I go outside when the weather is good. Outside is good." (Flora)

Marlyn, who is too weak to go outside, loves to sit next to the floor-to-ceiling glass window, enjoying the beauty of the nature.

"I love to watch the birds and squirrels from my window...I like watching the green grass, the sun... When I don't have a headache, I open the blinders and sit next to the window to see outside…Before I came here, I was worried that I could not go outside…I am an outdoor person….but here I can go to the backyard and walk around. I am happy." (Marlyn)

DISCUSSION

The results from this study support [1]'s multi-dimensional servicescapes model and extends it with a cultural dimension. Here, the participants expressed that they would prefer to stay at home and consider the nursing home a commercial place rather than home. Their family or physicians made this decision, elements of e-servicescapes such as visual appearance, financial security, application and customization mentioned in the studies of [18] and [17] uninteresting to them.

Older people have little control over their placement decisions. Most of the older people could be considered as being forced to go and live in nursing homes. Since it is the culture advocation and traditional virtue in some society that children, when grown up, should take the responsibility of taking care of their parents. This may lead to a result why older people have almost no opportunity to participate in the admission decision-making process. [32] Moreover, when the parent(s) becomes widowed or suffers from mental or physical health problems, they will be more likely to be placed in the nursing home. [33][34]

For the second dimension – physical features (ambience, spatial layout and facilities, and signs, symbols, and artifacts), the participants highly appreciated the physical surroundings of this nursing home. This facility effectively manages the ambiance when the healthcare staff keeps the noise level carefully low, the light comfortably dimmed, and a pleasant temperature maintained. This combination of multiple factors creates positive effects on participants' feelings, which support the congruity theory. [15, 16] This suggests that a consumer finds the servicescapes more favorable if multiple elements are consistent, less favorable, or even negative if it contains contrasting elements. The spatial layout and functionality within this nursing home also practically and efficiently facilitate social interactions among the participants, and between the participants and the healthcare staffs. Hence, the layout facility in healthcare facility assists the nursing home, which is congruent with the servicescapes literature. [19, 20]

For the third dimension – social factor (e.g., employees, social density), the participants expressed that the care and attention from the healthcare staffs play an important role in healthcare experience. This finding is consistent with Rosenbaum, Sweeney, Windhorst [27] research which suggests that social elements can assist the elderly with their diseases and manage negative feelings such as loneliness and isolation. However, this study also finds that some residents in this nursing home are unhappy with the services provided by the healthcare staffs and cannot get along with other patients. This in turn makes them feel unhappy and lonelier; hence, these unhappy patients need more responsive care and special attention.

For the fourth dimension - socially symbolic (e.g., ethnic signs and symbols), this nursing home was built in the endemic style in Texas with many different cultural signs, symbols and artifacts. Letting elderly to use different cultural signs and symbols gives the nursing home a feeling of homely environment. It is observed that the participants like these mixed socially symbolic features in this facility. For the final dimension – natural/environmental (e.g., being away, fascination, compatibility), the participants enjoy the beauty of the natural environment from the backyard and the front yard of this nursing home. The backyard is also used for relaxation. Participants described that the nature helps them get away from the nursing home, relax, and find peace. This finding is also consistent with Rosenbaum, Sweeney and Windhorst research [27] and that of 24 Bengtsson and Grahn [24] study.

THEORETICAL IMPLICATIONS

The findings of this research are consistent with Bitner [9] and Rosenbaum and Massiah [1] findings on the impact of servicescapes on consumers' perceptions and behaviours. This research contributes to healthcare servicescape literature not only in illustrating the consistency with existing literature, but also in extending the previous research findings by proposing the culture dimension.

The five dimensions (physical, social, socially symbolic, natural, and cultural) provide facility managers in the

healthcare industry an insight of the elderly's perceptions, behaviors and overall satisfaction on a nursing home's servicescapes. In the nursing home in the RGV, the managers should balance the residents' needs for social interaction and privacy, as well as enhance the care and attention that the healthcare staff provides to unhappy patients.

Furthermore, cultural diets and religions play an importance role in elderly's decision of nursing room placements. The findings here are consistent with [35] which particularly focuses on South Asian elderly. This study also claims that the elderly perceives a living in nursing home is being abandoned by their children instead of a place that they could been better taken care of. They then attribute the reason of staying in the aged facility as being a widowed, never get married, divorced or they are having some mental issues. In their perspective, staying at the nursing room is more of a "forced" choice than a voluntary option. Thus, this study confirmed the findings of Gupta, R. [35]

PRACTICAL IMPLICATIONS

The findings of this study can also be generalized to other social and cultural contexts, particularly Asia Pacific region where the populations in countries such as, Japan, Korea, Singapore are ageing. In Asian culture, elderly used to live with children in their old home. However, many Asian young now leave home and find jobs elsewhere. It forces many elderly people to start thinking about living in nursing home since they have none to care in their home. This phenomenon emphasizes the aged care service agencies to find a way of providing family-oriented atmosphere for the elders under various cultural backgrounds.

In addition, most of the current aged cares could not meet older people's needs based on their varied cultural backgrounds and religious practices. For instance, in Vietnam, faiths include Buddhism, Catholicism, Islam, Christianity, Taoism, each with fundamentally different religious practice. Specifically, elderly Buddhists in Vietnam tend to spend hours at the temples every night to pray. They are generally vegetarians. Therefore, it is difficult for them to keep such customs while being in nursing homes where the majority of the residents are non-vegetarians. Similarly, service providers could face challenges when dealing with those different cultural values and practices in operation.

LIMITATIONS

This study provides a foundation to understand healthcare servicescape elements. Based on the observation and interview techniques, authors try to identify servicescape elements. Future researchers can do more in-depth analysis and examine more servicescape elements. Future can also examine the perceptions of the elderly people in different cultural contexts. Moreover, researchers can also periodically check how the perceptions of the elderly changed.

The limitations also lie in our sample size. The naturalistic observation method enables us to study the participants' behaviors in their daily surroundings, but the small sample size of this study may make it difficult to generalize the findings and replicate the results for future research [30]. Similarly, the in-depth interviews allow us to collect specific data, which detail the participants' perceptions and behaviors on the servicescapes. Results of this study may be improved by future study conducting other empirical research method with a larger sample size.

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REVIEW ARTICLE

IMPACT OF LANGUAGE BARRIERS ON ACCESS TO HEALTHCARE SERVICES BY IMMIGRANT PATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

BACKGROUND

Research has demonstrated lower access to healthcare services by immigrant patients in comparison to native people. Cultural and linguistic differences have been considered as main factors that impede this access and as barriers to creating an effective relationship between immigrant patients and health professionals.

OBJECTIVE

The aim of this study was to better understand and synthesize the available evidence regarding the impact of immigrant patients' language proficiency on access to health care.

METHODS

A systematic literature search was performed to identify studies published between January 2000 and January 2019 that examined the impact of language proficiency on access to and use of health services by immigrant patients. Only articles in English were included. Cross-referencing of the identified articles was also performed.

RESULTS

A total of 140 publications was identified through online databases. In all 24 studies were reviewed, and the results were reported using four interrelated themes identified from the articles. These reports consistently showed a clear association between inadequate language ability and underuse of health care services, ineffective communication, and increased use of emergency care by immigrant patients. Identifying factors that can influence access to care, applying immigrant-friendly solutions such as provision of professional interpreters, and encouraging culturally and linguistically sensitive education may improve the quality of care and increase access to care. One study recommended utilisation of communication technologies such as telemedicine to bridge the communication gap and increase accessibility of healthcare services by immigrant patients.

CONCLUSIONS

All included studies indicated that language barriers hindered access to healthcare services. The data resulting from this study can update policy and practical solutions for language barriers on access to care by immigrant patients and provide an agenda for further investigations.

KEYWORDS

language, healthcare services, access, barriers, immigrants, migrants

INTRODUCTION

The significant number of migrants around the world is a fact. [1] As the globalisation process increases, the migration rate of individuals from different cultures and countries is rising. Reasons such as more secure employment, better education, escape from war and disasters or reuniting with families can compel individuals to migrate. [2] Based on a United Nations report, the number of international immigrants reached 244 million in 2015. [3]

Legal immigrants in host countries have the same access to health care services as native-born. However, inequalities in access to health care services have been reported. [4]

Access to healthcare services and facilitating this access is defined as helping people to command appropriate health care resources in order to preserve or improve their health. [5]

To gain access, patients need to be able to proficiently speak in the same language of the health professionals who provide the care. This proficiency is particularly vital in dealing with medical conditions, because clinical examinations depend on verbal communication between patients and medical staff. [6, 7] This miscommunication also increases the risks of delays in treatment, inadequate care, medical errors, and misdiagnosis received by these patients. Potential drug-related adverse effects and medical complications are also reported. [7-9]

Language barriers have been shown in various research studies as a significant impediment in establishing an effective doctor–patient relationship. [9-12] Barriers to communication between immigrant patients and health professionals can affect patients' access to available information or understanding of the information received. These barriers can also affect their decisions to accept and adhere to some types of treatment and medications. [13-17]

Australia has a long history of immigration' more than many other countries and is well recognised as a multi-cultural nation. According to Commonwealth of Australia statistics, Australia is a popular destination for immigrants and hosts one of the largest immigrant populations in the world. The latest trend data in Australia, shows that approximately 29% (7.3 million) of the Australian population was born overseas as at June 2018. [18]

There has been an increase in cultural diversity in Australia with more than 200 cultural and linguistic groups. [19] In this diverse background, the Australian health care system is experiencing a growing difficulty in delivering healthcare in an equal access and culturally capable manner. [20]

This review study focuses on the challenge of providing quality care in the context of immigration to developed countries such as Australia and the impact of language barriers on access to health care by immigrant patients.

The objective of this review is to synthesize the current evidence and to gain better understanding of language barriers, which is currently placing immigrants and patients from different ethnicities at high risk of suffering poorer health services.

The review is also searching for new and advanced solutions that can minimise the risk and fill the gaps in access to quality health care services by immigrants and ethnic minority groups. These solutions can apply to the Australian healthcare system.

METHODS

This review is steered by the Arksey and O'Malley framework for performing scoping review. The framework for performing scoping review has five stages. The five-stage framework includes: 1) identify the research question (s), (2) identify relevant studies, (3) select the study, (4) chart the data, and (5) report the results. [21]

Scoping reviews use systematic methods to identify and map fundamental concepts, evidence, and gaps related to an area of interest. They assemble secondary data, critically evaluate research studies, and produce findings qualitatively or quantitatively. [22]

A systematic search is conducted followed by the collection and amalgamation of current knowledge, and the reporting the findings.

Stage -1: Identifying the Research Question.

The purpose of scoping reviews is to attain detailed and extensive results because they aim to detect all related literature regardless of study design. The central question of this literature review is posed as:

"How is immigrant patients' access to healthcare services affected by language barriers?"

Stage -2: Identifying Relevant Studies

This review study will identify, evaluate and combine relevant information from online databases; international, Commonwealth and state documents; journal articles and books. (Table 1) To discover all possible sources of information, the reference lists of all selected articles were scanned for relevant articles.

TABLE 1: LIST OF DATABASES SEARCHED

Table 1. List of databases searched to identify literature for this synthesis.

For published articles
• MEDLINE
• PubMed
• Scopus
• CINAHL
• Web of Science
• Academic Search Complete
• Google
• Google Scholar

TABLE 2: SEARCHED KEYWORDS IN DETAILS

Table 2. Searched keywords in details.

- **Language:**
  Language, Diversity, Linguistic, Non-English speaking, Communication
- **Barrier:**
  Barrier, Impediment, Challenge, Obstacle, Hurdle, Difficult, Inequality, Obstruction
- **Immigrant**
  Immigration, Migrant. Emigrant, Foreign-Born
- **Access**
  Access, Healthcare Access, Healthcare Services Access, Healthcare Delivery, Healthcare Utilization, Accessibility
- **Interpreter**
  Interpreter, Translator

A list of all possible key words (Table 2) for language, barrier, access, healthcare and immigrant was included. To reduce the number of studies to a more manageable number, considering the time required to examine each article identified, the search was limited to articles published from 2000 to 2019. Most studies identified were in the English language. The author decided to include only articles published in the English language in this review.

Stage -3: Study Selection

The preliminary search in the databases produced a significant number of both related and unrelated articles. An inclusion and exclusion criteria list considering the study question was created. (Table 3) Only full-text available articles focusing on language and communication barriers to healthcare access by immigrants (regardless of their country of origin), were selected. In the final refining step, only articles published in peer-reviewed journals were considered as peer-reviewed journals ensure a level of control and credibility.

Stage -4: Data Charting

An Excel spreadsheet consisting of a data charting form was developed with the following data: author(s), year of publication, country of study, study title, methodology used, population/sample size, major results and findings, and quality assessment rating for original research studies. A similar spreadsheet was also developed for literature review studies included in this review.

TABLE 3: SEARCHED INCLUSIO AND EXCLUSION CRITERIA

Table 3. Searched Inclusion and Exclusion criteria used in the review.

Criteria	Inclusion	Exclusion
Year published	Between 2000–2019	Before 2000
Language	English	Non-English
Online availability	Full text	Abstract only
Peer-reviewed	Yes	No
Focus	Language and communication barriers between health professionals and patients	Other barriers
Population	Immigrants	Non-migrants or unclear

Stage -5: Reporting Results

In scoping studies, the purpose is to develop a description of what research exists, or to create a thematic construction in order to present a broad view of research in a topic area. [21] In this systematic literature review, the author used the chart from stage 4 to further contextualize the collected information of the included articles based on language barriers and their effects on access to health care services, identified and coded within the article.

ASSESSMENT OF QUALITY OF INCLUDED ARTICLES

According to Levac et al. (2010), employing quality assessment tools could prevent false conclusions in regard to the nature and extent of the gaps identified in the study. [23] Therefore, after screening the full-text articles, all included articles were assessed using a quality assessment tool by Health Evidence™. [24] The quality of the articles was evaluated to safeguard the strength of the synthesis and their methodological quality. An overview of the quality assessment is shown in Table 4 and Table 5.

RESULTS OF THE LITERATURE REVIEW

A primary electronic search recognized 140 publications. From these articles, 109 records were selected based on title and abstract. These 109 records were further screened by reading the full texts and then reducing the number of articles within the scope to 20 original research articles. Four literature review articles were also identified that met the inclusion criteria making a final total of 24. No relevant grey literature was identified. All of the studies included in this synthesis were conducted on immigrants in developed countries and included a mix of health care providers' and patient's perspective. (Figure 1, Table 4 & 5)

FIGURE 1: SEARCH FLOW FOR LITERATURE

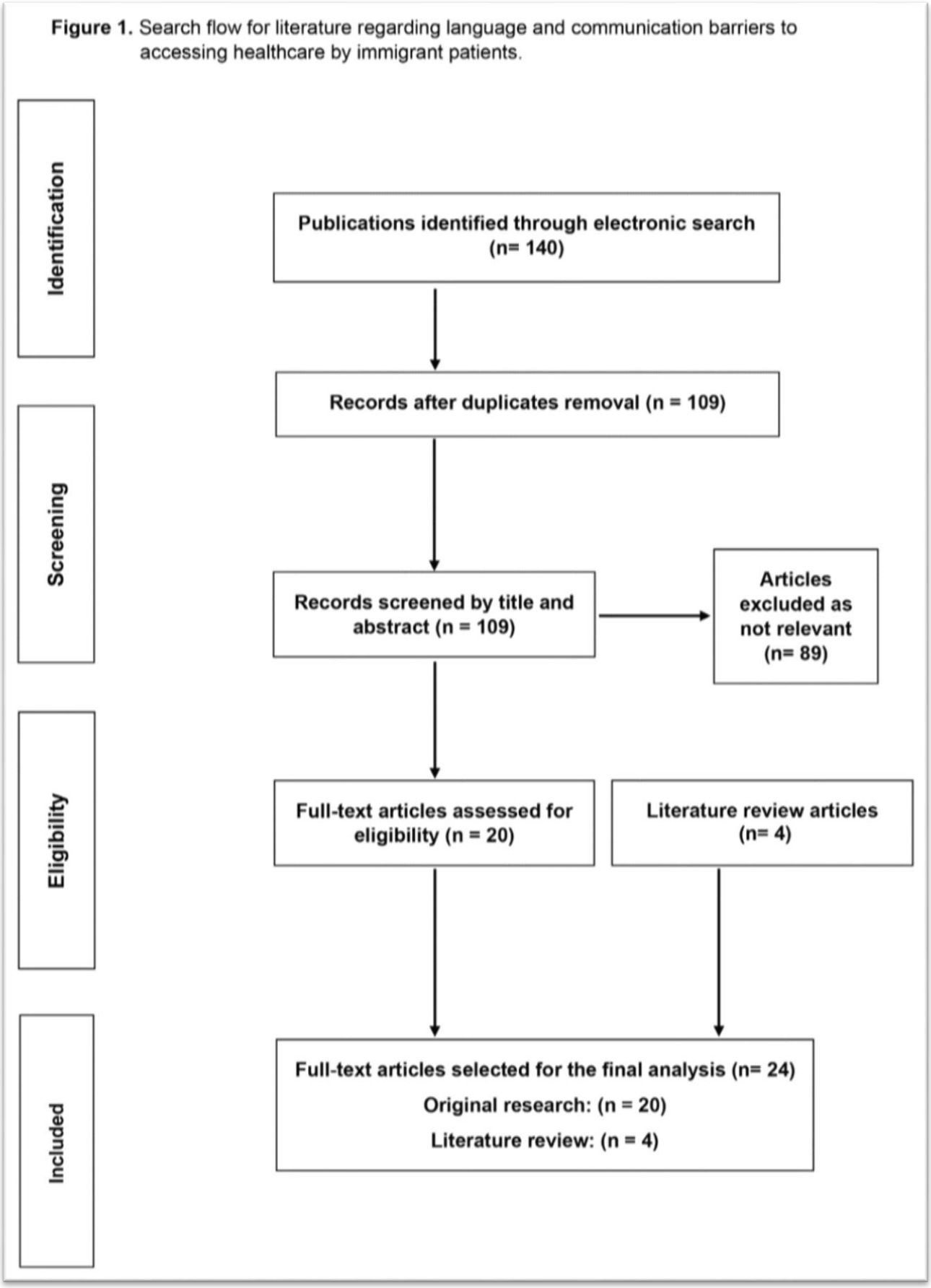

Table 4. Included original research articles.

Author/ Year/ Country	Title	Methodology	Sample size	Main findings	QA Rating
de Moissac et al. 2018, Canada	Impact of Language Barriers on Quality of Care and Patient Safety for Official Language Minority Francophones in Canada.	Surveys/ semi-structured interviews	20	- Language barriers contributed to poorer patient assessment, misdiagnosis and/or delayed treatment, incomplete understanding of patient condition and prescribed treatment, and impaired confidence in services received. - Reliance on Google Translate and ad hoc, untrained interpreters	High
Andreae et al. 2017, USA	The effect of initiatives to overcome language barriers and improve attendance: A cross- sectional analysis of adherence in an inner-city chronic pain clinic.	Retrospective cross-sectional analysis	14,459	Coordinated initiatives to overcome language barriers can be beneficial in improving appointment adherence and access to care by enhancing rapport and communication between pain physicians and their patients.	High
Hunter-Adams & Rother, 2017, South Africa	A Qualitative study of language barriers between South African health care providers and cross-border migrants.	Qualitative/ Semi structured interviews/ focus groups	71	- Effective communication is a prerequisite for quality care. - Free-to-patient professional medical interpretation would not only benefit migrant populations but would benefit the broader community where language and health literacy are barriers to accessing health.	High
Ross et al. 2016, Australia	Improving the management and care of refugees in Australian hospitals: A descriptive study.	Qualitative/ Questionnaires	150	- Language and cultural barriers are among barriers to care and access to available services including appropriate interpreters. - Need for additional support highlighting that caring for refugees in Australian hospitals is a significant challenge. - Additional support and education should be targeted to reduce barriers to care.	High
Sandre & Newbold, 2016, Australia	Telemedicine: Bridging the Gap between Refugee Health and Health Services Accessibility in Hamilton, Ontario.	Qualitative/ Structured interviews	6	-Telemedicine can be efficient in encouraging dialogue and policy change in the greater health-care setting. -It potentially can increase access to specialist health-care services.	Medium
Czapka et al. 2016, Norway	"Where to find those doctors?" A qualitative study on barriers and facilitators in access to and utilization of health care services by Polish migrants in Norway.	Qualitative/ Interview	19	- Lacking language skills - Communication problems - Experience of barriers to access to healthcare service by migrants	Medium
Alzubaidi et al. 2015, Australia	Barriers and enablers to healthcare access and use among Arabic-speaking and Caucasian English-speaking patients with type 2 diabetes mellitus: a qualitative comparative study.	Qualitative/ Semi Structured interviews	100	-Delay in access to medical services even when symptomatic. -Four barriers to health services access have been identified. -Tailored interventions must be developed for Arabic-speaking migrants to improve access to available health services, facilitate timely diagnosis of diabetes and ultimately to improve glycaemic control.	High
Meuter et al. 2015, Canada	Overcoming language barriers in healthcare: A protocol for investigating safe and effective communication when patients or clinicians use a second language.	Questionnaires	80	Understanding the role that language plays in creating barriers to healthcare by healthcare systems that are experiencing an increasing range of culturally and linguistically diverse populations.	Medium
Gele et al. 2015, Norway	Beyond Culture and Language: Access to Diabetes Preventive Health Services among Somali Women in Norway	Qualitative Multi-method	30	- Lack of access to tailored physical activity services - Poor access to health information.	High
Lindkvist et al. 2015, Sweden	Fogging the issue of HIV - Barriers for HIV testing in a migrated population from Ethiopia and Eritrea.	Qualitative/ Semi-structure interview	29	- Language problems - Barriers to access HIV testing	High
Attard et al. 2013, Australia	Improving communication between health-care professionals and patients with limited English proficiency in the general practice setting.	Qualitative/ Focus group discussions	18	- Wherever possible, communication in the patient's primary language is preferable. - Use of a qualified medical interpreter should be promoted. - Practices should have a standardised and documented procedure for accessing interpreter services. - General practice staff must increase their awareness about services that are available to facilitate communication with patients with limited English proficiency. - Develop attitudes that will maximise the effectiveness of these strategies.	Medium

Table 4. Included original research articles.

Author/ Year/ Country	Title	Methodology	Sample size	Main findings	QA Rating
Akhavan et al. 2013, Sweden	Practitioner and Client Explanations for Disparities in Health Care Use Between Migrant and Non-migrant Groups in Sweden: A Qualitative Study	Qualitative, interview	5 clients 5 doctors	- Limited Swedish language ability - Use of interpreters is time consuming which is not cost effective - Misunderstanding due to language barriers	High
Akhavan, 2012, Sweden	Midwives' views on factors that contribute to health care inequalities among immigrants in Sweden: a qualitative study.	Qualitative/ Semi-structure interview	10	Inequality in health care among immigrants could be due to language barriers	High
Gulati et al. 2012, Canada	Communication and language challenges experienced by Chinese and South Asian immigrant parents of children with cancer in Canada: Implications for health services delivery.	Qualitative, semi structured interview	50	-Interpreter service was inadequate and not readily accessible. -The provision of culturally and linguistically sensitive services may be helpful for immigrant families.	High
Papic et al. 2012, Canada	Survey of family physicians' perspectives on management of immigrant patients: attitudes, barriers, strategies, and training needs.	Mixed, interview	598	- Communication was the most difficult barrier in managing immigrant patients. - Most of the physicians would like to see improved access to an interpreter.	High
Henderson & Kendall, 2011, Australia	Culturally and linguistically diverse peoples' knowledge of accessibility and utilisation of health services: exploring the need for improvement in health service delivery.	Focus group interviews	42	- Even long-standing CALD communities were unfamiliar with health services and experienced difficulties accessing appropriate health care. - Language difficulties impeded communication with health professionals who were hindered by ineffective use of interpreters.	Medium
Goth & Berg, 2011, Norway	Migrant participation in Norwegian health care. A qualitative study using key informants.	Qualitative/ Semi-structured interviews	13	Language proficiency is one of the factors effecting integration into the RGP scheme and adequacy of patient-physician communication.	High
Todd & Hoffman-Goetz., 2011, Canada	A qualitative study of cancer information seeking among English-as-a second- language older Chinese immigrant women to Canada: sources, barriers, and strategies.	Qualitative, semi structured interview	50	Language issues and difficulty with medical words appeared to be barriers to cancer information seeking.	High
Hudelson & Vilpert, 2009, Switzerland	Overcoming language barriers with foreign-language speaking patients: a survey to investigate intra-hospital variation in attitudes and practices.	Questioners/ Survey	1,493	In order to foster an institution-wide culture conducive to ensuring adequate communication with LFP patients will require both the development of a hospital-wide policy and service level activities aimed at reinforcing this policy and putting it into practice.	Medium
Liang et al. 2009, USA	Cultural views, language ability, and mammography use in Chinese American women.	Quantitative	558	Culturally sensitive and language-appropriate educational interventions can improve mammography adherence among Chinese immigrant women.	High

Table 5. Included systematic review articles.

Author	Year published	Title	Number of included articles	Main findings	QA Rating
Ahmed et al.	2017	Experiences of communication barriers between physicians and immigrant patients: A systematic review and thematic synthesis.	32	- Physicians are mostly concerned about the fidelity of their conversation with immigrant patients - The Immigrant patients are mostly concerned about their culture and sometimes fearful that the physicians will misunderstand them due to lack of language proficiency. - Updated summary of communication barriers that may arise between physicians and immigrant patients, and their effects on quality of care.	High
Ohtani et al.	2015	Language Barriers and Access to Psychiatric Care: A Systematic Review.	18	- Limited language proficiency is closely associated with underutilization of psychiatric services. - Need for further investigations of the impact of language barriers on access to psychiatric care.	High
Gil-González et al.	2015	Is health a right for all? An umbrella review of the barriers to health care access faced by migrants.	9	- Barriers to health care for migrants range from entitlement in nonuniversal health systems to accessibility in universal ones, and determinants of access to the respective health services should be analysed within the corresponding national context. - Generating social and institutional changes that eliminate barriers to access to health services is essential to ensure health for all.	Medium
Schouten & Meeuwesen	2006	Cultural differences in medical communication: A review of the literature.	14	- Doctors behave less affectively when interacting with ethnic minority patients compared to White patients. - Ethnic minority patients themselves are also less verbally expressive; they seem to be less assertive and affective during the medical encounter than White patients.	Medium

TABLE 6: THEMATIC DATA SYNTHESIS

Table 6. Thematic data synthesis.

Analytical themes	Descriptive themes	Reference number
Effects of language barriers on access to healthcare services	- Poorer patient assessment - Misdiagnosis and/or delayed treatment - Incomplete understanding of patient - condition and prescribed treatment - Impaired confidence in services received - Quality of care - Lack of access to healthcare information	6, 9, 12, 13, 15, 16, 20, 26, 28, 29, 30, 34, 36, 37, 39, 40
Role of interpreters	- Reliance on Google Translate and ad hoc, untrained interpreters - Inadequate/ ineffective interpreter services - Use of professional interpreters	6, 20, 26, 34, 36, 39, 41
Provision of immigrant-friendly solutions	- Appropriate training for health professionals and migrants - Ensure cultural competence in institutional level - Culturally and linguistically sensitive approach & policies	26, 29, 40, 41, 42
Initiatives for overcoming language barriers	Telemedicine	31, 43

THEMATIC SYNTHESIS OF THE RESULTS

The synthesis of results identified four major themes within the included articles and references. (Table 6) The themes were identified by reading the articles and marking and underlining key phrases and concepts. The majority of the reviewed articles in this study cited language, communication, and access to health care services as problems for immigrant. Communication and language barriers were consistently reported in all included studies as an obstacle to accessing health care services.

EFFECTS OF LANGUAGE BARRIERS ON ACCESS TO HEALTH CARE SERVICES

Health care professionals in multicultural societies are faced with an increasing number of patients from diverse cultures and ethnicities. [25] Effective communication between health care professionals and patients is a prerequisite and important factor that influences quality of service provision and patient satisfaction. [6, 26-28] Communication could be verbal or non-verbal, such as body language, facial expression, gestures, clothing, eye contact, and tone of voice. Barriers to this communication can affect patients access to available information, understanding of the information received and their decisions to accept and adhere to some types of treatment and medications. [9, 12, 14, 28-30] It is also reported that language barriers can affect and delay access to healthcare services, even when symptomatic. [16] A review study conducted by Ohtani et al. (2015) with focus a on patients' access to psychiatric services has demonstrated a close association between migrant patients' limited language proficiency and underutilization of psychiatric services in the United States, Australia, Canada and the Netherlands. [7]

Identifying factors that can influence access to health care services may improve the delivery of these services to immigrant patients from different cultures. [5, 9] Studies have demonstrated that misinterpretation of the needs and wishes of immigrant patients or the information they received from health professionals can hinder their access to health care services. [12, 13, 15, 20] According to Akhavan (2012), miscommunication and misunderstanding may result from cultural diversity and from different cultural views, behaviour, and expectations. [12]

Goth and Berg (2011) believe that doctors are less affective when working with patients from ethnic minority groups where misunderstandings may occur. [13] Patients from

ethnic minority groups in comparison to native citizens are less verbally communicative, less confident and less affective in their medical visits. [9, 10] These patients with inadequate language abilities require more time to explain their problems. [13] This can undoubtedly challenge the doctor–patient relationship and provision of effective quality services. [13, 14, 28, 31-33] Similarly, Ahmed et al. (2017) consider the significant impact of language and communication on the quality of interactions between immigrant patients and health professionals. The patients are occasionally afraid about possible misunderstanding because of language barriers. [33] Those patients facing language barriers are often unable to make an informed consent. They are at the increased risk of medical mistakes and adverse events, complications, and lack of confidentiality. [34]

Language barriers are even associated with underutilisation of health care services because these patients cannot adhere to their booked clinical arrangements and thus miss their required specialist care. [31] Patients often do not inform the medical practice about cancelling their appointments. This can result in ineffective arrangements, overbooking, and longer waiting time for bookings, underutilisation of clinic resources, and increasing practice costs. [35]

ROLE OF INTERPRETERS

Immigrant patients and healthcare staff use telephone interpreters which make it more challenging for patients to describe their symptoms and health status. It can often result in frequent use of emergency care. [13, 14] Patients occasionally use interpreters ineffectively [20], or seek help from Google Translate [34], next of kin, children, or friends to translate when they need assistance. [7, 14, 36] The involvement of unqualified translators, particularly the use of their children or a partner to interpret, may result in insecurities and uncertainty for care providers because they cannot trust unqualified interpreters' capabilities in appropriately transferring information. [7, 14, 15, 34, 37] Even the use of language translators from the same community as the immigrant patient may make an insecure situation for the patient in regard to the professional practice of the interpreter for keeping confidentiality. [13]

Karliner et al. (2007) demonstrate that employment of professional interpreters can increase the quality of health care service for these patients, facilitate good practice, [8, 38] and improve accessibility and health service use. [20, 26] In addition, Hunter-Adams and Rother (2017) pointed out that provision of free-to-patient professional medical interpretation can benefit both immigrant patients and the wider community when language barriers impede their access to health care services. [6] Similarly, Papic et al. (2012) has stressed the need to improve access to interpreters by health practitioners. [39]

PROVISION OF IMMIGRANT-FRIENDLY SOLUTIONS

In countries experiencing cultural and linguistic diversity, understanding effects of language barriers regarding access to health care services by health systems is essential. [9, 17] O'Donnell (2018) recommends that health care systems need to consider immigrant-friendly solutions such as provision of professional interpreters and appropriate trainings for both health professionals and immigrants. [39] Similarly, Hudelson and Vilpert, (2009) and Wolz (2015) agreed that health care providers should identify language barriers, provide adequate language services, and ensure cultural competence at the institutional level. [32, 40] Culturally and linguistically sensitive education and approaches can play a helpful role in improving the access to health care services by immigrant families. [16, 26, 29, 41, 42]

INITIATIVES FOR OVERCOMING LANGUAGE BARRIERS

From all 24 reviewed articles, only Sandre and Newbold (2016) and Andreae et al. (2017) focused on use of coordinated initiatives to overcome language barriers and improving access to health care services. [31, 42] Sandre and Newbold (2016) proposed the use of communication technologies such as telemedicine to bridge the gap and effects of language barriers that hamper health care services accessibility for refugees. [43]

The term "telehealth" is identical to, and interchangeable with ''telemedicine''. [44] Telehealth is defined as the provision of healthcare services at a distance from a different geographical location, using information technology (ICT) and communication networks, mostly to respond to a shortage of health care facilities and professionals. [45] Telehealth may improve accessibility to primary, secondary and tertiary care for rural patients. [46] It can also be helpful in reducing emergency department visits, hospitalization, overall mortality [47] and in substantially saving health care costs. [48]

In Australia, the Australian Medicare Benefits Schedule has covered video consultation by medical specialists to patients in rural and remote areas since June 2013. The federal government also supports the education of clinicians and promotes the uptake of telehealth [49, 50]. Sandre and Newbold (2016) agree that telemedicine can effectively boost dialogue and policy change in the greater health-care setting. It potentially can also increase access to specialist health-care services. [42]

DISCUSSION

This systematic literature review of 24 articles that examined the impact of language barriers on access to health care services demonstrates consistent findings. These findings show clear association between insufficient language skills and affected access to health care services, regardless of where the study was conducted. Although the immigrants were entitled to access to health care services as equal to the native population, various factors such as communication and language have made access to healthcare services a challenge.

Because of mentioned barriers the process of consultation could be challenging and time-consuming, which may result in frustration for health professionals and for immigrant patients who are unable to communicate or understand the language of the host country. [33]

Some possible errors such as patient- healthcare staff miscommunication could arise and result in probable misdiagnosis. These patients would leave the health care centre confused and with low confidence in the care received and in the healthcare system in general. [7, 8] This negative experience and mistrust may continue and prevent them from seeking out future healthcare. [33]

Immigrant patients lacking communication skills with lowered access to healthcare services may also tend to utilise emergency services more often than native people. They are usually not required to make an appointment for emergency services. [7] Health care services are supposed to be equally accessible to legal immigrants as well as native citizens. Also, the provision of an effective health care service requires productive interaction between health care staff and patients. This level of communication is essential to healthcare professionals for understanding health status, uncovering symptoms, reaching right diagnoses, and planning proper treatments. [7]

This review supports the need for integrating cultural competency and awareness into health care systems. Immigrant-friendly strategies such as culturally and linguistically sensitive approaches and appropriate education for health staff and immigrants need to be considered by health systems. [38] Health care staff should be aware of immigrants' rights to access health care [38] and be updated about available services that ease communication with patients with language barriers. [26] Use of qualified medical interpreters as a practical solution for eliminating language barriers and bridging communication gaps is recommended by several studies, although it requires additional time and resources. [7, 14, 26, 38]

More research on language barriers in health care is still applicable. More studies need to be conducted to comprehensively identify the ways in which communication barriers affect health care, the efficiency of linguistic service interventions and the cost of language-communication barriers for the patients and health care system.

Finally, according to Sandre & Newbold (2016), utilisation of communication technologies such as telemedicine could be an efficient tool for bridging the communication gap and increasing accessibility of healthcare services by immigrant patients. [43] The finding indicates the need for more studies and research in this area.

FUTURE RESEARCH

In light of the findings presented in this review, and the resultant discussion, the following recommendations are proposed for future research on immigrant patients' access to health care services:

- Application of telemedicine by employing bilingual general practitioners or nurses (Accessible via phone, or video call from all healthcare centres).
- Establishment of an online history-taking, triage, telemonitoring and referral system.
- Establishing mobile health services.

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ANALYSIS OF MANAGEMENT PRACTICE

USE OF QUALITY MANAGEMENT TOOLS AND METHODS IS ESSENTIAL TO SUPPORT EFFECTIVE GOVERNANCE OF HEALTHCARE ORGANISATIONS

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ABSTRACT

For healthcare organisations, a significant governance responsibility is for quality of health care provision. This is an important reason for governance boards to have good understanding of quality management and patient safety systems and processes that guide provision of all aspects of healthcare.

It is also important that there is structure to how governance activities are undertaken. Use of quality management tools and methods can provide that structure and support systematic and consistent governance decision making. Using quality management systems and frameworks should be a pre-requisite for effective governance.

KEYWORDS

governance, quality, improvement

INTRODUCTION

In healthcare settings, how an organization is governed is a key determinant of healthcare quality and patient safety as well as effectiveness of healthcare delivered. [1-12] Conversely, lack of good governance of quality and patient safety has been implicated in enquires into serious failures, for example at Mid-Staffordshire NHS Foundation Trust in the UK [13] and in the Forster Review of Queensland's health services in Australia. [14] There are also examples of financial collapse of high profile health systems and hospitals from the United States where inadequate governance by boards was seen as major contributor to financial mismanagement. [15]

The effectiveness of quality of governance systems, processes and practices is of critical importance to an organisation's success. [16]

It is proposed that governance systems and processes that are informed by quality management theory and practice can provide the necessary scaffolding for socially responsible, ethical and consistent governance of healthcare organisations. Integration of quality and governance functions also has the potential to ensure that appropriate and necessary systems and processes are in place that identify, monitor and improve governance protocols and systems on an ongoing and continuous basis.

FOR CONSISTENCY IN GOVERNANCE PRACTICES, GOOD SYSTEMS AND PROCESSES ARE NECESSARY

There is little disagreement about the need and importance effective governance to provide a clear direction to any organisation. Indeed, good quality management practice by definition incorporates concepts of ethical management and governance as well as social responsibility. [17, 18] In Australia, Health Boards are guided by an `improvement guide' to meet the national standards for safety and quality. [19] Similar guidance documents provide guidance to the boards in

similar health care systems across the globe e.g. the United Kingdom [20] and in the United States. [21]
However, an `intention' to have good corporate governance may not be adequate to ensure effective governance function, including consistent management of vested interests, mismanagement and lack of accountability; consistency in consideration of issues, compliance with legislation; and effective decision making.

Integration of principles of quality management and governance has the potential to ensure that there is adequate process control and systems are in place that allow effective governance. These include consistent application of best practice, appropriate stakeholder involvement and consultation.

WHY IS A SYSTEM DRIVEN BY QUALITY MANAGEMENT NECESSARY?

There are a variety of quality management methodologies including Total Quality Management, Plan-Do-Check-Act, Lean Six Sigma, Kaizan, Poka-Yoka, Design of Experiments, Agile and Waterfall, a amongst others with commonalities in methods and methodologies across all. All quality management approaches share the philosophy that there must be a sequence or method to activities that are undertaken; measurement is a key to decision making; and, evaluation must be built into the method to ensure the system and process within it can be improved. Using quality management tools and methods is likely to give structure to the analysis, guide decision making and strengthen overall governance.

For healthcare organisations, a significant governance responsibility is that for quality of healthcare provision. [22] Understanding of quality and patient safety systems and processes is therefore almost a pre-requisite for the governance body. This enables understanding of how errors and omissions are identified, processes that are in place to ensure consistent clinical practice and clinical care delivery and how the organisation ensures it is a learning organization that is improving continuously. Not incorporating these quality improvement tools and methodology in governance and decision making in relation to healthcare provision, would be incongruous.

An important governance requirement is engagement of stakeholders. In today's world there is an imperative for stakeholders (i.e. those who have a vested interest in the decisions and actions) to be involved and engaged in wider governance of an organisation. For healthcare organisations (both public and private) essential stakeholders are healthcare consumers and the broader community. Even if the healthcare organisation is maintaining financial value, directors come under criticism for failing to demonstrate a sense of responsibility to healthcare consumers and the community. Health service governance must fully understand stakeholder interests and the impact of health services on the health of the community. This can be achieved using quality systems, tools, methods and processes that not only provide appropriate data and information but also allow the trust of stakeholders to be gained. Achieving transparency in relation to analysis and presentation of financial, quality and safety and key performance information is critical. Focus on continuously improving systems and processes also ensures consistency in application (often touted as the other side of the coin to corporate governance).

Yet another important aspect of a effective governance is evaluation. At least since the beginning of this century there has been a recognition that self-evaluation by the governing body and/or external evaluation of governance practices and decision making is essential. [23] Benefits of continuous evaluation of the governing boards have been noted and is now acknowledged as essential [24]. This methodology is firmly ingrained within quality management principles and systems.

GOVERNANCE SYSTEMS AND QUALITY MANAGEMENT SYSTEMS HAVE SIMILAR AIMS

In principle, the aim of corporate governance (stakeholder trust and high performance) and quality management (customer satisfaction and continuous improvement) are similar and complementary. Good governance and quality management systems are both concerned with setting and controlling standards as well as continuously improving processes to maintain (and if possible exceed) those standards.

Over the last two decades there have been several calls for hospital boards to focus on quality. [25, 26] In addition, it is really important that governance and quality improvement systems and processes also intricately linked. A strong link also ensures that governance system and decision making is informed and has the ability to

understand implications of data on quality, effectiveness, efficiency and outcomes to inform decisions. Therefore, an effective quality system embedded within governance processes should enable the organization to be directed and controlled in a systematic and transparent manner as within a quality management framework, activities are carried out effectively and efficiently to develop products or to provide services at a level of quality that satisfies customers, while ensuring service delivery is at an appropriate time and price.

THEN THERE IS THE ISSUE OF COMPLIANCE!

There are a number of lessons in relation to compliance from non-healthcare settings that are of relevance for healthcare organisations. The post-mortem following collapse of major corporate players (e.g. Enron) and major movement in share values of other giants (e.g. WorldCom and Tyco) suggested (amongst other things) a closer focus on regulatory compliance. Recommendations to improve regulatory compliance by itself is not unusual as following a corporate collapse, recommendations to increased regulation are almost inevitable. Of interest though is that fact that these major corporations were seen to have `good' corporate governance systems. More significant in the analysis was the fact that systems in place were inadequate to check misconduct or breach of governance protocols. What was identified was the need for such organizations to be prepared with tools, methods, compliance practices and policies to understand, on an ongoing basis, impact of regulation (decreased or increased) so that adjustments in practices and policies could be made on a continuous basis.

Inherent in quality management methods is the necessity to achieve high level of `assurance.' Various tools are routinely used, including audits, survey and inspections to quality assure achievement of high level of compliance. If underperformance is identified, it triggers an alert and requires an investigation and a response. Incorporation of quality management tools and methods within governance processes do have the potential to provide the necessary structure and processes to ensure high level of compliance.

CONCLUSIONS AND IMPLICATIONS FOR HEALTHCARE ORGANISATIONS

Governance should be seen to encompass various structures, processes and relationships through which policies are conceptualized, developed, implemented and evaluated, legislative requirements are met, resources allocated and/or distributed and how decision makers are held accountable. Many healthcare organisations are governed by boards of governance and several different types of Boards exist, including voluntary, paid, nominated, appointed, elected and mixed. These boards have decision making and governance responsibilities, lead strategic planning, direct the management (or executive) teams and provide direction and control. Irrespective of the type and structure of governance arrangements, effective governance must ensure that the organisation is maintaining public trust and goodwill by demonstrating efficient and responsible use of all its resources.

An important aspect of effective governance is consistency with which matters are analysed, strategic decisions made, decisions implemented and how systematically post-implementation evaluations are undertaken. It is an effective and mature quality management system that can provide structure and support to ensure consistent governance practice.

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RESEARCH ARTICLE

JOB VACANCY DATA FOR DENTISTS IN AUSTRALIA: ADVERTISED VACANCIES AS AN INDICATOR OF UNMET NEED

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ABSTRACT

OBJECTIVES

The aim of this study was to determine whether job vacancy data for dentists might be used as part of a needs-based index to indicate levels of workforce supply.

METHODS

Advertised job vacancies for dentists were collected at monthly intervals between October 2011 and June 2019; compiled into a data base and geo-coded by latitude and longitude. The vacancies were mapped using QGIS software and their geographic locations were observed relative to Accessibility/Remoteness Index of Australia Plus (ARIA+ 2016) and SEIFA Index of Relative Socio-economic Disadvantage (IRSD).

RESULTS

There was a slight decline in the number of advertised job vacancies relative to the population of Australia in the first 18 months of the study. For the remainder of the study period the number of vacancies per million of the population rose steadily. There were differences between ARIA+ regions; but remote and very remote Australia showed very little variation in vacancies across the study period.

The percentage of monthly advertised vacancies in IRSD1 (most disadvantaged) areas was much higher (>40%) at the start of the study period but by the end of the study the percentage of vacancies was relatively even across all IRSD groups.

CONCLUSIONS

The increase in the number of vacancies per million population since 2013 implies an increase in demand for dentists. The findings do not correlate with industry and government agency reporting of an oversupply. The use of job vacancy data might form part of a needs-based index to inform dental workforce planning.

KEYWORDS

Dentist, workforce, planning, policy, supply, Australia

INTRODUCTION

The World Health Organisation (WHO) supports and promotes a Human Rights-Based Approach (HRBA) to health service planning (Ref). Member nations are encouraged to adopt an HRBA framework to facilitate progress towards the realisation of Universal Health Coverage (UHC).[1] The HRBA is based on the four key principles of availability, accessibility, acceptability and quality. The first principle, availability, directs member nations to maintain a functioning health service built on sufficient facilities, services; and health workforce numbers to meet the needs of the population.[1] The process of estimating the number of health workers needed over time is complex and involves a dynamic process of review and reassessment of demand and supply. The WHO has developed guidelines and a code of conduct for building health workforce capacity in response to the increasing shortage of health care workers globally(COC)[2] Low and middle income nations are most keenly affected by shortages and the increase in health workforce migration

away from these nations adds strain to under resourced health systems. The COC encourages self-sufficiency in workforce planning and discourages policy that relies on overseas recruitment of trained professionals. Historically Australia has had a high percentage of overseas trained health workers, including dentists [3-4], and more recently high numbers of international dental students who choose to remain in Australia after completing their studies.[5] Many of the overseas trained dentists that migrate to Australia originate from countries that have dentist-to-population ratios of 3 dentists per 10 000 population or less, while Australia has one of the highest dentist-to-population ratios globally.[6-7] Dental workforce planning with current methodology is known to be imprecise and despite the modelling of various demand and supply scenarios, accurate predictions remain elusive and have fostered a reliance on overseas trained personnel.[8] Demand has previously been measured on a utilisation basis that extrapolates known patterns of dental service attendance combined with demographic data on population changes, tooth retention, and disease burden.[8] The accuracy of utilisation-based modelling is dependent on the availability of comprehensive data. Medical care in Australia is subsidised through the government funded Medicare system and this permits the collection of large-scale data to inform planning.[9] Conversely 95% of dental care is provided by private practitioners and only a small percentage of services receive Medicare rebates (Ref). This limits the data available for dental workforce planning. Utilisation patterns have instead been drawn from the National Dental Telephone Interview Survey 2013.[10] The design of the study, including sample size and limited disaggregation by regional area reduces the reliability of the inferences drawn.

Utilisation-based models are more likely to underestimate demand because of a frequent gap between utilisation and need.[11] The WHO promotes a transition to a "needs" based methodology that takes into account indicators of unmet need including workforce shortages in particular demographics; existing and projected morbidity, disease trends, and changes in demand for particular service items. The WHO promotes the better use and sharing of available data to develop a reliable needs-based model. Data does exist to extend the scope of demand projections for dentists. This is predominantly tightly held by custodians including private health insurance funds and individual dental practitioners. Some data is more publicly available including job vacancy data. This study analyses the job vacancy data over a 7-year period from 2011 to 2019 to see how this correlates with perceptions of workforce supply including a comparison of demand for dentists in metropolitan centres and rural and remote areas; and the distribution of job vacancies according to socio-economic indices.

METHODS

Ethics exemption: Data in this study was compiled from open access sources and ethics exemption was approved by the Human Research Ethics Office at The University of Western Australia. (Ref RA/4/20/5696)

DATA

Advertised vacancies for dentists were downloaded from a single open access web-based job advertisement site at monthly intervals between October 2011 and August 2019.[12] Details of the suburb; whether the position was offered full-time or part-time; and the date the advertisement was recorded, were compiled into a database using Excel version 16.8 □ Microsoft 2018.

MAPPING DATA

The latitude and longitude of the suburb centroids (geometric centre point) where vacancies were advertised were geocoded using Google maps API and mapped using geographical imaging software (QGIS v3.4.0-Madeira licenced under the GNU Public Licence http://www.gnu.org/licences). Geographic census district boundaries and remoteness classification boundaries (Accessibility/Remoteness Index of Australia Plus - ARIA+ 2016) were added to the mapping using data downloaded from the Australian Bureau of Statistics (ABS).[13]

POPULATION DATA

The Socio-economic Index for Areas (SEIFA) published by the ABS aggregates markers of economic advantage and disadvantage including household income and unemployment rates; housing details; and level of education, based on information collected at each population census.[14] One of the four SEIFA indices, the Index of Relative Socio-economic Disadvantage (SEIFA-IRSD) was used to classify Statistical Area 1 (SA1) census districts into 5 equal groups. SEIFA-IRSD1 most disadvantaged to SEIFA-IRSD5 least disadvantaged.

ANALYSIS

QGIS computed the location of advertised vacancies according to SEIFA - IRSD and ARIA+ and the results were exported to R Studio (version 1.1.456 - © 2009 – 2018 RStudio,

Inc) for final analysis. 24 months were missing from the full data set. Time series imputation for missing values of advertised vacancies, for each SEIFA-IRSD and ARIA+, was conducted using imputeTS software and the Kalman Smoothing algorithm to permit year by year comparisons.[15]

RESULTS

The details of a total of 14104 advertised vacancies for dentists were compiled between October 2011 and June 2019. Almost two-thirds (64%) of all vacancies were for positions in ARIA+ major cities; 23% in inner regional: 11% in outer regional; 1% in remote and 0.3% in very remote areas (Figure 1). A total of 43% of vacancies were for full-time employment; 49% for part-time employment and 8% for either casual, locum, or volunteer roles. The overall number of vacancies advertised each month increased across the study time frame in major cities and inner and outer regional areas (Table 1). The number of vacancies in remote and very remote areas were too few to permit time series imputation analysis and were excluded from the mean monthly average tables by ARIA+.

FIGURE 1: ALL DENTIST JOB VACANCIES BY ACCESSIBILITY/REMOTENESS INDEX FOR AUSTRALIA PLUS (ARIA+) - NO IMPUTED VALUES.

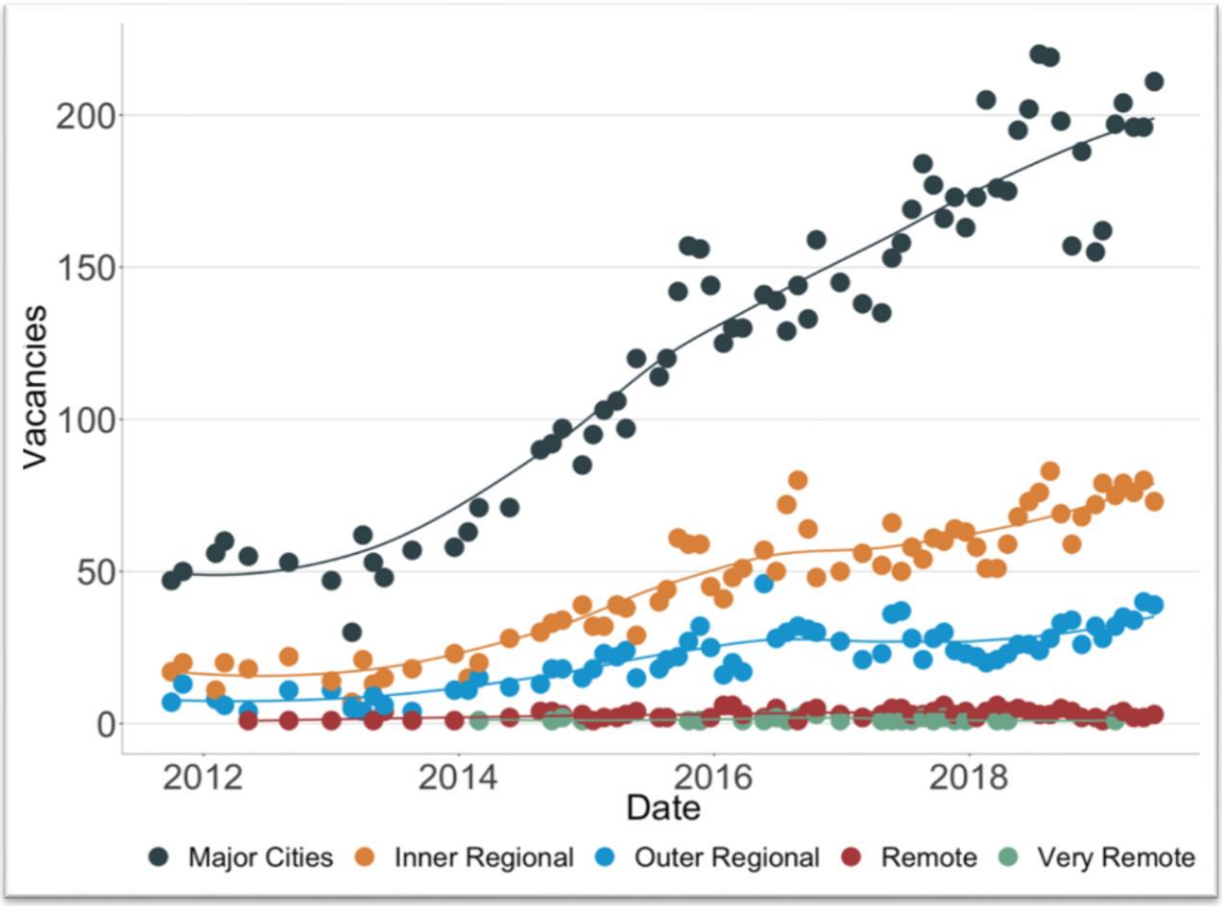


TABLE 1. MEAN (SD) MONTHLY ADVERTISED VACANCIES FOR ALL STATES AND TERRITORIES OF AUSTRALIA BY ACCESSIBILITY/REMOTENESS INDEX FOR AUSTRALIA PLUS (ARIA+) EXCLUDING REMOTE AND VERY REMOTE AREAS.

	ARIA+ classification		
Year	Major Cities	Inner Regional	Outer Regional
Full Time			
2011	12.7(2.1)	12.4(1.5)	6.7(2.1)
2012	17.1(2.4)	12.1(0.8)	6.7(1.4)
2013	15.8(4.8)	11.4(2.6)	6.0(2.4)
2014	23.8(4.8)	17.6(5.9)	10.6(1.6)
2015	37.3(7.7)	28.7(8.5)	15.4(3.8)
2016	42.9(6.1)	32.9(4.5)	19.4(5.4)
2017	46.8(6.3)	34.7(2.9)	20.3(4.0)
2018	54.3(8.6)	42.0(6.7)	20.7(4.6)
2019	48.3(4.3)	53.3(3.9)	27.7(3.1)
Part Time			
2011	33.8(0.7)	4.3(0.6)	0.4(0.5)
2012	33.5(2.6)	4.0(1.4)	0.2(0.2)
2013	32.9(5.2)	3.6(1.4)	1.3(0.4)
2014	49.6(6.9)	7.2(1.1)	1.7(0.9)
2015	73.3(12.4)	11.2(3.2)	5.0(1.7)
2016	81.8(7.1)	18.3(7.0)	4.7(2.0)
2017	100.6(16.5)	18.3(4.1)	5.1(1.6)
2018	120.8(13.0)	20.8(4.3)	5.3(2.1)
2019	130.3(12.8)	20.2(2.8)	5.0(2.0)

A comparison of vacancies relative to the population showed that the rate per million both for full-time and part-time vacancies more than tripled between 2011 and 2019 (Figure 2).

The majority of vacancies were in the major population centres, but relative to the population, the number of full-time job vacancies was consistently higher in outer regional areas and the number of vacancies in major cities was consistently lower than for inner regional areas (Figure 3).

Part-time vacancies were highest per capita in major cities and lowest in outer regional areas. The mean monthly average of advertised vacancies relative to the SEIFA-IRSD, increased year by year with the exception of 2013, and there were fluctuating values for full-time positions in the least disadvantaged SEIFA-IRSD 5 group (Table 2).

There were consistently more vacancies in the most disadvantaged areas although the percentage of the total monthly vacancies by IRSD changed over time (Figure 4).

In the final 18 months of the study there was a noticeable steady decline in the percentage of vacancies in IRSD1 and IRSD2 areas, matched by a steady increase in IRSD 4 and IRSD 5 districts.

FIGURE 2. ADVERTISED VACANCIES FOR DENTISTS RELATIVE TO THE POPULATION OF AUSTRALIA.

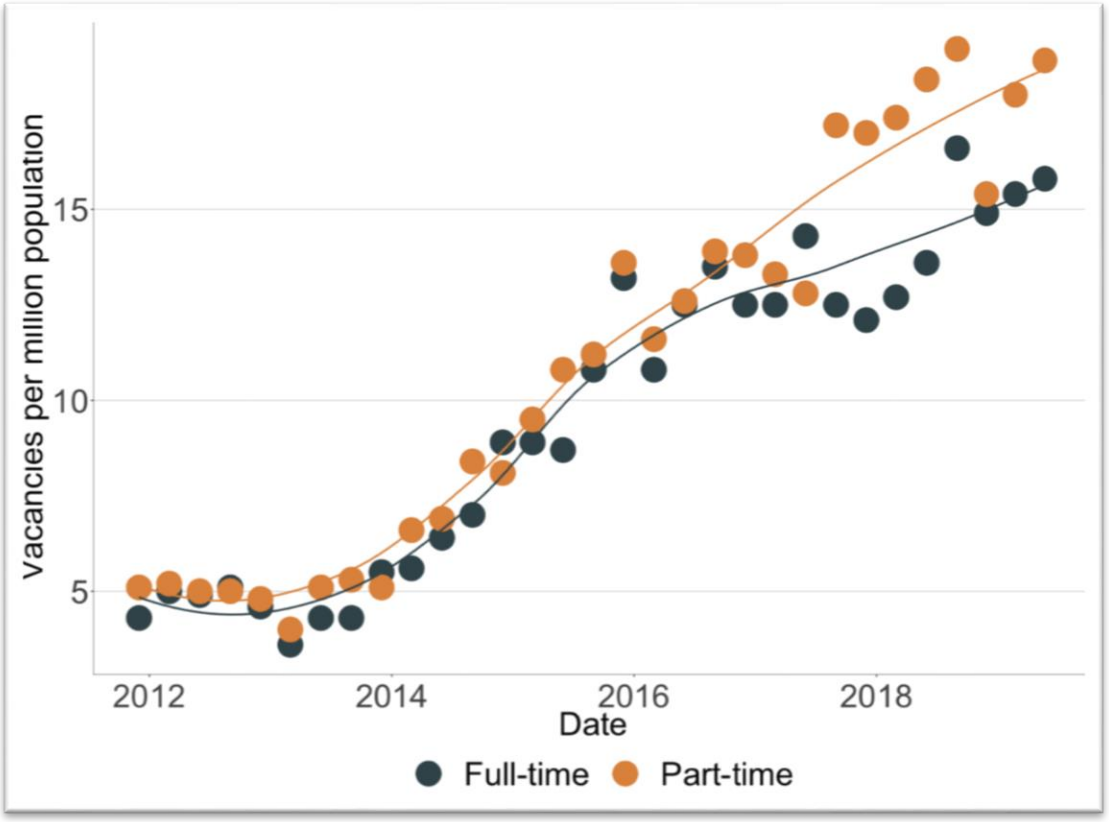


FIGURE 3. ADVERTISED VACANCIES FOR DENTISTS RELATIVE TO THE POPULATION OF AUSTRALIA CLASSIFIED BY ARIA+, EXCLUDING REMOTE AND VERY REMOTE AREAS

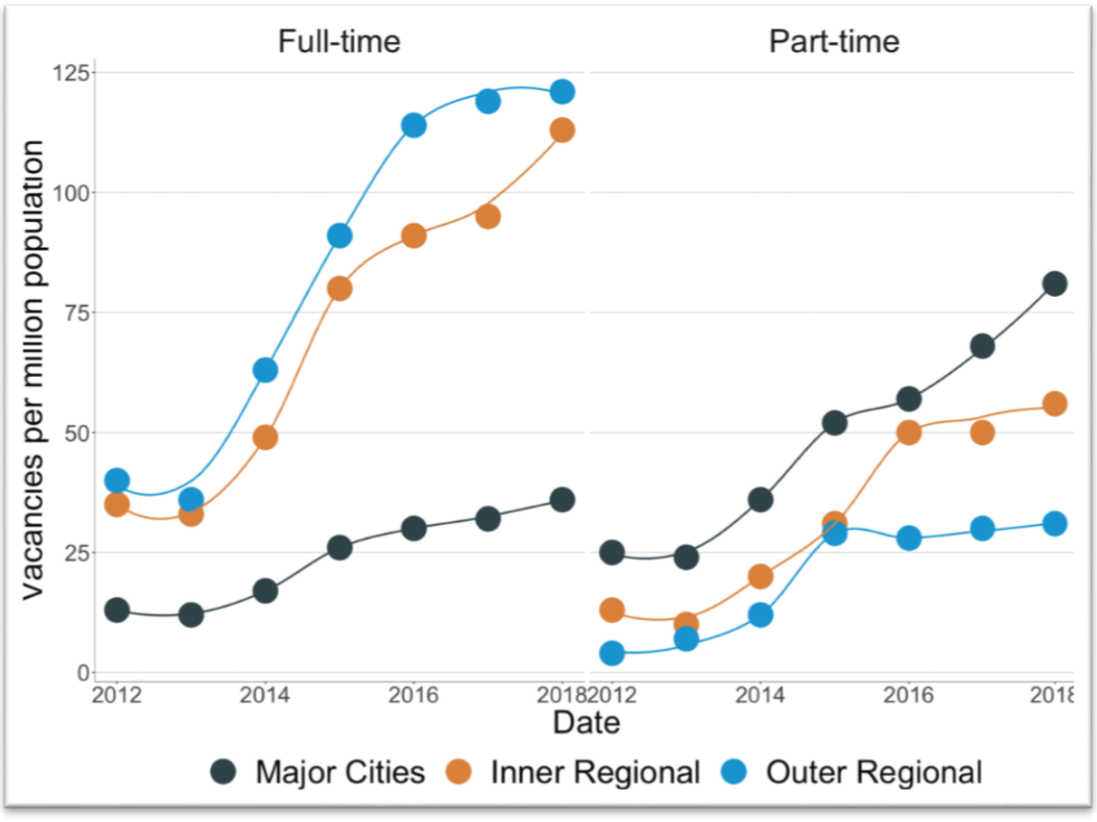
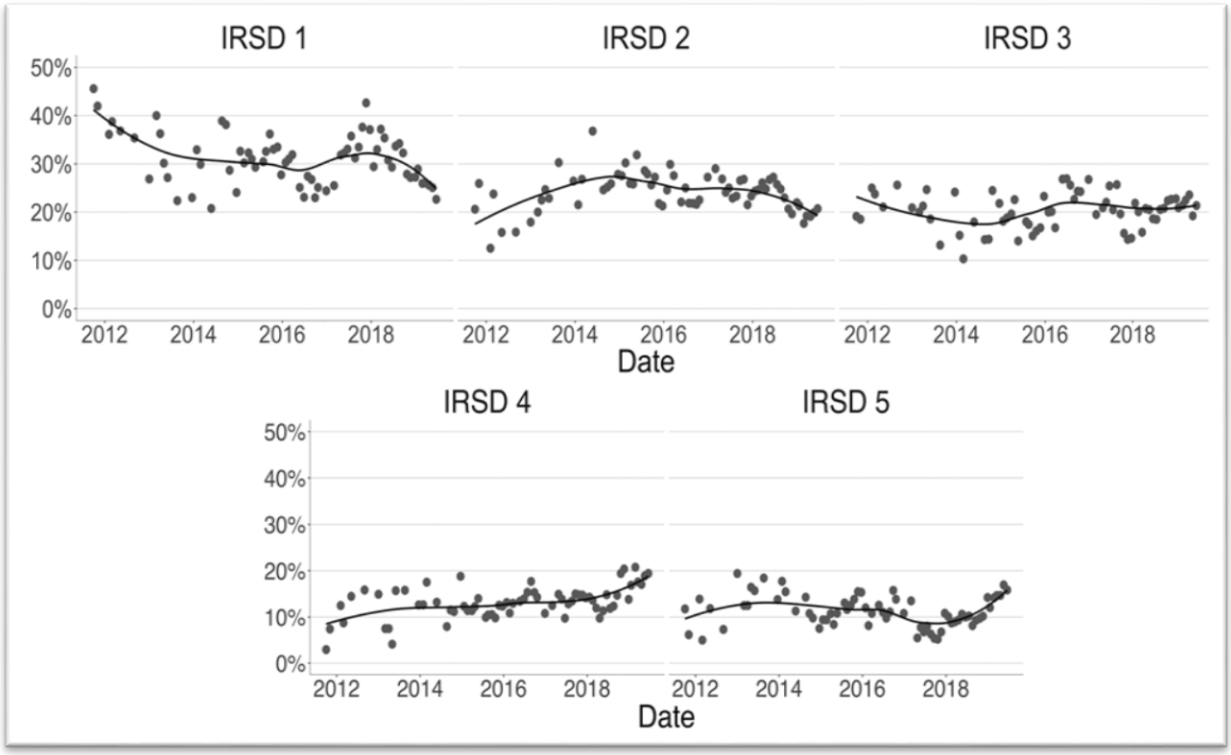


TABLE 2. MEAN (SD) MONTHLY ADVERTISED VACANCIES FOR DENTISTS ACROSS ALL STATES AND TERRITORIES OF AUSTRALIA (EXCLUDING ADVERTISED VACANCIES FOR REMOTE AND VERY REMOTE AREAS) BY SOCIO-ECONOMIC INDEX FOR AREAS (SEIFA) INDEX OF RELATIVE SOCIO-ECONOMIC DISADVANTAGE (SEIFA-IRSD1 - MOST DISADVANTAGED, SEIFA-IRSD5 – LEAST DISADVANTAGED)

	SEIFA					
YEAR	**IRSD1**	**IRSD2**	**IRSD3**	**IRSD4**	**IRSD5**	**NO IRSD**
FULL TIME						
2011	12.7(2.5)	8.9(1.2)	6.2(1.1)	1.3(1.4)	1.9(.8)	1.0(0.0)
2012	13.1(1.3)	5.0(1.4)	8.6(1.3)	4.8(1.9)	3.5(1.3)	1.1(0.4)
2013	9.5(2.2)	7.2(2.4)	6.8(2.2)	3.5(1.5)	4.4(1.7)	1.6(0.9)
2014	17.5(4.7)	14.2(5.5)	7.5(2.7)	5.0(2.0)	4.9(0.8)	3.7(1.8)
2015	28.2(6.3)	21.0(5.1)	12.9(4.1)	5.5(2.4)	7.6(3.3)	5.8(2.3)
2016	28.9(5.7)	22.3(2.7)	21.3(6.8)	9.2(4.0)	7.0(2.5)	6.6(2.7)
2017	39.1(7.9)	24.5(4.3)	17.8(4.6)	8.0(2.1)	6.1(3.4)	6.2(2.0)
2018	39.8(6.6)	28.3(4.8)	24.3(5.4)	10.3(4.6)	6.4(4.5)	7.9(2.3)
2019	40.5(4.2)	28.8(1.8)	24.7(4.6)	18.2(2.1)	11.5(1.9)	5.7(3.1)
PART TIME						
2011	17.3(1.6)	5.8(2.6)	6.7(0.6)	3.2(1.6)	3.8(1.0)	1.4(1.3)
2012	12.0(2.8)	7.2(1.8)	7.5(0.9)	3.7(1.7)	3.9(1.1)	2.8(1.1)
2013	8.6(2.4)	8.9(2.3)	6.5(1.0)	4.9(2.3)	5.9(1.8)	3.3(1.2)
2014	13.8(4.3)	13.5(3.3)	10.6(4.3)	8.0(1.8)	8.2(1.7)	4.7(1.4)
2015	23.4(6.1)	20.5(4.0)	15.3(2.4)	12.2(2.3)	11.5(4.4)	6.6(4.2)
2016	22.0(4.0)	24.5(2.7)	21.4(4.0)	16.0(3.3)	14.9(3.0)	6.1(1.6)
2017	32.0(11.2)	28.7(6.9)	24.8(5.3)	19.7(2.7)	11.4(3.6)	7.4(1.2)
2018	38.3(7.0)	30.4(8.4)	26.8(3.4)	23.0(4.7)	18.3(3.0)	10.0(3.9)
2019	30.0(4.5)	24.5(4.9)	31.8(2.6)	31.5(5.5)	26.8(6.4)	10.8(3.2)

FIGURE 4. ADVERTISED JOB VACANCIES FOR DENTISTS CLASSIFIED BY SEIFA INDEX OF RELATIVE SOCIO-ECONOMIC DISADVANTAGE (IRSD1 – MOST DISADVANTAGED, IRSD5 LEAST DISADVANTAGED) AS A PERCENTAGE OF TOTAL MONTHLY JOB ADVERTISEMENTS.



DISCUSSION

The results imply that the demand for dentists continues to be strong and that current perceptions of an oversupply may be unfounded. The continued growth in the number of vacancies relative to the population is a strong indicator that inflow to the profession is not outpacing demand. 2013 was the only year that recorded a decrease in advertised job vacancies. This correlated with the sharp increase in local graduate numbers due to the first final year course completion at new dental schools.[16] The demand for full-time dentists is lower per capita in major cities relative to inner and outer regional areas, but demand is growing and will be sustained by steady population growth (Figure 3). The consistently higher number of part-time roles relative to full-time roles in major cities has been interpreted as an indication that there are fewer employment opportunities (Figure 3).[17] This might also reflect a change in work patterns. There is evidence of a preference for part-time work; there are more applicants for part-time than full-time roles, and full-time roles are more likely to remain unfilled.[18]

Historically it has been difficult to attract and retain dentists to regional Australia.[19] The steep rise in advertised vacancies in inner and outer regional areas might imply that over the past 6 years it has become harder to recruit in these districts and indicate unmet need. The results warrant further comparison to changes in the distribution of dental practices. It is possible that a growth of new practices in previously underserviced centres is driving demand for dentists in these areas. [20-22]

The time taken to fill advertised vacancies might offer a better indication of unmet need than the collection of the number of vacancies alone. There has been a rise in the number of practices under corporate ownership and a consequent increase in opportunities for those seeking to practice in an employee relationship.[20] The limited available data for dentists reports no change in "time to fill" since 2010. [18] This might infer that the higher relative numbers of vacancies do not reflect a reluctance of dentists to engage in employee arrangements or indicate a burgeoning unmet need. Rather, a rise in demand for dental services that is currently balanced by a rise in the number of registered dentists. The use of "time to fill" for data would be an important element of a needs-based index for workforce planning.

Vacancy data has previously been excluded from workforce modelling in Australia because there is no agreed vacancy rate that reflects a workforce shortage; advertised vacancies may reflect difficulty in recruiting to certain demographics rather than a workforce undersupply; and vacancy rates may not indicate a true level of undersupply since they do not capture areas that are totally lacking in services.[8] This study indicates that vacancy data can offer insights into the state of the sector and that the concerns raised can be addressed by careful consideration of how the data is collected and interpreted. Vacancy data has been used to inform demand modelling elsewhere and the WHO supports the use of workforce data, including job vacancy data, as part of improved strategies to align demand estimates to better account for rural workforce disparities.[11] In Finland, dental workforce planning is broken down to a municipal level and vacancy rates are used to assess the number of areas where shortages persist. The Netherlands use vacancy rates and distribution of GPs (not dentists) in rural areas to measure unmet need.[23] A similar approach could form part of a local needs-based demand methodology and collect and monitor job vacancies by state and territory and ARIA+. Denmark records vacancies in public sector roles and uses this as a minimum estimate of undersupply.[23] The latter is an area that has relevance locally. Australia's National Oral Health Plan 2015 – 2024 cites ongoing difficulties in recruiting dentists to work in public sector roles as a barrier to maximising efficiency in service provision.[24] The public dental service in Australia is a minor employer of dentists and uncompetitive salaries reduce the appeal of employment.[24] A recent Grattan Institute report addressing the oral health care needs of financially disadvantaged populations, proposed a 20% expansion of public dental services and estimated that the current capacity of the dental workforce was such that it could absorb this expansion.[25] The number of vacancies recorded would imply otherwise, but closer monitoring of advertised public sector vacancies and time to fill data might be used effectively to inform planning.

Job vacancy data for healthcare workers is also considered to be a strong indicator of demand levels because the health sector is not as sensitive to economic conditions as other employment areas.[23] In many sectors of industry, a falling number of monthly job vacancies is an early indicator of slowing economic growth and conversely a rising number of advertisements is synonymous with economic recovery. Rates published by Trading Economics on behalf of the Australia and New Zealand Banking group show a marked decline in advertised vacancies across all industries, in the 18 months to June 2019.[26] This decline is not mirrored by the findings of this study and vacancy rates for dentists have continued to rise. This is despite the fact that many Australians postpone regular dental care because of financial hardship,[25] and that the current economic downturn and higher unemployment would be expected to push attendance rates lower. The fact that this is not reflected in dentist job vacancy data implies that there is continuing strong demand.

STRENGTHS AND LIMITATIONS

The study compiled a database of all the vacancies listed at monthly intervals. The web site chosen for this study retained listings for 3 months unless taken down by the advertiser. It was noted that corporate advertisers refreshed their posts regularly to retain their position near the top of the search results. It was not possible to clearly differentiate between new corporate listings and re-advertisement of unfilled corporate vacancies. Vacancies in sought after locations might also be listed for very short time frames and not be captured consistently by monthly data collections. It is possible that the method of collection in this study under reported vacancies in some areas.

The study focused on the vacancies posted on a single web site to avoid duplication of observations. A comparison of advertised vacancies for a single 30-day period across 4 major employment web sites indicated that the majority of vacancies are advertised on multiple but not all online platforms.[12,27-29] Elimination of duplicates is problematic because of the variation in formatting between web sites. The Australian Government Labour Information IVI reports include all new listings across 3 employment sites and do not attempt to remove duplicates. This method allows generalised month by month comparisons without the more detailed regional and socio-economic analysis sought by this study.[30]

Having considered these limitations, it was decided to include all advertisements listed at each collection date on a single web site as a reasonably accurate reflection of available vacancies.

CONCLUSION

Job vacancy advertisements for dentists per million of the population rose for six consecutive years between 2013 and 2019, and the rise was most pronounced in outer

regional areas of Australia. There was also a steady rise in advertised vacancies in Australian major cities. The demand for dentists as shown by job vacancy data does not correlate with current perceptions of workforce oversupply and would seem to imply unmet need. The findings of this study indicate that there might be benefits to including data on job vacancies as part of a needs-based index to project required dental workforce numbers. Job vacancy data is publicly available; updated monthly; easily analysable to monitor regional and socio-economic differences and can provide a dynamic indicator to better inform dental workforce planning. Stronger dental workforce projections will benefit Australia; allow it align workforce planning with WHO guidelines; and reduce reliance on overseas trained personnel.

DECLARATION OF CONFLICTING INTERESTS:

The Authors declare that there is no conflict of interest.

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RESEARCH ARTICLE

INCLUDING STAKEHOLDERS WHEN IMPLEMENTING NEW TECHNOLOGIES

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ABSTRACT

OBJECTIVE

Technologies such as Radio Frequency Identification (RFID) offer many benefits to health care providers and may raise stakeholder concerns. This study reviews a new technology from another industry, summarizes previous research on medical applications of RFID, and analyses survey responses on RFID applications. The goal is to develop recommendations for evaluating and implementing new technologies.

DESIGN

Marketing and stakeholder theories were used to develop lessons from the case study and prior research. A survey was mailed to adults in four Midwestern states in the US.

MAIN OUTCOME MEASURES

Respondent support ratings for two medical and two non-medical applications of RFID were analysed using principal component analysis and binary logistic regressions. Profiles of those supporting the applications were developed.

RESULTS

The case study highlighted the importance of considering the needs and concerns of all stakeholders. Previous studies suggested that many hospital administrators who examined RFID may not have included some stakeholders. This research found that support for RFID varied across respondents and applications. Anxiety about technology was negatively linked with RFID support. Religiosity also had negative coefficients for some applications.

CONCLUSIONS

Administrators considering new technologies need to consider patient privacy needs and stakeholder concerns. Surveying stakeholders and utilizing advisory boards could help administrators tailor their actions to the communities they serve. A few opponents of a technology can limit its adoption. Regular, two-way communications may help health care organizations improve technology decisions and enhance the odds of implementation success.

KEYWORDS

radio frequency identification; privacy; trust, religiosity; marketing orientation

INTRODUCTION

Medical organizations regularly face large capital spending decisions. Often these decisions involve technologies that may affect patients and staff. Several frameworks may guide these decisions. One involves marketing and emphasizes the importance of customer needs. Another framework, stakeholder theory, suggests that the concerns of owners, employees, suppliers, customers, and the community should be considered and addressed. Both frameworks have valuable implications for new technology decisions.

Several new technologies that are available to hospitals have potential privacy concerns for patients and staff. These issues include unauthorized secondary use of information, errors in data, and improper access. Privacy concerns can stem from the negative effects of having privacy violated or from the psychological effects of

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knowing that others accessed personal data, even if there were no negative consequences.[1] Matzner argued that individuals can be harmed even when none of their data has been collected or processed.[2] Researchers believed that privacy concerns can reduce patient interest in wireless sensor networks,[3] electronic records,[4] mobile wellness programs,[5] online health communities,[6] and health care information exchanges.[7] Patient privacy concerns were considered to be the biggest impediment to E-healthcare.[8]

This paper examines how new technologies with potential effects on privacy such as radio frequency identification (RFID) should be considered according to marketing and stakeholder theories. A technology adopted without considering patient needs or stakeholder concerns may face greater difficulties. After reviewing the two frameworks, a case study of a new technology from another industry is discussed where the decision process created problems. Given the lessons learned from this case, prior studies on RFID are reviewed and the results of a consumer survey are analysed. The paper concludes with a discussion on how hospitals could benefit from integrating more patient needs and stakeholder concerns into their technology plans.

MARKETING ORIENTATION

Marketing is essential for healthcare organizations. [9, 10] Several studies noted correlations between being marketing-oriented and healthcare organization performance. [11,12] Administrators should consider decisions from the patient's perspective. Some managers assume that a decision will not interest patients or that they know patient needs without asking them. Lee and Meuter suggested that interviews with hospital employees can adequately represent patient sentiments.[13] A case study showed that this might not always be true.[14]

An important patient need is privacy and this need has been linked to trust. [15] Trust is very important for a hospital's brand equity. [16, 17] Therefore, to address key patient needs, organizations should place a priority on enhancing perceptions of privacy and building trust.

STAKEHOLDER THEORY

Another business construct, stakeholder theory, suggests that administrators need to incorporate opinions from everyone who can affect or who are affected by the achievement of an objective into their decisions. Integration of stakeholder concerns can, at least indirectly, create a competitive advantage for organizations.[18] The weight of the evidence favours operating with a focus on the long-term interests of stakeholders over focussing on short-term shareholder interests.[19] How an organization responds to stakeholders can be as important as the response.[20] Good stakeholder relations are positively-linked to brand equity.[21]

One key stakeholder group is employees. A case study found that healthcare staff had a range of opinions about a new initiative. The case authors believed that employee involvement was critical for developing a competitive advantage and concluded that all staff opinions should be recognized.[22] Hospitals that surveyed their medical staff tended to have higher performance.[23] Employee satisfaction and loyalty have been connected to patient satisfaction and loyalty.[24]

Another key stakeholder group is customers or patients. Hospitals that surveyed the public also tended to have better performance.[23] One hospital system conducted in-depth analyses of patient comments and improved both admissions and patient satisfaction.[25] As important stakeholders, patients should be involved in many decisions.

CASE OF A PROBLEMATIC TECHNOLOGY

A problem can emerge if managers assume some stakeholders do not have legitimate concerns or do not integrate them into the decision process. When Monsanto developed genetically-modified agricultural seeds, they faced difficulties gaining societal acceptance, especially in Europe. Monsanto did not appreciate that economic, technical, and regulatory pressures were not the only constraints that could limit their technology.[26] The firm focussed on those perceived to be core stakeholders: investors, scientists (both at the firm and in academia), farmer-customers, and government regulators.[27] Food consumers were not considered. Activist groups and the general public added unexpected societal uncertainty and constraints. If Monsanto had a better understanding of the European environment, the company may have adjusted their actions and had more success in Europe.[28]

Other research on genetically-modified foods suggests that initial acceptance does not necessarily imply that key concerns have been addressed. Deeply-felt concerns

often persist and accumulate, causing problems later.[29] Monsanto's decisions to not involve the public early in the process and to not address the concerns of critics during and after the technology rollout made it more difficult to gain acceptance.[30, 31] A lesson for organizations is that they should monitor the concerns of all stakeholders, including groups with negative opinions about a technology, for an extended period of time.

PREVIOUS RESEARCH ON RFID

The medical field is striving to control costs while improving patient care. To accomplish these goals, many technologies have been tested. RFID has been successfully used for tracking equipment and employees, monitoring and identifying patients, matching patients with the prescribed dosages of medicine, and preventing the use of counterfeit medicines.[32] An RFID tag can be smaller than a grain of rice. The tag is attached to an antenna. If batteries are included, the "active" tags can broadcast information to a reader that is more than 100 yards away. If batteries are not included, the "passive" tags can be scanned from several feet away. Passive tags can be added to medicine containers, blood supplies, name badges, and folders and can be incorporated into patient wrist or ankle bands. They could also help count surgical sponges, making sure none is left in patients, and help match dentures to patients. [33, 34]

RFID technology raises privacy concerns with some consumers. These concerns can be major impediments to widespread adoption.[35, 36] Some believe that additional technologies could provide the needed security, but these privacy-enhancing technologies are generally not sufficient.[37] A few hospitals did not consider the privacy concerns of employees or patients in their RFID evaluations.[32[Several surveys asked management about factors that might influence their decisions. One survey asked about the benefits and challenges but did not mention patient privacy.[38] Another asked respondents to rank the reasons for adopting RFID (patient comfort was rated last) and the perceived impediments (stakeholder concerns were not listed).[39] A third survey asked about perceived risks and resistance to change but did not directly mention stakeholders or privacy.[40] These study designs and the responses received suggest that patient needs and employee and patient concerns were not priority issues at some hospitals.

LESSONS FROM RFID ADOPTION CASE STUDIES

Leonard discussed five critical success factors for the adoption of new technology in healthcare: resistance to change, training, buy-in from stakeholders, reporting of outcome measures, and dealing with system shocks. Unfortunately, when some hospitals considered new technologies like RFID, they did not examine the third factor, stakeholder concerns.[41] A survey of hospital managers, consultants, and researchers in Indonesia and Malaysia did not find that getting feedback from stakeholders was a critical success factor for RFID adoption.[42] One stakeholder group with limited consideration was nurses. Nurses from around the US expressed concern about tracking technologies and several hospitals had their RFID implementations blocked by nurse unions.[43] Another survey of nurses found their intention to use RFID was significantly related to basic attitudes about the technology and subjective norms (e.g., how others would feel about them using the technology) and was not linked to privacy concerns.[44] A survey of medical staff in Thailand also noted the importance of social factors for gaining acceptance of new technologies.[45]

Descriptions of early RFID adoptions usually emphasized the feasibility and benefits generated.[46-50] Issues included testing for radio wave interference, addressing infrastructure limitations, working with good vendors, and educating staff.[32, 51, 52] Only a few case studies mentioned the importance of patients. One noted that many RFID applications are potentially disruptive innovations and highlighted the need to be sensitive to patient privacy concerns.[53] Another believed one-way communication with patients (e.g., lectures and brochures) should be sufficient to address any privacy concerns.[54] A third mentioned that patient tags would require patient consent and assumed that this would not be difficult to get because the tags would not contain any data.[55] There appeared to be little concern that patients may resist the use of this technology. An Ohio hospital was surprised by the negative response when they required mothers and babies to wear RFID bracelets for identification.[56]

Only one published survey was found that examined the public's attitudes toward RFID adoption by hospitals.[57] It focussed on mobile healthcare devices and found considerable support with some differences across applications. Unfortunately, the authors used a non-symmetrical, 5-point scale with "4" indicating "No interest" and "5" labelled as "It's a bad idea." Some respondents

who were neutral on an idea may have assumed that the middle of the scale was "neutral." In surveys, it is often recommended that higher numbers should represent positive responses.[58] Despite these methodological issues, the authors found that between 5 and 10 percent of respondents thought the various applications were "bad ideas." The authors concluded that there were not high levels of public concern about RFID applications. However, if those responding "bad idea" had particularly strong feelings, ignoring their concerns could cause problems (e.g., at least one supermarket and library have been picketed by consumers when they started using RFID tags in their loyalty cards or books).[59, 60)

METHOD

To understand attitudes toward hospital applications of RFID, this research mailed an anonymous survey to about 4900 adults, aged 25 to 60, in Illinois, Indiana, Michigan, and Ohio during 2010. After explaining the technology, the applications were described (Table 1). Respondents rated their support using a 7-point Likert scale (i.e., 1 indicates strongly disagree and 7 indicates strongly agree). There were 268 usable responses about wrist bands and badges and 276 usable responses about medications. The low response rate was expected because the mailing list was generated at random, the topic was unfamiliar, and there was little incentive to complete the survey.

TABLE 1. DESCRIPTIONS OF RFID APPLICATIONS IN SURVEY

Hospitals are exploring the use of RFID tags in medical wrist bands and employee badges in order to identify where any patient, doctor, or nurse is located whenever that information is needed.
Prescription drug manufacturers are considering adding RFID tags to their medication containers to help identify counterfeit drugs and to reduce the likelihood that patients receive the wrong drug.
If RFID tags with batteries were added to automobile license plates or car tires, scanners could quickly track stolen cars on the highway and tickets for speeding or for failing to stop at traffic signals could automatically be sent to car owners.
Retailers are testing the use of RFID tags on individual items in stores. This may help them identify when shelves are close to empty of certain items and may help reduce shoplifting (if they place scanners at exits). If every package had these tags, the store checkout process could be much faster because scanners could quickly identify all the items in carts.

Table 2 shows the demographic profile of the survey respondents. The responses from the oldest age group and non-whites were lower than anticipated. More people with college degrees responded to the survey than were expected. Otherwise, the profile of the respondents was similar to the target audience.

Besides demographics, respondents were asked if they attended organized religious services at least once per month during the last year. Religiosity, often measured with self-reported religious attendance, may be linked with RFID support because it is associated with stronger ethical norms and judgments.[61, 62] Opponents of RFID based some

objections on religion.[63] Respondents were asked to rate their knowledge of RFID before they read the entire survey and 21 percent said they were very informed (i.e., a top-two-box response, a "6" or a "7"). Using a 7-point Likert scale, respondents were also asked about their attitudes toward privacy using a set of 13 questions (Table 3), adapted from other studies.[64, 65] Some health technology studies have used single-item questions and response scales with limited breadth to measure privacy.[66, 67] Multiple item scales with seven response options generally work better, especially with a concept that has several components or dimensions.[68, 69]

TABLE 2. SAMPLE DESCRIPTIVE DATA

Independent Variable	Percentage of Sample
Female Dummy Variable	46%
Age in the 30s Dummy Variable	29%
Age in the 40s Dummy Variable	52%
Age of at least 50 Dummy Variable	9%
Single/Separated/Divorced Dummy Variable	34%
No Children Dummy Variable	45%
Some College But No Degree Dummy Variable	30%
4-Year College Degree or More Dummy Variable	57%
Non-white Ethnicity Dummy Variable	13%
Household Income of $30,000 to $59,000	26%
Household Income of $60,000 to $89,000	26%
Household Income of $90,000 or More	31%
Religious Attendance Dummy Variable	44%
Knowledge of RFID: Informed about RFID (Top-Two-Box)	21%

TABLE 3. PRIVACY ATTITUDE SCALE STATEMENTS

1. When companies ask me for personal information, I sometimes think twice before providing it.
2. Computer databases that contain personal information should be protected from unauthorized access - no matter how much it costs.
3. I am anxious and concerned about the pace of automation in the world.
4. Sometimes I am afraid the data processing department will lose my data.
5. Companies should never sell the personal information in their computer databases to other companies.
6. Computers are a real threat to privacy in this country.
7. Companies should have better procedures to correct errors in personal information.
8. It bothers me to give personal information to so many companies.
9. Companies should take more steps to make sure that the personal information in their files is accurate.
10. Companies should never share personal information with other companies unless it has been authorized by the individuals who provided the information.
11. I am easily frustrated by computerized bills.
12. I am sometimes frustrated by increasing automation in my home.
13. People should refuse to give information to a business if they think it is too personal.

RESULTS

Principal component analysis (with varimax rotation) was used to reduce the 13 privacy variables to three factors. The first factor was dominated by questions 12, 11, 3, 4, and 6 from Table 3. These questions were the computer or technology anxiety scale. A review of consumer health information technology acceptance noted that three papers tested for computer anxiety effects and found them to have significant negative impacts.[70] A survey on patient privacy concerns and health information exchanges also found computer anxiety to be a significant factor.[7] The second factor, nicknamed company policies, was primarily questions 2, 9, 7, 5, and 10. The third factor, nicknamed individual control, was primarily questions 13, 1, and 8. Cronbach's alpha was 0.814, which indicated very good reliability for the privacy scale.[71]

For RFID in wrist bands and badges, 42.5 percent of respondents were very supportive, giving this application a "7" and 20.5 percent gave it a "6". About 10.8 percent gave it little support or were not supportive, a "2" or "1." For the question on medicine containers, 49.3 percent gave it a "7," 16.8 percent gave it a "6," and 8.2 percent gave it a "2" or "1."

Binary logistic analyses were used to identify which measures affected the probability of support for an application. The dependent variables indicated whether a respondent gave an application top-two-box support. The twelve demographic measures, religiosity, prior knowledge, and the three privacy factors served as independent variables.

Table 4 shows the results for including RFID tags in wrist bands and badges. Sex, age, marital status, the presence of children, education, ethnicity, and income were not linked with support, which suggests that demographic profiling may not help identify individuals with concerns. Religiosity and knowledge about RFID were also not significant. The only significant variable was a privacy factor. Those who were more anxious about computers and technology were less likely to support this RFID application.

The right-hand columns in Table 4 show the results for including RFID tags on medications. Only one demographic variable was significant. Respondents in the high-income class tended to be more supportive of this application (at the 90 percent confidence level). Those classified as being religious were significantly less supportive. Computer and technology anxiety was also related to support for this application.

One question is whether consumer opinions about the two medical applications are typical of all RFID applications. To answer this, two more survey questions were analysed. Table 1 includes an application that involved including RFID tags in car license plates. Only 27.5 percent gave this application a top-two-box score while 40.1 percent gave it a score of "1" or "2". The results in Table 5 show that those at least 30 years of age were significantly more likely to support this application than people under 30. Non-whites were significantly more likely to support it than whites and the middle-income category was significant and positive. Both the first privacy factor (computer anxiety) and the third factor (individual control) were significant and negative. The negative coefficient on individual control suggested that those who do not like sharing personal information were also less likely to support this application.

TABLE 4. BINARY LOGISTIC REGRESSION RESULTS FOR RFID IN WRIST BANDS AND ON DRUGS PACKAGES

	Hospital Wrist Bands and Badges			Chips to Receive Correct Drug		
	Coefficient Estimate	Standard Error	P-Value	Coefficient Estimate	Standard Error	P-Value
Constant	**1.429**	**0.718**	**0.047***	0.827	0.745	0.267
Female Dummy Variable	-0.246	0.283	0.385	0.437	0.288	0.128
Age in the 30s Dummy	0.398	0.514	0.438	-0.354	0.547	0.517
Age in the 40s Dummy	0.294	0.483	0.542	-0.468	0.520	0.368
Age of at least 50 Dummy	0.582	0.644	0.366	0.103	0.696	0.882
Single/Separated/Divorced	-0.500	0.312	0.109	0.033	0.319	0.917
No Children Dummy Variable	-0.006	0.284	0.982	0.341	0.288	0.237
Some College But No Degree	-0.373	0.461	0.418	-0.202	0.459	0.659
4-Year College Degree or More	-0.700	0.473	0.139	-0.520	0.467	0.266
Non-white Ethnicity Dummy	-0.017	0.426	0.967	0.755	0.474	0.111
Income $30k-59k	-0.111	0.432	0.797	0.313	0.438	0.475
Income $60k-89k	-0.271	0.469	0.564	0.528	0.476	0.267
Income $90 plus	-0.207	0.482	0.667	**0.876**	**0.490**	**0.074***
Religious Attendance Dummy	-0.410	0.284	0.149	**-0.707**	**0.283**	**0.013***
Knowledge of RFID	-0.136	0.336	0.686	-0.444	0.333	0.183
Privacy: 1. Computer Anxiety	**-0.568**	**0.149**	**0.000***	**-0.402**	**0.146**	**0.006***
Privacy: 2. Company Policies	0.055	0.138	0.690	0.218	0.137	0.112
Privacy: 3. Individual Control	-0.198	0.148	0.181	-0.003	0.144	0.985

* Bold and underlined indicate P-Value less than 0.10

TABLE 5. BINARY LOGISTIC REGRESSION RESULTS FOR RFID IN LICENSE PLATES AND ON STORE PACKAGES

	Chips in Car License Plates			Chips on Item Packages in Stores		
	Coefficient Estimate	Standard Error	P-Value	Coefficient Estimate	Standard Error	P-Value
Constant	**-2.622**	**0.835**	**0.002***	-0.601	0.724	0.407
Female Dummy Variable	0.223	0.315	0.480	0.030	0.278	0.915
Age in the 30s Dummy	**1.265**	**0.654**	**0.053***	0.500	0.523	0.339
Age in the 40s Dummy	**1.133**	**0.626**	**0.070***	-0.004	0.491	0.993
Age of at least 50 Dummy	**2.296**	**0.775**	**0.003***	0.613	0.646	0.342
Single/Separated/Divorced	0.315	0.354	0.374	-0.004	0.309	0.989
No Children Dummy Variable	-0.361	0.320	0.259	0.079	0.284	0.781
Some College But No Degree	-0.088	0.495	0.858	0.364	0.448	0.416
4-Year College Degree or More	-0.577	0.516	0.263	0.315	0.457	0.491
Non-white Ethnicity Dummy	**1.806**	**0.450**	**0.000***	**1.788**	**0.530**	**0.001***
Income $30k-59k	0.381	0.507	0.453	0.044	0.434	0.920
Income $60k-89k	**1.127**	**0.532**	**0.034***	0.255	0.463	0.582
Income $90 plus	0.734	0.555	0.186	**0.949**	**0.486**	**0.051***
Religious Attendance Dummy	-0.515	0.320	0.107	**-0.567**	**0.280**	**0.043***
Knowledge of RFID	0.056	0.367	0.880	0.095	0.331	0.773
Privacy: 1. Computer Anxiety	**-0.275**	**0.161**	**0.087***	**-0.303**	**0.140**	**0.031***
Privacy: 2. Company Policies	0.165	0.159	0.300	-0.039	0.133	0.768
Privacy: 3. Individual Control	**-0.317**	**0.151**	**0.036***	**-0.248**	**0.143**	**0.081***

* Bold and underlined indicate P-Value less than 0.10

The last application involved incorporating RFID tags into packages in stores (Table 1). About 55.9 percent gave this application a top-two-box score and only 9.4 percent gave it a "1" or a "2." These scores were closer to those for the medical applications, but the regression results were different. Non-whites and high-income respondents tended to support RFID in stores while those with greater religiosity or privacy concerns (factor 1 and factor 3) tended to have less support. The findings that knowledge of RFID and college experience were not associated with support for any application suggest that more education about the technology may not ameliorate concerns. Comparisons across analyses show that the profile of supporters differs by application.

DISCUSSION

The surveys of managers and case studies of RFID implementations suggest that some administrators did not consider patient needs or stakeholder concerns when they evaluated the technology. Perhaps they assumed that stakeholders would not be interested. This research does not support that assumption. This study and a previous survey [57] suggest that about 10 percent of consumers were very concerned about the medical uses of RFID technology. The Monsanto case suggests that only a few concerned opponents can limit a technology's adoption.

Many demographic measures (gender, education, marital status, and presence of children) along with prior knowledge of RFID were not linked with support for any application. Therefore, it would be difficult to develop demographic profiles of those who are likely to support or oppose this technology. The link between religiosity and support for some RFID applications provides some help for targeting information at sceptical consumers. Variations in the support across applications suggest that acceptance of a technology in one area does not guarantee acceptance in other areas.

Individuals with greater anxiety about computers and technology offered less support for RFID applications. The links between support and this anxiety and between support and religiosity suggest these attitudes and values are deep-felt and may be difficult to change. One-way communications after technology decisions are made are likely to have limited effects. Longer-term, more intensive educational efforts and regular, two-way communications may be needed with all stakeholder groups.

When healthcare administrators consider new technologies, they need to integrate patient needs and stakeholder concerns into their decisions. Integration could involve periodic surveys of stakeholders and regular meetings with advisory boards who represent various groups. If hospitals discover opposition to a new technology, adopting it without addressing concerns could reduce trust, damage brand equity, and create public relations challenges. Even if only a small group is concerned, the public response could even reach the level similar to what Monsanto experienced. Because the response process is important, efforts should be made to improve the response process. In-depth discussions may be needed to understand concerns and develop effective responses to the issues involved with the technology. Surveys and meetings with advisory boards need to continue throughout the implementation process so that any opinion changes can be identified and thoughtful responses can be developed.

This research generated several recommendations for healthcare administrators when they evaluate new technologies. First, consider decisions from the patient's perspective. Enhancing patient privacy perceptions and building trust will boost brand equity. Do not assume staff feedback is a sufficient proxy for patient feedback, patients are not interested in a technology, or other stakeholders do not have concerns. Gain insights from periodic surveys of patients and staff and from regular stakeholder advisory board meetings. Track stakeholder opinions before, during, and after a new technology is adopted. Reach out to the religious community and recruit their members for a patient advisory board. Ask patients more than "satisfaction" questions to produce new insights. Do not assume that a technology that is acceptable in some applications will be accepted for other applications. And, finally, remember that how a response is presented is as important as the contents of the response.

Like most research, this study has some limitations. It focussed on one technology. Other research could examine whether the principles apply to other technologies. The survey was mailed to just one US region and the response rate was low. Some groups were under-represented (e.g., non-whites) and others were over-represented (e.g., college graduates) in the sample. A national or international survey with response incentives could provide a more balanced sample. Including other scales (e.g., personality profiles) and more in-depth questions about the reasons why some applications were not supported could also be helpful.

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