Dimensions of Quality in Healthcare: Perceptions of Patients from Saudi Public Hospitals

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ABSTRACT

Healthcare quality is driven by multiple dimensions. The present study aimed to examine the main dimensions of healthcare quality from the perspective of patients in the Kingdom of Saudi Arabia public (KSA) hospitals. A patient satisfaction survey was designed to discover the perceived dimensions of quality in the KSA healthcare sector. The steps involved in identifying the quality dimensions relating to healthcare are presented in the paper. The principal component analysis (PCA) lead to identifying the components with total variance explained and result in identifying three meta dimensions. This included wellness support, compliance with Standards, and exceptional service and immediate care. The research findings have provided a platform for emerging and discovering patient needs, direct improvement efforts in such a critical service sector and can be used as a basis for developing new measures to discover patients' needs.

KEY WORDS: HEALTHCARE QUALITY DIMENSIONS, PRINCIPAL COMPONENT ANALYSIS (PCA), PATIENT NEEDS.

INTRODUCTION

The healthcare industry has a significant importance in the global economy. This is because of its critical role in maintaining the health of people and providing high-quality healthcare services. Most countries provide a large expenditure on the health sector to maintain the health of people. For instance, Fuchs (1998) pointed out that in 1997, the US spent around 8% of its GDP on healthcare. Moreover, Estes et al. (2013) expected that by 2020, the expenditures on healthcare will reach 20% of the US national GDP. The UK increased the expenditure on the health system as a percentage of GDP from 5.9% in 1981 to 9.6% in 2017 (OECD 2020). Indeed, the COVID-19 pandemic resulted in enormous changes in health care delivery systems and has a major impact on the global economy. Various governments went through major health investments for maintaining the health of people (Faruk et al. 2021).

The Ministry of Health (MoH) in the Kingdom of Saudi Arabia (KSA) is responsible for providing healthcare services and managing the healthcare sector through health directories across the kingdom (AlYami and Watson 2014). Additionally, military hospitals are controlled and supported by the Ministry of Defense and Aviation controls (Mufti

2000; MoH 2002; Faruk et al. 2021). The healthcare sector has been given a top priority in Saudi Arabia's Vision (2030). The vision aims to improve the quality of life across the Kingdom in several fields including the health of people. To respond to the patient needs, MoH has made an extensive effort to improve the healthcare system, develop the infrastructure of hospitals' facilities, and provide affordable medical services to patients. It also has contributed positively to improving healthcare services and satisfying patient needs by adopting the most advanced technology applications based on a world-class standard. The efforts have been made to achieve a high level of healthcare quality. However, this did not result in improving the medical services provided to the patients (Ishfaq et al. 2016). The healthcare sector in KSA developed greatly over the past years with increasing demand for healthcare services. In (1970), the total number of populations in the KSA was 5.8 million and increased to 34.2 million by 2019. The total number of beds were increased from around 9000 to 77000 while the total number of hospitals was shifted from 74 to 498 (MoH 2019; Faruk et al. 2021).

To improve performance in the delivery of healthcare services in the KSA, there is a need for assessing, and improving productivity in hospitals (Al-Hanawi and Makuta 2022). The healthcare system includes several dimensions that are rapidly changing over years. Thus, identifying the main dimensions of quality in healthcare is necessary to improve the medical services provided to the patients.

Patients as the main stakeholder in the healthcare system have significant importance when assessing healthcare quality (Potts et al. 1984; Bensing 1991). Patient-Centered Outcomes Research Institute (PCORI) (2014) identified the healthcare stakeholders which are patients, clinicians. researcher, purchasers, hospitals/health systems, policymakers, payers, industry, and training institutions (Faruk et al. 2021). Many studies showed that patient perceptions of healthcare service quality are important and should be prioritized when evaluating the healthcare system (Gabel et al. 2003; Iversen et al. 2012).

Table 1. Healthcare organizations and quality constructs

Health Organization	Abbreviation	Location	Year	Quality Constructs
The Institute of Medicine	IOM	USA	2001	effectiveness, safety, responsiveness, timeliness, efficiency, and equity.
Organization for Economic Co-operation and Development	OECD	France	2006	effectiveness, safety, and responsiveness.
The Institute for Healthcare Improvement	IHI	USA	2007	individual experience, populations health, and per capita costs of care
European Commission	EC	Belgium	2014	effectiveness, safety, responsiveness, efficiency, and equity.
The World Health Organization	WHO	Switzerland	2018	effectiveness, safety, responsiveness, timeliness, integration, efficiency, and equity
The Australian Health Performance Framework	AHPF	Australia	2019	effective, appropriate, efficient, responsiveness, accessible, safe, continuous, capable, and sustainability.

Specifically, studies in the field of patient satisfaction related to healthcare services in KSA have only focused on measuring efficiency levels among public hospitals (Alatawi, Niessen and Khan 2020; Faruk et al. 2021). Therefore, the aim of this study was to identify the main healthcare quality dimensions in KSA public hospitals based on patients' perceptions. In order to achieve this aim, the current study utilized the principal component analysis (PCA) to explore the relative contribution of each quality dimension in healthcare as perceived by patients. These perceptions can be expected to be considered for improving patient perception and satisfaction in KSA public hospitals.

MATERIAL AND METHODS

The current study examined the main dimensions of healthcare quality from the perspective of patients in KSA public hospitals. The survey questionnaire instrument was constructed and included closed-ended questions rated on a five-point Likert-type scale. It contained demographic characteristics about the patients such as nationality, marital status, sex, age, and education level. The Software Statistical Package for Social Sciences (SPSS) 20.0 was used to analyze the data. The principal component analysis (PCA) was utilized to explore the main dimensions of healthcare service quality in KSA public hospitals. PCA is a multivariate statistical method used for reducing the dimensions or components of the dataset into a small number to find out the internal uncorrelated variables (Hair et al. 2010). Four faculty members and two medical staff from different public hospitals evaluated the survey questions. They participated in a focus group meeting to clarify the survey questions and their relation to the main research objective. The discussion outcomes resulted in the selection of 36 out of 62 questions.

A pilot study was conducted with 29 undergraduate students who visited the medical center of the university to ensure the clarity and readability of the questioner's items. The 36 statements included in the survey questionnaire revealed a high level of clarity and the average time required for completing the questionnaire was less than five minutes. The sampling plan criteria included five public hospitals located in Jeddah city. These hospitals were convenient and mostly visited by patients from different cities located in the western region of KSA. The results presented in this study were based on descriptive statistics and multivariate statistics methods.

RESULTS AND DISCUSSION

Healthcare quality has been receiving much concern from researchers and several studies have been conducted. This is because of difficulties in defining the quality of healthcare service from only the patients' point of view

who use the service. According to Panchapakesan et al. (2009) improving quality in healthcare can be achieved by recognizing the perceptions of stakeholders. The Institute of Medicine (IOM) (1990) in the US described quality in healthcare as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Institute of Medicine 1990; Panchapakesan et al. 2009; Faruk et al. 2021).

Table 2. General information of the respondents

Description	Frequency	(%)
Nationality		
Saudi	471	79
Non-Saudi	99	21
Marital Status		
Single	393	68.9
Married	177	31.1
Sex		
Male	354	62.1
Female	216	37.9
Age		
18-25	313	54.9
26-35	139	24.4
36-50	85	14.9
>50	33	5.8
Education Level		
High School	124	21.8
Bachelor	272	47.7
Master	98	17.2
PhD	76	13.3
Visiting Frequency		
Weekly	86	15.1
Monthly	118	20.7
Every 6 month	207	36.3
Yearly	159	27.9

Previous studies showed that there is no generic model or instrument developed to measure patients' perceptions of quality dimensions in healthcare. Several organizations have identified quality dimensions in healthcare with different quality constructs (Faruk et al. 2021). In (2001), the IOM identified six healthcare quality dimensions, which are effectiveness, safety, responsiveness, timeliness, efficiency, and equity. These dimensions have been used as a tool for quality assessment and measurement of the healthcare system. According to Leatherman and Sutherland (2003) the most common health quality dimensions used in the USA, Canada, and the Organization for Economic Co-operation and Development (OECD) countries are access, effectiveness, communication, and safety. The OECD (2006) proposed three main dimensions of healthcare quality ,which are effectiveness, safety, and responsiveness. The WHO (2006) proposed the following quality dimensions in healthcare effectiveness, safety, acceptability, responsiveness, efficiency, access, and equity.

In (2018), the World Health Organization used the same IOM dimensions and added the integration dimensions, which formed the overall health quality dimensions. The Institute for Healthcare Improvement (IHI) (2007) in the USA proposed the framework for safe, reliable, and effective care that included three main dimensions: the individual experience, the populations' health, and the per capita costs of care. The European Commission (EC) (2014) identified five dimensions of healthcare namely, effectiveness, safety, responsiveness, efficiency, and equity (Faruk et al. 2021). The Australian Health Performance Framework (AHPF) (2019) is a tool used to measure the performance of health care in Australia based on nine dimensions effective, appropriate, efficient, responsiveness, accessible, safe, continuous, capable, and sustainability. Table 1 shows the healthcare organizations and quality constructs.

A total of 672 respondents participated in this study. Out of collected questionnaires, 102 were excluded because of missing data. This results in (84.8 percent) response rate. The first part of the questionnaire included general information about the patients. This information is shown in table 2. As shown in the above table (79 percent of patients) were Saudi and (21 percent) were non-Saudi. Moreover, (68.9 percent) of the respondents were single and (31.1 percent) were married. Most of the participated patients were male (62.1 percent) whereases (37.9 percent) were female. More than half of the respondents were younger than 35 years and most of them belonged to the college degree category. The demographic information indicated that patients used to visits public hospitals every 6 months. The quality dimensions that considered in this study were derived from Gronroos (1988), Garvin (1984), and Parasuraman et al. (1985), and IOM (2001). The healthcare quality dimensions with its definitions are listed in Table 3.

The second part of the survey questionnaire instrument contained 36 statements and constructed based on 13 dimensions. The reliability of the questionnaire scales was assessed using Cronbach alpha to ensure the trustworthiness of the answers gathered from the patients. According to Hair et al. (2010), the acceptable Cronbach's alpha is greater than 0.7 and reveals a high level of internal consistency. The Cronbach's alpha, mean, and standard deviation for 36 items were calculated and presented in Table 4. All identified dimensions have coefficients higher than 0.7 and the total reliability was 0.81, indicating high overall reliability (Hair et al. 2010: Faruk et al. 2021).

In order to know the numbers of components to consider, a scree plot was used where stress values are plotted versus the number of dimensions. As illustrated in Figure 1 the scree plot represented three components. Therefore, all components with an eigenvalue greater than one were considered. The overall significance of the correlation matrix is zero, the approximate chi-square value was 7285.981, and the Kaiser-Meyer-Olkin (KMO) was 0.920. According to Kaiser (1974) the KMO value greater than

0.6 indicates the sampling adequacy and the factor analysis performed is appropriate. The Components with total variance are shown in Table 5.

The items that represent the quality dimensions with high loading values were considered and a total of three components were obtained. According to Hair et al (2010) items can be included when the loading values exceed 0.5 onto a factor, and items less than 0.5 should be excluded. As shown in Table 6, three components have eigenvalues greater than 1.0 and account for 57.02 percent of the total variation in the data. The component weights and dimensions are represented in table 6. The results of PCA showed that out of 13 healthcare quality dimensions, only seven dimensions reflected the perception of patients in KSA hospitals. These dimensions were access, recovery, conformance, facility, reliability, feature, and responsiveness. Thus, 18 items were excluded as they were not meeting this criterion (communication, competence, security, courtesy, understanding, credibility). This is because of the low factor loading to the proposed factors (Faruk et al. 2021).

Table 3. Healthcare quality dimensions

| Construct	Definition
Reliability	The service provided is consistent and serves the patient right every time
Responsiveness	Readiness and response to patients need immediately
Competence	Obtain the skills needed and knowledge to perform the service.
Access	The healthcare services are easy to reach and access
Courtesy	The healthcare staff are polite, respectful, and friendly to patients
Communication	Patients can communicate with all medical staff members
Credibility	The trustworthiness, and honesty of all medical staff members
Security	The healthcare services are free from error, danger, and risk
Understanding	Recognize and understand patients' needs.
Tangibles	The physical components of healthcare services
Features	The supplementary characteristics of healthcare services
Conformance	The healthcare provider follows the healthcare standards, and procedures.
Recovery	The healthcare provider takes immediate action and solves any issues that could be occurred

Table 4. The healthcare quality dimensions and Cronbach alpha values

Health Care Quality Dimensions	Code	Item	Cronbach Alpha	Mean	SD
Access	Access1	The hospital location is easy to reach	0.899	2.78	1.27
	Access2	The hospital operational systems are working properly			
	Access3	Easily accessible by telephone and website			
	Access4	I can make an appointment and receive healthcare services			
Reliability	Reliabi1	Provides medical services as promised	0.852	2.77	1.24
	Reliabi2	Committed to providing medical services on time			
	Reliabi3	The medical services provided are trusted			
Communication	Commu1	The staff spoke using clear language	0.867	2.21	1.65
	Commu2	The doctor provides a clear explanation about the medications			
	Commu3	The hospital sent me an appointment reminder by text message			
Competence	Compet1	The staff are experienced and efficient	0.830	2.75	1.26
	Compet2	The doctors have high skills and knowledge			

Table 4 Continue

	Compet3	The nurses cooperate effectively with patients			
Security	Secur1	The hospital has several security men	0.710	2.69	1.26
	Secur2	Patient personal information is secured			
	Secur3	The hospital is equipped with surveillance cameras			
Facility	Facility1	Modern tools and equipment's are used to provide the service	0.950	2.73	1.22
	Facility2	Good atmosphere and decoration			
	Facility3	The hospital placed directions signs			
Responsiveness	Resp1	The medical services provided over 24 hours	0.932	2.77	1.25
	Resp2	Staff respond immediately to patients' complaints			
	Resp3	Staff inform patients of scheduled appointments			
Courtesy	Court1	Staff are friendly, polite, and respectful	0.627	2.73	1.26
	Court2	The clean and neat appearance of staff			
	Court3	Good understanding of the patient's needs			
Feature	Feature1	The hospital provides free water bottles	0.910	2.84	1.31
	Feature2	The hospital provides free WIFI internet			
	Feature3	The hospital has a mobile application or website for scheduling an appointment			
Conformance	Conform1	The time required to see the doctor is acceptable	0.770	2.80	1.26
	Conform2	The doctor prescribed the medication. according to the patient's age			
	Conform3	The patient medical report does not include any mistakes			
Understanding	Understand1	The hospital medical staff made an effort to understand my needs.	0.611	2.61	1.54
	Understand2	The doctor described the right medicine			
	Understand3	The medical staff assign the right doctor to me			
Credibility	Cred1	The hospital name and its reputation are trusted	0.701	2.70	1.25
	Cred2	The medical results are accurate			
	Cred3	The patient has confidence in doctor qualifications.			
Recovery	Recov1	The hospital staff take immediate action in case of emergency	0.880	2.73	1.23
	Recov2	The doctor informs the patient about the required medicine dosages.			
	Recov3	The doctor provides alternative recovery plans.			

Figure 1: Scree plot for the survey items
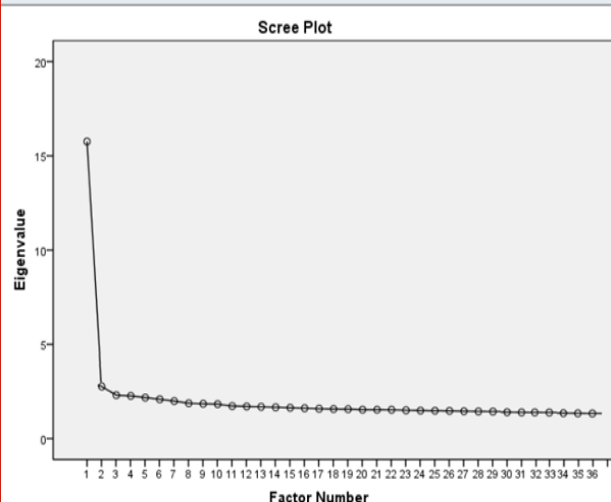
As a result, access and recovery dimensions pertained to the first component. The second component included two dimensions namely, conformance and facility. The third component resulted in obtaining three dimensions reliability, feature, and responsiveness. The PCA showed that seven dimensions explain 57.02 percent of the total variability in the count. Access and recovery belonged to the first component. This indicated that public hospitals should facilitate access to patient information, treatment details, and tests needed to be consistent with a patient's recovery plans. The meta dimension can be labeled as "wellness support". This result is consistent with Musa et al. (2021) study who emphasized on creating wellness programs within primary health (Musa et al. 2021).

According to the institute of medicine (IOM) (2001), the availability of information is important for patients and their families to have the right for choosing the healthcare providers that offer medical and treatment services. Conformance and facility pertained to the second principal component. This means that patient view regarding the appropriateness of medical facilities, and relates to the fulfillment of healthcare standards. This is suggested the "healthcare compliance with standards" meta dimension. The dimension can be assessed through accreditation and audit activities. This is supported by the fact that compliance

with accreditation standards provide many benefits to the hospitals in term of improving performance and patient safety (Hussein et al. 2021).

Indeed, most hospitals in Saudi Arabia work effectively to achieve Joint Commission International (JCI) accreditation. The JCI accreditation requirement is to execute patient satisfaction surveys and share these results with them (JCI 2008). Hospitals that have sought JCI accreditation have made the necessary steps to conduct patient satisfaction surveys. This required standard, prepared by the JCI to obtain patients' opinions on the medical care received and has been considered as a part of the quality indicators for improvement. However, some hospitals in Saudi Arabia have not used patient satisfaction data to improve the quality of their care, only collecting the survey data to comply with JCI requirements (Hussein et al. 2021).

Table 5. Components with total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative	Total	% of Variance	Cumulative %
1	1.144	7.153	30.247	1.144	7.153	30.247	1.133	7.081	29.092
2	1.122	7.010	37.257	1.122	7.010	37.257	1.125	7.034	36.126
3	1.019	6.370	57.022	1.019	6.370	57.022	1.098	6.861	57.022
..	…	…	…						
36	.741	4.630	100.000						

Table 6. Component weights and dimensions

Health care quality Dimensions	Factor		
	1	2	3
Access 1	0.96		
Access 2	0.947		
Access 3	0.919		
Access 4	0.762		
Recovery 1	0.657		
Recovery 2	0.615		
Recovery 3	0.521		
Conformance 1		0.944	
Conformance 2		0.874	
Conformance 3		0.777	
Facility 1		0.654	
Facility 2		0.566	
Reliability 1			0.852
Reliability 3			0.801
Feature 1			0.786
Feature 2			0.698
Responsiveness 1			0.599
Responsiveness 3			0.573

meta dimension is "exceptional service and immediate care". Lee and Yoon (2021) highlighted the usefulness of artificial intelligence (AI) based technology applications in hospitals, which help in improving the accuracy of medical diagnosis, creating new value for patients, and increasing the efficiency of operational processes. The health care meta quality dimensions in KSA public hospitals are represented in Table 7.

Table 7. Health care meta quality dimensions in KSA public hospitals

Wellness Support	Compliance with Standards	Exceptional Service and Immediate Care
Access Recovery	Conformance Facility	Reliability Feature Responsiveness

CONCLUSION

The findings of the present study showed that wellness support, compliance with standards, and exceptional service and immediate care are the most critical quality dimensions that influence patients' perceptions in KSA public hospitals, and can be used as the best predictors of overall patients' perceptions. A longitudinal study can be conducted to validate the identified dimensions and to find out changes in patients' perceptions. Other directions of study include comparing patient perceptions of healthcare quality dimensions in different regions of KSA. The main purpose of this study was to identify the main healthcare quality

The third principal component included reliability, feature, and responsiveness. This suggested supplemental services to patient needs in a short time. For instance, speed up the medical reports' turnaround time by improving the medical transcription process using an advanced information system. Also, reducing the patients waiting time, which includes the total time required to see a doctor and time needed to obtain prescribed medicines. The proposed

dimensions in KSA public hospitals based on patients' perceptions. This application provides a platform for the hospitals to discover opportunities for improvement and satisfy patients' needs. To ensure satisfactory performance, public hospitals should provide unique medical services to patients, which are in alignment with the Kingdom's 2030 vision.

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Conflict of Interests: Author declare no conflicts of interests to disclose.

Data Availability Statement: The database generated and /or analysed during the current study are not publicly available due to privacy, but are available from the corresponding author on reasonable request.

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