Service Quality Assessment of Hospitals in Asian Context: An Empirical Evidence From Pakistan

Muhammad Shafiq, PhD[1], Muhammad Azhar Naeem, PhD[2], Zartasha Munawar, MS[1], and Iram Fatima, PhD Scholar[1]

Abstract

Hospitals vary from one another in terms of their specialty, services offered, and resource availability. Their services are widely measured with scales that gauge patients' perspective. Therefore, there is a need for research to develop a scale that measures hospital service quality in Asian hospitals, regardless of their nature or ownership. To address this research need, this study adapted the SERVQUAL instrument to develop a service quality measurement scale. Data were collected from inpatients and outpatients at 9 different hospitals, and the scale was developed using structural equation modeling. The developed scale was then validated by identifying service quality gaps and ranking the areas that require managerial effort. The findings indicated that all 5 dimensions of SERVQUAL are valid in Asian countries such as Pakistan, with 13 items retained. Reliability, tangibility, responsiveness, empathy, and assurance were ranked first, second, third, fourth, and fifth, respectively, in terms of the size of the quality gap. The gaps were statistically significant, with values ≤.05; therefore, hospital administrators must focus on each of these areas. By focusing on the identified areas of improvement, health care authorities, managers, practitioners, and decision makers can bring substantial change within hospitals.

Keywords

scale development, patient perspective, hospital, service quality, structural equation modeling

Introduction

In the 21st century, all successful organizations adopt a customer focus as the central pillar of their strategic planning. The concept of quality originated in manufacturing organizations, but it is equally important for service organizations. It is now well recognized that the provision of quality services is closely associated with organizations' incremental customer satisfaction,[1-3] consumer maintenance,[1-4] consumer allegiance,[5] budgets and productivity,[6,7] facility assurance,[8] and economic presentation.[9]

Similar to other service industries, health care has become a highly competitive and rapidly growing industry worldwide.[10] In the health care industry, patient observations are a focal point of service quality.[11,12] Patient contentment is a principal decision-making tool in selecting health care services,[13] and service quality should meet customers' expectations.[14-17]

SERVQUAL, created by Parasuraman et al,[17] is a widely used scale for measuring service quality in the service sector. Aghamolaei et al[18] argued that it is also suitable for measuring service quality in hospitals; however, its suitability must be evaluated in different contexts. Patients from various parts of the world have different expectations and perceptions of service quality based on the social, cultural, and economic conditions in which they live.

In countries such as Pakistan, the majority of the population lives in rural areas.[19] The people living in these areas have insufficient knowledge of their rights, especially with regard to health care services.[20] Thus, the current study was motivated to develop a scale for assessing the service quality of hospitals in countries such as Pakistan. In this study, SERVQUAL items were adapted to make the scale context specific for Pakistan to evaluate patients' perception of service quality in hospitals.

Literature Review

Across the globe, economic conditions shape people's expectations of service quality and their lifestyle. Customers'

[1]Institute of Quality and Technology Management, University of the Punjab, Lahore, Pakistan
[2]Department of Electrical Engineering, University of the Punjab, Lahore, Pakistan

Corresponding Author:
Iram Fatima, Institute of Quality and Technology Management, University of the Punjab, Lahore 54590, Pakistan.
Email: iramfatima01@yahoo.com

perceptions play a vital role in the failure of any product or service.[12] Consequently, organizations develop tactics to provide greater service quality to customers to thrive in the current economic climate.[17,21]

The foundation of the service industry is the relationship between 2 parties: the consumer and service provider.[22] Many scholars have studied the connections among service quality, customer satisfaction, and behavior in several service organizations, particularly hotels and restaurants.[6,12,23-25] They have found that service quality is an abstract and elusive concept[26] and is determined by customers' personal understanding of their knowledge.[27]

In hospitals, the customers are patients, and the service providers are doctors, paramedical staff, or nurses, who vary in terms of their intellectual skills, knowledge competencies, and professional attitude. Generally, services in hospitals are intangible, such as the skills of doctors, the hospital atmosphere, a caring staff, and hygiene, and they represent a combination of tangible and intangible products. Patients' assessment of services is based on their entire understanding and shaped by the effectiveness of the operation, the hospital atmosphere, hygiene in rooms and wards, and the devotion of surgeons, nurses, and staff.

In the aggregate, the model "health care process quality" suggests a statistically significant positive association between procedure quality and patient fulfillment. Patients evaluate procedure quality based on, among other things, the actual procedures performed by surgeons, the communications between medical staff and patients, and the result of these interactions.[26] Both physicians and researchers have acknowledged the importance of service quality and become more devoted to it the past 2 decades.[28,29]

Seth et al[30] identified 19 models of service quality in diverse service settings (shown in Table 1). They revealed a close relationship between service quality and customer satisfaction. Earlier, Grönroos[31] noted that organizations must have the ability to influence the perceptions of consumers and should manage service quality by narrowing the gap between consumer expectations and perceptions. He described 2 distinct aspects of service quality in his model: technical and functional quality. Both of these aspects of quality shape the image of an organization. This image may be built by word of mouth, tradition, ideology, and public relations.[30]

Parasuraman et al[17] proposed a gap model that presented a set of discrepancies between the expectations and perceptions of service consumers. These discrepancies can be a hurdle for services to deliver high-quality services to consumers. According to those authors, this model depicts the consumer side of service, focusing on the magnitude and direction of each gap. Gap 1 is the difference between management's perception of consumers' expectations and consumers' actual expectations. Gap 2 is the discrepancy between management's perception of consumers' expectations and the service quality specifications translated from those perceptions. Gap 3 is the difference between management's perceived service quality specifications and the actual service delivered to customers. Gap 4 is the difference between the actual service delivery and the communication to consumers about the services delivered. Gap 5 is the difference between consumers' expectations and perceptions of services.[30]

After this exploratory research, Parasuraman et al[51] developed SERVQUAL, a more concise model to assess service quality within an organization. This model was continuation of a previous model in which 10 dimensions (tangibility, reliability, assurance, responsiveness, empathy, communication, competence, credibility, courtesy, and security) were decreased to 5 dimensions (tangibility, reliability, assurance, responsiveness, and empathy), with 97 items in the former model and 22 items in the latter.

Later, other models, such as the attribute service quality model,[32] suggested that in developing a service quality model, service attributes should be separated and then focused based on consumers' expectations and perceptions simultaneously. The authors described 3 attributes of service: physical facilities and processes, people's behaviors, and professional judgment. Similarly, other models described in Table 1 have been identified in the literature as enriching the current knowledge. However, none of these models has gained as much importance among academicians, professionals, and researchers as SERVQUAL.

Service Quality in the Health Sector

Health services are unique in identifying new challenges. Academics, practitioners, policy makers, and decision makers are still in the process of identifying valid tools to assess service quality.[52,53]

The health care facility can be divided into 2 quality dimensions: technical quality and functional quality.[31] Technical quality in health care is mainly related to technical correctness and medical analyses and techniques, whereas functional quality refers to how the health care service is provided to patients.[54] Furthermore, technical quality is about what the customers get, whereas functional quality is about how they get it. Ware and Snyder[55] state that although technical quality has high significance among patients, most patients do not have the information to assess efficiently the quality of the investigative and relaxing involvement procedure or material needed. Maximum patients cannot discriminate among the caring presentation and the curing presentation of doctors.[54]

Through a system approach, quality standards are formulated according to needs, but most of them focus on the technical delivery of services and ignore the customer's point of view.[56] This technical perspective focuses on the accuracy of diagnosis, success of procedures, and satisfaction of professional requirements at the facility.[57] As customers, patients describe the quality of services delivered

Table 1. Service Quality Models.

Study	Model	Respondents/test audience	Scale used	Measurement of service quality addressed through
Grönroos[31]	Technical and functional quality model	219/bank, insurance, restaurants, shipping, airline companies, cleaning and maintenance, car rental companies, travel agencies, and a range of institutes from the public sector	Basic statistical analysis (information compilation and presentation)	Functional and technical quality
Parasuraman et al[17]	Gap model	Ranged from 298–487 across companies/telephone companies, securities brokerage, insurance companies, banks, and repair and maintenance	Principal-axis factor followed by oblique rotation	Ten dimensions (reliability, security, responsiveness, access, communication, tangibles, courtesy, credibility, competence, and understanding/knowing)
Haywood-Farmer[32]	Attribute service quality model		Analysis not reported	Physical facilities and processes, people's behavior and conviviality, and professional judgment
Brogowicz et al[33]	Synthesized model of service quality		Analysis not reported	Technical and functional quality defining planning, implementation, and control tasks
Cronin and Taylor[12]	Performance-only model	660/banking, pest control, dry cleaning, and fast food	Principal-axis factor followed by oblique rotation and LISREL	Confirmatory 22 items, same as SERVQUAL but with performance-only statements
Mattsson[34]	Ideal value model	40 guests while checking in and checking out/2 large luxury hotels	Pearson moment correlation, pairwise intrasample and intersample median test, and chi-square test	18 items of value and 9 items of customer satisfaction
Teas[35]	Normed quality and evaluated performance model	120/randomly selected from discount stores	Qualitative assessment, correlation, and t test	Limited subset of SERVQUAL items (2 items for each of 5 dimensions)
Berkley and Gupta[36]	IT alignment model		Analysis not reported	The model does not cover the measurement of service quality
Dabholkar et al[37]	Attribute and overall affect model	505 undergraduate students/fast food setting	Confirmatory factor analysis and structural equation modeling using LISREL VII	3 items measuring expected service quality, specifically of ordering situation
Spreng and Mackoy[38]	Perceived quality and satisfaction model	273 undergraduate students	Confirmatory factor analysis and structural equation modeling using LISREL	Desires, perceived performance, expectations, and desired congruency (each comprising 10 attributes)
Philip and Hazlett[39]	Pivotal, Core, and Peripheral attribute model		Analysis not reported	Pivotal attributes, core attributes, and peripheral attributes
Sweeney et al[40]	Retail service quality and perceived value model	1016 respondents/electrical appliances stores	Confirmatory factor analysis using LISREL VIII	Functional quality through 5 SERVQUAL items and technical quality through 1 item

Table 1. (continued)

Study	Model	Respondents/test audience	Scale used	Measurement of service quality addressed through
Oh[41]	Service quality, customer value, and customer satisfaction model	545/two luxury hotels survey	Path analysis using LISREL VIII	Single item for perceived price and 8 items for perceptions of hotel settings
Dabholkar et al[42]	Antecedent mediator model	397/undergraduate and postgraduate students	Regression structural equation modeling using LISREL	SERVQUAL item through measurement of reliability, personal attention, comforts, and features
Frost and Kumar[43]	Internal service quality model	724 at different levels/Singapore airline staff	Principal component factoring, reliability coefficient, and split half coefficient	SERVQUAL dimensions
Soteriou and Stavrinides[44]	Internal service quality Data Envelope Analysis model	194 responses/26 bank branches	Data envelope analysis	Measurement of perceptions of customers using SERVQUAL-based instrument
Broderick and Vachirapornpuk[45]	Internet banking model	160 incidents on 55 topic episodes posted/UK Internet website community	Qualitative approach	Service setting, service encounters, customer expectation, and image
Zhu et al[46]	IT-based model	185/bank customers with past experience of using IT-based service options such as ATM and 24-hr call line	Factor analysis and structural equation modeling using LISREL VII	SERVQUAL items with perception-only statements
Santos[47]	E-service quality model	30 focus groups comprising 6 to 10 members	Qualitative analysis	Incubative and active dimensions
Dagger et al[48]	Model of health service quality	28 participants, 7 per focus group from clinics	Qualitative analysis	Interpersonal quality, technical quality, environmental quality, and administrative quality
Rakhmawati et al[49]	Service quality model for Public Health Center	800/patients	Factor analysis	Quality of health care delivery, the quality of health care personnel, the adequacy of health care resources, and quality of administration process
Lee[50]	HEALTHQUAL	368 patients and 389 public respondents	Factor analysis	Empathy, tangibles, safety, efficiency, and degree of improvements in care service

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Table 2. List of Studies That Have Used SERVQUAL Dimensions for Service Quality Assessment in Hospitals.

Dimension	Studies
Assurance	Babakus and Boller[67]; Babakus and Mangold[15]; Anderson and Zwelling[68]; Curry[69]; Curry and Stark[70]; Andaleeb[71]; Andaleeb[53]; Curry and Sinclair[72]; Chakravarty[73]; Kazemi et al[74]; Aghamolaei et al[18]; Islam et al[10]; Al Fraihi et al[75]
Reliability	Babakus and Boller[67]; Babakus and Mangold[15]; Anderson and Zwelling[68]; Curry[69]; Curry and Stark[70]; Dabholkar et al[42]; Curry and Sinclair[72]; Jabnoun and Chaker[76]; Kilbourne et al[62]; Chakravarty[73]; Kazemi et al[74]; Aghamolaei et al[18]; Islam et al[10]; Al Fraihi et al[75]
Responsiveness	Babakus and Boller[67]; Babakus and Mangold[15]; Anderson and Zwelling[68]; Curry[69]; Curry and Stark[70]; Andaleeb[71]; Andaleeb[53]; Curry and Sinclair[72]; Jabnoun and Chaker[76]; Kilbourne et al[62]; Chakravarty[73]; Kazemi et al[74]; Aghamolaei et al[18]; Islam et al[10]; Al Fraihi et al[75]
Empathy	Babakus and Boller[67]; Anderson and Zwelling[68]; Curry[69]; Curry and Stark[70]; Curry and Sinclair[72]; Jabnoun and Chaker[76]; Kilbourne et al[62]; Arasli et al[77]; Chakravarty[73]; Kazemi et al[74]; Aghamolaei et al[18]; Islam et al[10]; Al Fraihi et al[75]
Tangibles	Babakus and Boller[67]; Babakus and Mangold[15]; Anderson and Zwelling[68]; Curry[69]; Curry and Stark[70]; Curry and Sinclair[72]; Jabnoun and Chaker[76]; Kilbourne et al[62]; Chakravarty[73]; Kazemi et al[74]; Aghamolaei et al[18]; Islam et al[10]; Al Fraihi et al[75]

in a limited way because they have insufficient knowledge about technical aspects of the service. Nonetheless, based on customers' perceptions, expectations, and observations, both technical and nontechnical aspects of services can be evaluated. Patients' feelings are crucial to improving services.[58] Patients' arguments are important, in line with the "marketing concept," which focuses on ensuring customer satisfaction and considering that patients are neither right nor wrong but satisfied.[59]

Service quality and patient satisfaction have a significant impact in health care. Patients' perceptions of hospital facilities affect the image and cost-effectiveness of the hospital.[60] Perceived service quality also determines patients' loyalty and word-of-mouth behavior.[53] Due to increased patient expectations, health care service workers have been encouraged to recognize the factors that are essential to expanding health care services, which can lead to patient satisfaction and allow health care services to decrease the time and money they spend.[61] The SERVQUAL instrument has been broadly used to measure the service quality of health care,[15,16,54,62-66] as shown in Table 2.

Pakistan is the sixth most populated country, with a population of around 191.71 million. Its population growth rate is 1.92% as stated in the Pakistan Bureau of Statistics.[78] According to its constitution, the provision of health care services is the responsibility of federal and provincial governments, which plan and devise national health policies. The majority of people in urban areas go to public hospitals when they need care,[79] but these facilities are inadequate to serve the large numbers of people who use them. A strong government focus is required to support these services.

In Pakistan, service quality has been assessed by various researchers, such as Shabbir et al,[80] Sabir et al,[81] Irfan et al,[82] and Irfan and Ijaz.[20] They either used SERVQUAL or modified it; Sabir et al[81] studied service quality using SERVQUAL, whereas Irfan and Ijaz[20] and Irfan et al[82] studied hospital service quality using a modified version of SERVQUAL. The former studied service quality in Combined Military Hospital (CMH) and private and public sector hospitals and found that CMHs and private hospitals were a source to meet patient requirements due to timely treatment and other facilities, whereas later two studied public and private hospitals with the dimensions empathy, tangibles, timeliness, responsiveness, and assurance. They concluded that private hospitals deliver better services than public sector hospitals.

Methodology

A cross-sectional study was conducted at 9 hospitals (5 public and 4 private) in Lahore. The sample size was calculated as suggested by Hair et al,[83] and 340 valid questionnaires were administered to both inpatients and outpatients. The questionnaire was self-administered using a simple random sampling method. Hospitals were selected based on convenience and permission granted by hospital authorities to conduct the study. The study instrument was primarily based on standard SERVQUAL items[17] and also context-based items from Irfan and Ijaz.[20] The designed tool was discussed with experts of service quality to obtain content validity. The modified form comprised 68 items and 6 dimensions. These dimensions included tangibles (8 items), reliability (5 items), responsiveness (7 items), assurance (5 items), empathy (5 items), and timeliness (3 items) each for the perception and expectation measurements. All statements were measured on a 5-point "Agree-Disagree" Likert scale.[84] The instrument was translated into Urdu through a careful translation and back-translation process.[85] First, the author translated the 68-item scale into Urdu; then, experts back-translated the items into English to ensure that the original content was preserved in the translation.[86]

Informed patient consent was also obtained prior to the questionnaire completion. Pilot testing was conducted by

Table 3. Characteristics of Study Participants.

Variables	Category	Frequency	Percentage
Age, y	18-20	36	10.6
	21-30	97	28.5
	31-40	101	29.7
	40+	106	31.2
	Total	340	100
Education level	High school	79	23.2
	Some college	78	22.9
	College graduate	80	23.5
	Postgraduate	45	13.2
	PhD	1	0.3
	Uneducated	72	23.4
	Total	340	100
Monthly income, PKR	10 000-19 000	143	42.1
	20 000-50 000	120	35.3
	50 000-100 000	56	16.5
	100 000+	21	6.2
	Total	340	100
Type of hospital	Public	200	58.8
	Private	140	41.1
	Total	340	100

collecting feedback from 15 patients (7 outpatients and 8 inpatients, based on convenience) to assess the content validity and to ensure that the statements were easy for respondents to understand. These responses were not included in the study.[87] The Cronbach alpha coefficient was calculated to measure the reliability of the scales, and the values were found to be greater than 0.7, indicating high reliability.[88] Then, patients were instructed to fill in questionnaire after they provided informed consent. Ethical approval for the research project was obtained from the institutional review board. Patients aged 18 years or older were allowed to participate in the study, and their responses were calculated and analyzed. The data analysis was carried out using IBM SPSS version 20 and IBM AMOS version 20.

Results and Discussion

Sample Characteristics

The characteristics of study participants are described in Table 3. Of the participants, 10.6% were aged 18 to 20 years, 28.5% were aged 21 to 30 years, 29.7% were aged 31 to 40 years, and 31.2% were older than 40 years. In addition, 23.4% were uneducated, 23.2% had a high school degree, 22.9% had higher secondary school degree, 23.5% were college graduates, 13.2% had a postgraduate education, and 0.3% had a PhD. In addition, 58.8% were patients at public hospitals, and 41.1% were patients at private hospitals.

Monthly income was 10 000 to 19 000 PKR for 42.1% of participants, 20 000 to 50 000 PKR for 35.3%, 50 000 to 100 000 PKR for 16.5%, and more than 100 000 PKR for 6.2%.

Development of Perception-Based Scale

To measure sampling adequacy, Kaiser-Meyer-Olkin (KMO) and Bartlett tests were performed, and the values were found to be significant (KMO value: 0.914; P value: 0.000). Based on patient perception data, a covariance matrix was created between service quality dimensions, and the first run of the confirmatory factor analysis (CFA) provided satisfactory goodness of fit with the deletion of the "timeliness" dimension (with factor loadings ≤0.5).

Scale reliability and validity. Items used in the service quality measurement tool were screened earlier using CFA to establish whether the items actually measured their assigned practices. The unidimensionality, reliability, convergent validity, and criteria-related validity were also assessed.

Unidimensionality analysis. CFA was used to evaluate the unidimensionality of service quality constructs. The cutoff value of the comparative fit index was suggested by Bentler and Bonnet[89] to be 0.90. However, others, such as Hu and Bentler[90] contended that this value should be 0.95 for a strong fit and that the RMSEA value should be less than 0.08. Table 4 indicates that the CFI value is 0.962, and the RMSEA value is 0.087. The values mentioned above indicate that the constructs are unidimensional.

Reliability analysis. The Cronbach alpha value is used to evaluate the reliability of the constructs. This value is more than 0.70, which indicates reliability of the construct.[91] As shown in Table 4, the alpha value for the 5 dimensions ranges from 0.889 to 0.920. The overall value of Cronbach alpha for the service quality construct is 0.947. These values show that all constructs are extremely dependable.

Convergent validity. Bagozzi et al[92] suggested that CFA can be used to evaluate convergent validity and that convergent validity can be established if all factor loadings have significant values on their respective constructs. As shown in Table 4, all factor loadings range from 0.79 to 0.92 and are significant on their respective constructs.

The proposed service quality model of 5 dimensions is shown in Figure 1. The CFA evaluated the proposed modeled constructs. These constructs are actually quality dimensions that are built on collected data. Multiple items were converted to single construct that reflected the quality dimension. The goodness-of-fit statistics used to assess the fit of the data for the proposed model are shown in Table 5. The values of RMSEA = 0.08, CFI = 0.969, χ^2 / df = 3.57, PGFI = 0.557, and PNFI = 0.669 indicate a satisfactory fit of the model. Therefore, these values indicate that the structural model has the best fit.[93]

This perception-based model, which was validated by CFA, consists of 5 dimensions and 13 items, 2 each for tangibility and assurance and 3 each for reliability, responsiveness,

Table 4. Summary of Goodness-of-Fit Statistics for CFA of Model Constructs.

SQ		χ^2	df	χ^2/df	P value	CFI	RMSEA	PGFI	PNFI	NFI	TLI	SRMR	Factor loadings	Cronbach alpha	Mean	SD
		196.56	55	3.57	.000	0.97	0.087	0.56	0.67	0.95	0.95	0.038		0.942		
Tangibility	T38												0.91	0.903	3.66	0.88
	T39												0.92		3.68	0.81
Reliability	R43												0.90	0.886	3.66	0.83
	R46												0.87		3.59	0.86
	R47												0.81		3.72	0.87
Responsiveness	Re48												0.86	0.881	3.62	0.90
	Re49												0.90		3.57	0.95
	Re51												0.80		3.67	0.88
Assurance	A55												0.89	0.890	3.48	0.95
	A56												0.91		3.46	0.93
Empathy	E62												0.84	0.913	3.64	0.87
	E63												0.90		3.56	0.94
	E64												0.88		3.56	0.91

Note. CFA = confirmatory factor analysis; CFI = comparative fit index; NFI = normed fit index; PGFI = parsimony goodness-of-fit index; PNFI = parsimonious normed fit index; RMSEA = root mean square error approximation; SQ = Service Quality; SRMR= standardised root mean square residual; TLI = tucker-lewis index.
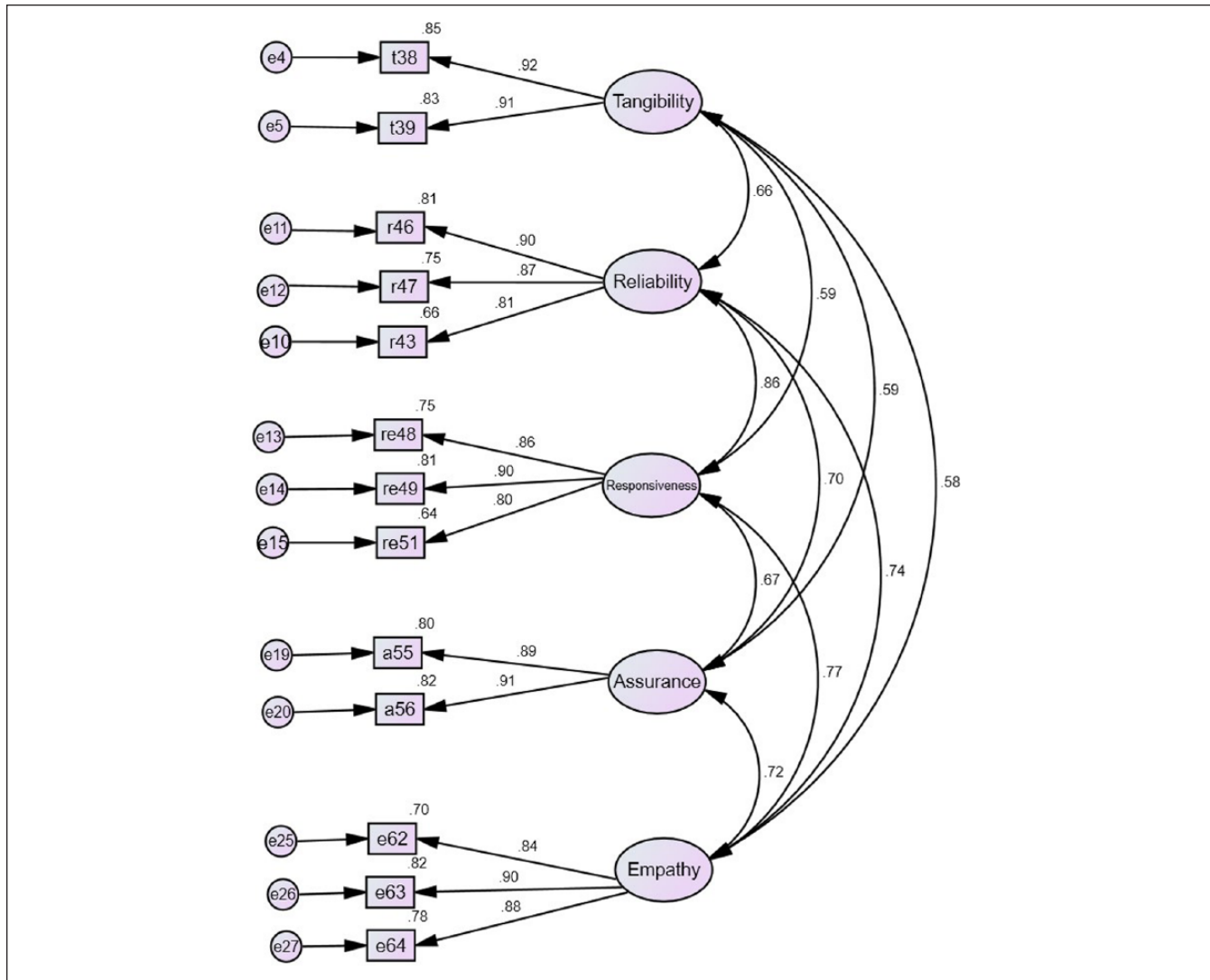
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Figure 1. The theoretical framework for perceived service quality among patients.

and empathy. The tangibility items were "the beds in the hospital are highly hygienic" (t-38) and "the rooms in the hospital are hygienic and ventilated" (t-39). The reliability items were "the hospital is trustworthy for its patients" (r-43), "the investigations conducted in the hospital are reliable" (r-46), and "the consultation provided by the doctors is trusted" (r-47). The responsiveness items were "the hospital always provides its services within the promised time limits" (re-48), "the hospital's employees provide services to its customers quickly" (re-49), and "the hospital employees are fully trained in their fields" (re-51). The assurance items were "employees of the hospital have developed a level of trust among their patients" (a-55) and "the hospital employees receive adequate support from top management to do their jobs well" (a-56). The items for empathy were "the hospital is committed to working in the best interest of the patient" (e-62), "the hospital has operating hours convenient to all their patients" (e-63),

and "the hospital workforce is concerned and sympathetic towards patient's issues" (e-64).

Measurement of quality gap. Based on the retained items, the quality gap was calculated by subtracting the scores of patients' expectations of service quality from their perceptions of service quality, and these scores were compared with similar items to validate the scale in Table 5. The Wilcoxon signed-rank test was applied to measure the significance of the gaps between all dimensions. The results showed the mean perception-expectation (P-E) gap for tangibility was -1.01 ± 0.98, for reliability was -0.98 ± 0.92, for responsiveness was -1.05 ± 0.95, for assurance was -1.19 ± 1.04, and for empathy was -1.10 ± 0.96. These gaps were consistent with the findings of other studies[18,75] and demonstrated the need to concentrate on all areas of service quality to satisfy patients. Managers and decision makers

Table 5. Measurement of Service Quality Gap and Its Statistical Significance.

Dimension	Perception, M ± SD	Expectation, M ± SD	P-E gap, M ± SD	z	P value	Ranking
Tangibility	3.67 ± 0.81	4.69 ± 0.46	−1.01 ± 0.98	−13.56	<.001	2
Reliability	3.66 ± 0.77	4.65 ± 0.47	−0.98 ± 0.92	−13.89	<.001	1
Responsiveness	3.62 ± 0.82	4.68 ± 0.44	−1.05 ± 0.95	−13.83	<.001	3
Assurance	3.47 ± 0.89	4.66 ± 0.47	−1.19 ± 1.04	−14.04	<.001	5
Empathy	3.59 ± 0.83	4.69 ± 0.46	−1.10 ± 0.96	−14.07	<.001	4

Table 6. Measurement of Service Gap According to Sectors and Its Statistical Significance.

Dimension	Category	n	Mean	SD	P value
Tangibility	Public	206	−1.17	1.03	<.001
	Private	134	−0.77	0.85	
Reliability	Public	206	−1.08	0.97	<.013
	Private	134	−0.83	0.82	
Responsiveness	Public	206	−1.16	0.98	<.012
	Private	134	−0.89	0.83	
Assurance	Public	206	−1.25	1.07	<.217
	Private	134	−1.10	0.93	
Empathy	Public	206	−1.19	0.97	<.030
	Private	134	−0.96	0.92	

should lean forward, listen the voices of patients, and try to bridge the existing gap.

The validity of the scale items was tested by measuring the quality gap, and they were found to be valid, as a significant gap existed between patients' expectations and perceptions. This indicates that patients were dissatisfied with the quality of services they received and that next time, they may switch to another facility for better services. This may lead to a poor image of the hospital in the community. Reliability appears to require more focus as it was ranked first, and patients lacked trust in services provided by the facility providers. The gap in tangibility ranked second, which may indicate that the resources were scarce or improperly utilized or maintained. Gaps in responsiveness ranked third, which may indicate that there is lack of hierarchy and a lack of management interest in employee training regarding customer service. The 4th- and 5th-ranked gaps also need attention for services to be convenient for patients and for staff to be more committed and sympathetic to patient needs.

The P-E gap calculated for each dimension in different sectors (public and private) was also calculated (Table 6) and found to be significant in each dimension except assurance ($P \geq .05$). The mean gap in all dimensions was higher in public hospitals than in private ones, indicating that private hospitals are better than public ones. These results are in line with the findings of Angelopoulou et al[94] reinforcing the fact that patients across the world go to private hospitals for higher service quality.

Conclusion

The model developed in this study has both theoretical and practical implications. Regarding theoretical contributions, many researchers have developed service quality models based on SERVQUAL[71] or applied SERVQUAL in their own cultural context[18]; however, such studies are scarcely conducted in Asian countries such as Pakistan.

In management research, it is also well known that different contexts can lead to varied results.[95] Therefore, this research bridges the gap in theoretical contributions in the form of developing a service quality model based on modified SERVQUAL dimensions that are appropriate for public and private hospitals in Asian countries such as Pakistan. This study evaluates the meticulous understanding of patients regarding the services they receive and then compares it with their expectations.[74]

The current study is limited in that it examines only the patient perspective, and patients are not completely knowledgeable of the services delivered to them; therefore, there is a need to investigate the view point of health care providers. Another limitation is that although we investigated service quality based on the SERVQUAL questionnaire and later adapted some items from the literature, there is need for qualitative studies to investigate more service quality dimensions.

For researchers, this study contributes by testing the applicability of SERVQUAL in developing countries such as Pakistan. This model was developed in the European context and needed to be evaluated in a developing area; therefore, more studies with the items suggested in this study and/or items from a more in-depth literature review should also be conducted in hospitals with a larger sample size to see whether the scale developed in this study is useful in similar situations to make generalizations.

Author Contributions

Each author contributes equally in conceptualization of idea, research work, manuscript writing and revision except Muhammad Shafiq who supervised the conduct too.

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Declaration of Conflicting Interests

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References

1. Aliman NK, Mohamad WN. Linking service quality, patients' satisfaction and behavioral intentions: an investigation on private healthcare in Malaysia. *Procd Soc Behv*. 2016;224:141-148.

2. Kara A, Lonial S, Tarim M, Zaim S. A paradox of service quality in Turkey: the seemingly contradictory relative importance of tangible and intangible determinants of service quality. *Eur Bus Rev*. 2005;17(1):5-20.

3. Boulding W, Kalra A, Staelin R, Zeithaml VA. A dynamic process model of service quality: from expectations to behavioral intentions. *J Mar Res*. 1993;30(1):7-27.

4. Reichheld FF, Sasser WE Jr. Zero defections: quality comes to services. *Harv Bus Rev*. 1990;68(5):105-111.

5. Boshoff C, Gray B. The relationships between service quality, customer satisfaction and buying intentions in the private hospital industry. *S Afr J Bus Manag*. 2004;35(4):27-37.

6. Cao Y, Kim K. How do customers perceive service quality in differently structured fast food restaurants? *J Hospit Market Manag*. 2015;24(1):99-117.

7. Zeithaml VA, Berry LL, Parasuraman A. The behavioral consequences of service quality. *J Market*. 1996;60(2):31-46.

8. Kandampully J, Butler L. Service guarantees: a strategic mechanism to minimise customers' perceived risk in service organisations. *Manag Serv Qual*. 2001;11(2):112-121.

9. Buttle F. SERVQUAL: review, critique, research agenda. *Eur J Market*. 1996;30(1):8-32.

10. Islam R, Ahmed S, Tarique KM. Prioritisation of service quality dimensions for healthcare sector. *Int J Med Eng Informat*. 2016;8(2):108-123.

11. O'Connor SJ, Shewchuk RM, Carney LW. The great gap. Physicians' perceptions of patient service quality expectations fall short of reality. *J Health Care Market*. 1993;14(2):32-39.

12. Cronin JJ, Taylor SA. Measuring service quality: a reexamination and extension. *J Market*. 1992;56(3):55-68.

13. Gilbert FW, Lumpkin JR, Dant RP. Adaptation and customer expectations of health care options. *J Health Care Market*. 1992;12(3):46-55.

14. Zeithaml VA, Berry LL, Parasuraman A. The nature and determinants of customer expectations of service. *J Acad Market Sci*. 1993;21:1.

15. Babakus E, Mangold WG. Adapting the SERVQUAL scale to hospital services: an empirical investigation. *Health Serv Res*. 1992;26(6):767-786.

16. Reidenbach RE, Sandifer-Smallwood B. Exploring perceptions of hospital operations by a modified SERVQUAL approach. *J Health Care Market*. 1990;10(4):47-55.

17. Parasuraman A, Zeithaml VA, Berry LL. A conceptual model of service quality and its implications for future research. *J Market*. 1985;49(4):41-50.

18. Aghamolaei T, Eftekhaari TE, Rafati S, et al. Service quality assessment of a referral hospital in southern Iran with SERVQUAL technique: patients' perspective. *BMC Health Serv Res*. 2014;14:322.

19. Chaudhry IS, Malik S, Ashraf M. Rural poverty in Pakistan: some related concepts, issues and empirical analysis. *Pakistan Econ Soc Rev*. 2006;44(2):259-276.

20. Irfan S, Ijaz A. Comparison of service quality between private and public hospitals: empirical evidences from Pakistan. *J Qual Tech Manag*. 2011;7(1):1-22.

21. Zeithaml VA, Parasuraman A, Berry LL. *Delivering Quality Service: Balancing Customer Perceptions and Expectations*. New York, NY: Free Press; 1990.

22. Johns N. What is this thing called service? *Eur J Market*. 1999;33(9/10):958-974.

23. Zaibaf M, Taherikia F, Fakharian M. Effect of perceived service quality on customer satisfaction in hospitality industry: Gronroos' service quality model development. *J Hospit Market Manag*. 2013;22(5):490-504.

24. Ramseook-Munhurrun P. Perceived service quality in restaurant services: evidence from Mauritius. *Int J Manage Market Res*. 2012;5(3):1-14.

25. Chow IH, Lau VP, Lo TY, Sha Z, Yun H. Service quality in restaurant operations in China: decision- and experiential-oriented perspectives. *Int J Hospit Manag*. 2007;26(3):698-710.

26. Mekoth N, George BP, Dalvi V, Rajanala N, Nizomadinov K. Service quality in the public sector hospitals: a study in India. *Hosp Top*. 2012;90(1):16-22.

27. Lehtinen U, Lehtinen JR. Two approaches to service quality dimensions. *Serv Indust J*. 1991;11(3):287-303.

28. Ladhari R. A review of twenty years of SERVQUAL research. *Int J Qual Serv Sci*. 2009;1(2):172-198.

29. Chowdhary N, Prakash M. Prioritizing service quality dimensions. *Manag Serv Qual*. 2007;17(5):493-509.

30. Seth N, Deshmukh SG, Vrat P. Service quality models: a review. *Int J Qual Reliab Manag*. 2005;22(9):913-949.

31. Grönroos C. A service quality model and its marketing implications. *Eur J Market*. 1984;18(4):36-44.

32. Haywood-Farmer J. A conceptual model of service quality. *Int J Oper Prod Manag*. 1988;8(6):19-29.

33. Brogowicz AA, Delene LM, Lyth DM. A synthesised service quality model with managerial implications. *Int J Serv Ind Manag*. 1990;1(1):27-45.

34. Mattsson J. A service quality model based on an ideal value standard. *Int J Serv Ind Manag*. 1992;3(3):18-33.

35. Teas RK. Expectations, performance evaluation, and consumers' perceptions of quality. *J Market*. 1993;57(4):18-34.

36. Berkley BJ, Gupta A. Improving service quality with information technology. *Int J Inform Manag*. 1994;14(2):109-121.

37. Dabholkar P, Thorpe D, Rentz J. A measure of service quality for retail stores: scale development and validation. *J Acad Market Sci*. 1996;24(1):3-16.

38. Spreng RA, Mackoy RD. An empirical examination of a model of perceived service quality and satisfaction. *J Retailing*. 1996;72(2):201-214.

39. Philip G, Hazlett SA. The measurement of service quality: a new P-C-P attributes model. *Int J Qual Reliab Manag*. 1997;14(3):260-286.

40. Sweeney JC, Soutar GN, Johnson LW. Retail service quality and perceived value. *J Retailing Consum Serv*. 1997;4(1):39-48.

41. Oh H. Service quality, customer satisfaction, and customer value: a holistic perspective. *Int J Hospit Manag*. 1999;18(1):67-82.

42. Dabholkar PA, Shepherd CD, Thorpe DI. A comprehensive framework for service quality: an investigation of critical conceptual and measurement issues through a longitudinal study. *J Retailing*. 2000;76(2):139-173.

43. Frost FA, Kumar M. INTSERVQUAL: an internal adaptation of the GAP model in a large service organisation. *J Serv Market*. 2000;14(5):358-377.

44. Soteriou AC, Stavrinides Y. An internal customer service quality data envelopment analysis model for bank branches. *Int J Bank Market*. 2000;18(5):246-252.

45. Broderick A, Vachirapornpuk S. Service quality in internet banking: the importance of customer role. *Market Intell Planning*. 2002;20(6):327-335.

46. Zhu FX, Wymer W, Chen I. IT-based services and service quality in consumer banking. *Int J Serv Ind Manag*. 2002;13(1):69-90.

47. Santos J. E-service quality: a model of virtual service quality dimensions. *Manag Serv Qual*. 2003;13(3):233-246.

48. Dagger TS, Sweeney JC, Johnson LW. A hierarchical model of health service quality. *J Serv Res*. 2007;10(2):123-142.

49. Rakhmawati T, Sumaedi S, Bakti IGMY, et al. Developing a service quality measurement model of public health center in Indonesia. *Manag Sci Eng*. 2013;7(2):1-15.

50. Lee D. HEALTHQUAL: a multi-item scale for assessing healthcare service quality. *Serv Bus*. 2016: 1-26. [published online ahead of print June 13, 2016]. doi:10.1007/s11628-016-0317-2.

51. Parasuraman A, Berry L, Leonard ZAV. SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. *J Retailing*. 1988;61:12-40.

52. Naidu A. Factors affecting patient satisfaction and healthcare quality. *Int J Health Care Qual Assur*. 2009;22(4):366-381.

53. Andaleeb SS. Service quality perceptions and patient satisfaction: a study of hospitals in a developing country. *Soc Sci Med*. 2001;52(9):1359-1370.

54. Lam SSK. SERVQUAL: a tool for measuring patients' opinions of hospital service quality in Hong Kong. *Total Qual Manag*. 1997;8(4):145-152.

55. Ware JE, Snyder MK. Dimensions of patient attitudes regarding doctors and medical care services. *Med Care*. 1975;13(8):669-682.

56. Alaloola NA, Albedaiwi WA. Patient satisfaction in a Riyadh tertiary care centre. *Int J Health Care Qual Assur*. 2008;21(7):630-637.

57. Rashid WE, Jusoff HK. Service quality in health care setting. *Int J Health Care Qual Assur*. 2009;22(5):471-482.

58. Wysong PR, Driver E. Patients' perceptions of nurses' skill. *Crit Care Nurse*. 2009;29(4):24-37.

59. Mpinganjira M. Understanding service quality and patient satisfaction in private medical practice: a case study. *Afr J Bus Manag*. 2011;5(9):3690-3698.

60. Donabedian A. *The Definition of Quality and Approaches to Its Assessment*. Ann Arbor, MI: Health Administration Press; 1980.

61. Pakdil F, Harwood TN. Patient satisfaction in a preoperative assessment clinic: an analysis using SERVQUAL dimensions. *Total Qual Manag Bus Excel*. 2005;16(1):15-30.

62. Kilbourne WE, Duffy JA, Duffy M, Giarchi G. The applicability of SERVQUAL in cross-national measurements of healthcare quality. *J Serv Market*. 2004;18(7):524-533.

63. Wong JCH. Service quality measurement in a medical imaging department. *Int J Health Care Qual Assur*. 2002;15(5):206-212.

64. Scardina SA. SERVQUAL: a tool for evaluating patient satisfaction with nursing care. *J Nurs Care Qual*. 1994;8(2):38-46.

65. Vandamme R, Leunis J. Development of a multiple-item scale for measuring hospital service quality. *Int J Serv Ind Manag*. 1993;4(3):30-49.

66. Taylor SA, Cronin JJ Jr. Modeling patient satisfaction and service quality. *J Health Care Market*. 1993;14(1):34-44.

67. Babakus E, Boller GW. An empirical assessment of the SERVQUAL scale. *J Bus Res*. 1992;24(3):253-268.

68. Anderson EA, Zwelling LA. Measuring service quality at the University of Texas M.D. Anderson Cancer Center. *Int J Health Care Qual Assur*. 1996;9(7):9-22.

69. Curry A. Innovation in public service management. *Manag Serv Qual*. 1999;9(3):180-190.

70. Curry A, Stark S. Quality of service in nursing homes. *Health Serv Manag Res*. 2000;13(4):205-215.

71. Andaleeb SS. Service quality in public and private hospitals in urban Bangladesh: a comparative study. *Health Policy*. 2000;53(1):25-37.

72. Curry A, Sinclair E. Assessing the quality of physiotherapy services using SERVQUAL. *Int J Health Care Qual Assur*. 2002;15(5):197-205.

73. Chakravarty A. Evaluation of service quality of hospital outpatient department services. *Med J Armed Forces India*. 2011;67(3):221-224.

74. Kazemi N, Ehsani P, Abdi F, Bighami MK. Measuring hospital service quality and its influence on patient satisfaction: an empirical study using structural equation modeling. *Environ Res Lett*. 2013;3(7):2125-2136.

75. Al Fraihi KJ, Famco D, Famco F, Latif SA. Evaluation of outpatient service quality in Eastern Saudi Arabia: patient's expectations and perceptions. *Saudi Med J*. 2016;37(4):420-428.

76. Jabnoun N, Chaker M. Comparing the quality of private and public hospitals. *Manag Serv Qual*. 2003;13(4):290-299.

77. Arasli H, Ekiz EH, Katircioglu ST. Gearing service quality into public and private hospitals in small islands: empirical evidence from Cyprus. *Int J Health Care Qual Assur*. 2008;21(1):8-23.

78. Pakistan Bureau of Statistics. Monthly bulletin of statistics 2016. http://www.pbs.gov.pk/sites/default/files//other/monthly_bulletin/monthly_bulletin_of_statistics_may_2016.pdf. Accessed May 9, 2017.

79. Saeed A, Ibrahim H. Reasons for the problems faced by patients in government hospitals: results of a survey in a government hospital in Karachi, Pakistan. *J Pak Med Assoc*. 2005;55(1):45-47.

80. Shabbir A, Malik SA, Malik SA. Measuring patients' healthcare service quality perceptions, satisfaction, and loyalty in

public and private sector hospitals in Pakistan. *Int J Qual Reliab Manag*. 2016;33(5):538-557.

81. Sabir RI, Irfan M, Sarwar MA, Sarwar B, Akhtar N. The impact of service quality, customer satisfaction and loyalty programs on customer's loyalty: an evidence from telecommunication sector. *J Asian Bus Strat*. 2013;3(11):306-314.

82. Irfan SM, Ijaz A, Farooq MM. Patient satisfaction and service quality of public hospitals in Pakistan: an empirical assessment. *Middle East J Sci Res*. 2012;12(6):870-877.

83. Hair JF Jr, Anderson RE, Tatham RL, Black WC. *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall; 2008.

84. Yesilada F, Direktör E. Health care service quality: a comparison of public and private hospitals. *Afr J Bus Manag*. 2010;4(6):962-971.

85. Candell GL, Hulin CL. Cross-language and cross-cultural comparisons in scale translations. *J Cross Cult Psychol*. 1987;17(4):417-440.

86. Malinowski B. *Coral Gardens and Their Magic, Vol. 2: The Language of Magic and Gardening*. London, England: George Allen & Unwin; 1935.

87. van Teijlingen ER, Rennie A-M, Hundley V, Graham W. The importance of conducting and reporting pilot studies: the example of the Scottish Births Survey. *J Adv Nurs*. 2001;34(3):289-295.

88. Hair J, Black W, Babin B, Anderson R. *Multivariate Data Analysis: A Global Perspective*. Upper Saddle River, NJ: Pearson/Prentice Hall; 2010.

89. Bentler PM, Bonett DG. Significance tests and goodness of fit in the analysis of covariance structures. *Psychol Bull*. 1980;88(3):588-606.

90. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Modeling*. 1999;6(1):1-55.

91. Bryman A. *Social Research Methods*. New York, NY: Oxford University Press; 2008.

92. Bagozzi RP, Yi Y, Phillips LW. Assessing construct validity in organizational research. *Admin Sci Q*. 1991;36(3):421-458.

93. Hooper D, Coughlan J, Mullen M. Structural equation modelling: guidelines for determining model fit. *Electron J Bus Res Methods*. 2008;6(1):53-60.

94. Angelopoulou P, Kangis P, Babis G. Private and public medicine: a comparison of quality perceptions. *Int J Health Care Qual Assur Inc Leadersh Health Serv*. 1998;11(1):14-20.

95. Nair A. Meta-analysis of the relationship between quality management practices and firm performance—implications for quality management theory development. *J Oper Manag*. 2006;24(6):948-975.