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The influence of total quality management on customer satisfaction

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ABSTRACT

Objective: As healthcare costs continue to rise, healthcare consumers expect service quality to improve. The aim of this study was to investigate the influence of Total Quality Management by a healthcare facility on perceived service quality and patient satisfaction.

Method: A self-completion questionnaire was submitted to inpatients who were treated in April 2018 at a tertiary-level hospital in Vietnam. There were 516 respondents. The Statistical Package for the Social Sciences (SPSS) ver. 25.0 and Amos ver. 25.0 programmes were used for frequency and descriptive statistical analysis, and structural equation modelling, respectively.

Results: Total Quality Management had a significant effect on perceived service quality and patient satisfaction; perceived service quality had a positive influence on patient satisfaction.

Conclusion: We used Total Quality Management and perceived service quality to develop a model showing that both factors directly influenced patient satisfaction. The work has significant implications for healthcare organizations; they may wish to consider these factors when engaging in strategic planning aimed at improving customer satisfaction. Those responsible for ensuring service quality should consider these factors.

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KEYWORDS
Total quality management; perceived service quality; customer satisfaction

Introduction

Over the past few decades, Total Quality Management (TQM) has become the final step in the evolution of quality management. Between 1970 and 1993, research has focused on Inspection Quality Control (IQC), Statistical Process Control (SPC), Total Quality Control (TQC), and Company-wide Quality Control (CWQC). In a step-by-step manner, these efforts became subsumed under Total Quality Management during the 1980s [1,p.14.1–14.33; 2]. The support programmes include Six-Sigma, Re-engineering, and (currently) ISO 9000 [1,p.11.1–11.26; 2], ISO 9001 [3] and ISO 10001 [4]. These standards have improved the management quality of business and industry worldwide. Companies embracing such programmes report high-level customer satisfaction [5,p.62–68]. Deming defines the TQM management philosophy as a top-down organization-wide commitment to the continuous improvement of quality and customer satisfaction [6]. TQM refers to the culture, attitude, and operation of a company that meets customer needs in terms of both product and service quality [7]. The TQM philosophy features integrated management, customer-oriented practices such as reducing re-work, long-range thinking, increased employee involvement, teamwork, process re-design, team-based problem-solving, constant assessment of results, self-inspection, cost-of-quality monitoring, and ever-closer relationships with suppliers with regard to ensuring quality [5,p.62–68]. TQM implementation is important to ensure organizational efficiency [8]. TQM focuses on continuous process improvement within organizations; it is imperative that companies offer superior value to customers, and meet their needs [7]. Quality improvement is an important strategy for company development. It ensures high-quality processes and products, which can help companies expand into the greater, globally competitive market [1,p.14.1–14.33; 9]. Companies often require core improvements in their quality systems before they can advance to innovative management models [5,p.14–17]. The standard ISO 9000 focuses on customer satisfaction, quality products and quality of services, and is used by organizations to achieve higher service quality [10,p.1–2]. ISO 9001 is aimed at ensuring the success of organizations wherein quality management includes both the service processes in play and interactions with customers; the expectations and satisfaction of customers are of paramount importance [3]. Total quality management systems lead to improved service quality and, thereby, higher patient satisfaction (PS). Patient satisfaction is the view of the patient as a consumer and is an important tool to measure the service quality of a healthcare organization. The modern ISO 10001 outlines a customer satisfaction code of conduct for companies seeking to meet or exceed customer needs and expectations [4,p.v-9]. Perceived quality improvement increases customer satisfaction [11]. A satisfied patient perceives high quality, and the antecedents of loyalty are service quality [12]. The healthcare organization that is the subject of this

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research had applied TQM to enhance service quality and, thereby, improve PS and increase loyalty. This study aimed to examine the effect of TQM factors and perceived quality of the healthcare organization on PS.

Literature review

Total Quality Management

Total Quality Management is a leadership tool that provides firms with a competitive strategy. This is a continually improving process aimed at providing a quality of service that meets or exceeds customer expectations. In TQM, customer satisfaction is an essential aspect of the quality system, and close relationships with customers are key to improved service quality [3]. "The primary focus of quality management is to meet customer requirements and to strive to exceed customer expectations" [10,p.3]. Customer satisfaction is essential in terms of the operations of a high-quality company; close relationships with customers greatly enhance perceived service quality [3]. According to the standard ISO 9001:2015, TQM focuses on customer satisfaction and customer expectations through product quality, service quality, process quality, organization, and the operating system [3]. ISO10001 is aimed at enhancing customer satisfaction by prescribing certain codes of conduct [4,p.vi]. Previous research has established that the four service quality factors of process quality, interaction quality, environmental quality, and outcome are key to patient loyalty to a healthcare facility [13,14]. This study examined three aspects of TQM at a healthcare organization: process quality, interaction quality, and environmental quality.

Perceived service quality

Perception refers to the process of noticing and making sense of information; consumers use perception to assess the performance of a service [15]. Service quality is the result of an assessment process by which a customer compares expectation with perception of service quality. The interaction process between customers and service providers includes some intangible factors such as tangibility (including the physical facilities, equipment, personnel and communication materials perceived by the five human senses), reliability, assurance, and empathy in providing these services [16–18]. Perceived quality significantly influences customer satisfaction and behavioural intentions [11]. A relationship is evident between customer perceptions and expectations of service quality [19]. Expectation is a more demanding factor than perceived quality [18]. Perceived service quality (PSQ) is an important factor for retaining customer loyalty. High-quality services attract new customers, retain current customers, and even entice customers from competitors [5,p.15–17; 20,21]. The five factors – tangibles, reliability, responsiveness, assurance, and empathy – have been demonstrated to affect PSQ [22,23]. This study examined the effect of only three factors on PSQ: tangibility, reliability, and responsiveness.

Patient satisfaction

Today, a competitive environment delivering high-quality service is key to a sustainable competitive advantage [24]. Measures of satisfaction include perceived quality of the service organization and customer expectations in terms of service [18]. The various service quality dimensions that affect overall service customer satisfaction have been explored [25]. Customer satisfaction mediates both perceived quality and behavioural intentions [11]. The PSQ positively influences customer satisfaction [26] and also influences loyalty as a mediating factor [23]. PS is the expected result of a patient in a healthcare facility. It is an indispensable factor when assessing the service process of a healthcare organization [4].

Research hypotheses

Total Quality Management is a strategy used by organizations to provide excellent service [27]. Kesuma et al. [28] showed that when service quality assessment is positive, it is the customers' desirable behavioural intentions that strengthen their relationship with the service provider. Phiri et al. [29] suggested that service quality results from customers' expectations of what the service provider should offer and how the provider actually performs to meet those expectations. Delivering quality service means ensuring consistency in service delivery performance on a daily basis. Based on these issues, we tested the following hypotheses (Figure 1):

H1: TQM positively influences PSQ.

The standard ISO 9000 defines a customer's satisfaction as "the customer's perception of the degree to which the customer's stated or implied needs or expectations have been fulfilled" [30,10,p.25]. The PSQ

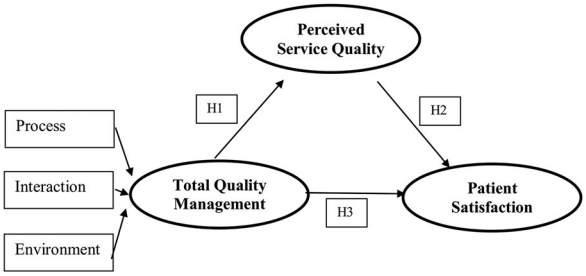


Figure 1. Hypothesis model.

positively influences customer satisfaction [23]. According to Keshavarz et al. [31] and Sathiyaseelan [32], perceived quality influences customer satisfaction. Almsalam [26] showed that customer expectation and PSQ positively affect customer satisfaction. Previous research has also identified a positive influence of perceived quality on service quality and satisfaction. Considering these findings, we propose the following hypothesis:

H2: PSQ positively influences PS.

Total Quality Management is a tool used to improve PS within the health service sector [26]. The route to increased patient satisfaction is improved healthcare service quality [33,34]. Patawayati et al. [35] reported that service quality has positive and significant effects on PS, and patient trust and commitment significantly affect patient loyalty. Mohajerani [36] found that the antecedents of satisfaction include variables such as quality, perceived value, and a method that enables comparison between perceptions and expectations. Therefore, the following hypothesis is proposed:

H3: TQM positively influences PS.

Research method

The study was conducted using a distributed questionnaire. The inclusion criteria comprised those patients aged 18 years and older who were treated at a tertiary-level hospital in Vietnam during April 2018 and agreed to participate in the study.

Wolf et al. [37] considered the sample size requirements for popular types of structural equation modelling (SEM) as a function of type of model, number of factors, number of indicators, the power of the indicator loadings and regressive paths, the outcome impact on sample size requirements for these different models, and the sample size requirements for the latent variables of different models. For our research, we determined that the sample size needed to be at least 500 cases to identify reliably the factors and indicators of our research model.

The subject hospital has been providing medical treatment for about 2500 inpatients per day in various medical fields encompassing 39 clinical departments. Respondents were randomly selected by simple random sampling from the list of patients in each department. To achieve a sampling rate of 20%, the target sample number was set at 500 inpatients. An additional 2% margin was reserved for those participants who failed to complete the questionnaire. Therefore, the total number of inpatients selected for data collection was 550 participants.

The questionnaire consisted of 29 questions in three parts. Twelve questions related to the TQM factors: four for process (PQ1–PQ4), five for interaction (IQ5–IQ9), and three for environment (EQ10–EQ12). Our questionnaire was based on the SERVPERF questionnaire [38] and was modified to fit more closely with this hospital. Fourteen questions were related to perceived service quality factors: five for tangibility (PT13–PT17), five for reliability (PR18–PR22), and four for responsiveness (PP23–PP26). These items were based on previous research [39]. There were three questions related to PS (PS41–PS43). All questions in this study used a Likert scale of measurement with a scale ranging from one to five. The data were analyzed using the SPSS (version 25.0) statistical software. Then, the confirmatory factor analysis (CFA) routine of the Amos 25.0 SEM programme was used to identify the interactions and associations among the latent variables of the model. Our modelling began with CFA because of prior theoretical and empirical research by the author.

Results

Reliability and validity

The data were analyzed using the SPSS 25.0 programme. Cronbach's alpha value was used to assess the scales' reliability analysis. The construct reliability considers the degree to which the consistency and stability of a set of indicators reflects a given construct.

Cronbach's alpha for the Total Quality Management (TQM) constructs were between 0.823 and 0.890, that for PSQ ranged from 0.845 to 0.873, and that for PS was 0.792 (Table 1). Cronbach's alpha reliability values for all latent variables exceeded 0.70, which indicated that the results were internally consistent.

Confirmatory factor analysis

The SEM was conducted using CFA. Each variable was examined by CFA to assess the construct and the correct assignment of variables.

The indexes used to assess the suitability of the overall model included the Chi-square/degrees of freedom ratio (Chi-square/DF (CMIN/DF)): <3 good, <5 sometimes permissible; the *P*-value: >0.5; the comparative fit index (CFI): >0.95 excellent, >0.90 acceptable, >0.80 sometimes permissible; the goodness-of-fit index (GFI): >0.95; the adjusted GFI (AGFI): >0.80; and the

Table 1. Reliability statistics.

Constructs	Items	Cronbach's alpha
Total Quality Management		
Process quality	4	0.896
Interaction quality	5	0.890
Environment quality	3	0.823
Perceived service quality		
Tangibility	5	0.873
Reliability	5	0.854
Responsiveness	4	0.845
Patient satisfaction	3	0.792

RMSEA (root mean square error of approximation): 0.05 good, from 0.05 to 0.1 moderate, >0.1 poor [40, p.640–653].

Modification indices (MI; requirement: less than 20%) and standardized residuals for any pair of items between 2.5 and 4.0 were examined to improve the fit of the model, which was developed using standardized regression weights (requirement: more than 0.5) [40, p.682]. The covariance paths between some pairs of errors based on the MI were calculated step-by-step from the highest to the lowest. Then, CFA was again carried out to evaluate the improvement in model fit. The results are presented in Table 2.

Table 2 shows that most of the standardized coefficients exceeded 0.6 (requirement: more than 0.5), ranging from 0.62 to 0.86. The composite reliabilities (CR) ranged from 0.79 to 0.93, and the average (AVE) of three factors ranged between 0.52 and 0.69 (CR > 0.7; AVE > 0.5) [40,p.665]. The general indexes, which indicate the level at which the model can be used, include CMIN/DF = 3.242 (ranging from 3 to 5) where CMIN = 726.319, GFI = 0.889 (>0.85), AGFI = 0.863, NFI = 0.911 (requirement: between 0 and 1), and RMSEA = 0.066 (requirement: between 0.05 and 0.08), CFI = 0.937, TLI = 0.929 (>0.9). All observable variables were thus fit for analysis and the model was acceptable. All measures associated with the construct were statistically significant. The results of the SEM are presented in Tables 3 and 4 and Figure 2.

Table 2. Confirmatory factor analysis results.

Construct measures	Standardized coefficients	Average variance extracted (AVE)	Composite reliability (CR)
Perceived service quality (PSQ)			
PSQ19 ← PSQ	0.716		
PSQ20 ← PSQ	0.714		
PSQ23 ← PSQ	0.769		
PSQ24 ← PSQ	0.726		
TQM9 ← PSQ	0.741		
PSQ21 ← PSQ	0.738		
PSQ25 ← PSQ	0.737		
PSQ17 ← PSQ	0.682	0.517	0.930
PSQ22 ← PSQ	0.685		
TQM12 ← PSQ	0.746		
TQM11 ← PSQ	0.711		
TQM8 ← PSQ	0.802		
PSQ26 ← PSQ	0.665		
TQM10 ← PSQ	0.750		
PSQ18 ← PSQ	0.682		
PSQ13 ← PSQ	0.623		
Total Quality Management (TQM)			
TQM1 ← TQM	0.863		
TQM2 ← TQM	0.794		
TQM4 ← TQM	0.846	0.685	0.916
TQM5 ← TQM	0.835		
TQM3 ← TQM	0.799		
Patient satisfaction (PS)			
PS41 ← PS	0.798	0.646	0.785
PS42 ← PS	0.809		
Chi-square (CMIN/DF) = 3.242; CMIN = 726.319, PCLOSE = 0.000; GFI = 0.889; AGFI = 0.863; CFI = 0.937, TLI = 0.929; NFI = 0.911; RMSEA = 0.066			

Model goodness-of-fit

Hair et al. [40,p.640–653] identified suitable requirement index values for model goodness-of-fit. The values for our model are given in Table 3 and Figure 2. The RMSEA value of 0.066, which is within the acceptable range, indicated a good fit between the model and the empirical covariance matrix. The TLI, NFI, and CFI values were 0.929, 0.911, and 0.937, respectively (all >0.9), and the CMIN/DF ratio of 3.242 indicated that the research model was acceptable.

Hypotheses testing

Hypothesis H1: TQM has a positive influence on PSQ

Hypothesis H1 is represented by the coefficient of the path TQM → PSQ in Table 4. The path coefficient of 0.857 was statistically significant ($P = 0.001$) and had a positive sign, which indicates that TQM had a positive influence on PSQ.

Hypothesis H2: PSQ has a positive influence on PS

Hypothesis H2 is represented by the coefficient of the path PSQ → Satisfaction in Table 4. The structure model coefficient value of 0.413 was statistically significant ($P = 0.001$) and clearly indicates a positive influence of PSQ on Satisfaction.

Hypothesis H3: TQM influences PS

Hypothesis H3 is represented by the coefficient of the path TQM → Satisfaction in Table 4. The structure model coefficient of 0.333 had a positive sign and was statistically significant ($P = 0.001$). It indicates a positive effect of TQM on Satisfaction.

Discussion

TQM on PSQ (H1)

The items in the questionnaire that related to service quality characteristics were tangibility (including the physical facilities, equipment, personnel and materials) (5 items, PT13–PT17), reliability (5 items, PR18–PR22), and responsiveness (4 items, PP23–PP26).

Table 3. Goodness-of-fit measures of the model.

Goodness-of-fit	Index	Value	Range	Accepted
Absolute fit	Chi-square	726.319		
	DF	224		
	Chi-square/DF	3.242	Less than 5	Accepted
	GFI	0.889	>0.85	Accepted
	RMSEA	0.066	0.05–0.08	Accepted
	RMR	0.026	Close to zero	Accepted
Incremental fit	NFI	0.911	Between 0 and 1	Accepted
	TLI	0.929	>0.90	Accepted
	CFI	0.937	>090	Accepted
Parsimony fit	AGFI	0.863	>0.80	Accepted

Table 4. Hypothesis test results.

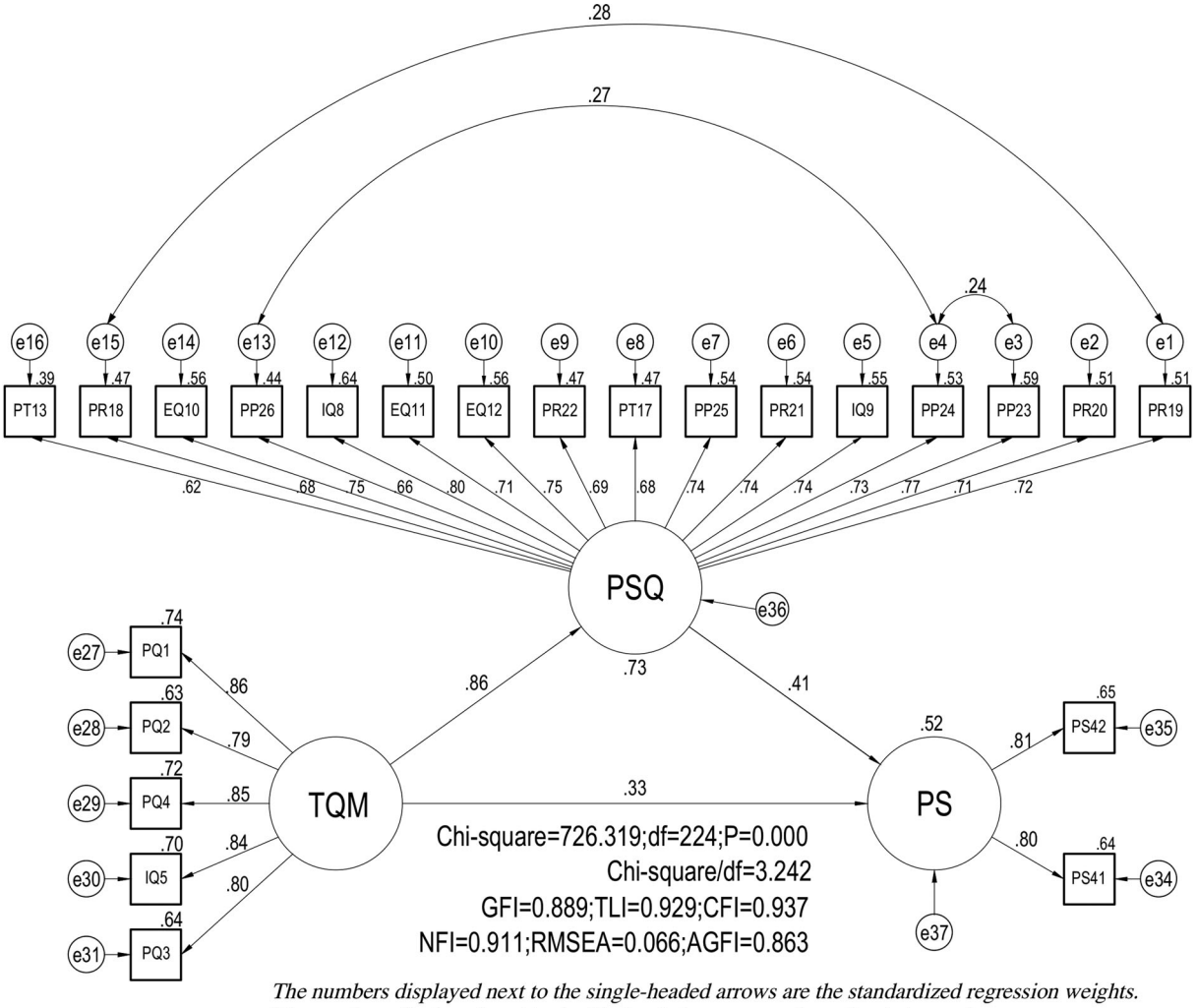
Hypothesis	Path	Standardized coefficients	Sig.	Results
H1	TQM → PSQ	0.857	***	Accepted
H2	PSQ → PS	0.413	***	Accepted
H3	TQM → PS	0.333	***	Accepted

Note: The probability of a *t*-value equal to or greater than the actual *t*-value is a two-tailed test for significance of the coefficient under the null hypothesis that the true value is zero. The symbol *** indicates that the null hypothesis is rejected at the 0.001 level of significance.

The standardized coefficient of the effect of TQM on PSQ was 0.857, i.e. PSQ was positively influenced by TQM. Thus, improving TQM would improve PSQ, which is consistent with previous research. The SERVPERF model was used to measure client perceptions and expectations of hospital service quality [18]. Polyakova and Mirza [41] proposed models for PSQ and suggested that PSQ should be viewed through the lens of a customer. Blesic et al. [42] reported a service quality gap between expectations and perceptions.

Perceived service quality on patient satisfaction (H2)

Our analysis revealed that there was a significant positive relationship between PSQ and satisfaction, with a coefficient of 0.413. This result indicates how a healthcare facility can improve total service quality and, thereby, maintain customer satisfaction through increasing management of a customer's perception. Others also found that customers' perceived quality toward the service had a significant influence on customer satisfaction [23,26,31]. Perceived quality influences client satisfaction and behavioural intentions [11]. This finding points to a strategic approach that health service managers can use to improve service quality and, thereby, improve customer satisfaction, expectation level, and retention.



The numbers displayed next to the single-headed arrows are the standardized regression weights.
The numbers displayed next to double-headed arrows are the estimated covariances
The numbers displayed next to boxes are the estimated variances.
e: The variable error is enclosed in a circle because it ts not directly observed. The error represents much more than random fluctuation in performance scores due to measurement error.
The value above PS indicates that TQM and PSQ account for 52% of the variance of PS. The value above PSQ indicates that TQM accounts for 73% of the variance of PSQ.

Figure 2. Structure model.

Note: The English in this document has been checked by at least two professional editors, both native speakers of English. For a certificate, please see: http://www.textcheck.com/certificate/Fb3ZKx.

TQM on PS (H3)

A positive influence of TQM on customers' satisfaction was confirmed at the 95% confidence level (Table 4). Perceived service quality is a factor in maintaining PS. Measurement of quality as perceived by the customer has been used to measure organization service quality [18]. Perceived quality directly affects client satisfaction [11]. The direct effect of service quality on customer loyalty without the mediation of customer satisfaction has been reported [43]. Customer loyalty is affected by customer satisfaction and service quality. TQM activity itself may also affect loyalty, independently of customer satisfaction.

Implications for practice

This research has significant practical implications for International Healthcare Managers, who may wish to consider the factors discussed above when engaging in strategic planning to improve customer satisfaction, add value to the organization, and improve the capacity to function in a competitive environment. Researchers should include these factors when modelling service quality.

Conclusion and recommendation

Our research examined the effect of Total Quality Management and PSQ on PS. Positive influences were identified. Service quality factors are closely related to satisfaction. Organizational TQM in the service process affects the quality of health services, adds value to the organization, and improves its ability to function in a competitive environment.

All research hypotheses examined in this study were confirmed. Knowledge gained through this research has significant implications for healthcare organizations. The services provided by these organizations are factors that affect customer satisfaction through PSQ and include tangibility, reliability, responsiveness, and, independently, TQM activity itself. The service organization should consider these factors in their strategic plan to improve customer satisfaction.

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Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributor

Thi Le Ha Nguyen has been a Medical Doctor for 18 years in Vietnam. She was graduated from the Mahidol University, Thailand, and was awarded Master of Primary Healthcare Management. Now, she is studying a doctoral programme in Healthcare Management at Kanazawa University, Japan.

Keisuke Nagase conducting research and teaching in hospital management, medical IT (including AI application), and Pulmonary Medicine for 20 years in medical schools, Keisuke Nagase provide service as a deputy director of the university hospital for finance, budget and IT.

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Appendix

QUESTIONNAIRE

The influence of Total Quality Management on customer satisfaction

Your responses will be used solely for research purposes. The information that you provide will help to improve the quality of healthcare services

Serial No:

……..

Date of completion……

Please write your response in the blank column or mark the box provided.

1. What is your age? ……years

2. What is your sex?

1. Male ☐ 2. Female ☐

3. What is your marital status?

1. Single ☐ 2. Married ☐
3. Divorced ☐ 4. Widowed ☐

4. What is your educational level?

1. No school ☐ 2. Primary school ☐
3. Secondary school ☐ 4. High school ☐
5. Bachelor's degree ☐ 6. Postgraduate degree ☐

5. What is your occupation?

1. Govt. employee ☐ 2. Non-govt. employee ☐
3. Unemployed ☐ 4. Agriculture ☐
5. General labor ☐ 6. Retired ☐

6. Method of paying hospital fees

1. Insurance ☐ 2. Personal payment ☐

Please place a cross in the box corresponding to the level of your agreement/disagreement with each of the following statements.

1. Very strongly disagree, 2. Strongly disagree, 3. Agree, 4. Strongly agree, 5. Very strongly agree

Total Quality Management (TQM)

	Statement/Item	1	2	3	4	5
PQ1	Services were provided on time					
PQ2	I was informed when services would be performed					
PQ3	Staff were available when needed					
PQ4	Medical and non-medical services were provided promptly					
IQ5	Round-the-clock services were available					
IQ6	Staff were polite and friendly					
IQ7	Staff had my best interests at heart					
IQ8	Staff understood my specific needs					
IQ9	Staff were knowledgeable when answering my questions					
EQ10	Hospital environment was clean and comfortable					
EQ11	Employees were well dressed and neatly presented					
EQ12	Equipment was up-to-date					

Perceived service quality

	Statement/Item	1	2	3	4	5
PT13	Hospital was conveniently located					
PT14	Direction signs were clear					
PT15	Wards were designed with easy access and were comfortable					
PT16	Staff were professional					
PT17	Free medicine was available					
PR18	The admission process was fast and straightforward					
PR19	Staff responded immediately when called					
PR20	Staff showed genuine interest in attending to my problems					
PR21	Staff were reliable in handling my problems					
PR22	Hospital treatment was error-free					
PP23	Admissions staff were friendly and courteous					
PP24	Staff responded promptly to my requests					
PP25	I was provided with adequate information about my health condition					
PP26	I was prescribed affordable medicines					

Patient Satisfaction

	Statement/Item	1	2	3	4	5
PS41	I am satisfied with the results of my recovery					
PS42	The quality of service I received met my expectations					
PS43	I am satisfied with my selection of this hospital to provide me with healthcare					