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## ANALYZING AND PRIORITIZING HEALTHCARE SERVICE PERFORMANCE IN HOSPITALS USING SERVQUAL MODEL

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### SUMMARY

Health care is essential for both public welfare and national growth. Nevertheless, the number of hospitals has increased; patients still face many problems highlighting the need for better healthcare services. The Present study aims to analyze the quality of healthcare services in view of patients' fulfillment and identify their requirements to provide better service in hospitals. SERVQUAL model has been applied to analyze the quality of healthcare services from 5 aspects: reliability, assurance, physicality, empathy, and approachability. Data were collected from 300 patients belonging to 30 hospitals in Jeddah. IBM/Statistical Package for Social Science (SPSS) was utilized the investigation of patients' satisfaction with hospital services. The questionnaire validation was done through SPSS. Analysis revealed that the total effects of reliability and responsibility on patients' satisfaction were 0.550 and 0.160, while the effects of patients' loyalty were found to be 0.666. However, the indirect effects of reliability and responsiveness on patients' loyalty were 0.366 and 0.160. Moreover, physician's empathy, assurance, and tangibility toward patients significantly affected their satisfaction. Management of hospitals can improve healthcare services by focusing on responsiveness, and reliability factors, which in turn affect the loyalty and satisfaction of patients. The research reviewed with the implementation of FMEA in further research evidenced the reliability and responsiveness critical dimensions in the healthcare sector and hospitals take necessary steps to enhance the quality of service focusing on reliability and responsiveness. Risk Priority Number calculation helped to find the lagging services in the healthcare sector.

Key words: *service quality, prioritizing service, customer satisfaction, SERVQUAL model.*

### INTRODUCTION

Health care industry has always been important for the economic and social well-being of societies [2]. Governments all over the world intend to offer preventive and rehabilitative services to their people, but

face serious challenges due to escalating prices of medical care [19]. Because health care budgets are proportionally related to their respective economies, thus, making it difficult for both developed and developing countries to ensure quality healthcare within economic constraints [23]. However, the problem gets more severe in low and medium-income countries, where lack of resources is coupled with their high population growth. These challenges have removed the emphasis of the hospitals from general care models to process-integrated models, in which emerging technologies play a pivotal role [16]. Nevertheless, technological advancements bring a lot of improvement in healthcare services and offer exciting opportunities for both patients and doctors; affordability of costly medical services is a challenging issue for both stakeholders [13]. Under these situations, respective governments, insurance companies, patients, and hospitals face great difficulty in finding the right balance between quality and costs [45].

Wide-hooked providers can be studied to perceive their effect on vast effects with the satisfaction of the affected individual, specifically to have a look at the provider's excellent (SERVQUAL) dimensions, which can be studied, particularly within the context of developing international locations, where the government is sponsored on offers Health services [4]. Overlapping patients on medical doctors for vital options can also encompass the significance of great dimensions in growing worldwide places, together with Jeddah. Each of those growing countries has events that the cost of fitness care is strongly supported. This must be a pointed out that with the low literacy on the equal time low focus is the reality of inequality. It surely relies upon the recommendation of the physician approximately the service issuer's choice for the sufferers [7]. The present-day literature no longer copes with this web page inside the context of developing nations defined within the previous brand. This proposed work supports finding the patient's requirement for hospital services [9]. The FMEA tool is utilized to validate the research.

## LITERATURE REVIEW

Quality is generally known as the no deviation from customer fulfillment and customer observations, where expectations are the desires of patients' and perceptions refer to their evaluation of services [10]. In the fast-changing business environment of the 21<sup>st</sup> century, quality is regarded a major force to get a competitive advantage, by compelling organizations to meet and exceed customers' expectations [17]. The importance of quality is evident in all types of industries; however, it gains more significance in the healthcare industry due to the heterogeneous nature of its services [27]. Quality assurance in the healthcare industry is more cumbersome as compared to the manufacturing industry, where processes are machine-dependent and quality parameters can be randomized to reduce costs [37]. On the other hand, the health industry comprises a complex web of numerous factors, which are non-tangible, and demand a high level of personalized interaction [34]. The complexity of this web is further enhanced due to patients' perceptions, the engagement of their families, and more expectations from service providers [12]. Resultantly, a lot of variation is observed in the quality of healthcare services and organizations face great difficulty in maintaining profits without compromising the quality of services [27].

Trust is considered one of the most crucial components of healthcare business and a patient's trust in a physician greatly influences his/her satisfaction with healthcare services [30]. On the other hand, a lack of trust between patient and physician not only results in poor health outcomes but also questions the credibility the entire hospital service [38]. The phenomenon of trust attains new dimensions for a backdrop of developing countries, where governments offer subsidized rates for state-run hospitals to compensate for the escalating prices of these services [40]. A study [15] conducted by Arumugam on the public hospitals of Malaysia revealed the number of patients, intending to avail of subsidized rates is continuously increasing, which not only prolongs their waiting time but also hinders the flow of quality services [47]. Moreover, it was observed that low charges of medical services create a lack of trust among patients when they compare low charges in public hospitals with high charges for similar services in private hospitals [46]. Similarly [36] found poorer status of hospital services in and around areas of Australia as compared to urban areas of the country [36]. A similar study, conducted in 211 acute care hospitals in the USA revealed that lean orientation directly affects patients' safety, but its effect on the financial performance of hospitals turned out to be indirect. It indicates that any variation within the healthcare budgets of different states leads to significant variation in social services quality and

healthcare outcomes of these states [14].

### **Quality of Health Care**

In the last few decades, quality function has emerged as one of the distinguishing parameters of healthcare business owing to the sensitive nature of medical services. It prompted the healthcare managers to bring the highest standards of quality in their services including both technical and functional aspects [26]. Technical quality in the healthcare industry means the operational skills of doctors, drug administration by nurses and the conduction of tests by the laboratory staff. Similarly, functional quality in healthcare means tangible things like cleanliness, facilities, equipment, food and the attitude of the staff [11]. As patients are mostly unaware of the details of their diseases or the justifications behind diagnostic procedures, they tend to draw satisfaction from the functional quality parameters instead of technical ones [32]. Thus, their failure to distinguish between caring and curing forces them to base their evaluation on environmental factors instead of technical ones.

### **Quality Consciousness in Patients**

Patient's assessment of quality is considered important in hospitals, as their satisfaction or dissatisfaction directly affects the credibility of medical services. Due to this, the focus of performance assessment has now shifted from clinical care measurement to patient satisfaction as existing quality frameworks prove insufficient to capture patient experience [42]. Considering growing nations, where the majority of the population is illiterate and possess little knowledge about the disease, patients mostly rely on functional quality parameters [32]. Under these situations, physical parameters including facility layout, ambient, space utilization and spatial design greatly influence their satisfaction [24]. However, factors affecting the satisfaction levels of outdoor patients are different from factors affecting the satisfaction level of admitted patients, as they pass through entirely different levels of experiences [21]. Sawn and Chandra found that procedures, infrastructure, social support, interaction and technical services is considered vital in patient fulfilment [41]. In a study conducted by Russell, it was found that the trauma of illness creates fear, stress, and anxiety among patients, further highlighting the significance of quality care by medical services in hospitals [33].

### **Quality Consciousness in Hospitals**

Quality parameters in hospitals keep changing due to their alignment with customers' expectations and are ranked based on either meeting or exceeding customers' expectations [6]. Therefore, a good quality control system must have the capacity to measure patients' expectations, without which, it is challenging to improve the satisfaction level of customers in hospitals. [31] defined staff responsiveness and technical quality as the main components of hospital services that can be further categorized into accessibility, affordability and convenience for patients [31]. Similarly, the staff working in big hospitals have more experience due to the large number of patients visiting them. It not only helps them in developing their technical skills but also improves their clinical facilities as well [22]. However, a study in Tanzania revealed that patients tend to move toward private hospitals, when the government hospitals run short of drugs due to a scarcity of resources [28]. A similar study conducted in Bangladesh found that patients visit unqualified medical practitioners due to a lack of resources and a shortage of qualified doctors in rural area hospitals. However, educated and affordable patients are less likely to follow this trend as compared to their uneducated contemporaries [1].

### **Quality Models in Healthcare**

The structure-process-outcome-design model evaluates the quality of healthcare services from three dimensions. The structure depicts the context in which health care services are provided, the process indicates the flow of technical activities and the outcome means the effects of these services on patients' health [25]. The development of valid and reliable quality tools for the healthcare industry is required to judge patients' perceptions and preferences as quality metrics. However, many of the available models fail to recognize patients' input, thereby ignoring valuable feedback from one of the most important stakeholders of healthcare industry [8]. SERVQUAL scale is considered one of the most effective and popular tools to gauge quality from both patients' and providers' perspectives [35]. There are five main

dimensions of the SERVQUAL model, under which further questions are asked from the respondents on a seven-point Likert- type scale. Different studies found this model more reliable and authentic in hospital environments due to the involvement of caring and empathy dimensions [44]. The present study targets to evaluate the quality of the fulfilment level of customers in hospitals using SERVQUAL in Saudi Arabia. The proposed work aims to identify all elements that are affecting the satisfaction and loyalty of patients toward the hospital. Table 1 summarises the existing work carried-out using the SERVQUAL model.

Table 1. Existing Work related to the SERVQUAL model.

Author and Year	Work done	Adopted tools and techniques	Identified parameters
Prabhakar (2014)	To measure the hospital services at different locations in and around India, and find out the gaps in service quality	Used SERVQUAL model to analyze the service quality	Empathy and responsiveness got top priority in healthcare services based on the geographical study
Makarem and Al-Amin (2014)	Introduced the new method based on the impact on customer satisfaction by organizational and marketing factors	Collection of Patient’s responses through survey.	The physical facilities and market competence in healthcare expected from the customer
Wongrukmit & Thawesaengskulth, (2014)	Analyzed the perceived hospital services in different nations	SERVQUAL and Kano’s model adopted this study and variance analysis done	The perceived quality differed among the nations based on facilities which was provided by the nation
Chia-Wen et al. (2013)	Examine the parameter associated with patient loyalty in hospitals	Questioner-based survey /fuzzy set qualitative comparative analysis used	The patients expect to provide complete information about the treatment process and wish to be involved in decisions making in the treatment process
Lee (2012)	To determine the performance of hospital services toward patient satisfaction	The responses collected from all stakeholders and analyzed the lagging services in the hospital.	Patient fulfillment and reliability are attained by providing well-organized operations at all levels.
Xiaoyun, Kwortnik Jr., and Chunxiao, (2008).	Identified the different dimensions focusing on customer loyalty in the hospitals	The responses collected from all stakeholders and analyzed the lagging services in the hospital.	The identified key factors were customer friendships, commitment toward services and care.
Raju and Lonial (2001)	Investigated the market orientation in analyzing the service quality	Used structural questioner-based model to analyze the quality	Market orientation significantly affects the performance of the organization
Dubé, and Morgan (1998)	The patient’s psychological expectation of the healthcare services	The responses collected from Male and Female patients contribute to equal distribution in the survey	The personal attention, willingness to help at any time, the above factors expect more psychological from patients

**METHODOLOGY AND FINDINGS**

**Model**

The proposed work includes the reviews of 300 patients who got treatments from 30 different multispecialty hospitals in [3]. There are 50 percent of women and 50 percent of men were included in the sample of the reviews from the patients nearly 75 percent are from married persons and 25 percent are from singles. The sample consists of 20 percent of young persons, 35 percent of old persons, and 45 percent of middle-aged persons. There were 5-6 samples collected from different hospitals to balance the randomization in the research.

**Research Instrument**

The framework of SERVQUAL was slightly altered to fit with the local perceptions. The modified dimension of SERVQUAL is described in Table 10. The modification process is carried out based on industry veterans. The five different dimensions of service quality are physicality, trustworthiness, approachability, guarantee, and sympathy. These are considered necessary parameters and considered as an endogenous variable while satisfaction of the patient. Another endogenous variable considered here secondly is the loyalty of patients to the hospitals.

Table 2. Estimation of Cronbach's alpha

Necessary Parameters	Particulars	Value (Cronbach's Alpha)
1. Physicality	1. The healthcare industry adopted advanced equipment. 2. The facilities are located in and around the hospital. 3. The cleanness and employees appearance neat	.802
2. Reliability	1. The service is carried out at the right time 2. The patient health information provided by the hospital and treatment procedure. 3. The hospital money transaction with patients is accurate and safe.	.815
3. Responsiveness	1. Employees willing to help at any time. 2. The employees respond to patient queries. 3. The availability of the hospital services	.842
4. Assurance	1. The success rate of disease cures in hospitals. 2. The employees are competent. 3. Employees approach patient attendees	.836
5. Empathy	1. The hospital employees understand the real expectation of patient's requirements. 2. The hospital employees have treated the patients with a friendly approach	.942
6. Patient Satisfaction	1. I am entirely fulfilled with the facility provided by the healthcare sector. 2. The success rate of treatment obtained by patients 3. The medical services are obtained at affordable prices.	.808
7. Patient Loyalty	1. I will refer this hospital to my known contacts. 2. I am delighted with the service provided by the hospital. 3. I will recommend the hospital services to others 4. I feel safe and comfortable with the hospital services	.877



Figure 1. Path Diagram: Patient satisfaction influencing factors

RESULTS

**Model Fitness**

The model fitness of this study is shown in Table 4. The fitness rate of CMID/DF is 3.568 and can't be more than 5. The value of SRMR is .082 and can't be more than .08. Here, the SRMR rate is slightly higher than the upper limit. The value for GFI (General Fit Index) is .998 and it should be less than .9. The value of AGFI (Adjusted General Fit Index) is .869 and it also can't be more than .9. The CFI, TLI, and NFI have suited better and its values are .96, .952, and .986. Some of the models do not have good fitness rates, including RMSEA and PCLOSE. The rate of RMSEA is .258 and the rate of PCLOSE is .017, both need to be less than .05. Still the overall fitness of the model is better even with some of them indicating a poor fit. The rate of regression weights provided in Table 3 and Figure 1 shows the path diagram for the service quality model.

Table 3. Regression Weights

	<b>Standardized evaluation</b>	<b>Un-standardized evaluation</b>	<b>S.E.</b>	<b>C.R</b>	<b>. P</b>
Patient Fulfillment ← Trustworthiness	.620	.472	.044	7.560	***
Patient Satisfaction ← Responsiveness	.180	.182	.063	3.560	.045
Patient Satisfaction ← Assurance	.086	.083	.072	1.189	.452
Patient Satisfaction ← Empathy	.090	.131	.063	1.59	.28
Patient Satisfaction ← Tangibility	.029	.027	.075	.578	.706
Patient Loyalty ← To Hospital Patient Satisfaction	0.637	.846	.077	12.639	***

The overall effects (direct and indirect effects are also included) of Empathy, Reliability, Tangibility, Assurance, and Responsiveness during the satisfaction of patients are shown in Table 2. In the analysis of post-data, there about 10 patients were not involved during this study and they were called to inspect and confirm the findings. That is they are invited to find the irrelevance.

Table 4. Model fitness

<b>Index</b>	
CMIN/DF	3.568
RMR	.082
GFI	.998
AGFI	.869
NFI	.96
TAG	.952
CFI	.986
RMSEA	.258

There two different researchers [5] [18] identified that reliability (.550) and responsiveness (.160) have direct effects on the satisfaction of the patient. The dimensions of the service quality model (SERVQUAL) were unessential and two of its dimensions are relevant among the five dimensions. During this context, empathy, assurance, and tangibility don't have any relevance. Thus, the caution here instructs that the usage of SERVQUAL while the context is classified with the base of asymmetric data, developing countries, and patients trusting highly referring physician's advice.

The Sympathy, Approachability, Physicality, Trustworthiness, and Guarantee indirect effects on the loyalty of customers (patients) in hospitals are described in Table 5. The rates of reliability and responsiveness are .481 and .147. These studies are by those of [20].

Table 5. Effects of the proposed model

Parameters	Physicality	Sympathy	Guarantee	Approachability	Trustworthiness	Patient Fulfillment
Patient Fulfillment (Direct Effects)	.037	.076	.074	.170	.642	.200
Patient Trustworthiness To Hospital (Direct Effects)	.004	.020	.020	.010	.070	.767
Patient Satisfaction (Indirect effects)	.010	.010	.070	.050	.060	.090
Patient Trustworthiness To Hospital (Indirect Effects)	.055	.097	.057	.131	.685	.100
Patient Satisfaction (Total effects)	.047	.083	.077	.202	.496	.202
Patient Loyalty To Hospital (Total Effects)	.024	.057	.055	.124	.401	.637

On satisfaction of patient, the total effects of reliability and responsibility are .401 and .124. The loyalty of patients to the hospital, the total effects of reliability and responsiveness are indirect effects and its rates are .47 and .170. The loyalty of patients to the hospital, the total effects is .637. From this study, our significant findings are accuracy in billing, delivering services at the right time, accurate reports about the service delivery time, the employee’s caring for patients, the willingness of employees, and promptness of services. These discoveries validate those of [29]. One of the most significant observations from this study is the satisfaction of female patients is much harder to build loyalty. But if the satisfaction level is high for women, then they wish to return to the same hospital. Table 6 describes the CRs for different age groups of patients. Blow table 7 shows the CRs for coefficients with the base of marital status. On particular variables, marital status doesn’t have any influence on the ratings of patients.

Table 6. CR quantities based on the different age groups of patient

	Below 30	31 to 50	>50 age
Age group under Young	0		
Age group under Middle Age	1.736	0	
Age group under Old age	1.568	.714	0

Table 7. CR quantities based on the marital status of the patient

	Unmarried	Married
Unmarried	.000	
Married	.971	.000

Below Table 8 shows the CRs for quantities that exceed the threshold limits (female). These discoveries are in accordance with those of [38] and [39]. The rate (regression weight) of patient loyalty and fulfillment on the female side is .185 and is considerably higher than .113, which is the rate of the male group as shown in Table 9.

Table 8. CR coefficients based on gender

	Male	Female
Male	.000	
Female	3.432	.000

Table 9 Coefficients of male and female groups

	Assessment (Male)	Assessment (Female)
Quality of Care ← Reliability	.241	.146
Quality of Care ← Responsiveness	.186	.189
Quality of Care ← Assurance	.177	.345
Quality of Care ← Empathy	.328	.278
Quality of Care ← Tangibility	.210	.233
Patient Trustworthiness ← To Hospital Patient Fulfillment	.129	.212

Table 10. Details of Assumption based on the outcomes

Assumption	Description	Findings through Research
Hypothesis 1	The customer was expecting all the SERQUAL dimensions equally which should be provided by the hospital.	SERQUAL dimensions Reliability and Responsiveness contribute highly to customer satisfaction
Hypothesis 2	No significant evaluation of impacts of Gender, age and Marital status	Gender alone impacts the valuation of customer satisfaction but no significant variation from age group and married/unmarried status
Hypothesis 3	Patient fulfillment is directly related to patient loyalty.	The healthcare sector achieves patient loyalty by proving Reliability and Responsiveness in services.

The service quality fulfillment in female groups has a higher impact on the loyalty of patients and the parameter is not comparable for the male group. The age and married status of patients don't have any impact on quality variables, but gender makes an impact on service quality. The considered status of hypotheses with the base of the results from this study is given below.

On the first theory, the satisfaction of patients is not similarly impacted with all patients with SERVQUAL dimensions. So, the first theory gets rejected. In the second theory, similar impacts are earned only by the factor of gender others are not as hypothesized. So, the second theory also gets rejected. At last, the third theory is accepted because of its satisfaction with patient loyalty. These results are shown in Table 10, for easier visual checking and to show the status after the study.

In addition, factors affecting the loyalty of female patients were different from the factors affecting the loyalty of male patients.

#### REVIEW OF RESEARCH THROUGH FAILURE MODE AND EFFECT ANALYSIS [FMEA]

#### Data Collection from Hospitals

[43] developed the SERVQUAL model. There were five provider first-rate dimensions described in this version inclusive of tangibles, reliability, responsiveness, guarantee, and empathy. In this proposed work 245 responses accumulated from sufferers to recognize roughly their response in severity (S) of the service components. The two hundred replies accrued from a team of workers nurses, and receptionists for identifying the Occurrence (O) and for detection (D) 30 responses were collected through purchaser relation officers' individuals who are working in hospitals. The collected data is shown in Table 11.

Table 11. Calculation of Risk Priority Number

Process Function	Potential Failure Mode	Potential Effect(s) of Failure	Severity(S)	Potential Cause(s)/ Mechanism(s) of Failure	Occurrence(O)	Current Process Controls	Detection(D)	RPN = S*O*D
Analysis of healthcare service quality	Tangibles	Not meeting patient expectations leads to dissatisfaction with the service, which in turn reduces the hospital's profits	6	The improper planning in the layout and facilities of the hospital	7	The proper facilities to be provided	7	294
	Reliability		9	The diseases are not cured after enough treatment	8	The committed services provided to the patient	7	504
	Responsiveness		8	Not understanding the patient's requirements and needs	7	Respond to customer quires immediately	7	392
	Assurance		8	The insufficient of specialists for all diseases.	6	The employee should be professional in dealing with the patient in a better way	6	228
	Empathy		8	Not giving individual care to every patient	7	Take care of every patient in the hospital (individual care)	6	336



The above table eleven proves the calculation of RPN for different working professional aspects. The linker scale technique was utilized for accomplishing the questionnaire’s review and it was calculated and verified by using SPSS tool.

Table 12. RPN Rank for service component

Parameters	RPN value	Rank
Tangibles	294	4
Trustworthiness	504	1
Approachability	392	2
Guarantee	228	5
Sympathy	336	3

From this investigation, we recognize that the patients anticipated trustworthiness in services as the most vital service element and reliability got first rank in risk priority quantity in table 12. The responsiveness was given a 2d rank in RPN, the affected person expected character worrying and interest in their trouble. The different carrier factors empathy, tangibles, and guarantee were given 1/3, fourth; and fifth rank in risk precedence variety respectively. The review of research also strongly states that reliability and responsiveness in the SERVQUAL model are considered important dimensions when compared to other dimensions.

CONCLUSION

The hospital managers need to focus on various significant aspects including caring for employees, delivering the services at the right time, billing accuracy, timeliness of services, the willingness of patients to support patients, and proper reporting of service delivery time. Another significant thing is satisfying the service quality on the women’s side and it has an enormous influence on the loyalty of patients to a hospital at the same time it is not the same as the male group. Mainly the satisfaction of patients was high impacted by two dimensions of the service quality model including responsiveness and reliability. These are adjusted only by the satisfaction on the patient’s side in promoting loyalty. The research reviewed with the adoption of FMEA in further research evidenced the reliability and responsiveness critical dimensions in the healthcare sector.

Expressing it in another way, the success of a hospital is mainly based on the attitudes of employees while treating the patients, accurate communication, and proper service delivery time. If the hospital management likes to return the patients to their hospital, the key solution is the ACD Model (Attitude, Communication, and Delivery). The conclusion from this proposed method is that sympathy, guarantee, and physicality to the patients will be high with the base of treating the physician. From the results of patient satisfaction in this study, the SERVQUAL model is not completely relevant to the situation and two of the dimensions are only relevant to the satisfaction of patients. Although the SERVQUAL model is not completely relevant to the situation, two of the dimensions are found to be strongly relevant to patients’ satisfaction.

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