Effect of Technology on Service Quality Perception and Patient Satisfaction- A study on Hospitals in Bangladesh

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Abstract. This study investigates the intricate dynamics of technology's influence on service quality perception and patient satisfaction in Bangladesh's healthcare sector, a vital component of emerging economies. Focusing on the interplay between technology, service quality, and patient satisfaction, the research employs a quantitative approach, utilizing a structured questionnaire survey conducted both online and in-person among patients in private hospitals in Dhaka city. Statistical analyses, including correlation and regression, were applied to the gathered data. Key findings reveal significant correlations between service quality dimensions (responsiveness, assurance, communication, and discipline) and patient satisfaction. Notably, technology-related factors, specifically the use of tips, negatively impact satisfaction levels. Regression analysis identifies responsiveness, assurance, communication, and tips as significant predictors of patient satisfaction. Limitations, including the exclusive focus on Dhaka city's private hospitals, underscore the necessity for broader research across diverse healthcare settings to enhance generalizability. Practical implications recommend healthcare providers prioritize improving responsiveness, assurance, and communication, considering patient preferences on technology-related practices like tipping. From a societal perspective, the study emphasizes the broader importance of optimizing technology to elevate patient experiences, contributing to overall well-being. The research's originality lies in its nuanced examination of technology's influence on service quality and patient satisfaction within the distinctive context of Bangladeshi private hospitals. Acknowledging its limitations, this study encourages future research to explore technology's impact on service quality across various healthcare settings, providing valuable insights for ongoing improvements.

Keywords: Service Quality, Health Care, SERVQUAL Model, Customer Loyalty, Hospital, Customer Satisfaction, Bangladesh

1. INTRODUCTION

Service sectors play a crucial role in the overall growth of an economy, especially in emerging nations. Currently, the importance of service quality in determining the survival and success of a business in a competitive market is well emphasized. One of the fastest-growing service sectors is health care [1]. In service industries, the attention on service quality is increasing, while in terms of healthcare sector, the importance of service quality is gaining more attention. In a growing economy like Bangladesh, healthcare is a critical issue that practitioners, researchers, and policy makers must address. Both private and government sectors provide health services in Bangladesh. By definition, health care quality is extent to which individual and community medical treatments improve the probability of achieving targeted health outcomes and are in line with accepted clinical practice guidelines [2]–[4]. It is also defined as "the combination of a service's traits and attributes that contribute to its ability to satisfy a certain demand"[5]. When compared to other developed countries, Bangladesh's current health expenditure of 0.8% of GDP is very low [6]. Health care obtains an insufficient portion of the budget, and there is no system in place to guarantee a fair and transparent distribution of those funds. Because of this, Bangladesh is included on the list of countries with insufficient medical care.

Generally, hospitals in the private sector are commercial enterprises. People from higher socio-economic backgrounds likely to choose private hospitals since they can more easily afford the higher treatment costs. Public hospitals are favored by those with low incomes because they provide care at no cost or at reduced cost. Improving quality, increasing access, and decreasing prices are three of the major barriers facing Bangladesh's healthcare delivery system [7]. Even while all three factors are essential, there is significant proof that patient's perceptions of their treatment quality have the greatest impact on their actions [8]. The service quality of the healthcare system in the private hospital sector in Bangladesh is a particular area of interest for this research. Private hospitals in Bangladesh that provide essential medical services have expanded during the last decade. According to data released in 2020 by the Bangladeshi Ministry of Health and Family Welfare, there are 960 private hospitals providing healthcare services in the country [6]. According to [9], the quality of the services provided is the single most important factor that may set one service provider apart from another, hence it is crucial that it be continuously enhanced and monitored. Nowadays, it is necessary to deliver high-quality healthcare services to the patients because of the rising living standards and growing expectations of consumers [10]. Consequently, it's becoming more difficult for academics, hospital administrators, government policymakers, and medical specialists to identify aspects beyond patients' happiness that contribute to positive health outcomes [11]. The performance of private hospitals is directly tied to how their customers rate their service. Service quality may be defined as the extent to which real hospital treatment meets patients' expectations. By surveying a variety of private hospitals throughout Bangladesh, this research aimed to provide information on the degree to which patients are satisfied with healthcare in the country's private sector.

2. LITERATURE REVIEW

The necessity and complexity of measuring service quality has resulted in a significant amount of attention in the literature [12], [13]. Although the ways may vary, one of the most essential ways is by satisfying consumers' wants or expectations [14]. The original authors of this idea were [13], [15]. Many researchers in the field of healthcare have conceptualized the

idea of service quality and evaluated many facets of hospital service to determine their effect on service result. PubHosQual, which stands for "Service Quality," is made up of five components: admission, discharge services, medical services, social responsibility, and overall services [16]. By analyzing the physical environment, interactional quality, and result quality, [17] determined how customers felt about the service they received. According to [18], six factors of healthcare service quality—including how well patients' requirements are met, how friendly the personnel is, how clean the facility is, how good the food is, and how well they are treated—are measured. A variety of factors contribute to what [19] term "healthcare perceived service quality," including hospital infrastructure, personnel quality, collected and processed, patient safety, the clinical treatment process, social responsibility, and the overall medical care experience." Quality of service was evaluated by [20] based on the following factors: ease of admission, competence of nurses and doctors, friendliness of the facility, respect for patients' loved ones, comfort of patients, and speed of release. One of the most crucial factors in a hospital's success is how its patients perceive its performance, since patients' evaluations of the quality of treatment they get foster the kind of two-way communication that ultimately inspires trust in the medical system as a whole [21].

The literary importance of SERVQUAL is considerable. Various investigations have focused on particular SERVQUAL aspects. Radević et al., (2021) found that highly hierarchical, highly segmented, and complicated organizational structures are the main obstacles to implementing TQM. Issues include hospitals' special connection with doctors, quality assurance mechanisms already in place, philosophical differences between hospital administration and medical staff, and labor-management tensions [23]. Selman et al., (2018), Youssef, (1996), focused on patients' reactions and hopes after receiving treatment. Hospital quality and factors that influence patients' decisions were examined between public and private facilities in Bangladesh by [8]. According to common belief, a hospital's quality of service is determined by the organizational framework in which it functions. Respond time, confidence, communication, discipline, and Tips are all factors in determining quality [26]. SERVQUAL delivers an all-encompassing evaluation of service quality by taking into account both customer expectations and actual user input [27]. Especially common in the service sector, it is the most important tool a company may have. This may need to be modified depending on the nature of the specialized institution [28]. Even while all hospitals provide the same essential services, the quality of those services differs considerably [25]. Consumer satisfaction is the most reliable measure of service quality since customers are the service's ultimate users [29]. For quite some time, clinics have used the provision of technical service without concentrating on patients' essential needs and requirements as a measure of excellent healthcare. Recent publications in developed countries have emphasized the need of including the patient's point of view. Studies focusing on the quality of healthcare delivery are also conducted. Since 1994, however, attention has switched from focusing only on objective measures of quality to also considering patients' subjective perceptions [30]. Several studies have been done in Bangladesh's healthcare industry to measure service quality and patient satisfaction [31]. Whether or not a patient leaves a hospital satisfied is often based on the quality of the care they received. Quality in services may be predicted along a number of parameters. The primary focus of the present study includes Responsiveness, Assurance, Discipline, Communication, and Tips, that are discussed below:

Responsiveness: A hospital's service commitment is the level to which its doctors, nurses, and other staff members are prepared to help their patients. Appointments must be made, services and prescriptions must be provided promptly, and regular checkups must be performed [30],

[32], [33]. It's the capacity to assist clients and provide services quickly [34]. If they listen to their patients, they will be able to provide better care [30].

H1: "Responsiveness" has a positive effect on Patients Satisfaction of a Hospital

Assurance: Employees' honesty and integrity in serving clients' best interests is what sets this company apart [30], [34]. Prescriptions and suggested medical tests are contingent on the physicians' and staff's degree of expertise and training [30], [35]. It's also about making sure staff members know they'll get quality care in a timely manner [8], [30].

H2: "Assurance" has a positive effect on Patients Satisfaction of a Hospital.

Communication: Maintaining contact with customers and updating them on their health status is accomplished via constant communication [36]. Additionally, this entails informing patients about their health condition and therapy in a language that they can comprehend [30].

H3: "Communication" has a positive effect on Patients Satisfaction of a Hospital.

Discipline: Discipline of both the service providers and their employees is a part of this [37]. Patients, who must use all of the hospital's services, may provide the most accurate assessment of the facility's cleanliness since they have direct experience with it [8], [30]

H4: "Discipline" has a positive effect on Patients Satisfaction of a Hospital.

Tips:

It's the amount of money given to staff after they've done a good job the first time to get better service. It is given when there isn't a good way to measure or keep track of Service Quality [30], [38]. So, patients pay their own money to get better care that hospital staff wasn't giving before. If a patient wants better service, he or she should give money to the staff so that they can do a better job [8], [30]

H5: Tips has a negative effect on Patients Satisfaction of a Hospital.

Patients' Satisfaction:

The measure to which patients' overall health care demands and their particular condition needs are satisfied or clinically important is the assessment of patient satisfaction with health services. This is because happy patients are more likely to actively take part in their own care, utilizing medical care services continuously, comply with treatment, and remain with the same health practitioner [30], [39].
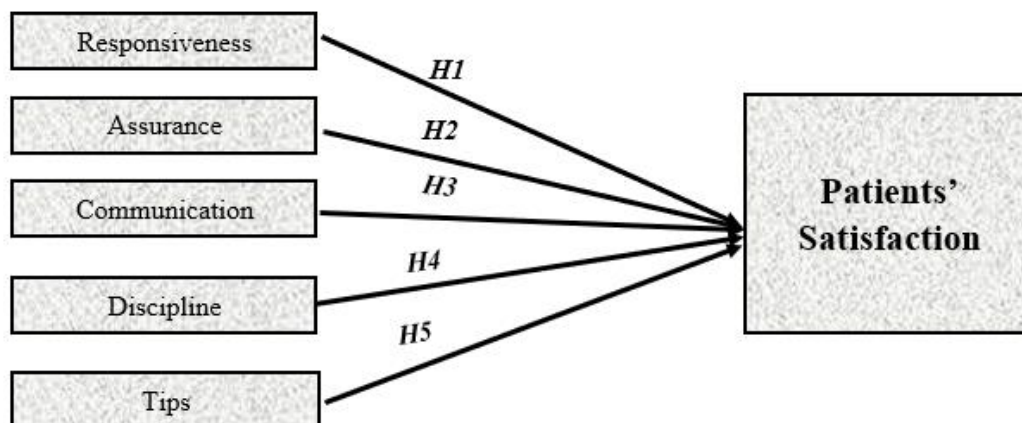

Figure 1. Conceptual Framework

3. METHODOLOGY

3.1 Research Design

Collection of primary data were performed through a structured questionnaire survey carried out to the patients in Dhaka city's private hospitals. Five hypotheses (see figure 1), have been tested to generate the research outcomes, with the collected data analyzed through quantitative technique

3.2 Unit of Analysis and Unit of Observation:

Researcher relates the results of their study to a unit of analysis at the end of their study. It could be a person, a group, or an organization, with regards to the type of study and the condition [40]. On the other hand, a unit of observation is any object that a researcher study while examining the unit of analysis [41]. Hospitals in Bangladesh served as the unit of analysis, and the patients who were hospitalized in the past 12 months were considered as the unit of observation.

3.3 Target Population and Sampling

The utilization of random sampling aims to determine the characteristics of the people who would take part in the study, and both online and in-person surveys were used to collect the data. The survey was intended for people who have been hospitalized in the last twelve months. All of the people who took part in the research were informed what the goals had been and that their answers would be kept hidden. About 250 surveys were done over the period of four months to get useful information.

3.4 Questionnaire Designing

Several steps were taken to make sure this study's questionnaire was accurate: Items for measuring Responsiveness, Assurance, Communication, Discipline, and Tips were taken from peer-reviewed literature on different research articles and found to be reliable.

3.5 Measurement Scale

The measurement used a five-point Likert scale. To rate each of the item, the Likert scale varies from "strongly disagree" (1) to "strongly agree" (5).

3.6 Data Collection Process

The Hard copy of the Questionnaire was circulated to patients who are hospitalized in the past 12 months at different hospitals inside Dhaka city and conducted the survey through face to face interview.

3.7 Data Analysis Technique

SPSS is used for quantitative data analysis to examine the results of the survey, like Descriptive Statistics, Frequency Distribution, correlation, and regression.

4. RESULTS

4.1. Demographic Statistics

Table 1. Demographic Statistics

	Frequency	Percent	Valid Percent	Cumulative Percent
Gender				
Male	154	61.6	61.6	61.6
Female	96	38.4	38.4	100.0
Age				

	Frequency	Percent	Valid Percent	Cumulative Percent
Below 18 Years	17	6.8	6.8	6.8
18-34 Years	148	59.2	59.2	66.0
35-49 Years	59	23.6	23.6	89.6
50-64 Years	19	7.6	7.6	97.2
65 and above Years	7	2.8	2.8	100.0
Marital Status				
Single	102	40.8	40.8	40.8
Married	146	58.4	58.4	99.2
Others	2	.8	.8	100.0
Level of Education				
Primary School	13	5.2	5.2	5.2
Secondary School	54	21.6	21.6	26.8
Diploma	34	13.6	13.6	40.4
Bachelor	87	34.8	34.8	75.2
Master's Degree	62	24.8	24.8	100.0
Level of Income				
Below TK 20,000	44	17.6	17.6	17.6
Tk. 20,001-50,000	61	24.4	24.4	42.0
Tk 50,001-80,000	94	37.6	37.6	79.6
Tk 80,001-200,000	42	16.8	16.8	96.4
Tk 200,000 & above	9	3.6	3.6	100.0
Occupation				
Service Holder	66	26.4	26.4	26.4
Unemployed	25	10.0	10.0	36.4
Student	38	15.2	15.2	51.6
Professional and Technical	64	25.6	25.6	77.2
Home Maker	41	16.4	16.4	93.6
Retired	6	2.4	2.4	96.0
Businessman	9	3.6	3.6	99.6
Others	1	.4	.4	100.0
Total	250	100.0	100.0	

Table 2 represents Respondents Demographic Characteristics; the sample respondents were comprised of 61.6% male and 42.7% female respondents. Which is talk about more male respondents than female respondents go to the hospital as a patient or with a patient. Most of the respondents, 59.2%, were between the age of 18 and 34, 23.6% were between the age range

of 35 and 49, 7.6% were between the age range of 50 and 64, 6.8% were younger than 18, and only 2.8% were 65 or older. Out of the 250 individuals who responded 102 were not married, which is 37.3% of the total, 146 were married, which is 58.4% of the total, and 2 were in other situations, which is.7% of the total. That indicates that the majority of participants who completed the survey were married, and according to our findings, they expressed a wide range of opinions. Thirteen respondents were enrolled in primary school, constituting 5.2% of the total. Additionally, 54 respondents had completed secondary school, comprising 21.6% of the total. Thirty-four respondents held a diploma, representing 13.6% of the total, while 87 respondents possessed a bachelor's degree, accounting for 34.8% of the total. Sixty-two respondents held a master's degree, constituting 24.8% of the total.

Approximately 24.4% of respondents have monthly household income ranging between 20,001 taka and 50,000 taka. For 37.6% of respondents, the monthly household income fell within the range of 50,001 taka to 80,000 taka. Additionally, 16.8% of respondents reported a monthly household income around 80,001 taka and 200,000 taka, while 3.6% reported a monthly household income of 200,000 taka and above. Lastly, 17.6% of respondents earned below 20,000 taka monthly. That means from our findings most of the respondent's monthly income Tk. 50,001-80,000 and it was expected because they were our targeted respondents. 26.4% of the respondent's occupation were Service Holder which is the highest of total respondents, 15.2% of the respondent's occupation were Student, 25.6% of the respondent's occupation were Professional and Technical, 16.4% of the respondent's were Home Maker, 2.4% respondents were retired professional, 3.6% respondents were businessman, 0.4% respondents were others and rest 10% respondents were unemployed.

4.2. Descriptive Analysis

Table 2. Descriptive Statistics

	N	Mean	Std. Deviation
The staff was caring	250	3.6400	1.02106
Hospital staff was helpful	250	3.6360	1.16832
The staff was responsive to patient needs	250	3.5080	1.10944
The staff responded immediately when called	250	3.1840	1.11855
Services provided was prompt	250	3.5080	.98683
The staff was courteous	250	3.4480	1.18190
The hospital had skilled staff	250	3.2880	.94266
Services were provided efficiently	250	3.3560	.99257
The staff was professional	250	3.1400	.97375
The nurses were well-trained	250	3.7120	.98841
The doctors were competent	250	3.7400	1.36817
Medical procedures were performed correctly the first time	250	3.5960	1.13044
I received adequate explanation of any tests I had to undergo	250	3.8840	.93919
The doctors were willing to answer any questions	250	4.0920	1.01965
I was given adequate information on my treatment	250	3.8600	.98197

I was given adequate information on my health condition	250	3.6720	.91200
My health condition was monitored regularly	250	3.7760	.83943
Toilet facilities were clean	250	3.9440	.99237
The staff had a clean appearance	250	3.5960	.93610
Cabins/Wards were regularly cleaned	250	3.8680	.95405
The staff was disciplined	250	3.2880	.91235
Cleanliness was maintained throughout the facility	250	3.9000	.74040
Rules and regulation were maintained	250	3.8200	1.22047
Services were not provided properly without tips	250	3.8560	.97934
Hospital staff expected tips	250	4.0360	.87966
Overall, how satisfied were you with the treatment you received at the hospital	250	3.3800	1.01574
Overall quality of service you received from this hospital was good	250	3.3760	.99931
How willing would you be to recommend the hospital to a friend	250	3.3320	1.07816
How willing would you be to return to the hospital in feature if needed	250	3.3840	1.06257
Valid N (listwise)	250		

In Table 4, five-point Likert scale was used to explain descriptive statistics. The variable has a positive effect if the mean value >3.5 and the standard deviation is <1; vice versa. If the mean value <3.5 and the standard deviation is <1, the variable has a minor effect; vice versa. So, this table was used to find the variables with a mean value of more than 3.5 and a standard deviation of less than 1. In descriptive statistics table (Table 2) it can be seen that "Services provided was prompt" mean value more than 3.5 and std. Deviation less than 1, It refers the Responsiveness factor of the model. That means that Respondents satisfaction depends on because of its Responsiveness characteristics. The nurses were well-trained, I was provided sufficient information on the tests I had to do, the therapy I would get, and my current health status, my health was monitored frequently; the restrooms were clean; the staff looked presentable; the cabins/wards were cleaned frequently; the entire facility was clean, All of these items refer to the model's Assurance, Communication, and Discipline factors, and their mean values are all greater than three and their standard deviations are less than one. According to the findings it is clear that the satisfaction of a patients depends on because of Assurance, Communication and Discipline factors of a hospital. Services were not delivered adequately without gratuities. Hospital staff anticipated tips, and these two aspects also exhibited higher mean values. This situation is likely to adversely affect patient satisfaction within a hospital. In light of the preceding discussion, it can be asserted that customer satisfaction positively influences Hospital Responsiveness, Assurance, Communication, and Discipline Characteristics.

4.3. Correlation Analysis

Table 3. Correlations

		Responsiveness	Assurancen	Communicatio	Discipline	Tips	Satisfaction
Responsiveness	Pearson Correlation	1	.845**	.837**	.746**	.204*	.786**
	Sig. (2-tailed)		.000	.000	.000	.012	.000
	N	250	250	250	250	250	250
Assurance	Pearson Correlation	.845**	1	.868**	.767**	.147	.820**
	Sig. (2-tailed)	.000		.000	.000	.073	.000
	N	250	250	250	250	250	250
Communication	Pearson Correlation	.837**	.868**	1	.790**	.230**	.797**
	Sig. (2-tailed)	.000	.000		.000	.005	.000
	N	250	250	250	250	250	250
Discipline	Pearson Correlation	.746**	.767**	.790**	1	.178*	.779**
	Sig. (2-tailed)	.000	.000	.000		.029	.000
	N	250	250	250	250	250	250
Tips	Pearson Correlation	.204*	.147	.230**	.178*	1	.078
	Sig. (2-tailed)	.012	.073	.005	.029		.343
	N	250	250	250	250	250	250
Satisfaction	Pearson Correlation	.786**	.820**	.797**	.779**	.078	1
	Sig. (2-tailed)	.000	.000	.000	.000	.343	
	N	250	250	250	250	250	250

In a Pearson Bivariate Correlation Analysis four variables "Responsiveness, Assurance, Communication, Discipline" is Strongly correlated with "Satisfaction" variable. If hospitals focus on those four variables it will positively effect on Patients Satisfaction of a hospital. On the other hand, Tips has slightly correlated with patients' satisfaction. Patients care more about a disciplined environment, the promise of a quick recovery, and a staff that is friendly and easy to talk to than about tips. If a small price needs to be paid in the form of tips, this has a big but not huge effect on how happy the patient is.

4.4. Regression Analysis

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
					Change Statistics				
1	.820a	.672	.665	.53457	.672	99.850	5	244	.000

a. Predictors: (Constant), Tips, Assurance, Discipline, Communication, Responsiveness

In this model summary, significant F change is (.000) which is significant at (0.01). Where Adjusted R Squire Patients Satisfaction is related with Assurance, Discipline, Responsiveness, Communication, and Tips. Where Adjusted R Square value is (.665) and the R value is .672.

Table 5. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	142.668	5	28.534	99.850	.000b
	Residual	69.726	244	.286		
	Total	212.394	249			

a. Dependent Variable: Satisfaction

b. Predictors: (Constant), Tips, Discipline, Communication, Assurance, Responsiveness

In Table 5, It can be understood that the significant value is .000 which means that the model is fit in explaining Patient Satisfaction.

Table 6. Coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.043	.236		4.416	.000
	Responsiveness	.328	.064	.299	5.152	.000
	Assurance	.587	.060	.570	9.743	.000
	Communication	-.148	.050	-.136	-2.969	.003
	Discipline	.065	.053	.055	1.235	.218
	Tips	-.134	.042	-.125	-3.186	.002

a. Dependent Variable: Satisfaction

The variables in this investigation that were statistically significant at .05 were included in the model. This coefficient table suggests that four factors have a significant effect on the level of satisfaction experienced by customers. Responsiveness, Assurance, Communication, and

Tips are the four variables, with Responsiveness being significant at.000, Assurance at.000, Communication at.003, and Tips at.002. None of the other independent variables are related to the dependent one, so we can rule out Discipline as a potential explanation. Marketers have it easiest if they prioritize the three characteristics with the greatest Beta values (.570 for Assurance,.299 for Responsiveness, and.055 for Discipline) since customers are most happy with those characteristics.

5. CONCLUSION

It's very important to enhance the level of service quality regarding patients' health care in private hospitals. If hospital staff is trained and knows what patients want, they might be able to make a significant contribution to satisfy their valued clients in the long run. In addition to this, hospitals should make sure their staffs are committed to understand and fulfill the needs of their patients. In hospitals, there should be a team or management in place that is responsible for monitoring each and every activity that is carried out by the staff. In the emergency that patients require any kind of specialized care, the team in charge of overseeing the situation should immediately notify the appropriate authorities. As a result, staff can feel their responsibility and accomplish their responsibilities effectively. Bangladeshi private hospitals should keep up their efforts to upgrade their service quality management practices. Also, trained professionals should be employed who will be focused on improving the health care service quality. Moreover, a quality management system should be implemented routinely in hospitals. The government should be informed about the budget required for patient treatment prior to their admission to the hospital.. As this is how private hospitals work, the budget needs are told to the authority after the patient is admitted. In addition to the aforementioned concerns, it's important to periodically seek patients' feedback on the quality of treatment they've had at the hospital. Hospital policies and procedures should also be explained to patients. Also, the hospital pharmacy has to have access to all medications. If a patient has a medical emergency, they shouldn't have to depart from the hospital to get their medicine. Most importantly, no reference should be made to any authorized person while treating any of the patients, and everyone should be treated equally. Ensuing all the stated measures stated above, the private hospitals in Bangladesh can make significant improvements in raising the service quality and assuring the customer satisfaction at every aspect of their health care service.

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