

PERCEPTION OF CUSTOMER SATISFACTION AND HEALTHCARE SERVICE QUALITY IN THE CONTEXT OF BANGLADESH

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Abstract: Purpose – Healthcare service quality and customer satisfaction have been a major research issue over the decade. Customer satisfaction has been measured by different researchers under varied environment. As environment varies, desires of customers and the perception of satisfaction vary. As a result, a major issue is to define the complex nature of customer satisfaction under varied environment. On the other hand, a compromising trade-off is required in operational cost in the wake of increase in cost to uplift service quality. This research addressed the issue from the context of Bangladesh.

Design/methodology/approach – This research used SERVQUAL, which is a very powerful tool to measure service quality. The study utilized the benefit of hierarchical nature of satisfaction. Service quality was analyzed from customers' view point, as well as the service providers, such as doctors, nurses, etc. Finally hypothesis tests were performed to investigate into the possibility of relationships among the affecting quality parameters and the output service. This analysis was based on customer's perception, as well as expectation.

Findings – The research found the values of service quality parameters, such as tangibles, doctor service, nursing, infrastructure and management. The established fact of dependence of perception of quality on culture has been proved once again. The relationship among conflicting parameters were also found using hypothesis testing. Although the study was conducted in the context of Bangladesh, the analysis procedure is well applicable to other countries.

Originality/value – The study proved that the hierarchical nature of satisfaction can well be analyzed using the powerful tool of SERVQUAL. The dependence of customer satisfaction on service quality has been assumed to be a function of market segmentation and customer perception. This result can guide many of the future research works in further analysis of complex nature of service quality and customer satisfaction.

Keywords: Customer satisfaction, Service quality, Hypothesis testing ANOVA

1. INTRODUCTION

The US-based Agency for Healthcare Research and Quality (AHRQ) defined healthcare quality as – “Healthcare that is accessible, effective, safe, accountable and fair is quality healthcare”. For the patient, this means that they can obtain care in a timely manner, receive accurate and understandable information about risks and benefits, and remain protected from unsafe implications.

However, accessibility to the service is largely dependent on societal as well as country's economic and communication structures. This may include availability and distance of healthcare centers nearby, physical communication, fee structures, client-service provider-facilities ratio, etc. These are all society and culture dependent. Accountability is another important factor

which has high correlation with societal culture. Thus, it is logical to state that perception of healthcare quality and related customer satisfaction may widely differ between countries. Research reports reveal that too [Rabbani et al 2009]. In the context of Bangladesh, some more factors add to these general accessibility factors, two most important being – presence of intermediaries in the process of healthcare services, unscrupulous hospital management. On the other hand, accountability in healthcare service in Bangladesh has been the main concern. Total absence of accountability coupled with highly weak management has created high obstacle towards development of an effective healthcare system. Safety is alarmingly absent too. Thus, as per AHRQ definition of quality healthcare, Bangladesh has to do a lot in this sector, as this is the weakest sector in Bangladesh [Andaleeb 2000, Mahdy 2009].

When customer satisfaction is considered, the poor quality of healthcare services has been a persistent concern not only in Bangladesh, but in many other similar countries. What is intolerable is the lack of supervision and accountability. If corrupt practices are added to the list, it is not difficult to imagine the predicament of patients.

This paper aims at defining the healthcare quality, measuring the quality & service level and customer satisfaction in the context of Bangladesh. The study was conducted at two very big hospitals in Bangladesh.

2. LITERATURE REVIEW

Healthcare quality and customer satisfaction has been a major research issue over the decade. Customer satisfaction has been measured by different researchers under varied environment. As environment varies, desires of customers and the perception of satisfaction vary. As a result, a major issue is to define the complex nature of customer satisfaction under varied environment. On the other hand, a compromising trade-off is required in operational cost in the wake of increase in cost to uplift service quality. A host of researchers addressed the issue from different points of views under varied background [Badri et al. 2009, Larsson and Larsson 2010, Naidu 2009].

The issue of customer satisfaction was triggered when Total Quality Management (TQM) has shown significant benefits in business organizations. Later on, application of TQM became an important research issue especially in two sectors – education and healthcare. Since the definitions of the elements of TQM are suitable for and directly applicable to business organizations, the main issue of application of TQM in these two sectors was initially centered on how to map these definitions to the largely different types of activities of educational and healthcare organizations [Rashid and Jusoff 2009]. Now that this mapping is quite known, there are several examples of successful implementations of Continuous Improvement techniques of TQM in healthcare organizations [Hasin et al. 2001].

Organizational culture is a determinant for quality improvement. Because, the perception of quality and the factors creating dissatisfaction are outgrowth of societal culture, norms and values, as well as strength of prevailing healthcare administration system in that society [Rabhani et al. 2009]. As a result, patterns and approach of implementation of TQM tools and techniques will certainly differ from country to country.

While applications of TQM tools and techniques in health care service industry are widely advocated, determination of customer satisfaction and factors of dissatisfaction in the hospitals has become enormously important as the main ingredient of TQM. The standard TQM approach suggests that, the first step to TQM

implementation should be measurement of customer requirements and subsequently design the healthcare system accordingly. This is advocated in Quality Function Deployment too. Research reveals that this standard technique has been successfully followed in implementing selected tools of TQM in the hospitals [Hasin et al. 2001].

As there are several tools and techniques of TQM to serve different purposes of overall improvement effort, it is a matter of judgment as to which tools can be implemented step-by-step. Several examples and reports reveal that there are examples of implementations of individual qualitative tools of TQM, as well as statistical quality control, in healthcare organizations [Canel 2010].

Statistical quality control and econometric techniques, such as Taguchi loss function and Data Envelopment Analysis (DEA) have been applied to calculate the diagnostic efficiency in medical applications. This method reflected the diversity of inputs and outputs by incorporating the stepwise application of sensitivity, specificity, leveling threshold, and efficiency score [Taner¹ and Sezen 2009]. On another occasion, the principles of Six Sigma have been applied to the high turnover problem of doctors in medical emergency services and paramedic backup. Six Sigma's define -measure - analyze - improve - control (DMAIC) has been applied for reducing the turnover rate of doctors in an organization operating in emergency services. Variables of the model were determined. Explanatory factor analysis, multiple regression, analysis of variance (ANOVA) and Gage R&R were employed for the analysis [Taner² and Sezen 2009].

Badri et al. [Badri et al. 2009] have presented a comprehensive structural equation based service quality and patient satisfaction model taking into account the patient's condition before and after discharge. The structural equation modeling representation provided a comprehensive picture that allows healthcare constructs and patient satisfaction causality to be tested. The goodness-of-fit statistics supported the healthcare quality-patient status-satisfaction model.

In any improvement effort, it has to be remembered that the customer is the sole reason why organizations exist. Consumer surveys are used worldwide as service and quality of care improvement tools by all types of service providers including health service providers. Several researchers critically appraised the value of consumer surveys as service improvement tools in health services tool and its future applications. Consumer surveys seem impressive tools as they provide the customer a voice for change or modification. However, from a scientific point-of-view their credibility in service improvement in terms of reproducibility, reliability and validity, has remained debatable. Nevertheless, on many occasions, the information were obtained through structured

questionnaire and subsequently analyzed using statistical measures, such as goodness-of-fit test, t-test, chi-square-test, F-test, correlation test, etc., a conclusion was reached. As per standard statistical analysis, these conclusions were verified for validity using hypothesis testing [Hasin et al. 2001, Vinagre and Neves, 2010].

Service quality, as the single most important factor for customer satisfaction, has been addressed by several researchers under varied environment. Variation in environment will need difference in approach to implementation of right technique. These research works discussed several service quality dimensions and service quality problems in order to provide a more holistic conception of hospital service quality. The summary of all researchers reveal that service quality in health care is very complex as compared to other services because this sector highly involves risk. As such, analysis and improvement approaches need to be customized depending upon many factors, including culture [Narang 2010, Rabbani 2009].

As far as service quality improvement is concerned, organizational efficiency of the hospitals must improve. This requires that the performances of individual activities and overall organizational system as a whole have to be addressed using operations management techniques. Successful applications of such techniques to improve organizational performances have been reported. It must be noted that customer satisfaction has a strong correlation with organizational performance. Healthcare service quality is a natural outgrowth of organizational performance.

Necessity of application of operations management tools and techniques to improve organizational performance in turn necessitates the role of system engineers (Industrial Engineering as a discipline). Systems engineers have worked in the service and manufacturing sectors for quite some time. Omachonu and Einspruch [Omachonu, V. K. and Einspruch 2007] have drawn attention to the growing importance and complexity of the healthcare industry, and specifically the role of systems engineering in it. Finally, they examined how the concepts of systems engineering can be utilized in conjunction with emerging information technologies (ICT) in the healthcare industry [Cabral et al 2007]. Because the issues facing healthcare organizations are complex and multi-functional, the ability to evaluate problems across functions and disciplines is increasingly becoming critical.

Several researchers analyzed the healthcare delivery processes, identified their strengths and weaknesses, and suggested improvement in service system using different techniques [Dey and Hariharan 2008, Krupka et al. 2008].

Persona et al. [Persona et al. 2008] addressed the issue of smooth supply chain system for better performance of hospital. They addressed the issue of inventory stock management system using just-in-time (JIT) and Kanban tools. This research dealt with the

design and experimentation of innovative automatic supply models, such as the JIT system, as applied to ward materials. The first application of the proposed procedure was implemented in the City Hospital of Padua. The second application was carried out in the Religious Hospital of Turin, where the implementation of the Kanban method has a particular development.

However, improvement in healthcare system requires the system to change. There is enormous opposition to any change in the current practices. This resistance to change in healthcare system is much more severe than in any other system. The continuous introduction of new healthcare technologies, as well as the proliferation of new processes that guarantee better treatment and care of patients, suggests that the pace of continuous change the healthcare environment needs to be accelerated. Traditional history shows that healthcare professionals are more resistive to reform, and thus, less dynamic too. Nevertheless, this change is required to ensure improvement [Landaeta 2008].

In the backdrop of weak management in the healthcare organizations of Bangladesh, there is a major necessity for reforming the outdated healthcare system that has not changed since its independence in 1971. Among many attributes to weak management, lack of up-to-date knowledge on modern organizational management and quality systems is one. This creates in high degree of dissatisfaction, and as a result, recommendations for reform are highly suggested [Andaleeb 2000, Mahdy 2009].

3. QUESTIONNAIRE DEVELOPMENT AND DATA COLLECTION

Three sets of questionnaire were developed: 1) for measuring service quality using SERVQUAL [Andaleeb 2000], 2) for measuring external customer satisfaction, and 3) for measuring employee satisfaction. It must be noted that employees of an organization are considered as "Internal customers" for the organization. Because employee satisfaction or dissatisfaction largely influence the service quality of the organization. As such, employee satisfaction is highly related to organizational service quality [Hasin 2007].

1) SERVQUAL Questionnaire – The questionnaire for measuring service quality contained 20 questions, rated in a 7.0 point Likert scale [where point 0 indicates "strongly disagree", point 7 indicates "strongly agree"]. The 20 questions are sub-grouped into five dimensions: Tangibles (4 questions), Reliability (4 questions), Responsiveness (4 questions), Assurance (4 questions) and Empathy (4 questions). Some sample questions are:

- i) If the hospital promises to do something by a certain time, they do so
- ii) The personnel help in building patients' confidence

- iii) The hospital understands patients' specific needs, etc.
- 2) Measuring external customer satisfaction – The questionnaire contained 50 questions, grouped in 6 sub-groups, as follows:
 - a) Basic information regarding clients (patients) – This subgroup contained 12 questions, such as – Profession, age group, income level, number of visits to the hospital, how the name of the hospital was known, etc.
 - b) Consultants' care – This subgroup contained 10 questions, rated in a 5.0 point Likert scale, such as – The doctor gives explanations about treatment, the doctor pays good attention to the patient, the doctor is interested to listen to the patient and his/her accompanied relatives, etc.
 - c) Nursing care – This subgroup contained 9 questions, rated in a 5.0 point Likert scale, such as – The nurses are accommodative, the nurses are caring, the nurses are well behaved, the nurses have expertise, etc.
 - d) Supporting staff – This subgroup contained 5 questions, rated in a 5.0 point Likert scale, such as – The staffs are available in need, they are well behaved, etc.
 - e) Infrastructure and maintenance – This subgroup contained 7 questions, rated in a 5.0 point Likert scale, such as – The hospital space is sufficient for good medical service, the whole area is clean and hygienic, etc.

- f) Hospital management (admission, accounts, reception, etc.) – This subgroup contained 7 questions, rated in a 5.0 point Likert scale, such as – The management is cooperative, fees are logically acceptable, procedures are simple, etc.
- 3) Measuring employee satisfaction – The questionnaire contained 20 questions, some are basic (e.g. education level, years of experience, type of responsibilities, salary and benefits, etc.); some are rated in a 5.0 point Likert scale (e.g. immediate supervisor's attitude towards subordinates, autonomy, etc.).

Data and information were collected from 320 patients or their accompanying relatives (both IPD and OPD), 30 doctors, 52 nursing and other staffs.

4. OVERALL SERVICE QUALITY: SERVQUAL ANALYSIS

The SERVQUAL is a simple, but a very powerful measuring tool [Andaleeb 2000]. The SERVQUAL score is the gap between scores against *Perception* and *Expectation*. 'Perception' score is the rating that the customer gives to the service attributes of a hypothetical "Ideal" hospital, where as 'Expectation' score is the rating that the customer gives to the same service attributes regarding what (s)he actually gets from the hospital under consideration. Thus, there are 20 pairs of questions for each customer. The difference in a pair reveals the gap between perception and expectation.

Table 1: Mean SERVQUAL scores and weights.

Service Quality Dimension	Question No.	Normalized weights (100 scale)	Perception score (1)	Expectation score (2)	SERVQUAL Score (1) – (2)	Mean score
Tangibles	1	15	5	4	1	1.5
	2		6	4	2	
	3		7	5	2	
	4		5	4	1	
Reliability	5	20	6	5	1	1.75
	6		7	5	2	
	7		6	4	2	
Respon-siveness	8	20	7	5	2	1.75
	9		6	6	0	
	10		7	5	2	
	11		7	4	3	
Assurance	12	15	7	5	2	1.5
	13		6	5	1	
	14		7	5	2	
	15		6	5	1	
Empathy	16	30	7	5	2	2.5
	17		6	4	2	
	18		6	4	2	
	19		6	3	3	
	20		7	4	3	

The gap for each pair of questions is computed, as in Table 1. It is to be noted that the scores are the nearest rounded-up values assigned by 320 patients. This gap is the SERVQUAL score. The mean of this

gap, i.e. mean SERVQUAL score for a service quality dimension is then obtained. Next, the weighted scores are computed from mean SERVQUAL score as in Table 2.

Table 2: Weighted SERVQUAL score.

Quality Dimensions	Mean Score	Normalized weights	Weighted scores
Tangibles	1.50	0.15	0.225
Reliability	1.75	0.20	0.350
Responsiveness	1.75	0.20	0.350
Assurance	1.50	0.15	0.225
Empathy	2.50	0.30	0.750
Total score			1.90

As the scores represent the gap between perceived quality and the quality the customers received, the higher the score the poorer the service quality.

5. CUSTOMER SATISFACTION

The functional service quality measures the service quality individually for each functional areas of a hospital. The five functional areas selected were: consultant (doctor) service, nursing service, infrastructure and maintenance, support staff service, overall management.

The information was collected based on a 5 point Likert scale. This score was then weighted against number of days spent in the hospital. Because, the logical assumption was: the longer a patient stays, the better the ability to judge quality. Those patients were included in this study who spent at least 3 days in the hospital. There were 120 patients in this category. The score given by one customer for one question in functional area is converted to weighted score for that functional area, which is termed as *Indicator* value for

that question in that functional area. The Cumulative Indicator Average (CIA) is the average weighted score [Equation 1]. The performance of the functional area is then calculated by dividing this CIA value by perceived (target) value for that issue. This is known as Indicator Performance Factor (IPF) [Equation 2].

$$CIA = \frac{\sum_{i=1}^n w_i s_i}{\sum_{i=1}^n w_i} \tag{1}$$

where, i = number of patients (maximum n)
s = score; w = weight

$$IPF = \left(\frac{CIA}{PV} \right) \times 100\%; \tag{2}$$

where PV is the perceived value (target value)

The weights are assumed to be proportions of number of days spent as follows

Days spent	3-4 days	5-7 days	8 days or more
Weight	0.8	0.9	1.0

Table 3: Sample calculation of Indicator value.

Functional area : Consultant (doctor)

Question number: 3; Perceived value is measured in a scale of 5 point.

	Patient Number (i)										Total value
	1	2	3	4	5	6	7	8	9	10	
Score (s _i)	4	4	3	4	3	4	5	4	4	3	38
Weight (w _i)	0.9	0.8	0.9	1.0	0.9	0.8	0.8	0.8	0.9	1.0	8.8
Weighted score	3.6	3.2	2.7	4.0	2.7	3.2	4.0	3.2	3.6	3.0	33.2
PV	5	5	5	5	4	5	5	5	5	4	48

Average PV = 4.8

$$\text{Thee CIA value} = \frac{33.2}{8.8} = 3.77; \quad IPF = \left(\frac{3.77}{4.8} \right) \times 100 = 0.79$$

This means that the customer is only 79% satisfied against only one question in the category of doctor's

service, which is considerably low. As this functional area has 10 questions, this calculation was done individually for all questions, and then a Cumulative CIA value (CCIA) and a Cumulative IPF value (CIPF) were obtained.

The summary of CCIA and CIPF values for 120 IPD patients against 20 questions for 5 functional areas

are tabled below (Table 4). Those who stayed in the hospital for minimum 3 days through In-Patient Department (IPD) were considered in this study.

The summary of CCIA and CIPF values for 5 service areas are given in Table 4.

Table 4: CCIA and CIPF or five functional areas.

Functional areas	CCIA	CIPF (%)	SIW
Consultant	3.76	78	0.30
Nursing	3.52	69	0.25
Infrastructure	3.80	80	0.20
Support Staff	3.70	74	0.15
Management	3.67	72	0.10

The overall satisfaction for all five areas together is the weighted value of the above CIPF values for individual areas. Overall Customer Satisfaction (OCS) is computed as follows:

$$OCS = (CIPF_C \times SIW_C) + (CIPF_N \times SIW_N) + (CIPF_I \times SIW_I) + (CIPF_S \times SIW_S) + (CIPF_M \times SIW_M) = 74.95\%$$

where, subscripts indicate functional areas.

This overall customer satisfaction value is quite low, since healthcare is a very sensitive service, compared to many other service areas of the society.

6. HYPOTHESIS TESTING

The overall satisfaction of customers may have some kind and level of relationships with some social parameters. In fact, three questions in the questionnaire included those parameters, which are age group, income level, and education level. The above analysis was based on all people surveyed. The same analysis was carried out again for different values of these three social parameters, in order to identify if there exists a relationship with satisfaction level and parameters. For instance, there may be a relationship of satisfaction level with income level. In order to verify that, hypothesis testing was done with one-way ANOVA, for different income levels and satisfaction levels [Lind et al. 2001]. As an example, a hypothesis testing is shown below for income groups. It is to be noted that Taka is

the local currency, where 1 US \$ = 69 Taka, as of date 8 March 2010. To have a good understanding about the income level, it is additionally important to note that 1 Kg of rice costs about 22 Taka in the capital city of Dhaka.

Table 5: Income group segmentation

Income group	Income level (Taka/month)
Group 1	< 10,000
Group 2	10,001-15,000
Group 3	15001-20,000
Group 4	20,001 above

The hypothesis testing was carried out in terms of mean value of satisfaction for each income group.

$$H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4$$

$$H_1 : \text{Not all } \mu \text{ are equal}$$

The CCIA values for 120 patients are grouped into four. Thus degrees of freedom $k=4, n= 120$ [Lind et al. 2001]. For instance, arrangement of X values (i.e. CCIA) for the first 30 patients are shown in Table 6. A sample calculation is also shown in Table 8, with these 30 CCIA values.

Table 6. Input Data (CCIA) Table for ANOVA

Group 1	Group 2	Group 3	Group 4
3.680	3.837	3.570	3.732
3.658	3.767	3.585	3.713
3.817	3.777	3.654	3.656
3.782	3.604	3.544	3.605
	3.827	3.566	3.366
	3.649	3.609	3.444
	3.662	3.580	
	3.799	3.455	
	3.796		
	3.559		
	3.733		
	3.693		

The standard one-way ANOVA Table (Table 7) and related equation sets are described below [Lind et al. 2001].

Table 7: One-way standard ANOVA Table.

Sources of Variation	Sum of squares	Degree of freedom	Mean square	F _{calc}
Groups/treatments	SST	k-1	SST/(k-1) = MST	MST/MSE
Error	SSE	n-k	SSE/(n-k) = MSE	

$$SS \text{ Total} = \sum x^2 - \frac{(\sum x)^2}{n} \text{ and } SST = \sum \left(\frac{T_c^2}{n_c} \right) - \frac{(\sum x)^2}{n} \tag{4}$$

The final ANOVA yielded the following results (Table 8).

Table 8: One-way standard ANOVA Table.

Sources of Variation	Sum of squares	Degree of freedom	Mean square	F _{calc}
Groups/treatments	0.170041	3	0.05668047	20.217
Error	0.072893	26	0.00280359	

Since F_{calc} (20.217) is much greater than F_{crit} (2.98, as obtained from standard statistical table), the null hypothesis is rejected and the alternative hypothesis is accepted. This means that there is strong relation between level of satisfaction and income.

Similar analyses were done for age group and education level also. The following results were obtained (Table 9).

Table 9: Relationship of parameters

Social parameters	Relationship	Strong or weak relation	Nature of relationship
Income level	Yes	Strong	Satisfaction level went down for higher income
Age	Yes	Weak	Older customers have marginally higher satisfaction
Education level	Yes	Moderate	Satisfaction level went down for higher educated people

7. CONCLUSION

Customer satisfaction and overall service quality are two important determinants of a healthcare service center. In majority of the cases, these two are highly related, but not the same as quality measures. Being a sensitive and critical service provider, it is important to note that a satisfaction level of 79% is not satisfactory,

although it may be satisfactory for an educational institute. Whatever improvement effort is taken, those must be customer-oriented, i.e. the patients and their accompanying relatives. Collection of information from a critically ill patient or their relatives is not easy. There is a high possibility to believe that satisfaction level of a critically ill patient may widely vary between two situations: if cured and if failed to cure. This may be tested using hypothesis testing in future research.

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