Analysis of Service Quality of Hospitals- A Case Study of Kolkata, West Bengal, India

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Abstract: *The aim of this paper is to identify the level of service quality in some randomly selected hospitals in Kolkata, West Bengal, India. Consumers' perceptions and expectations towards various parameters of service quality can differ and the degree of discrepancy between perception and expectation helps in analyzing service quality. For capturing responses of various consumers towards service quality in hospitals a 22-question (item) SERVQUAL scale measuring five basic dimensions i.e., Tangibles, Reliability, Responsiveness, Assurance and Empathy of service quality was used. Population for the study consisted of patients and visitors of few hospitals in Kolkata. Categorization of Hospitals in Kolkata is : (A)Private Super-Speciality Hospitals, (B)Government Medical Colleges as well as Hospitals, (C)Private General Hospitals.15 hospitals (5 hospitals from each category) were randomly selected. 10 customers were chosen on convenience and judgement basis from each of the selected hospitals and were asked to fill the questionnaire. In all 150 customers were surveyed. It was found that the hospitals of category 'A' were performing as per customers' expectations whereas the hospitals of other two categories were not fulfilling the expectations of the customers. Whether the three categories were different or not in terms of service quality was checked for its significance through Analysis of Variance (ANOVA) Technique. There was a significant difference in three categories for empathy. No significant difference was found in other dimensions. On the whole the industry did not match the expectations of customers.*
Keywords: *Service Quality, SERVQUAL, ANOVA*

I.Introduction

All service organizations try and provide the best possible and high quality services to their customers but still they very often fall short of the customers' expectations since the customers have become more aware of their requirements and demand higher standards of services. Their perceptions and expectations are continually evolving, making it difficult for the service providers to measure and manage the services effectively. The concept of service quality has been explored by many researchers but due to its elusive, indistinct and abstract nature it had been difficult to delimit and measure it. As a result only a handful of researchers have operationalized the concept like Gronroos in 1984, Parasuraman, Zeithaml and Berry in 1988, Brown and Swartz in 1989, Carman in 1990 and Cronin and Taylor in 1992. Service quality in its simplest form is a product of the effort that every member of the organization invests in satisfying its customers. It also refers to the delivery of excellent or superior service relative to customer expectations. Zeithaml et al in 1988 defined service quality as the degree and direction of discrepancy between consumers' perceptions and expectations in terms of different but relatively important dimensions of service quality, which can affect their future behavior. Parasuraman, Zeithaml and Berry's (1988) conceptualization of five dimensions: tangibles, reliability, responsiveness, assurance and empathy, eventually led to the development of SERVQUAL, a model for measuring service quality.

Servqual

SERVQUAL is a service quality assessment tool. Since the development of SERVQUAL, it is the most favoured instrument for measuring service quality (Robinson, 1999). Parasuraman et al (1988) concluded that consumers perceive quality by comparing expectations to performance and evaluate the quality of the service in different dimensions. A 22-question (item) scale measuring five basic dimensions was developed:

Tangibles: The appearance of the physical facilities, equipment, communication material and personnel.
Reliability: The ability to perform a promised service dependably and accurately.
Responsiveness: The willingness to help customers and to provide prompt services.
Assurance: The knowledge and courtesy of employees and their ability to inspire trust and confidence in the customers.
Empathy: The caring, individualized attention a firm provides its customers.

SERVQUAL has been widely used by the researchers in a variety of industrial and commercial settings like tyre retailing (Carman, 1990), Hotels (Saleh and Ryan, 1992), travel and tourism (Fick and Ritchie, 1991), car-servicing (Bouman and Van der Wiele, 1992), business schools (Rigotti and Pitt, 1992), information

services (Pitt et al, 1995), higher education (McElwee and Redman, 1993), health care applications (Babakus and Mangold, 1992) and many more. The present study examines the research problem i.e. the quality of services offered by hospitals in Kolkata by using SERVQUAL.

II.Review of Literature
Hospitality services are a harmonious mixture of three elements- material products, behaviour and attitude of employees and the environment (Reuland et al, 1985)

Service quality in hospital sector
The main purpose of the SERVQUAL is to measure the result of patients' expectation and perception regarding on particular service sector (Haque, Sarwar, Yasmin, & Nuruzzaman, 2012). Many researchers have applied SERVQUAL to assess perceived service quality in the hospital sector in different countries (AI-Hawary, 2012; Zarei et al., 2012; Butt & Run, 2010; Suki, Lian, & Suki, 2011; Norazah, Jennifer, & Norbayah, 2011; Irfan & Ijaz, 2011; Ahmed & Samreen, 2011; Brahmbahtt, Baser, & Joshi, 2011; Haque et al., 2012). AI-Hawary (2012) studied health care service quality of private hospitals in Jordan and Saudi Arabia and found that tangibles and accessibility were better provided in Saudi Arabia hospitals. Ramez (2012) found that patients rated the reliability dimension most important, the assurance dimension least important. The study also reported a significant relationship between service quality and overall satisfaction with the service. Abu-Kharmeh (2012) found that among the service quality dimensions, responsiveness, assurance, tangibles, empathy, and reliability were ranked in order of importance respectively. In another study, tangibles were found to be perceived better in the hospitals in Jordan. Zarei et al. (2012) studied service quality in private hospitals of Iran, evaluating the service quality from the patients. They found that the highest expectations and perceptions were related to the tangibles dimension and the lowest expectation and perception related to the empathy dimension. Butt and Run (2010) found that the highest and lowest expectations and perceptions gap of service quality was reported in the tangibles dimension as it relates to the physical delivery of care at private hospitals in Malaysia.

III.Research Methodology
The research design of the study is exploratory in nature. The target population consists of the customers of some hospitals in Kolkata. All the hospitals in Kolkata were categorized into (A) Private Super-Speciality Hospitals,(B) Government Medical Colleges as well as Hospitals, (C) Private General Hospitals. A total of 5 hospitals from each category were selected based on random sampling. So a total of 15 hospitals were selected. They were coded :(A) Private Super-Speciality Hospitals- as A1,A2,A3,A4,A5, (B) Government Medical Colleges as well as Hospitals-as B1,B2,B3,B4,B5, (C) Private General Hospitals-as C1,C2,C3,C4,C5. Out of all the selected hospitals in each category ten customers from every hospital i.e., 150 customers in all were selected on the basis of convenience and judgement sampling.

Primary data was collected using the structured and non-disguised questionnaire which was administered personally and respondents were asked to fill the questionnaire on the tangibility, reliability, responsiveness, assurance and empathy parameters. The statements in the model were adapted as per the hospital industry. The respondents were first asked to give weightage to the service quality dimensions like tangibility, reliability, responsiveness, assurance and empathy based on how important each of these factors was to them. The total score of these weights must add up to 100. Then respondents were asked to mark their expectations and perceptions on a 7 point scale ranging from Low i.e. 1 to High i.e. 7. Service quality gap as well as the weighted SERVQUAL score for all dimensions for each of the 15 hospitals was calculated. Then overall service quality gap and weighted service quality score for all the dimensions in case of all the categories of hospitals was drawn followed by the overall SERVQUAL score for the hospital industry in Kolkata.

Further the inter category analysis was carried out to see whether the results were significant or not. A one-way ANOVA as given below was applied. The various statistical tools that were used on the data were mean, weighted mean and one-way analysis of variance(ANOVA).

ANOVA table for one way classification

Sources of variation	SS (sum of squares)	Degree of freedom	MS (mean square)	Variance ratio of F
Between samples	SSC	v1 = c-1	MSC= SSC/(c-1)	MSC/MSE
Within samples	SSE	v2 = n-c	MSE=SSE/(n-c)	
Total	SST	n-1		

Where, SST = Total sum of squares of variations SSC = Sum of squares between samples (columns) SSE = Sum of squares within samples (rows) MSC= Mean sum of squares between samples MSE= Mean sum of squares within samples

IV. Findings and Conclusion of the Study

The findings of the study have been divided into three sections- first section deals with the relative importance of service quality dimensions for various categories of hospitals, second section assesses service quality gap among three categories of hospitals through SERVQUAL and third section deals with inter-category analysis of various variables.

I. Relative importance of service quality dimensions for various categories of hospitals

The customers were explained the five service quality dimensions and were asked to assign relative importance to each of them. This helped the researcher to know which dimension is relatively more important to the customers as compared to the other dimensions and also helped in calculating the weighted service quality score.

Table 1					
Relative importance of service quality dimensions for categories : (A)Private Super-Speciality Hospitals, (B)Government Medical Colleges as well as Hospitals, (C)Private General Hospitals					
(A) Private Super-Speciality Hospitals (N = 50)					
Service quality dimensions	A1	A2	A3	A4	A5	Overall
Tangibles	22.5	18.5	18	21	19.5	19.9
Reliability	24	24	24.3	25	25.5	24.6
Responsiveness	20.7	23.5	21.5	22.5	19	21.44
Assurance	15	15.5	18	14.5	16.5	15.9
Empathy	16.8	18.5	18.2	17	19.5	18
Total	100	100	100	100	100	100

(B) Government Medical Colleges as well as Hospitals (N=50)					
Service quality dimensions	B1	B2	B3	B4	B5	Overall
Tangibles	20.5	26.5	26.5	28.2	28.0	25.94
Reliability	24.5	24	23.0	23.0	20.0	22.90
Responsiveness	18.8	18.5	19.5	19.0	19.5	19.06
Assurance	18.5	14	14.5	13.0	15.0	15.00
Empathy	17.7	17	16.5	17.5	17.5	17.24
Total	100	100	100	100	100	100

(C) Private General Hospitals (N=50)					
Service quality dimensions	C1	C2	C3	C4	C5	Overall
Tangibles	23.9	19.8	19	19	19	20.14
Reliability	23.5	25.2	23.5	23	23.4	23.68
Responsiveness	20	20.5	19	21.5	22.2	20.64
Assurance	15	16	17.5	16.5	15.2	16.04
Empathy	17.6	18.5	21	19	21.2	19.46
Total	100	100	100	100	100	100

In the following table the results of the three categories of hospitals with respect to the five dimensions have been compiled and the overall relative importance of each dimension has been found.

Table 2				
Inter category comparison in terms of relative importance and overall relative importance for all the fifteen hospitals (N=150)				
Dimension	Category			
	(A) Private Super-Speciality Hospitals	(B) Government Medical Colleges as well as Hospitals	(C) Private General Hospitals	Overall
Tangibles	19.9	25.94	20.14	21.9
Reliability	24.6	22.9	23.68	23.72
Responsiveness	21.44	19.06	20.64	20.38
Assurance	15.9	15	16.04	15.64
Empathy	18	17.24	19.46	18.23
Total	100	100	100	100

If we compare the categories of hospitals for the relative importance of service quality dimensions, we find that in case of the first dimension i.e. tangibles, the B category hospitals have a higher score (25.94), in case of reliability (24.6) and responsiveness (21.44) A category hospitals have higher score and for assurance (16.04) and empathy (19.46) C category hospitals have higher score. This shows that the customers of the B category hospitals give greater preference to the physical appearance of the hospitals like the premises, equipment, material, appearance of personnel, taste of the food, cleanliness, comfort, communication services as compared to the customers of the A and C category hospitals.

Except tangibles the difference in the overall scores of the three categories for the four dimensions is very less. For the entire hospital industry in Kolkata the most important service quality dimension is reliability, followed by tangibles, responsiveness and empathy and the least important dimension is assurance.

II. Assessment of service quality gap among three categories of hospitals using SERVQUAL

This section discusses the service quality gap for service quality dimensions for all the three categories of hospitals. After calculating the service quality gap for each hospital in a category, the service quality gap for the category itself was calculated by taking an average of the sum of the gaps for five hospitals in a category. Positive gap indicates that perception is more than the expectation and the negative gap indicates that perception is less than the expectations.

Table 3										
Service quality gap and weighted service quality score for (A)Private Super-Speciality Hospitals										
Service Quality Dimensions	Expectation (E)					Perception (P)				
	A1	A2	A3	A4	A5	A1	A2	A3	A4	A5
Tangibles	6.18	5.96	5.49	6.61	6.46	6.63	6.15	5.55	6.8	6.65
Reliability	6.10	6.22	5.48	6.52	6.32	6.38	6.4	5.42	6.78	6.58
Responsiveness	5.70	6.23	5.37	6.43	6.4	6.03	6.43	5.4	6.77	6.63
Assurance	5.63	6	5.3	6.47	6.33	5.93	6.47	5.67	6.73	6.47
Empathy	5.65	5.9	5.23	6.48	6.43	6.05	6.1	5.7	6.7	6.65
Overall	6.09	6.06	5.37	6.5	6.39	5.08	6.31	5.55	6.76	6.6

Service Quality Dimensions	Service Quality Gap (P-E)					Weights(%)				
	A1	A2	A3	A4	A5	A1	A2	A3	A4	A5
Tangibles	0.45	0.19	0.06	0.19	0.19	22.5	18.5	18	21	19.5
Reliability	0.28	0.18	-0.06	0.26	0.26	24.	24	24.3	25	25.5
Responsiveness	0.33	0.20	0.03	0.34	0.23	20.7	23.5	21.5	22.5	19
Assurance	0.30	0.47	0.37	0.26	0.14	15	15.5	18	14.5	16.5
Empathy	0.40	0.20	0.47	0.22	0.22	16.8	18.5	18.2	17	19.5
Overall	-1.01	0.25	0.18	0.26	0.21	100	100	100	100	100

Service Quality Dimensions	Weighted SERVQUAL score				
	A1	A2	A3	A4	A5
Tangibles	0.10	0.04	0.01	0.04	0.04
Reliability	0.07	0.04	-0.01	0.07	0.07
Responsiveness	0.07	0.05	0.01	0.08	0.04
Assurance	0.05	0.07	0.07	0.04	0.02
Empathy	0.07	0.04	0.09	0.04	0.04
Overall	-1.01	0.25	0.18	0.26	0.21

Table 4										
Service quality gap and weighted service quality score for (B)Government Medical Colleges as well as Hospitals										
Service Quality Dimensions	Expectation (E)					Perception (P)				
	B1	B2	B3	B4	B5	B1	B2	B3	B4	B5
Tangibles	5.94	5.24	5.18	4.88	5.31	6.06	5.55	3.98	3.89	4.3
Reliability	6.02	5.5	5.64	4.92	5.1	5.98	5.8	4.82	4.24	4.5
Responsiveness	5.83	5.2	5.8	5.13	5.17	5.67	5.8	4.33	3.6	4.13
Assurance	5.93	5.23	5.2	4.83	5	5.83	5.5	4.5	4	4
Empathy	5.68	5.1	5.3	4.95	5.05	5.6	5.48	4.43	3.8	3.93
Overall	5.88	5.25	5.42	4.94	5.13	5.83	5.63	4.41	3.91	4.17

Service Quality Dimensions	Service Quality Gap (P-E)					Weights(%)				
	B1	B2	B3	B4	B5	B1	B2	B3	B4	B5
Tangibles	0.12	0.31	-1.20	-0.99	-1.01	20.5	26.5	26.5	28.2	28
Reliability	-0.04	0.30	-0.82	-0.68	-0.60	24.5	24	23	23	20
Responsiveness	-0.16	0.60	-1.47	-1.53	-1.04	18.8	18.5	19.5	19	19.5
Assurance	-0.10	0.27	-0.70	-0.83	-1.00	18.5	14	14.5	13	15
Empathy	-0.08	0.38	-0.87	-1.15	-1.12	17.7	17	16.5	17.5	17.5
Overall	-0.05	0.38	-1.01	-1.03	-0.96	100	100	100	100	100

Service Quality Dimensions	Weighted SERVQUAL score				
	B1	B2	B3	B4	B5
Tangibles	0.02	0.08	-0.32	-0.28	-0.28
Reliability	-0.01	0.07	-0.19	-0.16	-0.12
Responsiveness	-0.03	0.11	-0.29	-0.29	-0.20
Assurance	-0.02	0.04	-0.10	-0.11	-0.15
Empathy	-0.01	0.06	-0.14	-0.20	-0.20
Overall	-0.05	0.38	-1.01	-1.03	-0.96

Table 5										
Service quality gap and weighted service quality score for (C)Private General Hospitals										
Service Quality Dimensions	Expectation (E)					Perception (P)				
	C1	C2	C3	C4	C5	C1	C2	C3	C4	C5
Tangibles	4.75	5.7	5.54	4.86	4.21	4.09	4.25	4.41	4.9	4.21
Reliability	4.72	5.64	5.14	5.12	4.84	4.56	4.74	4.84	5.3	4.9
Responsiveness	4.67	5.63	5.2	4.77	4.63	4.43	4.4	4.17	5.17	4.83
Assurance	4.37	5.53	5	4.6	4.4	4.27	4.83	4.77	4.87	4.63
Empathy	4.53	5.45	5.03	4.75	4.88	4.38	4.35	4.3	4.9	5.13
Overall	4.44	5.6	4.82	4.82	4.54	4.35	4.51	4.5	5.03	4.74

Service Quality Dimensions	Service Quality Gap (P-E)					Weights(%)				
	C1	C2	C3	C4	C5	C1	C2	C3	C4	C5
Tangibles	-0.66	-1.45	-1.13	0.04	0.00	23.9	19.8	19	19	19
Reliability	-0.16	-0.90	-0.30	0.18	0.06	23.5	25.2	23.5	23	23.4
Responsiveness	-0.24	-1.23	-1.03	0.40	0.20	20	20.5	19	21.5	22.2
Assurance	-0.10	-0.70	-0.23	0.27	0.23	15	16	17.5	16.5	15.2
Empathy	-0.15	-1.10	-0.73	0.15	0.25	17.6	18.5	21	19	21.2
Overall	-0.09	-1.09	-0.32	0.21	0.20	100	100	100	100	100

Service Quality Dimensions	Weighted SERVQUAL score				
	C1	C2	C3	C4	C5
Tangibles	-0.16	-0.29	-0.21	0.01	0.00
Reliability	-0.04	-0.23	-0.07	0.04	0.01
Responsiveness	-0.05	-0.25	-0.20	0.09	0.04
Assurance	-0.02	-0.11	-0.04	0.04	0.03
Empathy	-0.03	-0.20	-0.15	0.03	0.05
Overall	-0.09	-1.09	-0.32	0.21	0.20

Table 6	
Overall SERVQUAL score for the hospital industry in Kolkata (N=150)	
Service quality dimension	Weighted service quality Score
Tangibles	-0.08
Reliability	-0.03
Responsiveness	-0.05
Assurance	-0.007
Empathy	-0.02
Om	

So from the above table we can say that the whole the industry did not match the expectations of customers.

<div align="center">V.Inter category analysis</div>

In order to know whether the difference in the results for the three categories is significant or not an inter-category analysis was conducted using one way analysis of variance with the null hypothesis (Ho) that there is no significant difference for the five service quality dimensions as well as for the overall weighted SERVQUAL score between the three categories and the alternative hypothesis (H1) that there is a significant difference for the five service quality dimensions as well as for the overall weighted SERVQUAL score between the three categories. The results for the various dimensions as well as for the overall SERVQUAL score have been shown below. The following table shows the variance ratio of F for various parameters of service quality. This will help us to know whether the difference between the categories for this dimension is significant or not.

<div align="center">Table 7
ANOVA table for attributes of service quality</div>

Source of Variation	Sum of squares	Degrees of freedom	Mean squares	Variance Ratio of F
Tangibles				
Between categories	0.122	2	0.056	3.111
Within categories	0.216	12	0.018	
Total	**0.328**	**14**		
Reliability				
Between categories	0.046	2	0.023	2.875
Within categories	0.097	12	0.008	
Total	**0.143**	**14**		
Responsiveness				
Between categories	0.089	2	0.045	2.5
Within categories	0.215	12	0.018	
Total	**0.304**	**14**		
Assurance				
Between categories	0.026	2	0.013	2.6
Within categories	0.066	12	0.005	
Total	**0.092**	**14**		
Empathy				
Between categories	0.092	2	0.046	5.111
Within categories	0.116	12	0.009	
Total	**0.208**	**14**		

The table value of F at (2, 12) degree of freedom and at 5% level of significance is 3.8853 which is greater than the calculated value of F for tangibles (3.111), reliability (2.875), responsiveness (2.5) and assurance (2.6) as shown in the table 7. Therefore the result is insignificant in other words it means that the difference in tangibles, reliability, responsiveness and assurance for the three categories of hospitals is insignificant. So H0 is accepted for these parameters.

The table value of F at (2, 12) degree of freedom and at 5% level of significance is 3.8853 which is less than the calculated value of F for empathy i.e. 5.11. This goes to show that the result is significant. So H1 is accepted. There is significant difference in empathy parameter between the three categories of hospitals.

The following table shows the variance ratio of F for the SERVQUAL score for the three categories. This will help us to know whether the difference between the three categories for the SERVQUAL score is significant or not.

<div align="center">Table 8
ANOVA table for overall SERVQUAL score</div>

Source of Variation	Sum of squares	Degrees of freedom	Mean squares	Variance Ratio of F
Between categories	**0.069**	**2**	**0.035**	**3.18**
Within categories	**0.126**	**12**	**0.011**	
Total	**0.195**	**14**		

The calculated value of F at (2, 12) degree of freedom and at 5% level of significance is 3.18 which is less than the table value which is 3.8853 thus showing that the results are insignificant. In other words the difference in the SERVQUAL score for the three categories of hospitals is not significant. Therefore we accept Ho. So from Tables 7 and 8 one can observe that there was a significant difference in three categories for empathy. No significant difference was found in other dimensions..

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