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RESEARCH ARTICLE

PATIENTS' ZONE OF TOLERANCE IN THE SERVICE PROCESS AND SERVICE QUALITY AT A MULTI-SPECIALTY HOSPITAL

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ABSTRACT

OBJECTIVE

The purpose of the study is to examine patients' Zone of Tolerance by measuring the gap between perceived and expected service quality and the waiting time to complete the service process during the provision of Master Health Checkups (MHC).

METHOD

Service Quality was tested by using a questionnaire among patients who underwent an MHC in a multi-speciality hospital, in Chennai, India. The observation checklist was used to measure the waiting time.

RESULTS

The F test results revealed that demographic factors may affect the zone of tolerance. The empathy of health care professionals may affect qualified and employed groups' Zone of Tolerance. The patients who were dissatisfied with time were satisfied and delighted with overall services.

CONCLUSION

Patients who come for MHC will have certain expectations. The mean score results indicate that patients are delighted with the empathy of healthcare professionals during the test procedure patients' weighting time was highlighted as the main problem of many patients, which needs to be fixed but the customer perceived opinion on overall services may compensate for the time issue. If healthcare professionals and management can adhere to patients' expectations, the organization will be able to satisfy them, and if they go above and beyond, they will be able to delight them.

KEYWORDS

hospital, master health checkup, service process, service quality, SERVQUAL, zone of tolerance.

INTRODUCTION

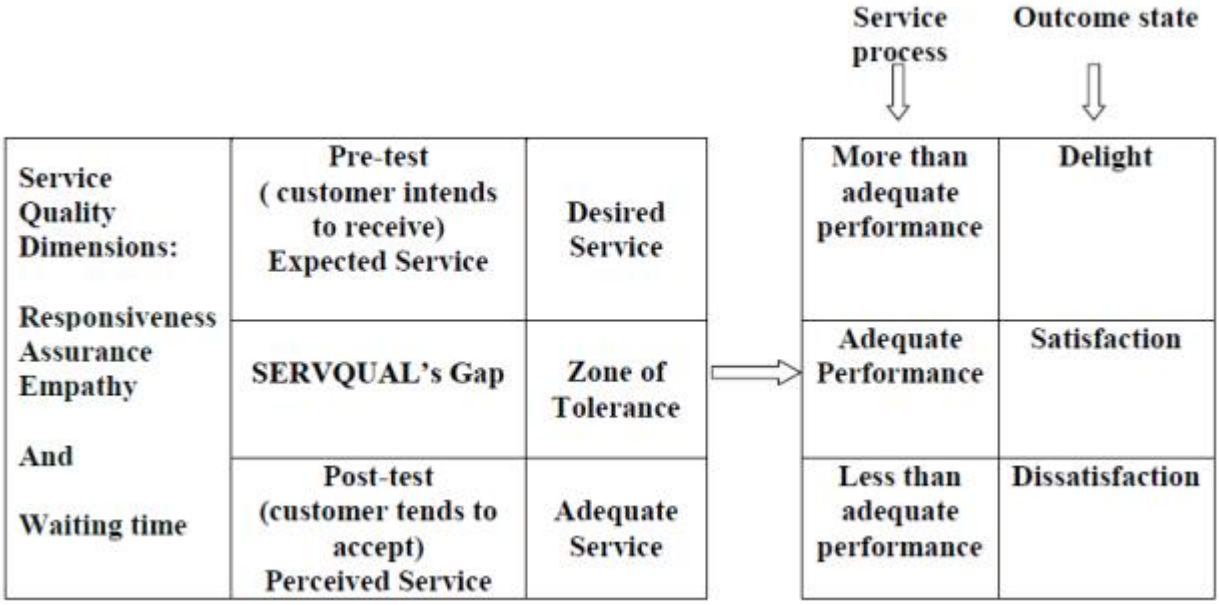
Everyone deserves a healthy mind and body. These days every individual has great concern for their health and is profoundly bothered about future health issues. The hospital in this study provides healthcare packages to get a comprehensive health check which include Master Health Check, Executive Health Check, Diabetic Package, Geriatric Health Check (above 60 years), Well Women Health Check, Executive Heart Check, Whole Body Health Check, Teenage Health Check and Pre-Employment Health Check of various diagnostics and tests with doctor consultation for a special price. A routine medical checkup plays a significant role in preventive health care and provides critical baseline data for future comparison in the event of the occurrence of a new disease. Medicines are constantly evolving, and newer and improved ones are constantly being introduced to the market. A Master Health Checkup (MHC) will aid in the detection of early symptoms of a chronic illness so that it can be treated appropriately with suitable medicine.

A multispecialty hospital, which is the single largest healthcare facility in Chennai, India and one of the largest in South Asia, which offers comprehensive healthcare packages to suit the varied needs of patients was chosen for the study. This study is to analyze the Zone of Tolerance of patients concerning the service process and service quality. It focused on functional quality. Functional quality deals with the manners of health care delivery to patients. [1] The Zone of Tolerance is based on the patient's view of service quality results by comparing their expectations before receiving service to their service experience itself. Zeithaml et al [2] recognized the existence of a Zone of Tolerance between desired service and adequate service The desired service refers to the expectation of the customers. Adequate service refers to the services that are received by the customer. The gap between the desired and adequate service will lead to a Zone of Tolerance. [3] If a patient's perceived services were matched by his/her expectations, then the customer is satisfied with the service. If the experience was better than expected, then perceived service quality is high and the outcome is a state of delight. If the experience did not meet expectations, then service quality is perceived to be poor, and the outcome is dissatisfactory. "An outcome which is neither dissatisfying nor delighting is, defined as being within the customer's outcome zone of tolerance". [4 p.4]

The Zone of Tolerance theory focuses on understanding and meeting customer service expectations by calculating the range between the desired level and the minimally acceptable level. [3] The highest expected service is what the consumer intends to receive and is referred to as the desired service. The degree of service that customers tend to accept is adequate service. [5] Perceived service is what the patient believes or perceives to have received from the hospital (after the service experience). SERVQUAL's gap can be measured by using perceived service quality minus expected service quality. [6,7] Zone of Tolerance is defined as the desired service and adequate service levels which represents the range of performance of service to a customer. [8] The mindset of users cannot predict the Zone of Tolerance, but many will tolerate it without quitting. [9]

Zeithaml et al [2] identified the gap model which consists of a scale measuring service quality (SERVQUAL) with ten dimensions and then was reduced to five dimensions namely reliability, assurance, tangibility, empathy, and responsiveness. The Zone of Tolerance is analyzed through dimensions of the SERVQUAL gap model. [10] Customers' assessments include expectations and experience across five dimensions. This study focused only on three dimensions such as responsiveness, assurance, and empathy which are indicating "responsiveness –willingness to help the customer and provide prompt service, assurance-knowledge, and courtesy of employees and their ability to inspire trust and confidence and empathy – caring the individualized attention the firm provides its customer" [1 p.769] are tested to measure the zone of tolerance of a patient and directly related to patient satisfaction. The goal of the zone of tolerance is to explore the relationships between consumers' satisfaction with particular transactions or customer service interactions and their satisfaction with the service overall.[11] The conceptual framework of the study was developed based on the literature reviews and is given in Figure 1.

FIGURE 1 CONCEPTUAL FRAMEWORK OF ZONE OF TOLERANCE AND ITS OUTCOMES



The study objective is to measure the Zone of Tolerance of patients measured by using service process and service quality dimensions. The service process was measured by using an observation checklist and service quality was tested by using a questionnaire among patients who underwent an MHC in a tertiary care hospital.

METHODS

Patients who visited the hospital for taking an MHC were approached. Informed consent was used to get acceptance from patients.

SAMPLING TECHNIQUES & SAMPLE SIZE

A purposive sampling technique was used to collect the data sample. The sample size was calculated for infinite population by using the following formula: n=(p[1-p][z2]/e2, p = probability of success expected to be 50%, z=1.645(z value at 10% level of significance) and e =.10 (margin of error), the sample size was calculated to be 67. For collected accurate information 80 patients were approached out of which 74 patients' responses were taken for analysis. Incomplete responses from 6 patients were eliminated. The observation checklist was used to measure the waiting time for 17 tests. 18 patients were observed separately for measuring the average waiting for each test. A total of 92 patients were involved in this study. The questionnaire was used to measure the perception of the patient's expectations and post-test opinion of the patient concerning the desire and adequate service.

DATA COLLECTION & MANAGEMENT

Two bilingual (English and Tamil) questionnaires were administered for collecting data. The first questionnaire, called Pre-test, was designed to measure patients' expectations before the participated in MHC tests. The Pre-test questionnaire was used to collect the data between 7.00am and 9.00am. The second questionnaire was called a post-test questionnaire designed to measure the effect of service patients received (adequate service) during the MHC, which was used to collect data afternoon. Patients who completed the Pre-test questionnaire were asked to complete the Post-test questionnaire. Pre-test and Post-test titles were included on the questionnaires together with serial numbers. It was feasible to compare the opinions of the same patients regarding their expectations and experiences with the hospital's services. The questionnaire was distributed to patients who registered their names with for an MHC and expressed a desire to take part in the study.

Questions were related to three service quality dimensions namely responsiveness, assurance, and empathy. Five-point Likert scales were used to measure the responses. Content validity of the questionnaire was checked by the Medical Director, Dean of Medical College, Medical Superintendent, and Dean of Faculties. The reliability of the questionnaire was tested using Cronbach's Alpha. The pre-test questionnaire's estimated test result was 0.947 and the post-test questionnaire test result was 0.932 ensuring good statistical reliability.

Service quality dimensions were calculated with a "gap analysis" as the difference between expected (pre-test) and perceived (post-test) using statistical analysis of weighted average, standard deviation, and ANOVA. Time factors were measured using the Programme Evaluation and Review Technique (PERT).

The study's scope was limited to how patients perceived the level of service and wait time. Hospital executives' opinions may still be included in future research, despite being excluded.

SERVICE PROCESS

In the selected multi-speciality hospital, an MHC starts at 7.00am up until 12noon and are available on all days except public holidays. On average, 10 patients arrive before 12 noon every day. However, only those who visit between 7.00am and 9.00am are allowed to take the MHC and whoever comes after 9.00 am will get the details regarding the MHC from the secretary at the registration counter and will be instructed to come on another day for a checkup. But those who visit between 7.00and 9.00am will consult the MHC secretary regarding various health checkup packages to fix the suitable one. This registration and billing process will take at least 40 minutes to 1 hour. The MHC covers hemogram, lipid profile, liver function test, biochemical parameters, and general [Blood Grouping-RH typing, Complete urine analysis, Stool Test for Occult Blood, Pap Smear (for Women), oPSA (Men), ECG (Resting), X-Ray Chest and Ultrasonogram of the abdomen (Screening)].

ETHICAL CONSIDERATION

Ethical clearance was obtained from the Institutional Ethics Committee of Sri Ramachandra Institute of Higher Education and Research (Deemed to be University), Chennai. (REF.IEC-NI/18/NOV/67/87). All the participants were informed about the purpose of the study and the confidentiality of the data collected for which written informed consent was used for involving patients in this study.

RESULTS

Waiting time analysis for undertaking various tests in an MHC other than the actual testing time) showed several results.

There were 17 MHC-specific tests, and a checklist was used to record the waiting time for each test details are given in Table 1.

TABLE 1: PROGRAM EVALUATION AND REVIEW TECHNIQUE- SERVICE PROCESS WAITING TIME ANALYSIS (IN MINUTES)

S.No.	Procedure	Minimum Time (To)	Maximum Time (Tp)	Avg Time (Tm)	Total Estimated time (Te)=(To+4Tm+Tp)/6
1	Blood & ECG	15	47	31	31
2	Echo	2	51	27	27
3	X-ray	1	12	7	7
4	Dexa	2	18	10	10
5	USG	1	35	18	18
6	Urine & Stool sample	1	17	9	9
7	Primary Consult	1	17	9	9
8	Dental	1	18	10	10
9	Cardiac	1	54	28	28
10	PFT	3	40	22	22
11	Mammo	4	41	23	23
12	Mammo Sono	4	25	15	15
13	Ophthal	7	20	14	14
14	ENT	2	55	29	29
15	TMT	3	13	8	8
16	Nutrition	5	15	10	10
17	Secondary Consult	5	50	28	28
In Mins	Total Wait Time	58	528	293	296
In Hrs	Total Wait Time	1	9	5	5

Source: Primary Data

Program Evaluation and Review Technique (PERT) was used to measure the duration of each activity. Table 1 shows the average waiting for each test of 18 patients. There are three types of time estimates. The optimistic time estimate (To) is the minimum time of each activity, the pessimistic time estimate (Tp) which is the maximum time of each activity and the most likely time estimate (Tm) which is the average time of each activity. The total expected time of each activity was calculated based on the formula (which is mentioned in Table 1), and the total time estimate was calculated. The test result shows that the patient is expected to wait for 5 hours. If it is considered as benchmark time, then if the patients happen to wait more than 5 hours is an indicator that they are in the zone of tolerance. The organization should take steps to protect those patients by providing adequate facilities and proper explanations for exceeding the time limit. Otherwise, long waiting time will have an adverse effect on patient flow in the future.

Respondents' opinions on Pre-test and Post-test Waiting Time and the level of satisfaction.

TABLE 2: RESPONDENTS' OPINION ON WAITING TIME AND THE LEVEL OF SATISFACTION

waiting time	Pre-test Total	Per cent	Post-test total	Per cent	Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied
No idea	15	20.3	8	10.8	1	0	2	4	1
2 hours	1	1.4	4	5.4	0	2	0	0	2
3 hours	2	2.7	2	2.7	0	0	2	0	0
4 hours	10	13.5	5	6.8	0	0	0	3	2
5 hours	23	31.1	19	25.7	0	0	0	9	10
6 hours	18	24.3	21	28.4	0	3	6	9	3
7 hours	3	4.1	6	8.1	0	2	1	2	1
8 hours	2	2.7	9	12.2	0	0	7	2	0
Total	**74**		**74**		**1**	**7**	**18**	**29**	**19**
Per cent		100		100	1.4	9.5	24.3	39.2	25.7

Source: Primary data

Table 2 shows the patients' opinions on waiting time. 20.3 % of respondents who visited the hospital for MHC without having any expectations concerning waiting time, and 10.8% of respondents had no idea about waiting time even after the test. These groups mostly visit the hospital again and again because time is not at all an issue for them. It shows that they have a very strong opinion on some other factors relating to medical tests. 31.1% of respondent exactly assumes the benchmark average waiting time. These groups might have good knowledge of the service process of the hospital. The management must be very careful to deal with this group. The result shows that 25.7% of respondents had got treated within that time limit as per their expectations. Patients who have come with the expectation of 6 to 8 hours were 31.1% but the post-test opinion of patients concerning time was 48.7% which indicates that many who come with the expectation of fewer than six hours have felt that they spent extra time to complete the test process. The reason for this perception needs to be confirmed with the patient case records kept by the hospital and should be the focus of future research because some patients' perceived waiting times were longer than expected. The impact of time could be seen in the opinion of the patient's satisfaction rating. 1.4% were highly dissatisfied with 9.5% dissatisfied and 24.3% not ready to say anything, which indicates they have some issue otherwise they would have expressed their satisfaction. Patients who come to the hospital without being aware of the waiting period and are extremely disappointed may decide not to return unless they have no other choice. Patients who expected a waiting time of six hours were dissatisfied or neutral which indicates they were not only

dissatisfied with the waiting time there may be some other factors disturbing them to feel satisfied with the service process. These groups were willing to spend more than the average benchmarking timing, so management has to monitor the service process and sort out the issues now and then to retain these groups of patients. 30.2% of patients who were satisfied with the treatment process indicate that they are loyal patients. They will come again for treatment. 25.7% were highly satisfied indicating that they will come back and there are chances they may also refer others for this MHC.

EXPECTED AND PERCEIVED OPINION OF RESPONDENTS CONCERNING SERVICE QUALITY

Table 3 weighted means score results reveal that expectation on responsiveness is 4.24 which has slightly reduced after completing test 4.21 whereas Assurance results remain the same for pre and post-test. The result of the weighted mean score on the empathy of the pre-test was low (4.17) than the post-test (4.23). The mean score results indicate that patients are delighted with the empathy of healthcare professionals during the test procedure, but their opinions on responsiveness had some issues, which are reflected in the post-test mean score.

DEMOGRAPHIC RESPONDENTS' OPINION ON SERVICE QUALITY

Hypothesis: There exists a significant difference between demographic respondents (age, gender, occupation, monthly income, qualification, and the number of visits) and their opinion on responsiveness, assurance, and empathy.

TABLE 3 WEIGHTED AVERAGE ANALYSIS OF SERVICE QUALITY

	Responsiveness		Assurance		Empathy	
	Expected (Pretest)	Perceived (Post-test)	Expected (Pretest)	Perceived (Post-test)	Expected (Pretest)	Perceived (Post-test)
Mean	4.24	4.21	4.31	4.31	4.17	4.23
SD	0.787	0.688	0.659	0.656	0.797	0.642

Source: Primary data

TABLE 4: ANOVA AND T-TEST ANALYSIS

Socio-Demographic Characteristics	Frequency	Per cent	Responsiveness		Assurance		Empathy	
			Expected (Pretest)	Perceived (Post-test)	Expected (Pretest)	Perceived (Post-test)	Expected (Pretest)	Perceived (Post-test)
Gender			T-test (Sig)	T-test (Sig)	T-test (Sig)	T-test (Sig)	T-test (Sig)	T-test (Sig)
Male	43	58	0.409 (0.684)	1.759 (0.083)	1.847 (0.069)	1.889 (0.063)	1.006 (0.318)	0.835 (0.407)
Female	31	42						
Total	74	100						
Age			F(Sig)	F(Sig)	F(Sig)	F(Sig)	F(Sig)	F(Sig)
Below 20	2	3	2.073 (.094)	2.307 (.067)	0.843 (0.503)	2.808 (0.032)*	2.605 (0.043)*	1.267 (0.291)
20-30 years	19	26						
30-40 years	17	23						
40-50 years	19	26						
Above 50	17	23						
Total	74	100						
Occupation			1.619 (0.179)	2.382 (0.060)	2.780 (0.33)*	4.192 (0.004)**	2.278 (0.70)	4.432 (0.003)**
Private	29	39						
Public	7	9						
Self-employed	17	23						
Homemaker	14	19						
Retired	7	9						

Total	74	100					
Monthly Income							
No Income	7	9					
Less than Rs10,000	8	11					
Rs.10,000-20,000	13	18					
Rs.20,000-30,000	15	20	1.362 (0.250)	1.369 (0.247)	2.381 (0.047)*	1.356 (0.252)	2.446 (0.042)*	2.032 (0.085)
Rs.30,000-Rs.40,000	10	14					
Above Rs.40,000	21	28					
Total	74	100					
Qualification							
Professionals	17	23					
Degree Holders	37	50					
Diploma	9	12	0.080 (0.988)	1.186 (0.325)	0.981 (0.424)	1.570 (0.192)	0.317 (0.866)	2.538 (0.048)*
Schooling	8	11					
No Academic	3	4					
Total	74	100					
No. of Visits							
First	49	66					
Second	16	22					
Third	1	2	3.631 (0.017)*	7.630 (0.000)**	2.126 (0.105)	4.126 (0.009)**	1.408 (0.248)	5.111 (0.003)**
Four and above	8	10					
Total	74	100					

Source: Primary data

Note * significant at 5 % level

** significant at 1% level

Table 4 shows that there exists a significant difference between age group respondents' opinions on assurance concerning perceived service which revealed that there are differences of opinion among age group respondents on assurance on their perceived service. The same age group respondents have significant differences in empathy before taking the test (F=2.605, P =0.043*) but there exists no significant difference after the test which indicates age group respondents have the same opinion on empathy which is perceived well. The results show that gender groups have no significant difference concerning responsiveness, assurance, and empathy. There is a significant difference among occupational groups between expected (2.780, p=0.33*), and perceived (4.192, p=0.004**) opinions on Assurance given by health workers relating to MHC. The results relating to a perceived opinion on empathy show that there are significant differences among occupational groups (4.432, P=0.003**). Qualification groups have a significant difference in perceived opinion on empathy (2.538, p=0.048*). There is a significant difference between the monthly income group's expected opinion on assurance (2.381, p=0.047*), and empathy (2.446, p=0.042*). The results relating to the number of visits shows that there are significant differences among the groups on expected and perceived opinion on responsiveness, But there is a significant difference between the respondents perceived opinion on assurance(4.126, p=0.009**) and empathy (5.111, p=0.003**) which indicates that after getting the treatment they have some issues.

TABLE 5: TIME AND OVERALL OPINION ON SERVICE QUALITY

	Overall opinion on Service Quality				
Level of Satisfaction with waiting time	Delight Per cent	Satisfied Per cent	Dissatisfied Per cent	Total	Per cent
Highly Dissatisfied	0.0	1.4	0	1	1.4
Dissatisfied	4.1	5.4	0	7	9.5
Neutral	1.4	23.0	0	18	24.3

Satisfied	10.8	28.4	0	29	39.2
Highly Satisfied	14.9	10.8	0	19	25.7
Total	31.1	68.9	0	74	100

Source: Primary data

Table 5 shows that the highly satisfied respondents (25.7 %) with waiting time but comparatively less (14.9 %) were delighted with the overall opinion on service and the remaining (10.8 %) respondents were satisfied with the overall service which indicates that they have some issues preventing them to feel delighted while getting treatment other than waiting time. 24.3 %,9.5% and 1.4% (26 patients out of 74) were neutral, dissatisfied and highly dissatisfied respective concerning time, which indicates that some time factors prevent them to feel satisfaction at the time of MHC. This needs to be identified and addressed otherwise their level of tolerance may go adverse.

DISCUSSION

While considering treatment, it is quite natural that each person has their own opinion and assumption about service quality but after taking treatment if the patients have differences of opinion, then there are some other factors, they need to pay attention to so as to improve. The overall weighted mean results revealed that perceived opinion on responsiveness was slightly lower than the expected result which may lead to crossing the level of the zone of tolerance and there are chances patients may stop visiting the hospital for taking MHC due to non-responsiveness. The findings of the F test (Table 4) indicate that the zone of tolerance may be influenced by demographic factors. After receiving medication, 'assurance' differs significantly among age groups, occupational categories, and visit frequency groups. The perceived opinions on 'empathy' vary significantly among occupational and qualification groups. The findings showed that the zone of tolerance for qualified and employed groups may be influenced by the 'empathy' of health care workers. The number of visits results indicates that some issues may cross their zone of tolerance level on all the three factors of responsiveness, assurance, and empathy. This needs to be focused on to sort out the issues, otherwise, there are chances the new or the old patients may not visit again.

Time study and overall opinion on service quality results (Table 5) revealed that the patients who were dissatisfied with time are satisfied and delighted with overall services. Patients who were in the neutral concerning time factors are satisfied with the services and no one is dissatisfied with the overall services. Table 2 also revealed that patients who have visited the hospital with no idea of time for getting treatment are satisfied and highly satisfied with the time. This reveals that waiting or other time issues can be overcome through effective service quality.

CONCLUSION

The indicators of Zone of Tolerance would be measured through the expected and perceived opinions of the respondents and provide an insight into the relative importance of each dimension of SERVQUAL which are useful for developing quality improvement strategies. [12]

Patients who come for MHC will have certain expectations. Occupation and monthly income group respondents expect assured service. Age groups and monthly income groups expect empathy. The numbers of visits groups expect responsiveness.

If healthcare professionals and management are able to adhere to patients' expectations, the organization will be able to satisfy them, and if they go above and beyond, they will be able to delight them. Johnston [4 p.10] stated that "there are weak points or fail points in a service system that may be too expensive or difficult to remove, the service designer or operator could try to compensate for them by including several high spots in the process". Time was highlighted as the main problem of many patients, which needs to be fixed but the customer perceived waiting for time and satisfaction opinion on overall services may compensate for the time issue.

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