

Capacity of Service Delivery Facility and Perceived Quality as Determinants of Patient Service Tangibles in Healthcare Service Delivery Models: An Indian Outlook

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Abstract

Capacity, from the very beginning has been announced as a key factor in healthcare service delivery models (HSDM). Academicians as early as the pre-industrial era have understood the association. In the Indian context scant research has been done on the relationship with the variables selected by the authors of this present study. The aim of the study is to analyze the effect of capacity of service delivery facility on perceived quality of service delivery institution in India. The study was completed taking into account 381 samples consisting of all levels of professionals and patients from various Indian healthcare organizations. Statistical Tools like Correlation and Regression Analysis by using SPSS 20.0 have been applied to gain understanding about the relationship between the two variables. The results have shown that patients and doctors in the healthcare organizations that were studied do show importance to perceived quality, and there exists a positive correlation between capacity and perceived quality.

The results have implicated that institution wide acceptance regarding important work related guidelines and mandatory roles is positively related to perceived quality which in turn calls for action on volume and capacity management.

Introduction

With the emergence of the new environments of performing health care services, the way the health care organization itself is perceived has also changed. The shift from simple line and staff structure of the government owned and operated hospitals to ever new structures like the semi-government and foreign owned and even more hybrid models have sprung everywhere. The administrations role which was limited to managing the job descriptions till now has gone tremendous and phenomenal change. Now perceived quality has a far broader role in success of hospital and healthcare institutions alike than written claims of having large bed capacity, obedient and co-operative staff and full time specialty departments. Perceived quality on all lines is an important responsibility for every health care employee. What has been stated by academicians (Trumble et al., 2006; Mavalankar et al., 2009) is widely accepted that with

organizations everyday giving more value to the way the work is being done and also the people who perform those tasks, different kinds of capacity plans are required just to make the patients feel safe and feel higher self-worth. Employees also have started to feel attached to health care organizations and have started exhibiting behaviors of an improved service host which go far beyond than just the basic motivations of better salary and work. Fuentes (1999) and later Marley et al. (2004) took the concept and gave a number of dimensions regarding capacity decisions for health care service facilities. The authors attempted to present this study based on the two important concepts of Trumble et al. (2006) who also accepted the linkage between the two. Our study aims to understand the true nature of the relationship in the Indian context

Perceived Quality

Perceived quality is the point to which requisite

knowledge is presented on how a healthcare organisation employee is anticipated to conduct his/her job (Lovell, 1993). It is the scope to which a patient accepts the competence of the health care service facility and available information to make an informed decision about the staff possessing necessary skills and technical knowhow to carry out the job (Rohini and Mahadevappa, 2010). Rasmussen and Sandman (2000) defined perceived quality as the extent to which an employee is able to convince the patient regarding how he/she is anticipated to perform on a service delivery task. This level of perceived quality has also been connected to performance in health care organization whereby an employee who is clear about his/her role will be more pertinent in fulfilling that particular function (Gronroos, 2001). According to Trumble et al. (2006) perceived quality can also be defined as the point to which a patient obtains information about the anticipated outcomes of the duties to be delivered to him/her in specific terms. It enhances the insight of the service facility being proficient in patients because they realize what they must know, what they are competent of and how will they do it (Lavy and Shohet, 2007; Kardes et al., 2004). If staff roles are not properly/clearly defined, there is constantly likelihood of patients taking up misinformed decisions pertaining to perceived quality of service delivery facility that are not in fact true while disregarding what employees and staff are striving and trained to do. This disproportion between what one is expected to perceive and what he/she actually perceives creates ambiguity and service conflict among employees (De Blok et al., 2012).

Capacity Decisions at Service Facility (CSD)

Capacity decisions are presented as “individual behavior to achieve captive service delivery volumes that is discretionary or flexible, not directly or explicitly recognized by a formal utilization rate or system and that in the aggregate promotes the effective functioning of the healthcare service organization, as explained by

(Brady et al., 2006). By discretionary, it is meant that the capacity behavior is not an enforceable obligation of the role or function of the service facility, or the service claim description of the hospital, and that it is very noticeably specified in terms of the persons employed and service equipment maintained within the agreements of the health care organization; the capacity behavior of the health care service firm is rather a concern of individual healthcare organizations private choice, such that it is not overburdened and not understaffed or suffering from shortages in the general performance windows.

It can also be referred to as pro-patient CSD requirement as mentioned by (Vogel, 2004), extra-capacity and out sourced capacity by Waleed (2001) and contractual scaling up and down as per season and foot falls by (Zheng et al., 2006). Researchers are fascinated towards and involved in CSD mainly because it is assumed to have a positive and affirmative impact on health care organization benchmarking.

Scope of (CSD)

Even if there is a lack of consensus on the scope of CSD, the authors project at least five important dimensions of CSD, which are most often used in studies worldwide. The first dimension is functional capacity which refers to as helping behaviors of installed captive capacity aimed at particular patient groups and persons and that will eventually profit the health care organization. An illustration of functional capacity is instant sharing a patients bio-fluid and blood plasma analysis reports with hospital doctor. Compulsory capacity is defined as trying to avoid health care service related regulation and human rights problems or difficulties from civic monitoring authorities taking place. A good example is noticing minimum installed number of hygiene and sanitary stations in the capacity and cleaning staff and other maintenance staff not being absent from duties in advance. Accessible capacity means studying the construction and engineering decisions that are

beneficial to the patients in reaching to locations within and around the capacity of the health care organization, and it involves performing handicapped and elderly patients role or implied activities in the service delivery model with and without staff to assist them, such as following equipment on and off rules when nobody is using them.

Maintenance capacity is taken as tolerating less than model situations of equipment and temporary staff on the job without making unreasonable delays and breakdown stoppages. Ambient capacity for health care service facility transforms into responsibly being concerned and alarmed about the hygiene and appearance of equipment and staff and the physical conditions of the area where service is to be performed in the health care organisation. An example is attending procedural training meetings and keeping up with major issues about the cleanliness and safety regulations in the institution.

With reference to the five dimensions of CSD by Mavalankar et al. (2009) and Marley et al. (2004) accessible and maintenance capacity are more individual oriented (ICSD), and the functional capacity, ambient and compulsory capacity are much more oriented towards the organization wide (OWCSD). Although the authors five-dimension structure has been widely used in prior research (Bajpai et al., 2009; Charnes et al., 1978) because current research has not reached consensus in regards to which specific dimensions should be included when examining CSD.

To address this issue, the authors conducted a panel discussion and small multi criteria decision making analysis to examine the relationship among these dimensions. The results of the exercise thus produced indicated that these dimensions were highly correlated with the exception of compulsory capacity, although the dimension did differentially relate to the several predictors of perceived quality including patient satisfaction, doctor commitment, administration

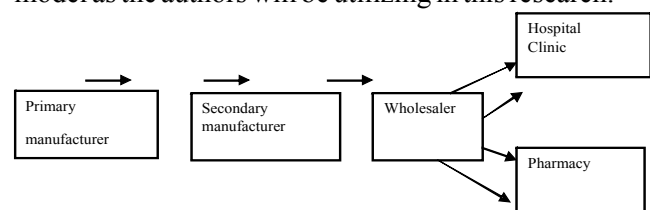
fairness, service leader support, and employee judgement.

Patient Service Tangibles

Transferring patient service tangibles to healthcare is relatively new. This term has been derived from automobile service industry until recently in literature of service marketing (Gabbot and Hogg, 1996). The term means that patient or the consumers refer to side elements as tangibles like waiting time, quality of nutrition and employees courtesy rather than medical “core” technical competencies as the significant measures of their satisfaction or dissatisfaction (Craig et al., 2007). A 25 item questionnaire was used to perform measurement for patient service tangibles in the selected health care organisations. We achieved a reliability measure of 0.941 which is significantly high.

Healthcare Service Delivery Models

Medical service quality has been traditionally defined as a judgment of judging if the service performed for a patient has been chosen carefully over all other alternatives to produce the best result that could be demanded by the patient in a balanced setting, and if the service or services were delivered with consideration to the doctor/patient relationship (Fuentes, 1999). The below figure explains the healthcare service delivery model as the authors will be utilizing in this research.



(Source. Shah, 2004 and Morton, 2003)

Objectives

The study has three main objectives based on the arguments and previous literature review:

1. To study the (CSD) relationship with

perceived quality in a selected healthcare organisations.

2. To examine the (CSD) dimensions and perceived quality dimensions as independent variables by regressing them upon patient service tangible scores.
3. To examine impact of specific CSD dimensions and perceived quality variables upon patient service tangible scores.

Hypothesis

H1. CSD will be positively related to and predict patient service tangibles.

H2. Perceived quality will be positively related to and predict patient service tangibles.

Respondents

The Respondents were from both Private and Public health care service organisations, in total 144 (37.81 percent) were from Private institutions and 237 (62.19 percent) from government owned service organisations. In front of Total Experience, 56 (14.91 percent) were between 0-5 years, 75 (19.81 percent) between 5-10 years, 76 (20.03 percent) between 10-15 years, 46 (12.11 percent) between 15-20 years and there were 126 (33.14 percent) with more than 20 years of Work Experience. Respondents when examined for differences in education produced the following results. 34 (9.01 percent) respondents were having Diploma, 186 (49.00 percent) with Graduate degree, 106 (27.99 percent) were having a Post Graduate degree and 55 (14.00 percent) had above than Post Graduate degree as Highest Qualification with them. Based upon the hierarchy within the health care organization, 103 (27.04 percent) respondents were from Junior Level, 225 (59.21 percent) from Middle level and 53 (13.75 percent) from Senior Level.

The questionnaires were distributed to respondents

taking into consideration their willingness and interest to give responses. The data was collected through face to face interviews. 301 (79.01 percent) were male and 80 (20.99 percent) were female. About 55 (14.6 percent) participants were in the age group of 23-28 years, 40 (10.7 percent) between 29-34 years, 73 (19.23 percent) between 35-40 years, 86 (22.7 percent) between 41-45 years, 53 (14.07 percent) between 46-51 and 71 (18.70 percent) were above 52. In conclusion we find it important to mention that 381 participants from Private as well as Public healthcare organisations from Delhi and Uttarakhand region took part in the study.

Measures

Perceived quality was checked based on items derived from previous research to assess level of perceived quality among the patients for the health care institution they were presently using for service at the time of our study. The perceived quality questionnaire comprises of 55 items and utilizes a 5-point Likert scale.

Five interpretable factors i.e. (1) patient satisfaction related perceived quality, (2) doctor commitment related perceived quality, (3) administration fairness related perceived quality, (4) service leader support related perceived quality and (5) employee judgement related perceived quality were extracted as a result of literature review (Gronroos, 2001; Kardes et al., 2004 and Elleuch, 2008). The Cronbach's alpha value for the 55 item perceived quality questionnaire was found to be 0.917. This is a significantly high value. Some sample items of the questionnaire are 'Does your doctor ask you questions about your treatment progress', 'Are you aware of any instances when rules, regulations and procedures relevant for a patients treatment were not followed in your current health care institution and do you feel that it was handled sufficiently by the hospital administration', 'Are you concerned that your current health care institution might not be able to provide you with treatment in the future and you

will have to change service location but will not receive similar high quality care'.

The perceived quality score is the sum of five selected constructs out of all the 55 items of the questionnaire. (CSD) was measured on five-point Likert Scale with items using constructs from (Mavalankar et al., 2009, Bajpai et al., 2009; Charnes et al., 1978 and Marley et al., 2004). The questionnaire consisted of 50 items which consisted of five constructs specifically targeting (CSD) dimensions of compulsory capacity, ambient capacity, maintenance capacity, patient satisfaction (CSD) dimensions of compulsory capacity, ambient capacity, maintenance capacity, accessible capacity and functional capacity. Some sample items of the questionnaire are 'we have been trained to assist busy stations which have heavier workloads', 'we take pride in reporting instances of successful resolutions of complaints' and 'I am satisfied with the installed equipment as it is serviced regularly for preventive maintenance'. The co-efficient of reliability for this questionnaire was found to be sufficiently large at 0.921.

Data Analysis

Data was analyzed with the help of Statistical Tools like Mean, Standard Deviation, Correlation analysis, Regression Analysis and also Cronbach's Alpha to achieve the objectives of the Study with SPSS 20.

Results

The purpose of this study was to empirically find out the effect of (CSD) on perceived quality of the healthcare organization in Indian Context. Towards this objective, the research investigation was designed to examine relationships and also the impact of (CSD) on the dimensions of perceived quality in the present sample of health care organizations of Delhi and Uttarakhand region of India. The results, the interpretation and significance are as follows.

Table 1: Correlation Values between CSD and

perceived quality

	Mean	Standard Deviation	1	2	3	4	5	6	7	8	9	10	11	12	13
Accessible capacity	22.82	2.77	1												
Functional capacity	23.70	3.01	.056	1											
Compulsory capacity	20.40	2.82	.080	.692**	1										
Ambient capacity	16.78	3.67	.127*	.746**	.681**	1									
Maintenance capacity	19.22	2.89	.149**	.712**	.789**	.691**	1								
Patient satisfaction	21.19	3.14	.095	.802**	.666**	.745**	.655**	1							
Doctor commitment	22.71	3.77	.110*	.682**	.752**	.630**	.760**	.631**	1						
Administration fairness	17.49	2.77	.129**	.609**	.661**	.583**	.649**	.566**	.689**	1					
Service leader support	20.96	3.95	.205**	.141**	.175**	.193**	.221**	.174**	.173**	.159**	1				
Employee judgment	21.94	2.89	.203**	.146**	.186**	.181**	.232**	.186**	.187**	.160**	.920**	1			
CSD	119.58	17.95	.291**	.154**	.194**	.207**	.199**	.137**	.189**	.147**	.477**	.479**	1		
Perceived quality	20.57	2.78	.202**	.154**	.177**	.170**	.230**	.147**	.177**	.141**	.465**	.452**	.501**	1	
Patient service tangibles	210.49	35.89	.486**	.164**	.172**	.194**	.192**	.164**	.155**	.165**	.209**	.191**	.303**	.223**	1

Note. Source: developed by the author based on the data available

*. Correlation is significant at the 0.05 level (2-tailed).**. Correlation is significant at the 0.01 level (2-tailed).

Relationship between CSD and Patient Service Tangibles:

There exist a positive correlation between CSD and patient service tangibles ($r=0.303$, $p<0.01$).

Relationship between Perceived Quality and Patient Service Tangibles:

There exist a positive correlation between perceived quality and patient service tangibles ($r=0.223$, $p<0.01$).

Relationship between (CSD) and Perceived Quality:

Correlation Analysis was deployed In order to find out the relationship between the two variables. Table 1 shows that there exists a positive correlation between (CSD) and perceived quality

($r=0.501$, $p<0.01$).

It means that as CSD increases, perceived quality also increases. The correlation analysis further shows that all dimensions of CSD are positively correlated with perceived quality. Furthermore the dimensions of perceived quality also exhibit a positive relationship with CSD. The maximum correlation with perceived quality i.e. 0.452 at 0.01 level of significance is shown by service leader support.

We also examine that the CSD dimension of maintenance capacity shows the maximum correlation with perceived quality at 0.230 at the 0.01 level of significance. This is understandable as maintenance capacity has a very visual presence and is easily open for perception and comments by patients and visitors alike (Zineldin, 2006; Zeithaml, 2000; Yang, 2002 and Whang et al., 2003). Also CSD scores upon closer examination show high positive and significant correlation with employee judgement. This can be understood by considering how operations are performed in a health care service facility (Wensing et al., 2006; Waleed et al., 2006; Ahmed and Pecenka, 1990). We observe a repetition of patient waiting and reservation based scheduling. This means that either the presence of empty service locations are planned before the patient arrives or empty service location should be present upon arrival of the patient. A success on both ends will translate into high accuracy of employee judgement. If the high scores of employee judgement lead to higher CSD scores this means that better employee judgment affects other dimensions of CSD such as maintenance capacity and accessible capacity. This is also shown with the high correlation scores of 0.232 and 0.203 at the 0.01 level of significance of accessible capacity and maintenance capacity with employee judgement.

Table 2: Backward stepwise regression estimates with CSD dimensions as independent variables and patient service tangibles as a dependent variables

Model	Independent variables	R-Square	Adjusted R-Square	F-value	Standardized Beta value(β)
1	a) Accessible capacity. b) Functional capacity. c) Compulsory capacity. d) Ambience capacity. e) Maintenance capacity.	.259	.249	26.221	a) .472** b) .062 c) .063 d) .049 e) -.005
2	a) Accessible capacity. b) Functional capacity. c) Compulsory capacity. d) Ambience capacity.	.259	.251	32.862	a) 0.472* b) .061 c) .060 d) .048
3	a) Accessible capacity. b) Functional capacity. c) Compulsory capacity.	.258	.252	43.73	a) .475** b) .086 c) .075
4	a) Accessible capacity. b) Functional capacity.	.255	.251	64.78	a) .479** b) .137**

Note. Source: developed by the author based on the data available, **p value is significant at 0.01 level.*p value is significant at 0.05 level.

Regression Analysis was performed to find out the impact of CSD dimensions on patient service tangibles and the results were scrutinized. In the first model we can see that. F value of 26.221 which is significant at the 0.01 level proves that regression model is valid and the CSD dimensions do a good job of prediction in the patient service tangible scores. The backward stepwise regression was performed for this exercise. Later on CSD dimensions which possessed an insignificant standardized beta value are dropped one by one and consequently model 4 is achieved. Model 4 has a much improved F statistic at 64.78 than the 26.221 of model 1 and is also statistically significant at the 0.01 level. Together accessible capacity and functional capacity have a prediction of 25.1 percent in the variance of patient service tangibles. Table 3 shows that regression analysis with perceived quality variables as independent measure and patient service tangibles as dependent measures. Sadly only 5.6 percent of predictive capability is produced at best by the perceived quality variables behaving as independent predictors. It means that 94.4 percent is explained by other factors.

We have again used backward stepwise regression to report the results between perceived quality variables and patient service tangibles.

Table 3: Backward stepwise regression estimates with perceived quality as independent variables and patient service tangibles as a dependent variable

Model	Independent variables	R-Square	Adjusted R-Square	F-value	Standardized Beta value(B)
1	a) Patient satisfaction. b) Doctor commitment. c) Administration fairness. d) Service leader support. e) Employee judgement.	.066	.054	5.317	.073 .025 .078 .206 -.029
2	a) Patient satisfaction. b) Doctor commitment. c) Administration fairness. d) Service leader support.	.066	.056	6.650	.073 .024 .079 .179**
3	a) Patient satisfaction. b) Administration fairness. c) Service leader support.	.066	.058	8.854	.081 .091 .180**
4	a) Administration fairness. b) Service leader support.	.061	.056	12.361	.135** .187**

Note. Source: developed by the author based on the data available, **p value is significant at 0.01 level.*p value is significant at 0.05 level.

Collinearity Diagnostics:

We further add that in regression analysis of Table 2 upon closer examination there were no violations of the collinearity statistics. The tolerance and variance inflation factors (VIF) were well within permissible ranges.

However in Table 3 upon closer examination it was revealed that tolerance limits were violated in construction of model 1 however the final model did not have any violations of the collinearity measures which can inspire future researchers to use a modified form of the tools used to measure administration fairness and service leader support to predict variance in patient service tangibles.

Conclusion

The bivariate correlations and the tested models have produced important contributions to the understanding of the special nature of patient service tangibles in the healthcare organizations. The CSD dimensions when analysed for correlation with dimension of perceived value produced significant and positive values. This

means that in the health care service models it is important to consider at the stage of capacity planning and design the consequences of present actions on future perceived value attributes.

As such regression analysis was further performed to find out factor wise predictor variable for dependant variable patient service tangibles. We are happy to report that adjusted R Square scored increased from 0.922 to 0.948 by introduction of CSD dimensions. That means CSD dimensions along with other defined constructs such as modified constructs of perceived quality and other constructs from the CSD questionnaire and patient service tangibles questionnaire explained and altogether 94.8 percent variation in patient service tangibles with F value 191.999 at $p < 0.1$.

Implications for Future Researchers

Future research in service management and design can focus on CSD dimensions as discussed in this paper and hope to achieve significant improvements in patient satisfaction experience with the service and reduction on unwanted measures like patient treatment failure, grievances and breakdowns.

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