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Healthcare Service Quality and Patient Satisfaction in Healthcare System: Structural Equation Modeling Approach

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Abstract: This research paper analyses the relationship between perceived healthcare quality and the determinants of patients satisfaction in the healthcare sector in Saudi Arabia. In this study, patients attitudes towards satisfaction and healthcare quality are investigated. Also the factors that are thought to affect good healthcare quality in healthcare system in Saudi Arabia within the framework of patient satisfaction were studied. A questionnaire based survey was conducted to study the perception of the patients towards service quality and satisfaction. Data were collected from 535 patients located in Saudi Arabia. Structural equation modelling (SEM) was applied for data analysis.

Keywords: Healthcare System, Service Quality, Perception, Patient Patisfaction

I. INTRODUCTION

Service quality is defined as an overall judgment of service attitudes related to, but not equivalent to, customer satisfaction. There are several trends of management thinking related to the quality issue. Perceived and expected service quality measure- ments and their impact on patient satisfaction have received much attention by researchers and managers of hospitals. Service quality in the healthcare sector has become more important in Saudi Arabia, as in many other countries, due to the fact that hospitals are dealing with human lives and in addition to the higher expectations of patients. In the current study, patients attitude about healthcare quality was taken from the viewpoint of medical aspects of care, performance of services, service expectations, infrastructure and settings and expectations of care.

II. OBJECTIVES

The objectives are given below

- To examine the usefulness of structural model for evaluating patient perceptions of quality in healthcare sector.
- To investigate whether all the measures fitting the suggested value.

III. LITERATURE REVIEW

Prior research and how it frames this study is important to identifying and understanding the concept of service quality as it relates to patient satisfaction. Dagger, Sweeney and Johnson (2007)¹ classified service quality in the healthcare setting into interpersonal service quality, administrative service quality and technical service quality. Interpersonal service quality consists of manners, communication and relationships. Evidence suggests that perceived service quality influences patient behavior and that patient satisfaction is the overall metric or outcome variable of the service (Andaleeb, 20012 ; Carson and Roe, 19983). The constructs of medical aspects of care, infrastructure and settings, service expectations, performance of services and expectations of care directly impact overall patient satisfaction as shown in the proposed model.

IV. RESEARCH DESIGN

A structured questionnaire was used and the secondary data was collected from various articles, journals and different websites. Primary data were collected from 535 expatriates in KSA. A simple random sampling method was adopted for the selection of the respondents. Likerts scale was used, for the measurement of satisfaction.

V. HYPOTHESIS

- 1) Null hypothesis (H10): Perceived service quality is not positively associated with medical aspects of care.
- 2) Null hypothesis (H20): Perceived service quality is not positively associated with service expectations.
- 3) Null hypothesis (H30): Perceived service quality is not positively associated with performance of service.
- 4) Null hypothesis (H40): Perceived service quality is not positively associated with infrastructure and settings.
- 5) Null hypothesis (H50): Perceived service quality is not positively associated with expectations of care.
- 6) Null hypothesis (H60): Perceived service quality is not positively associated with patients satisfaction.

VI. ANALYSIS AND INTERPRETATION

Data were analyzed using software package SPSS and AMOS. The following statistical techniques were employed viz., Reliability analysis, Descriptive analysis, confirmatory factor analysis SEM.

(A) Reliability Analysis

Table shows the total reliabilities of the variable scores. This result indicates that Cronbachs Alpha for all dimensions have a high level of internal consistency and they are highly reliable.

Table 1
Demographic Profile of Respondents

<i>Attributes</i>	<i>Categories</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Gender	Male	390	72.9
	Female	145	27.1
Age group (Years)	20-30	105	19.6
	31-40	137	25.6
	41-50	166	31
	51-60	127	23.7
	High school	27	5
Educational qualification	Diploma	112	20.9
	Bachelors	255	47.7
	Masters	141	26.4
Marital status	Single	71	13.3
	Married	464	86.7
	Professionals	356	66.5
Occupational Status	Non professionals	105	19.6
	Laborers/Technicians	74	13.8
Monthly income	Below 3000	104	19.4
	3001-7000	206	38.5
	7001-10000	148	27.7
	Above 10000	77	14.4

Table 2
Reliability analysis for Variables

<i>Determinants</i>	<i>Number of attributes</i>	<i>Cronbachs Alpha</i>
Medical Aspects of Care	10	0.858
Service Expectations	10	0.834
Performance of Service	10	0.766
Infrastructure and setting	10	0.848
Expectations of Care	10	0.753
Patients Attitudes towards Satisfaction	10	0.834

(B) Confirmatory factor Analysis

The SEM Model is an example of confirmatory factor analysis. Before boarding on SEM modeling, it is necessary to prepare the variables for analysis.

VII. VARIABLE DESCRIPTIONS

There are two types of variables in this particular model: observed, endogenous variables and unobserved, exogenous variables. The exogenous variables are based on a review of those process attributes that are

related to service quality in a healthcare setting. The endogenous variables are indicating that these were patient satisfaction measures. There are six observed, endogenous variables and seven unobserved, exogenous variables listed in this model. They are:

- A) Observed, Endogenous Variables
 - Infrastructure and Settings
 - Performance of Service
 - Service Expectations
 - Medical aspects of Care
 - Patients attitudes towards Satisfaction
 - Expectations of Care
- B) Unobserved, Exogenous Variables Perceived Service Quality
 - e1: Error term for Medical Aspects of Care
 - e2: Error term for Service Expectations
 - e3: Error term for Performance of Service
 - e4: Error term for Infrastructure and Setting
 - e5: Error term for Expectations of Care
 - e6: Error term for Patients Satisfaction

VIII. ERROR TERMS

Error terms represent not only the measurement errors, but also the unmeasured errors that include the endogenous

Table 3
Variable Counts

<i>Variables</i>	<i>Count</i>
Variables in this model	13
Observed	6
Unobserved	7
Exogenous	7
Endogenous	6

From the above table, coefficient of perceived service quality is 3.779 and it represents the partial effect of perceived service quality on medical aspects of care, holding the other variables as steady. Then coefficient of perceived service quality 2.733 represents the partial effect of perceived service quality on service expectations, holding the other variables as stable. The next coefficient of perceived service quality is 3.474 represents the partial effect of perceived service quality on performance of service, holding the other variables as stable. The coefficient of perceived service quality 4.407 represents the partial effect of perceived service quality on infrastructure and setting, holding the other variables as changeless. Then

coefficient of perceived service quality 1.156 represents the partial effect of perceived service quality on expectations of care, holding the other variables as constant. Then lastly coefficient of perceived service quality 4.435 represents the partial effect of perceived service quality on patients attitudes towards satisfaction, holding the other variables as constant.

Table 4
Estimated Model Co-efficients

Variables			Unstandardized		Standardized	t value	p value
			Co-efficient	S.E.	Co-efficient		
MC_tot	←	PSQ	3.779	0.207	0.74	18.224	< 0.001**
SE_tot	←	PSQ	2.733	0.191	0.597	14.317	<0.001**
PS_tot	←	PSQ	3.474	0.177	0.756	19.67	<0.001**
IS_tot	←	PSQ	4.407	0.198	0.827	22.202	<0.001**
EC_tot	←	PSQ	1.156	0.149	0.347	7.756	<0.001**
AS_tot	←	PSQ	4.435	0.18	0.879	24.693	<0.001**

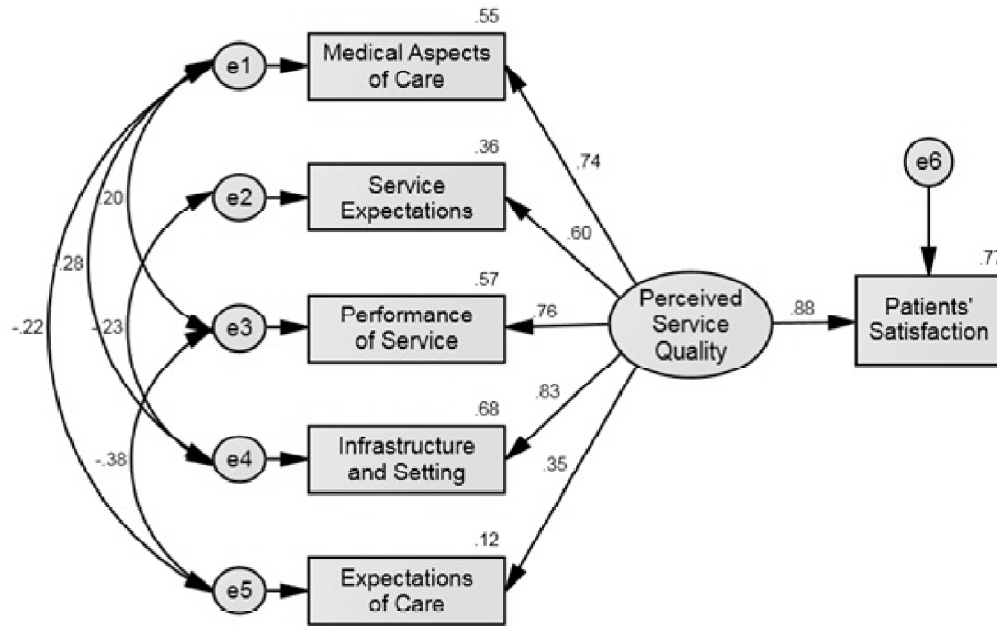


Figure 1: SEM Based on Standardized Co-efficients

Table 5
Standardized Regression Weights

			Estimate
MC-tot	←	PSQ	0.74
SE-tot	←	PSQ	0.597
PS-tot	←	PSQ	0.756
EC-tot	←	PSQ	0.347
IS-tot	←	PSQ	0.827
AS-tot	←	PSQ	0.879

Table 6
Model Fit Summary of Structural Equation Model

<i>Indices</i>	<i>Value</i>	<i>Recommended Value</i>
Chi-square value	5.179	–
DF	4	–
Chi-square value/DF	1.294	< 5.00 (Hair <i>et al.</i> , 1998) P
Value	0.269	> 0.05 (Hair <i>et al.</i> , 1998) GFI
	0.997	> 0.90 (Hu and Bentler, 1999) AGFI
	0.983	>0.90 (Hair <i>et al.</i> , 2006) CFI
	0.999	> 0.90 (Daire <i>et al.</i> , 2008) RMR
	0.046	< 0.08 (Hair <i>et al.</i> , 2006) RMSEA
	0.023	< 0.08 (Hair <i>et al.</i> , 2006)

The estimated positive sign implies that such effect is positive that medical aspects of care, service expectations, performance of service, infrastructure and setting, expectations of care and patients attitudes towards satisfaction would increase by 3.779, 2.733, 3.474, 4.407, 1.156 and 4.435 respectively for every unit increase in perceived service quality and these coefficients are significant at 1 percent level.

IX. STANDARDIZED REGRESSION ESTIMATES

Standardized estimates are comparable, for example, when comparing direct effects on a given endogenous variable in a single group. Figure 1 displays SEM based on standardized coefficients. All the 6 items of service quality dimensions of this study were taken for confirmatory factor analysis. Standardized estimates for the fitted model is shown below.

X. FIT STATISTICS OF THE MEASUREMENT MODEL

There are a number of goodness of fit indices which can create comparisons. Absolute fit indices determine how well a prior model fitting the sample data (McDonald and Ho, 2002).

From the above table it is seen that the calculated P value is 0.269 which is greater than 0.05 which implies perfectly fit. The GFI (Goodness of Fit Index) value and AGFI (Adjusted Goodness of Fit Index) value is greater than 0.9 which denote it is a good fit. The calculated CFT (Comparative Fit Index) value is 0.999 which signify that it is a perfect fit and also it is seen that RMR (Root Mean Square Residuals) and RMSEA (Root Mean Square Error of Approximation) value is 0.023 which is less than 0.08 which showed it is perfectly fitted. The Chi-square value/DF is 1.294 which is less than 5 show a good absolute fit of the model.

XI. FINDINGS

The results revealed that there was a positive and significant ($p = <0.001$) relationship between perceived service quality and medical aspects of care, service expectations, performance of service, infrastructure and setting, expectations of care and patients attitudes towards satisfaction. Hence all the six null hypotheses

(H1, H2, H3, H4, H5, and H6) were rejected. It thus establishes that the proposed theoretical models applicable to the healthcare industry.

Results confirmed that Cronbachs alpha for all six dimensions were high, above 0.75 which proved to be reliable, appropriate and valid, and hence assumed that the model employed in this particular study was effectively suitable.

XII. LIMITATIONS AND FUTURE RESEARCH

The current study concentrates on the perceived service quality for improving performance outcomes. The samples collected is limited to Saudi Arabia only, and the model should be further tested using data from different geographical locations.

XIII. CONCLUSION AND IMPLICATIONS

In a people-centric and dependent organization, the operations strategy and related metrics must emphasize patient satisfaction and consistent service quality. This study highlighted the application of multivariate analysis to extend the business analytics of a healthcare organization beyond descriptive statistics. Further this study created a SEM to better understand the factors that predict patient satisfaction.

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