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## Factor of Services that Effect a Patient Attitude towards Private Multi-Specialty Hospitals in North and South India

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### **Abstract:**

*This paper highlights the tangible and intangible factors of services that effect a patient's attitude towards a private multi-specialty hospital in north and south India. A binary regression model was used to identify the factors of services that have a positive effect. Five variables that have positive effect on patient's attitude are professional attitude by hospital staff, doctors should examine patients thoroughly before prescribing treatment plan, complete health information to be conveyed, doctors should be readily available during emergency, and cost of hospital services are reasonable.*

### **1. Introduction**

Attitude is any general and enduring positive or negative feeling about some person, object or issue Petty and Cacioppo<sup>1</sup>(1981). Unlike products which are tangible, services are intangible and co-created by a service provider and customer. An actual service encounter enables a customer to form thoughts and feelings about it. Some thoughts and emotions are positive and others are negative. There are certain variables in the service environment that can cause extremely positive or extremely negative attitudes. We expect this positive or negative feeling or attitude associated with service after the service encounter to influence word of mouth and likelihood to recommend the service to others. In fact, the more extreme an attitude that is formed, the more influential it is to thinking and action Krosnick & Ableson<sup>2</sup>(1992). Thus extremes in attitude towards service formed after an actual service experience is expected to influence the reputation of service in the long run.

This study uses three key intent based measures of attitude of patient's admitted at private multi-specialty hospitals after service encounter in a hospital setting:

- a) I will say positive things about hospital to other people
- b) I will recommend this hospital to my family and friends
- c) I am not happy with services of hospital (This negative statement will help us cross check the responses on two positive statements - I will say positive things and I will recommend this hospital)

The scale that measures attitude was self-developed using the three intent based measures mentioned above.

In order to assess impact of factors and variables on 'say positive things' and 'recommend this hospital to family and friends', patients were divided into two groups.

- Group one consisted of patients who strongly disagreed with the statements, or held extremely negative attitude towards the service
- Group two consisted of patients who strongly agreed with the statements or held positive attitude towards the service encounter. This study is focused on Group two patients since positive word of mouth, likelihood to recommend would positively influence the reputation of a service provider in the long run.

For the purpose of this study, a field investigation was conducted through an interview of 500 respondents. The target population consists of patients of private multi-specialty hospitals of North and South India who had completed their treatment at that facility. In all 250 (250 from each region) patients from two private multi-specialty hospitals across North and South India were surveyed. Two private hospitals – Fortis Hospital, Mohali, Punjab and Fortis Hospital, Bannerghatta Road, Bangalore, were selected on judgmental basis for collecting data of patients who had undergone treatment at the above hospitals in the two regions of India.

<sup>1</sup>Petty, R.E. and Cacioppo J. T. (1981), Attitudes and Persuasion: Classic and Contemporary Approaches. *Brown Company Publishers*, Dubuque, Iowa

<sup>2</sup>Krosnick, J. A., & Abelson, R. P. (1992). The case for measuring attitude strength in surveys. *Questions about questions*, 177-203.

Data Collection		
	South India	North India
Patients	250	250

Table 1: Data Collection  
Source: Field Investigation Survey

Binary logistic regression model was used to measure and predict which factors effect attitude of patient towards private multispecialty hospitals of North and South India. Each question on attitude was tested for data's predictive validity. The next three sections will analyze and measure attitudes based on the responses provided to the statements mentioned above. The variables used in this analysis are defined below:

Variables
X <sub>1</sub> Doctors Competence
X <sub>2</sub> Trained Nurses
X <sub>3</sub> Skilled Support Staff
X <sub>4</sub> Professionalism Staff
X <sub>5</sub> Accessibility Doctors
X <sub>6</sub> Complete health information to be conveyed to patient
X <sub>7</sub> Communicated Treatment Advice
X <sub>8</sub> Explained the Test Results
X <sub>9</sub> Doctor Answered all Health Related Queries
X <sub>10</sub> Doctors Asked about Past Ailments
X <sub>11</sub> Doctor Suggested Preventive Measures
X <sub>12</sub> In case of an emergency, doctors should be promptly accessible
X <sub>13</sub> Doctors should examine the patient thoroughly before treatment
X <sub>14</sub> Health Condition Monitored Regularly
X <sub>15</sub> Best Treatment Plan was Developed by Doctors
X <sub>16</sub> Hospital Has Latest Medical Equipment's
X <sub>17</sub> Medical Procedure Perform Correctly First Time
X <sub>18</sub> Confidence in Medical Test Results
X <sub>19</sub> Caring and Empathizing Staff
X <sub>20</sub> Courteous Staff
X <sub>21</sub> Helpful and Attentive Staff
X <sub>22</sub> Doctors and Staff Sensitive
X <sub>23</sub> Responsive to Patient Needs
X <sub>24</sub> Staff Responds Quickly
X <sub>25</sub> Staff have Clean Appearance
X <sub>26</sub> Toilet Facilities' are Clean
X <sub>27</sub> Cabins and Wards Are Cleaned Regularly
X <sub>28</sub> Hospital Facilities Well Maintained
X <sub>29</sub> Staff is Disciplined and Punctual
X <sub>30</sub> Hospital Facilities Have Pleasing Design
X <sub>31</sub> Hospital has Good Entertainment Facilities
X <sub>32</sub> Food Services Were Good
X <sub>33</sub> Quality of Food Was Food
X <sub>34</sub> Beds Were Comfortable
X <sub>35</sub> Wards Were Noise Free
X <sub>36</sub> Wards had Privacy
X <sub>37</sub> Cost of Medical Care Was Reasonable
X <sub>38</sub> Convenient Method of Payment and Settlement
X <sub>39</sub> Insurance Claims Were Settled Expeditiously

Table 2: Variables used in Binary Regression Analysis

## 2. Analysis of Results: Positive Word of Mouth

→ H<sub>1</sub>: Factors and associated variables of service had no effect on word of mouth by patients about hospital services  
Group one had to be discounted because numbers of respondents in this group were only 9. Given the reputation and quality of brands selected for the study, we did not find enough patients who held extremely negative attitude towards the hospital. The predictive value of the data was only 33%.

In Group two, 200 responded with score of 5 on a 5-point scale. The predictive value was 98%. The fit of model and variables that influence the positive word of mouth are mentioned below.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
4	32.686	.180	.603

Table 3: Model Summary

Step	Chi-square	Df	Sig.
4	.876	8	.999ns

Table 4: Hosmer and Lemeshow Test

Null hypothesis (H0): the given data fits well to the logistic model against the alternate hypothesis (H1): the given data does not fit well to the model that has been tested using the Hosmer–Lemeshow goodness of fit statistic, which indicates a good fit if the significance value is > 0.05. Since p-value is > 0.05, therefore the null hypothesis that given data fits well to the logistic model is accepted. Moreover, according to Omnibus tests of model coefficients, p-value<0.05 suggest that the forward stepwise (likelihood) procedure of logistic regression is appropriate. The Wald test clearly shows that there are significant variables (or predictors), which shows significant changes in the - 2 log-likelihood method as illustrated in Table 3, which further supports the adequacy of the model. Coefficient of determination (R<sup>2</sup>) was computed to check the association of variables in the current model. It is evident from Nagelkerke’s R<sup>2</sup> value that there is a strong association of selected independent variables with dependent variables Nagelkerke’s<sup>3</sup> 1991.

2.1. ROC Model to Test Accuracy

Positive Word of Mouth	Valid N (list wise)
Positive	200
Negative	9

Table 5: Case Processing Summary

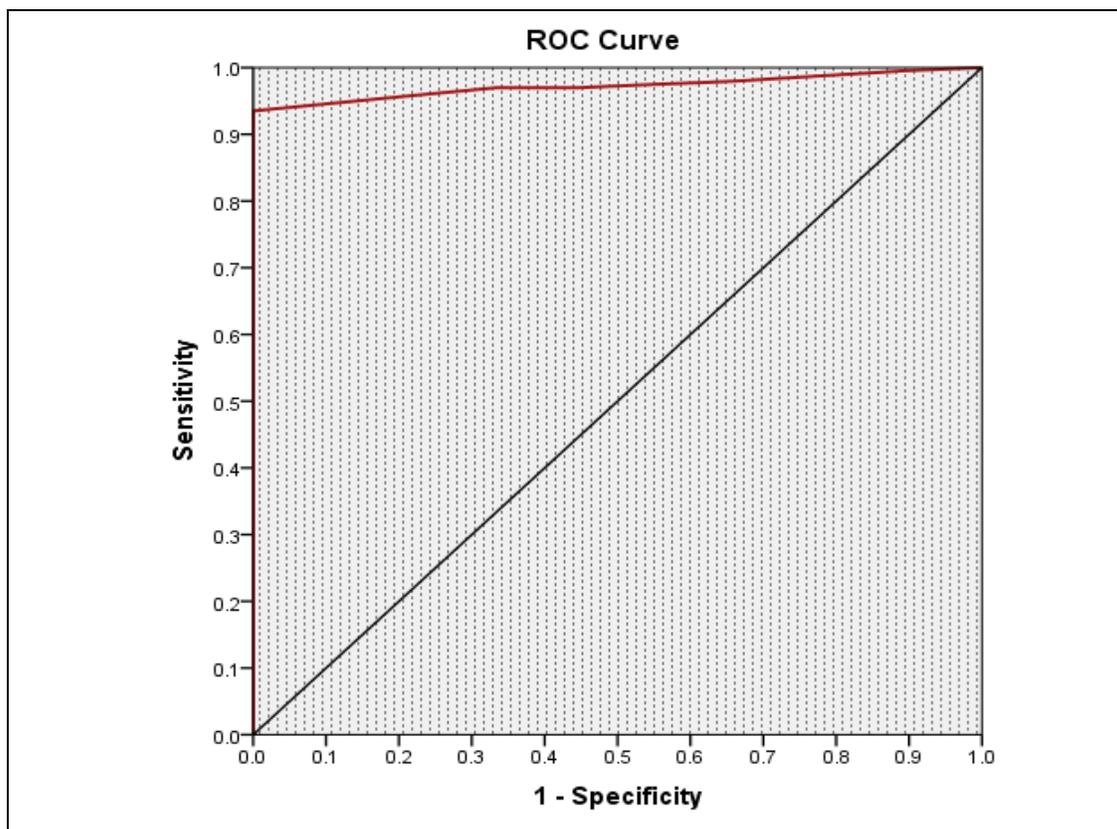


Figure 1: ROC Curve

<sup>3</sup>Nagelkerke, N. J. (1991). A note on a general definition of the coefficient of determination. *Biometrika*, 78(3), 691-692

Test Result Variable(s): Predicted probability				
Area	Std. Error	Asymptotic Sig.	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.972	.011	.000	.950	.994

Table 6: Area under the Curve

The ROC graph represents the accuracy of test. The area under the curve is 97%, at 95% confidence interval as (.95 - .994) which are close enough for accuracy.

### 2.2. Results Positive Word of Mouth

In a binary logistic model, 95.2% of the factors of services have been correctly classified (Table 8).

	Observed		Predicted		
			Positive word of mouth		Percentage Correct
			1	5	
Step 4	Positive word of mouth	1	3	6	33.3
		5	4	196	98.0
Overall percentage					95.2

Table 7: Classification Table

Variables		B	S.E.	Wald	df	Sig.
Step 4	Professional attitude of hospital staff	7.665	3.097	6.13	1	.013*
	Complete health information to be conveyed to patient	-3.295	1.328	6.16	1	.013*
	In case of an emergency, doctors should be promptly accessible	-11.497	5.13	5.02	1	.025*
	Cost of hospital services were reasonable	5.281	2.363	5	1	.025*
	Constant	11.959	7.252	2.72	1	.099ns

Table 8: Variables in the Equation

Variable		Model Log Likelihood	Change in -2 Log Likelihood	df	Sig. of the Change
Step 4	Professional attitude of hospital staff	-26.036	19.387	1	.000**
	Complete health info to be conveyed to patient	-27.548	22.411	1	.000**
	In case of an emergency, doctors should be promptly accessible	-24.746	16.807	1	.000**
	Cost of hospital services were reasonable	-20.644	8.603	1	.003**

Table 9: Model if Term Removed

### 2.3. Variables Affecting Positive Word of Mouth

Equation:

$X_4$  = Professional attitude of hospital staff

$X_6$  = Complete health information to be conveyed to patient

$X_{12}$  = In case of an emergency, doctors should be promptly accessible

$X_{37}$  = Cost of hospital services were reasonable

$Y = 11.959 + 7.665X_4 - 3.295X_6 - 11.497 X_{12} + 5.281X_{37}$

$$P = \frac{1}{1 + e^{-Y}}$$

The average score in this category across both the region is 4.214. 95% of the patients were happy about their treatment outcome and would say positive things about the hospital. There were cases where treatment outcome didn't meet the patient expectations. In some instances, the cost of treatment was higher than expected, which lead patient to feel dissatisfied with hospital services. The findings by Anderson, E. W.<sup>4</sup> (1998) indicate that dissatisfied customers do engage in greater word of mouth than satisfied ones. Given tight knit family and friend communities in India, saying 'positive things about the hospital to others' means long term business success of services in India.

The positive word of mouth for private multi-specialty hospitals in South and North India are influenced by following variables of services. They mostly fall under functional factors that impact careful human thought processes.

<sup>4</sup>Anderson, E. W. (1998). Customer satisfaction and word of mouth, *Journal of service research*, 1(1), 5-17

### 2.3.1. Service Interaction of Patients and Attendants with Members of Hospital Staff

- Professional attitude of hospital staff: All the staff that came in contact or otherwise with the patients were included in this category. This factor of services is one of the strongest predictor of positive word of mouth. Professionalism has to do with organizational culture. It can be as simple as physician seeing a patient at the scheduled appointment. All staff whether in contact with the patient or otherwise has to exhibit professionalism for hospital care to be considered in par with best in the world. Professionalism is linked to different components of hospital care mentioned below.
  - *Professionalism of nursing care*: Nurses are the vital link in the process of hospital care. Private multi-specialty hospitals have severe shortage of quality nurses. There is also a problem of high attrition rate. High quality Indian nurses look for job opportunities abroad. This could compromise quality of care in the long run. In India, there is also no regulatory requirement for continuing nursing education; therefore, there is no pressure on nurses to keep abreast with latest in nursing care. It is up to hospital to train nurses. Professionalism in nursing care is very important for positive word of mouth.
  - *Professionalism of post-operative care*: For faster recovery and to avoid relapses good post-operative care is imperative. Nurses are vital in performing post-operative care. Good quality of nurses will ensure good quality post-operative care.
  - *Professionalism of diagnostic staff*: Medical lab technicians and their skills are very important in identifying the cause of illness. The test results are used by doctors to plan the treatment for a patient. Hospitals in both regions have sophisticated diagnostic and medical equipments.
  - *Professionalism of non-medical support staff*: Non-medical staff also provides clues about quality of service. Services offered by the reception, billing, or security could determine how hospital services are perceived by patients.

Thus professional attitude of all hospital staff impact positive word of mouth of private multi-specialty hospitals.

### 2.3.2. Service Interaction of Patients with the Doctor

- *Complete health information to be conveyed to patient*: It means that patient is given feedback on everything about the line of treatment to expected treatment outcome. Advice and constant communication with a patient is critical. This variable is also a strong predictor of positive word of mouth. Patients believe that current health condition, line of treatment, and expected outcome needs to be clearly conveyed to them in simple language. Informal communication is also important component of patient – doctor interaction. Meterkoet al<sup>5</sup> (1998) suggests that doctor–patient consultations will look, mean and feel differently according to their organizing principle or ‘higher’ purpose. They might be (and often are), for example, organized around the achievement of a diagnosis, a transaction involving the transfer of knowledge (symptoms given to doctor by patient; diagnosis given to patient by doctor). Cheng et al<sup>6</sup> (2013) further corroborate the use of informal communication. They say formal systems often fail to support the spontaneous and opportunistic needs of healthcare providers to communicate patient information.
- *In case of an emergency, doctors should be promptly accessible*: This variable was significantly different and it is a strong predictor of positive word of mouth. Patients admitted to multi-specialty hospitals have health conditions that may require medical intervention at odd hours. Patients expect the consulting physician or a specialist to be available in case of such emergencies. Resident doctors who only have basic MBBS degree are the doctors who are always available, but the patient expects their consulting physician to be present during medical emergencies.

### 2.3.3. Cost of Services Were Reasonable

- *Cost of hospital services*. Hospital services at private multispecialty hospitals are expensive. Most of the patients have insurance or have the capability to privately fund hospital expenses. The treatment outcome could also influence cost sensitivity. There are also additional costs associated with pharmacy, diagnostic testing, food and accommodation for attendants. Treatment cost always exceeds the estimate in 100% of the cases. In case of complications, the cost can escalate at rapid rate, causing financial distress to not only families of the patients, but also mental distress to the patient. Out of all the paying customers, 30% of the total customers are dissatisfied by the cost of treatment. Indian customers view price more in context of value, that is, getting one’s money worth, Assael, H<sup>7</sup>. (2005). This is true for evaluating hospital services too.

➤ The hypothesis H<sub>1</sub> was rejected. Four variable of services namely, ‘professionalism of staff’, ‘complete health information to be conveyed to patients’, ‘doctors should be readily available in case of emergency’, and ‘cost of hospital services are reasonable’ effect word of mouth by patients.

## **3. Analysis of Results: Recommending Hospital Services**

→ H<sub>2</sub>: Factors and associated variables of service had no effect on patient’s likelihood to recommend hospital services

<sup>5</sup>Meterko, M., Nelson, E. C., Rubin, H. R., Batalden, P., Berwick, D. M., Hays, R. D., & Ware, J. E. (1990). *Patient judgments of hospital quality: report of a pilot study*. *Medical care*, S1-S56.

<sup>6</sup>Cheng (2013). Patient satisfaction with and recommendation of a hospital: effects of interpersonal and technical aspects of hospital care, *International journal for quality in healthcare*, Vol 15: pp344 -355

<sup>7</sup>Assael, H. (2005). *Consumer Behavior A Strategic Approach Indian*, Dreamtech Press.

Total of 233 responded as either strongly agree or strongly disagree. Strongly disagree group was disregarded from our analysis because the number of respondents were 13 and the predictive value was only 22.2%. In the strongly agree group two, there were 220 respondents and model predicted with 98.2% accuracy about the predictive value of dependent variable.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
2	49.092	.170	.594

Table 10: Model Summary

Step	Chi-square	Df	Sig.
2	2.210	5	.819ns

Table 11: Hosmer and Lemeshow Test

Null hypothesis (H0): the given data fits well to the logistic model against the alternate hypothesis (H1): the given data does not fit well to the model that has been tested using the Hosmer–Lemeshow goodness of fit statistic, which indicates a good fit if the significance value is > 0.05. Explanation provided in the previous section about goodness of fit and predictive value of variables is same for this section.

3.1. ROC Test of Accuracy

Sat positive	Valid N (list wise)
Positive	224
Negative	9

Table 12: Case Processing Summary

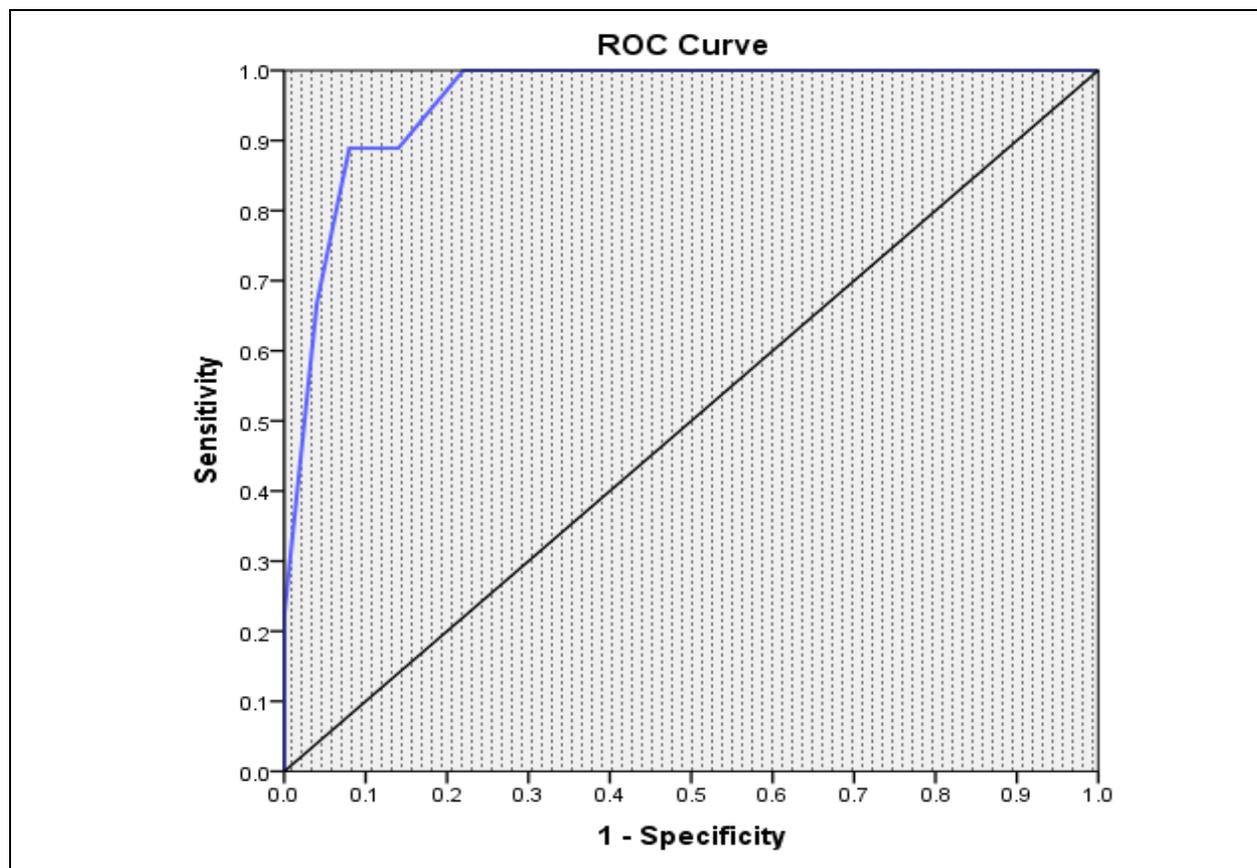


Figure 2: ROC Curve

Test Result Variable(s): Predicted probability				
Area	Std. Error	p-value	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.934	.020	.000	.895	.973

Table 13: Area under the Curve

The ROC graph represents the accuracy of test. The area under the curve is 93% at 95% confidence interval as (8.95 - .973) which are close enough for accuracy.

### 3.2. Results Likelihood to Recommend Hospital Model

In a binary logistic model, 95.3% of the factors of services have been correctly classified Table 13.

	Observed		Predicted		
			Recommend		Percentage Correct
			1	5	
Step 2	Recommend	1	2	7	22.2
		5	4	220	98.2
Overall Percentage					95.3

Table 14: Classification Table

Variables		B	S.E.	Wald	df	Sig.
Step 2	Professional attitude of hospital staff	2.012	0.679	8.78	1	.003**
	Doctors should examine the patient thoroughly before treatment	-2.491	0.719	12	1	.001**
	Constant	6.221	3.294	3.57	1	.059ns

Table 15: Variables in the Equation

Variables		Model Log Likelihood	Change in -2 Log Likelihood	df	Sig. of the Change
Step	Professional attitude of hospital staff	-30.127	11.162	1	.001**
2	Doctors should examine the patient thoroughly before treatment	-33.979	18.866	1	.000**

Table 16: Model if Term Removed

### 3.3. Results on Likelihood to Recommend Hospital

Equation:

$X_4$  = Professional attitude of hospital staff

$X_{13}$  = Doctors should examine the patient thoroughly before treatment

$$Y = 6.221 + 2.012X_4 - 2.491X_{13}$$

$$P = \frac{1}{1 + e^{-Y}}$$

The Table 17 lists the two variables that can predict the Likelihood to Recommend Hospitals. This is positively correlated to the previous one constraint that was measured. All the patients who say positive things about hospital experiences to others, were also happy to recommend the hospital to family and friends. This augurs well for the hospital as word of mouth is best way to grow healthcare business in India.

A study by Reidenbach, R. E., & Sandifer-Smallwood, B.<sup>8</sup> (1990), suggests that hospital services are recommended by patients based on patient confidence in treatment outcome. In this study we reveal that a patient's likelihood to recommend hospitals services are positively correlated with two key variables. These two strong predictors of patient recommendation of hospitals services are:

Service Interaction of Patients and Attendants with Members of Hospital Staff

- *Professional attitude of hospital staff*: This variable is significant predictor of recommending hospital services. This variable has been explained in detail in the previous section

Service Interaction of Patients with Doctor

- *Doctors should examine the patient thoroughly before treatment*: This variable is significant predictor of recommending hospital services. A thorough examination of patient has direct impact on treatment outcome.
- Hypothesis  $H_3$  was rejected. Two variables of service namely, professionalism of staff and doctors should examine the patient thoroughly before treatment effects likelihood to recommend hospitals by patients.

## 4. Analysis of Results: I am Not Happy with Services of the Hospital

→  $H_3$ : Factors and associated variables of services had no effect on happiness of patient with hospital services

<sup>8</sup>Reidenbach, R. E., & Sandifer-Smallwood, B. (1990). Exploring perceptions of hospital operations by a modified SERVQUAL approach. *Journal of Health Care Marketing*, 10(4).

Total of 59 responded either strongly agreed or strongly disagreed.

- In the strongly disagreed Group one (which means that patients are happy with hospital services) there were 46 respondents. The predictive value was 92%.
- In the strongly agreed Group two, as expected there were only 9 respondents (which means that patients are not happy with the hospital services) and model predicted with 88.9% accuracy about the predictive value of the dependent variable.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
3	19.645	.406	.707

Table 17: Model Summary

Step	Chi-square	Df	Sig.
3	.915	8	.999

Table 18: Hosmer and Lemeshow Test

Null hypothesis (H0): the given data fits well to the logistic model against the alternate hypothesis (H1): the given data does not fit well to the model that has been tested using the Hosmer–Lemeshow goodness of fit statistic, which indicates a good fit if the significance value is > 0.05. Explanation provided in the previous section about goodness of fit and predictive value of variables is same for this section.

4.1. ROC Test of Accuracy

Sat_not happy	Valid N (listwise)
Positive	9
Negative	50

Table 19: Case Processing Summary

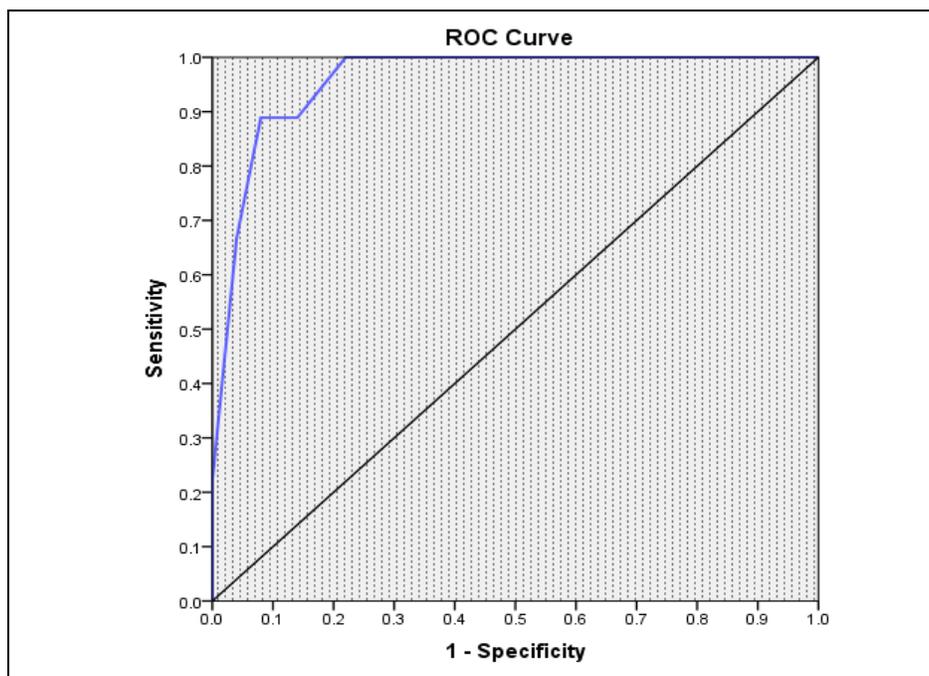


Figure 3: ROC Curve

Test Result Variable(s): Predicted probability				
Area	Std. Error	p-value	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.958	.026	.000	.907	1.000

Table 20: Areas under the Curve

The ROC graph represent the accuracy of test. The area under the curve is 96%, at 95% confidence interval as (.907 – 1.00) which are close enough for accuracy.

4.2. Results ‘I am Not Happy with the Hospital Services’

In a binary logistic model, 91.5% of the factors of services have been correctly classified in Table 20.

	Observed		Predicted		
			Sat_not happy		Percentage Correct
			1	5	
Step 3	Sat_not happy	1	46	4	92.0
		5	1	8	88.9
	Overall Percentage				91.5

Table 21: Classification Table

Variables		B	S.E.	Wald	df	Sig.
Step 3	Professional Attitude of Hospital Staff	-19.871	4.997	5.99	1	.014*
	In case of an emergency, doctors should be promptly accessible	19.902	5.921	4.6	1	.031*
	Doctors should examine the patient thoroughly before treatment	2.534	1.155	4.81	1	.028*
	Constant	-12.347	6.042	4.18	1	.041*

Table 22: Variables in the Equation

Variable		Model Log Likelihood	Change in -2 Log Likelihood	df	Sig. of the Change
Step 3	Professional Attitude of Hospital Staff	-17.954	16.262	1	.000**
	In case of an emergency, doctors should be promptly accessible	-15.462	11.278	1	.001**
	Doctors should examine the patient thoroughly before treatment	-14.511	9.377	1	.002**

Table 23: Model if Term Removed

Variables Predicting ‘I am Not Happy with Hospital Service’

Equation:

X<sub>4</sub> = Professional attitude of hospital staff

X<sub>12</sub>=In case of an emergency, doctors should be promptly accessible

X<sub>13</sub> = Doctors should examine the patient thoroughly before treatment

$$Y = - 12.347 - 19.902X_4 + 19.902X_2 - 2.534X_{13}$$

$$P = \frac{1}{1 + e^{-Y}}$$

Table 23, list the three variables that can predict ‘I am not happy with hospital services’. In order to comparatively assess results on likelihood to recommend and positive word of mouth, the study focused on patients who disagreed strongly with the statement ‘I am not happy with services of hospital’. In other words, these are patients who are happy with hospital services. The three strong predictors of patient happiness with service experience are:

Service Interaction of Patients and Attendants with Members of Hospital Staff:

- *Professional attitude of hospital staff*: This is a significant predictor of patient happy with hospital services. The variable has been explained in detail in the previous section

Service Interaction of Doctor with Patient

- *Doctors should be readily available during emergencies*: This is a strong predictor of patient happiness with hospital services. Doctor’s availability during emergencies can have critical bearing on treatment outcome and has been explained in the previous section
- *Doctors should examine patients thoroughly before treatment*: This is a strong predictor of patient happy with hospital services. Thorough examination of patient has direct impact on treatment outcome. Diagnosis of illness will be direct result of the thorough examination of patient. The treatment line followed is also direct result of examination of patient.

➤ The hypothesis H<sub>4</sub> was rejected. Three variables of service namely, professionalism of staff, doctors should be readily available during emergencies and doctors should examine the patient thoroughly before treatment effects happiness with hospital services.

## 5. Conclusion

There are five variables that strongly impact extremely positive attitude of patients towards private multi-specialty hospitals of South and North India. These variables impact positive word of mouth, likelihood to recommend and happiness with the service services provided by the multi-specialty hospital.

- Professional attitude by hospital staff
- Doctors should examine patients thoroughly before prescribing treatment plan
- Complete health information to be conveyed
- Doctors should be readily available during emergency
- Cost of hospital services are reasonable

Important point to note here is that almost all variables fall under functional factors. The patients of private multi-specialty hospitals are influenced most by functional factors of services, which are concerned with rational human thought. Patients and their attendants are under emotional stress when they seek the services of a hospital. They seek understanding and partnership not only from the doctors, but also from the hospital staff. Reasonable costs appear to have a significant impact on positive word of mouth only. Given the value conscious nature of the Indian consumer, it is likely that benefits of hospital treatment are evaluated against price of services in order to get a subjective assessment of perceived value.

## 6. References

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