Statistical Analysis of Patients' Satisfaction with Hospital Services: A Case Study of Shashemene and Hawassa University Referral Hospitals, Ethiopia

Haile Tariku Tesfaye
Arbaminch University, College of Natural Sciences

Department of Statistics

Arbaminch, Ethiopia

Email: tarepeace@gmail.com

Abstract

Patient satisfaction is considered as one of the desired outcomes of health care; however, it is not brought to desired level due to different reasons.The aim of this study was to identify factors affecting patients' overall satisfaction regarding hospital services provided. The data were obtained from a sample of 310 in-patients who have been diagnosed at Hawassa University referral and Shashemene referral hospitals using stratified random sampling technique and analyzed using multivariate method and binary logistic regression. The results obtained from the analysis showed that 58.4% were satisfied with hospital service while 41.6% patients were dissatisfied. From binary logistic regression analysis, age of patient, educational level, occupation, monthly income, department of diagnosis, fee-for-service, interpersonal quality of doctors, comfort in the ward, speed of services, accessibility and attitude of support staffs toward patients were found to be statistically significant predictors of patients' overall satisfaction at 5% level of significance.

Keywords: Binary Logistic Regression Analysis, Factor Analysis, Patient Satisfaction.

1 INTRODUCTION

Patient satisfaction is considered as one of the desired outcomes of health care and it is directly related with utilization of health services. Asking the patients what they think about the care and treatment they received is an important step toward improving the quality of care and to insuring that local health services are meeting patient's needs. Patients' satisfaction is of fundamental importance as a measure of the quality of care because it gives information on the provider's success in meeting client values and expectations, matters on which the client is the ultimate authority (Donabedian, 1980). Quality is one of the prime factors which affect satisfaction. There is a strong connection between health service quality perceptions and customer satisfaction. Only when the health service providers understand what exactly the customer (patient) wants when he says that he wants quality, will they be able to satisfy their patients and only then will it be a successful hospital. Both Hawassa University and Shashemene referral hospitals give both inpatient and outpatient services like internal medicine, surgery, pediatrics and gynecology & obstetric medical service. Ethiopia has been implementing the Health Sector Development Programme (HSDP) since 2005. As such, there has been encouraging improvements in the coverage and utilization of the services over the periods of implementation of the HSDP. However, there is still a significant gap in terms of access and quality of services provided to communities. Moreover, the community remains dissatisfied with the services being provided (Ethiopia Federal Ministry of Health, 2009). Thus, the objective of this study is to identify factors affecting patient satisfaction at Hawassa University and Shashemene referral hospitals and provide important information for hospital managements to improve patients' satisfaction.

2 PATIENTS AND METHODS

After obtaining the ethical approval from the hospitals Ethical Committee, a cross-sectional study was conducted from May 1 to May 30, 2011 at Hawassa University and Shashemene referral hospitals. And the data was obtained from inpatients diagnosed at the hospital at least for 3 days using interviewer administered structured questionnaire. Using stratified random sampling technique, 310 inpatients were selected as representative sample of patients based in study hospitals, from which 187 inpatients from Hawassa University referral hospital and 123 from Shashemene referral hospital. The questionnaire was designed based on factors came from examination of the literature review on patients satisfaction. It is a patient-centered on socio-demographics, hospital environment and care providers factors and each question has five responses from "poor" to "Excellent" in the form of a Likert scale of items. The dependent variable is overall patient's satisfaction which was obtained from the global indicators of overall satisfaction: overall, how satisfied they were with their care, the outcome of the care they received, reuse the hospital for future care and recommend the hospital to their family or friends were measured in a five point Likert-scale from 1 = "strongly disagree" to 5 = "strongly agree" which were obtained from MOS memorandum (Ron et al.,1987) and converted to percentage score using the formula adopted by Monnin and Perneger (2002) which is given as: % score=25x(i^{th} score-1), for i=1,2,3,4,5. Then the average percentage score was computed for each patient.

The data were entered and analyzed using the statistical package for social sciences (SPSS), version 16. Statistical significance was determined when the *p* value was < 0.005. Binary logistic regression was analyzed for overall patient satisfaction which is dichotomized as satisfied if average percentage score is greater than or equal to 70%; otherwise dissatisfied (Rade, 2006). Factor analysis with varimax rotation was used to reduce number of variables which were correlated with each other and only factors with eigen-value greater than one are considered.

3 RESULTS AND DISCUSSION

3.1 Descriptive Statistics

The study used primary data which was collected from May 1 to 30, 2011. Among in-patients who have been diagnosed at Hawassa University referral and Shashemene referral hospitals during the study period, a sample of 310 was taken for this study. The results displayed in Table 3.1 shows percentages and counts of overall patient satisfaction, satisfied/dissatisfied with respect to socio-demographic and economic variables. Out of the 310 patients considered, 41.6% patients were dissatisfied while 58.4% were satisfied with hospital service.

3.2 Bivariate Analysis Results

This section reports the association between the overall patient satisfaction and each of the socio-demographic variables using chi-square and likelihood ratio tests. The results are displayed in Table 3.1. With respect to age of patients diagnosed, 21% were under the age of 15 and 31.9% were on 15-35 age category; whereas 18.1% and 29% were on the age categories of 36-45 and above 45 years, respectively. Among the patients diagnosed, 33.9% of them had no formal education and 24.5%, 22.3% and 19.4% had primary, secondary and college or higher educational level, respectively.

Table 3.1: Test of Association between Overall Patient Satisfaction and Socio-demographic Variables (Hawassa University Referral and Shashemene Referral Hospitals, May 2011).

Variable	Category	Overall Satisfaction				Total		Chi-square (sig.)	LR (sig.)
		Dissatisfied		Satisfied					
		Count	%	Count	%	Count	%		
Age of patient	<15	31	47.7	34	52.3	65	21.0	0.000	0.000
	15-35	54	54.5	45	45.5	99	31.9		
	36-45	22	39.3	34	18.1	56	18.1		
	>45	22	24.4	68	75.6	99	29.0		
Educational level	Illiterate	38	36.2	67	63.8	105	33.9	0.000	0.000
	Primary	30	39.4	46	60.6	76	24.5		
	Secondary	28	40.6	41	59.4	69	22.3		
	College and above	39	65.0	21	35.0	60	19.4		
Occupation	Farmer	35	47.9	38	52.1	73	23.5	0.000	0.000
	Merchant	33	44.6	41	55.4	74	23.9		
	Civilserv	22	21.8	79	78.2	101	32.6		
	Other	39	62.9	23	37.1	62	20.0		
Monthly income	<500	34	54.0	29	46.0	63	20.3	0.047	0.047
	500-1000	28	35.4	51	64.6	79	25.5		
	1001-2000	37	46.3	43	53.8	80	25.8		
	>2000	30	34.1	58	65.9	88	28.4		
Department of Diagnosis	Pediatrics	14	25.0	42	75.0	56	18.1	0.000	0.000
	OB/Gyna	43	54.4	36	45.6	79	25.5		
	InterMed	31	32.0	66	68.0	97	31.3		
	Surgery	41	52.6	37	47.7	78	25.2		

From Table 3.1 we can see that a significant association was found between overall patient satisfaction and the socio-demographic variables: age of patient, educational level of patient, monthly income, occupation of patient, and department of diagnosis.

Moreover, comparing the level of overall patients' satisfaction at the two hospitals, a result displayed in Table 3.2 indicates that there was no statistically significant difference in proportion of overall patient satisfaction between the two hospitals at 5% level of significance.

Table 3.2: Test for Two Proportions of Overall Patients' Satisfaction: SRH, HURH

Variable	Success=2 Satisfied	No. of patient	Sample p	Estimate for p(SRH) - p(HURH)	Z-value	P-Value
SRH	78	123	0.6341	0.0833442	1.47	0.141
HRH	103	187				

SRH= Shashemene Referral Hospital, HURH=Hawassa University Referral Hospital

3.3 Establishing Reliability

The reliabilities of the variables (data) were checked against the Nunnally's recommended standards (Cronbach's alpha ≥ 0.70) mainly to ensure that they are reliable indicators of the constructs (Nunnally's, 1967). The Cronbach's alpha calculated for all items was 0.907 (Table 3.3) and this result confirms that the items identified as factors affecting patient satisfaction are cohesive enough to adequately represent a single concept (patient satisfaction).

Table 3.3: Reliability Statistics for the Data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
.907	.894	40

3.4 Factor Analysis

Using Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, factor analysis was performed on 29 items (variables) that measure patient satisfaction. From Table 3.4, Kaiser-Meyer-Olkin (KMO) test shows that there are probably significant relationships among the perceived determinants of patient satisfaction as Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.883>0.5 and Bartlett's Test of Sphericity has p=0.000<0.05 is statistically significant, which shows that the variables are correlated highly enough to provide a reasonable basis for factor analysis.

Table 3.4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy. .883		
Bartlett's Test of Sphericity	Approx. Chi-Square	4664.159
	Df	406
	Sig.	.000

For factor analysis in varimax rotation convergence established after nine iterations and 65 % of the total variance was explained by the first seven factors with eigenvalues greater than one as displayed on Table 3.5.

Table 3.5 Rotated Components and their Loadings

Factor	Factor Label	Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %
1	Interpersonal quality of doctors	4.352	15.008	15.008
2	Visiting permission	2.905	10.017	25.024
3	Efficacy of care providers	2.747	9.472	34.496
4	Comfort in the ward	2.457	8.473	42.970
5	Speed of services	2.233	7.700	50.669
6	Medical stuff	2.183	7.526	58.196
7	Attitude of support staffs.	1.994	6.876	65.072

3.5 Binary Logistic Regression Analysis

Checking for the overall significance of logistic regression model, the model chi-square has a value of 134.906 and a probability of p-value (0.000) < 5% (see Table 3.6). This shows that the final model has a good-fit, indicating that the predictor variables do have a significant effect the dependent variable overall patient's satisfaction.

Table 3.6: Summary Statistics of the Likelihood Ratio Test

Model	Model Fitting Criteria	Likelihood Ratio Test		
	-2 Log likelihood	Chi-Square	Df	Sig.
Null model (Intercept only)	420.980	134.906	27	0.000
Final model	286.081			

The results of logistic regression analysis are given in Table 3.7. The results revealed that age of patient, educational level, occupation, monthly income, department of diagnose, interpersonal quality of doctors, comfort in the ward, speed of services, availability of medical stuff and attitude of support staffs contributed significantly to the prediction of overall patient satisfaction.

Table 3.7: Variables in the Logistic Regression Model (Shashemene and Hawassa University Referral Hospital, May 2011)

Predictor Variable	$\hat{\beta}$	S.E. ($\hat{\beta}$)	Wald	Df	Sig.	Exp (β)	95% C.I. for Exp(β)	
							Lower	Upper
Age(Ref)			12.856	3	.005			
Age(1)	-.253	.428	.350	1	.554	.777	.336	1.795
Age(2)	.796	.503	2.502	1	.114	2.217	.827	5.948
Age(3)	1.06	.449	5.589	1	.018	2.888	1.199	6.958
Education(Ref)			13.007	3	.005			
Education(1)	.352	.422	.695	1	.405	1.422	.621	3.254
Education(2)	.697	.426	2.681	1	.102	2.007	.872	4.623
Education(3)	-.950	.450	4.450	1	.035	.387	.160	.935
Income(Ref)			16.247	3	.001			
Income(1)	.325	.445	.534	1	.465	1.384	.579	3.312
Income(2)	1.52	.475	10.190	1	.001	4.573	1.876	10.557
Income(3)	-.565	.458	1.520	1	.218	.568	.231	1.395
Occup(Ref)			22.965	3	.000			
Occupation(1)	.099	.430	.053	1	.817	1.105	.475	2.566
Occupation(2)	1.59	.450	12.507	1	.000	4.918	2.034	11.890
Occupation(3)	-.561	.463	1.465	1	.226	.571	.230	1.415
Dept(Ref)			13.515	3	.004			
Dept(1)	-1.49	.508	8.554	1	.003	.226	.084	.612
Dept(2)	-.366	.509	.516	1	.472	.694	.256	1.881
Dept(3)	-1.21	.512	5.551	1	.018	.299	.110	.816
InterpersonalDr	.410	.163	6.341	1	.012	1.507	1.095	2.074
VisitingPerm	.363	.153	5.651	1	.017	1.438	1.066	1.940
EfficacyCP	.258	.152	2.877	1	.090	1.294	.961	1.742
Comfort	.345	.151	5.192	1	.023	1.412	1.049	1.900
SpeedService	.443	.156	8.022	1	.005	1.557	1.146	2.115
AvailabiliMdSt	.331	.150	4.869	1	.026	1.392	1.040	1.860
AttitudeSstaff	.328	.148	4.876	1	.027	1.388	1.038	1.856
Constant	1.21	.687	3.122	1	.077	3.366		

* Ref; in the brackets indicates the reference category for each predictors.

3.6 Discussion

From the logistic regression model, twelve variables were identified as displayed in Table 3.7. The first factor that affects overall satisfaction of patients is age of patients. Patients in age group >45 years were 2.888 times more likely to be satisfied with the hospital services as compared to those with age <15 years. The present result concords with earlier studies of Tucker (2000) and Abebe et al. (2008). The result also revealed that patients who attained college and above educational level were less satisfied than patients with no education (p-value <0.05). This might be due to the fact that the expectation of patients with relatively higher educational attainment was high and they were more critical and as a result experienced less satisfaction. This result is in line with the study of Oljira and Gebereselassie (2001), Singl et al. (1999) and by Abebe et al. (2008). On the other hand, the service center factor, interpersonal relationship quality of doctors was found to have positive coefficient and statistically significant at 5% level of significance, indicating doctors with better interpersonal relationship quality will increase patients' satisfaction. This result is consistent with the findings of Sohn et al. (2001), Birhanu et al. (2010), Girma (2008) and Syed et al. (2007). The other factor that was found to have positive and statistically significant relationship with overall satisfaction of patients is availability of medical stuff at 5%

level of significance. Speed of the service was also found to positively affect the overall satisfaction of patients. This signifies that services provided efficiently (not extended waiting time) will enhance the degree of overall satisfaction of patients. The result of this study is also consistent with the findings of World Bank (2004), Newman et al. (1997), and Ziaei et al. (2011).

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

From the empirical results it can be concluded that the socio-economic and demographic characteristics of patients: patient's age, education, occupation, income and department of diagnoses had a significant relationship with patient's general (overall) satisfaction with the facilities considered in this study. From the service factors, there was convincing evidence from the study that many of the candidate variables had an impact on the patient's overall satisfaction. Interpersonal relationship quality of doctors, visiting permission by the hospital, efficacy of care providers, comfort in the ward, speed of service, availability of medical stuff and attitude of support staffs had a positive impact on the patients overall satisfaction. However, there was no evidence to conclude that the proportion of overall satisfaction of patients at Hawassa University referral and Shashemene referral hospital was significantly different.

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