

Multivariate regression analysis of prime variables affecting ophthalmic patients' satisfaction in a resource limited economy

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Abstract

The aim of the present study was to appraise prime dependent variables of ophthalmic patients' satisfaction in a Nigerian public eye care facility with a view to boosting service uptake. It was a cross sectional study conducted between March and May 2012 in our centre. Consecutive clinic patients (n=251) that met study's criteria were recruited. The patients filled interviewer-administered structured questionnaires. A total of 251 patients were analyzed comprising 139 males (55.4%) and 112 females (44.6%). Male:female ratio=1:0.8. The ages of the patients studied ranged from 17 to 92 years with a mean of 37.2 years±15.57. Bivariate analysis, validated by multiple logistic regression, showed P values of 0.021, 0.008, 0.036, 0.008 and 0.004 for privacy, comfort during eye exam, fairness (non-partiality), thoroughness of examination and expectation, respectively. Satisfaction with overall quality of services was 80.1%. The services of any eye facility should be patient-driven to attain desired goals; therefore the identified areas of patients' dissatisfaction should be addressed for effective service uptake.

Introduction

One of the factors that influence patient satisfaction is efficiency of services. Efficiency has a broad scope that embraces promptness of care, duration of consultation, quick response to emergencies, quick dispensation of drugs, fast and accurate laboratory tests, privacy, comfort during exam, fairness (non-partiality), thoroughness of examination and expectation.¹ The extent to which the patients perceive these needs and expectations are met by the service provider determines satisfaction.² With dwindling government earnings and health care becoming increasingly privatized and economically competitive, evidenced by privatization and commercialization of some of

Nigeria's public institutions, there is urgent need for patient-centered health services. Other reasons that have necessitated a shift towards business approach to healthcare delivery are intense competition, more patient awareness, increased purchasing power of patients, and availability of specialist care.^{3,4}

Public health systems in developing countries have failed to achieve adequate level of services. Nigeria, for instance, satisfaction to public health care is considerably low.² To improve public participation and effectiveness of health programs, one must understand the underlying factors that contribute to patients' satisfaction. The success of any public institution should be consumer-driven to attain desired goals. Interest has grown not only in the assessment of treatment interventions by patients, but in the systematic evaluation of the delivery of that care.

This study attempted to define the level of ophthalmic health-care satisfaction in a cohort of Nigerian patients, as well as to further explore its primary determinants.

Materials and Methods

Setting

Our centre is a public tertiary referral centre in the heart of a state capital. The Ophthalmology department is one of the oldest clinical units in the hospital that could be a window to the services rendered in this public institution. The hospital statutory activities include research, training of various cadres of health professional and clinical services to the state of location and not exclusively, 5 other neighbouring states in Nigeria

Design of the study and sampling technique

This was a cross sectional study. A total sampling of all consecutive patients who met the inclusion criteria and who presented within the study time frame were studied.

Population

This study was conducted among adult patients attending Eye Clinic in our centre between March and May 2012.

Sample size

To determine the sample size of this study, the following formula was used:

$$N = \frac{Z^2 pq}{d^2} \quad (1)$$

where N represents minimum sample size required, P stands for prevalence (from previ-

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ous study)=83%, $q=1-P/100$, i.e. $1-83/100=1-0.83=0.17$. Z is standard normal deviation of 1.96 (which corresponds to 95% confidence interval), while $Z^2=3.84$. Degree of accuracy desired (d) was 0.05 ($d^2=0.0025$).

Substituting the above figures in the formula, we obtained:

$$N = \frac{Z^2 pq}{d^2} = \frac{3.84 \times 0.83 \times 0.17}{0.0025} = 217 \quad (2)$$

Thus the sample size calculated using the above formula was 217. In order to make an allowance for non-responders, an attrition rate of 10% of the calculated sample size was added to the 217 sample size to obtain a figure of 239.

Inclusion and exclusion criteria

The inclusion criteria used in this study were as follows: i) age more than 16 years; ii) patients who were duly registered in the Eye Clinic and seen by a doctor at least once.

Conversely, the exclusion criteria were: i) age 16 years and below (UNICEF definition of a child is 16 years and below;⁵ children were deliberated excluded in this response-based

study to enhance reliability). Adults' appreciation of service provided is more likely to be objective; ii) non-eye patients of the hospital; iii) eye patients not yet seen by a doctor, whether registered or not.

Pilot study

Questionnaire was validated through pre-test study that lasted one week conducted at the Eye Clinic of a peripheral health facility attached to our centre. This was to test research tools and to train data collectors in order to minimize inter and intra-observer variations.

Consents and ethical approval

Ethical approval was obtained from the Ethics Committee of our centre. Written and oral informed consents were sought from every participant in accordance with the tenets of Helsinki declaration.

Data collection proper

The study was based on primary information collected through pretested questionnaire from consecutive patients of the Eye Clinic. Only clinic patients were involved in the study to maintain homogeneity. Structured questionnaires grossly divided into two parts was specifically developed for this study. The first part was on biodata to get basic information from patients including occupation and educational levels. The second part was a two-section, 10-items questionnaire to cover areas of research interest. All ratings were made on a modified 6-point Likert-type scales.

Among others, questions contained in the questionnaire included socio-demographics characteristics, patient-provider relationship, issues on expectation, hospital appearance and adequacy of facilities in the eye clinic. Questionnaires were filled by literate patients while medical students, specifically trained in the conduct of interviews assisted illiterate

patients. Communication among respondents was discouraged to check undue interferences.

The items in the questionnaires were adapted from existing instruments used in previous patient satisfaction survey.⁶ Options provided for patients to choose from included undecided or non-applicable to ensure patients were not forced to tick options which might not be relevant to them.

Patient indicated their level of satisfaction by the following options: agree, strongly agree, disagree and strongly disagree. Those who chose disagree and strongly disagree were considered dissatisfied while those who selected agree and strongly agree were considered satisfied. Focus Group Discussions (FGDs) were held among the participants in batches during each clinic session. During the FGDs, filled questionnaires with vague entries were clarified to douse ambiguity. One of the authors supervised data collection.

Data analysis

The data from questionnaires were coded, entered and analyzed using SPSS (Statistical Package for Social Sciences) version 12 software in form of frequencies and percentages. Multivariate regression analysis was used to control for confounders, with categorical vari-

ables compared by chi-square test. P values <5% (0.05) were considered statistically significant.

Results

Of the 267 filled questionnaires, only 251 were found suitable for research work, comprising 139 males (55.4%) and 112 females (44.6%). Male:female ratio=1:0.8. The ages of the patients studied ranged from 17 to 92 years with a mean of 37.2 years±15.57. Table 1 shows age and sex distribution of the patients studied. 17 to 40 years constituted the highest age group. The adoption of this age grouping was on the premise that they share similar ideologies and not on any statistical prejudice.

Table 2 shows the responses of the subjects. About 30% of patients were dissatisfied for not being attended to in the order they arrived at the clinic. Majority of patients had pre-visit expectations meant in addition to being satisfied with patient-provider relationships, hospital appearance, manner of eye examination and level of privacy. The computed overall patient satisfaction with all services was 80.1%. P values were 0.021, 0.008, 0.036, 0.008

Table 1. Age and sex distribution of the patients studied.

Age (years)	Male		Female		Total	
	n.	%	n.	%	n.	%
17-4	79	31.5	80	31.9	159	63.3
41-60	47	18.7	23	9.2	70	27.9
>60	13	5.2	9	3.6	22	8.8

Chi-squared=6.127; P=0.047; degree of freedom= 2; 95% confidence interval=0.045-0.069.

Table 2. Responses of subjects.

Question	S (%)	NS (%)	U (%)	NA (%)	NR (%)
1 Confidentiality (privacy)	175 (69.7)	38 (15.1)	15 (6)	8 (3.2)	15 (6)
2 Comfort of examinations	199 (79.3)	31 (12.4)	11 (4.4)	2 (0.8)	8 (3.2)
3 Fairness (first come first serve was obeyed)	141 (56.2)	74 (29.5)	22 (8.8)	6 (2.4)	8 (3.2)
4 Thoroughness of examination	204 (81.3)	8 (3.2)	23 (9.2)	5 (2)	11 (4.4)
5 My expectation was meant	188 (74.9)	11 (4.4)	37 (14.7)	6 (2.4)	9 (3.6)
6 Pharmacists were courteous	157 (62.5)	24 (9.6)	28 (11.2)	38 (15.1)	4 (1.6)
7 Lab scientists were courteous	122 (48.6)	18 (7.2)	46 (18.3)	60 (23.9)	5 (2)
8 Other hospital staff were courteous	184 (73.3)	10 (4)	34 (13.5)	18 (7.2)	5 (2)
9 Nurses were caring	203 (80.9)	24 (9.6)	16 (6.4)	2 (0.8)	6 (2.4)
10 Doctor was willing to explain your eye condition	222 (88.4)	2 (0.8)	9 (3.6)	5 (2)	13 (5.2)
11 Doctor was caring	225 (89.6)	6 (2.4)	12 (4.8)	4 (1.6)	4 (1.6)

S, satisfied; NS, not satisfied; U, undecided; NA, not applicable; NR, no response. Source: compiled from questionnaires.

and 0.004 for patients' privacy, comfort during eye exam, fairness (non-partiality) to patients, thoroughness of examination and patients' expectation respectively. These key variables remained statistically significant after accounting for confounding factors such as literacy level, travels and socio-economic status. This is detailed in bivariate analysis in Table 3 and validated by multiple logistic regressions in Table 4.

Discussion

The interpretation of this study must be understood against the backdrop of the pervasive limitations inherent in this kind of study. The spectrum of patients being questioned varied and so could have been their responses. A homogenous population could have obviated biases introduced by confounders such as literacy level, travels and socio-economic status. Hospital-based studies have inherent selection biases to which this study could not be said to be immuned. The perception of satisfaction cannot be measured quantitatively while the qualitative alternative, being replete with subjectivity, is difficult to interpret.

The age distribution of the patients showed that majority, 159 (63.3%) were between the ages of 17 and 40 years in conformity to a study in a similar institution in Kano.² The mean age of 37.2 years was comparable with the 38 years reported by Umar *et al.* in Sokoto, Northern Nigeria but significantly lower than 45 years obtained in Karachi.^{7,8} There were more males than females in this study like another south-

ern Nigerian study on patients' satisfaction.⁴ The finding of predominantly youthful male population taking advantage of public health facility might be because they are the working class and more likely to afford incurred expenses than their female counterparts who often depend on them, being from lower socioeconomic status in developing countries.

There have been inconsistencies in the figures obtained from patient satisfaction surveys across Nigeria in the order of 84, 83, 75 and 53%.^{2,9-11} Though the overall satisfaction of 80.1% of this study falls comfortably within this range, the reasons for varied figures are multifactorial. These would include individual study's methodology, setting and the target patients (population). Others are patients' expectation, socio-cultural differences and chequered political history and subsequent effects on public institutions in developing nations. The above studies cut across multi-ethno religious Nigeria with variegated opinions and inequality in the distribution, most times stark inaccessibility to basic amenities. The diverse satisfaction figures reported are thus not unexpected.

Among the dependent variables considered in this study, patients' privacy, comfort with examination, perception of equality of treatment, thoroughness of examination and patients' pre-visit expectations were specifically isolated for discussion. This was because they remained statistically significant after accounting for such confounding variables as literacy and socio-economic factors. Again, these variables are often not subjects of focus in many patients' satisfaction surveys. Reports of Woodside *et al.* showed that overall satisfac-

tion was related to specific services and there are certain service characteristics which are more important than others.¹² On the contrary, it was found in the current study that substantial association existed among different variables. These divergent results may reflect different nature of service rendered in different settings. Similar to the findings in this study, Anderson, reported that patients' comfort does affect satisfaction.¹³

Yadav *et al.* and Ogunfowokan *et al.* reported strong associations between patients' expectations and comfort of examination and satisfaction.^{3,14} Though linked with satisfaction in the current study, satisfying patients' expectations does not translate to performance. In view of diversity of expectations against supposedly uniform services, patients' perceptions of satisfaction are bound to be divergent. A system that tailors services to expectations seems likely to achieve higher levels of satisfaction despite a modest performance.

Thoroughness and comfort with medical exams were among the intangible variables that influenced patient's satisfaction in this study. A similar association was reported by Sharma *et al.*¹⁵ Both examination parameters require that the examiners be gentle, empathic and not in a hurry. Iiyasu *et al.* underscored the role of friendly staff attitude towards enhanced customer care.² Unfortunately, the large patient load and the conditions of the examination rooms in most developing countries cannot guarantee these all the time. Dearth of basic amenities like electricity and water in health facilities were major sources of patient dissatisfaction in Lagos and Ibadan surveys.^{16,17}

Privacy during consultations and examinations, also reported by Umar *et al.* and Net *et al.* was a source of satisfaction or dissatisfaction.^{7,18} Gender, religion, previous experiences and knowledge about presenting ailment are plausible confounders that determine patients' privacy threshold.

Only about half of the subjects were satisfied with levels of fairness they experienced. Some patients noted they received attention much later than they should. Patients who came very late jump queues in connivance with their relations who work in the hospital resulting in dissatisfaction of punctual patients.

Table 3. Bivariate analysis showing correlation between overall satisfaction and specific variables.

Variables	P value	Pearson chi-square	Odds ratio	95% CI	df
Privacy	19.502	0.021	11.630	0.019-0.084	9
Comfort during examination	62.477	0.008	11.048	0.000-0.019	9
Partiality	26.150	0.036	10.361	0.013-0.059	9
Thoroughness of check-up	34.610	0.008	15.729	0.000-0.019	9
Expectation	42.061	0.004	22.278	0.000-0.012	9

CI, confidence interval; df, degree of freedom. Source: compiled from questionnaires.

Table 4. Multivariate logistic regressions for overall satisfaction with quality of eye care.

Variables	95% CI	P
Privacy (confidentiality intact)	0.650-1.656	<0.001
Comfort during eye examination	0.939-1.738	<0.001
Fairness (no partiality)	1.139-2.187	<0.001
Thoroughness of examination	0.361-1.342	0.001
Expectation was meant	0.564-1.659	<0.001

CI, confidence interval.

Conclusions

Based on the findings, this article concludes that to enhance satisfaction, it is important to give patient-centered care. This is health care that is responsive to patients' wants, needs, and preferences. This is against the backdrop

that the choice and eventual success of many treatment options are based on subjective patient-defined criteria. It is recommended that exit suggestion boxes should be strategically located at patients' departure points to solicit suggestions on how services could be improved upon. Providing grievances redressal system for aggrieved patients to access is a pragmatic step of showing genuine concern for improving patient satisfaction. Periodic patient satisfaction survey should be institutionalized to provide feedback for continuous quality improvement. And most importantly, excellent health care can only be achieved when all the cadres of staff work as a team and as stakeholders. There should be routine stakeholders training workshops where health care workers are trained and re-trained on ways of improving quality of services.

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