

Full Length Research Paper

Differentials in patients' satisfaction with routine radiological services: A cross-sectional study in a developing country

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Patient satisfaction survey with health care services is a growing concept in Nigeria where study on the subject is just beginning to gather momentum. Satisfaction with health care services has not been given the attention it deserves, let alone comparing institutional differences on the subject. The purpose of this study was to understand the factors that may account for differentials in patient satisfaction with radiological services in a public and a private hospital. A cross-sectional descriptive study was carried out in two hospitals of public and private nature in Enugu metropolis, Southeast Nigeria. Three hundred respondents responded to the survey; one hundred and forty five from the public hospital and one hundred and fifty five from the private hospital. Males were ninety two 92(30.7%) in number while females constituted the majority with two hundred and eight 208(69%). The data was analyzed in terms of descriptive statistics using 95% confidence interval. ANOVA test for significance, chi-square for association and regression for differences were applied in the analysis. Patient satisfaction with radiological services was better and in favour of the private hospital which registered a mean level of satisfaction of 3.96 as against the public hospital that registered a mean level of satisfaction of 3.43, at 95% confidence interval. Respondents at both facilities were not impressed by radiographers/nurses in nine same service areas and as such performances in those areas were poorly rated and were seen as sources of dissatisfaction. Providers of health care services and radiographers in particular need special orientation in customer relations to foster good patient satisfaction strategies. Governments and the university system could help in this direction by improving on the curricula of radiographers to include professional code of conduct and patient-centredness while in the university.

Key words: Differentials, patients, satisfaction, routine, radiological, services, public, private, professional, conduct.

INTRODUCTION

The importance of patients' satisfaction with health care services cannot be over emphasized especially in this era

of informed and educated patients. There are five main factors that determine patients' satisfaction with health

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services (Hoe, 2007; Ayat et al., 2009; Chingarande et al., 2013): Reliability of services, responsiveness to customer needs, assurance-guaranteeing comfort to patients, empathy and tangibles like physical appearance of the departments and quality of the equipment. Other factors like providers' professional skill and conduct have also been found to influence patients' satisfaction with health care (Ayat et al., 2009; Chingarande et al., 2013; Beyer et al., 2010). Survey of the literature reveals that patients' satisfaction with health care services though has long been conducted in developed countries has rarely been investigated in developing countries let alone differentials in health care services satisfaction between public and private healthcare institutions. This work was an attempt to not only understand patients' satisfaction with radiological services, but also investigate the factors that may account for differences in patients' satisfaction between public and private healthcare institutions.

Patients' satisfaction constitutes a significant indicator of the health care quality (Johansson et al., 2002; Laschinger et al., 2005; Anastasios et al., 2013). Studies (Zamil, 2012; Salam et al., 2010) involving private and public hospitals, found that there were significant statistical differences of the impact of health service quality on patients' satisfaction between hospitals of public and private organisations and the impact was found to be better in the private hospitals. In a study (Ugwu, 2009) on patients' perception of care during special radiological examination in Nigeria, it was observed that indeed, the way in which patients view the care that they receive from their health care providers can greatly influence their satisfaction with their examinations. Having radiologists directly communicate results to patients would not only increase the speed at which imaging results are delivered to patients and improve patient satisfaction (Pat et al., 2011; Peteet et al., 1992), but could also help improve test result follow-up. The majority of complaints in a radiology examination as described by Salazar et al. (2013) was a failure to provide patient-centered care. Complaints regarding quality were associated with operational systems, safety and professionalism. Delays accounted for some of the complaints and about half of the complaints concerned radiology staff members.

Results from a survey in Nigeria (Eze et al., 2006) on obstetric ultrasound scan service showed that majority of the patients were not given adequate information required to make a knowledgeable decision about their scan. Large number of the women waited for a long time (1-4 h) before their scan. About half of the respondents were satisfied with the way the result of the scan was communicated to them. That study concluded that full implementation of informed consent, reduced waiting time, better communication, explanation and counseling of scan findings to patients would improve the quality of obstetric ultrasound service. Another survey (Ugwu et al., 2009) on patients' expectations of radiology staff noted that service delivery should be improved as a requirement,

that relatives should be present during examination, that friendliness should be improved and that radiology staff should be more courteous. Indicators of satisfaction for patients during radiological examination (Ochonma et al., 2015) were the observation of professional boundaries with patients and equity in treatment for the patients during the radiological examination. Others include patients receiving individualized service during examination, radiographers' observation of the principle of confidentiality, timely completion of examination, radiographers' serving patients' best interest and radiographers' demonstration of appropriate skills in effective communication while failures in explanation of what to expect during the exam and explanation of what to expect after the exam were seen as sources of dissatisfaction

It has been argued that consumer perception of health care is largely ignored by health care providers in low income countries (Hall, 1995; Rajani et al., 2011; Nyongesa et al., 2014), let alone comparing institutional differences. The search of the literature confirms that a growing progress was being made to understand patients' satisfaction with health care services in Nigeria. The aim and objective of this study was to determine some of the factors that may influence patients' satisfaction with health care services, particularly radiological services in a developing country like Nigeria. The rationale behind this study was to understand how radiological services could be improved based on the information gathered so as to better address the concerns of the patients and ultimately improve their satisfaction with radiological services.

MATERIALS AND METHODS

This was a cross-sectional, descriptive study in which three hundred respondents (patients) who had received radiological services as out-patients in one public-tertiary hospital (University of Nigeria Teaching Hospital, Ituku/Ozalla) and one private health care institution (Life Chart Diagnostic Centre, Abakpa Nike) both in Enugu, Southeast Nigeria were surveyed to ascertain their levels of satisfaction with the services they had received. The respondents were chosen among outpatients who had visited the hospitals (public/private) for radiological examinations. In no particular order, patients were scheduled for examination which was held on the clinic day of every Monday for the public hospital. To allow for chance alone determine who gets included in our sample, random sampling technique was used in which we made a determination that every second examinee who shows up for the examination regardless of gender gets included in our sample. The public-tertiary hospital sees about forty patients on its clinic day of every Monday, so about twenty patients got to be interviewed on each clinic day of Monday. The same process was repeated for the private clinic that sees about (25) patients on its clinic day of every Friday and about (13) patients got to be interviewed on each clinic day of every Friday until the determined sample sizes for both hospital were reached.

The survey was conducted between March and July 2013. The validated questionnaire was used by radiography students who had training in questionnaire administration to collect information from the respondents. Each respondent's consent was obtained as well as ethical clearance from the institutions before the questionnaire

administration. The indicators used in the assessment of satisfaction with radiological services included patient preparation for specific test/exam, registration process at the front desk/courtesy of staff, waiting time before procedure, courtesy of radiographers/staff, explanation of what to expect during the exam, how questions were answered by the radiographers/staff, making an appointment, choice of appointment time, explanation of the billing process, explanation of what to expect after the exam, level of attention by the radiographers/staff, and the physical appearance of the facility and quality of the equipment.

The data was analyzed in terms of descriptive statistics using 95% confidence interval. ANOVA test for significance, chi-square for association and regression for differences in data were applied.

Sample size calculation

The appropriate sample size for the work was achieved using the formula which was developed by (Charan et al., 2013) for calculating sample size in medical research and the findings from previous work (Iliyasu et al., 2010) in which eighty three percent (83%) of the patients were satisfied with overall health services in the hospital. The calculated sample size was initially one hundred and eleven (111) for each hospital and two hundred and twenty two (222) for both hospitals, but in order to improve on the result and conclusion of the study and more so because of patient availability, the sample size was increased to three hundred (300) respondents, one hundred and fifty five (155) for the private hospital and one hundred and forty five for the public hospital. Few patients whose number was not tracked decided not to partake in the study. They decided mostly not to partake because of time factor.

RESULTS

Socio-demographic statistics of the respondents

As noted in Table 1, there were three hundred respondents and those under thirty years of age constituted the majority and numbered one hundred and forty two 142 (47.3%). One hundred and forty five (48.3%) questionnaires were administered in the public hospital and one hundred and fifty five (51.7%) questionnaires in the private hospital. There were 92(30.7%) males and 208 (69.3%) females respondents. Those with college/university education 115 (38.3%) constituted the majority. When asked about their monthly income, majority 92 (30.7%) stated they had no income. The means of payment for services received was mostly self-pay as the majority 261 (87.0%) indicated just that. Majority of the respondents 112 (21.0%) were married with children and about half of them 154 (51.3%) indicated that they have had radiological services within the last one month prior to the interview. Those that indicated that the radiological service they received was their first experience with their centre were in the majority 200 (66.7%).

Table 2 shows the mean scores of the respondents pertaining to the questions on satisfaction with the radiology centres (public/private) they had attended. A likert scale with five different options-very dissatisfied, dissatisfied, neutral, satisfied and very satisfied was

provided to the respondents as answer options to the questions on satisfaction. Some of the indicators of satisfaction examined included making an appointment, choice of appointment times, the preparation for specific test/exam, the registration process at the front desk/courtesy of staff and explanation of the billing process. The score points of one and two were seen as dissatisfaction, point of three seen as neutral response and points of four and five were seen as satisfaction with the radiological services. The mean score for the respondents that visited the public radiology service centre was 3.41 while that of the private radiology service centre was 3.96. The overall average mean score between the public and the private hospitals of 3.69 was within these ranges as above.

Also, the mean level of satisfaction experienced by the respondents showed that, the mean level of satisfaction for those that went to the public radiology centre is 3.43 while that of those that went to the private radiology centre is 3.96. The overall average mean level of satisfaction of 3.71 is within these ranges for the public and private hospitals.

To test further whether this result was significant and thus establish the existence of difference in the level of patients' satisfaction with radiological examination between the private and the public hospitals, the ANOVA test was applied. The results are presented in Table 3. The ANOVA results (Table 3) show that F-values of 49.819 (mean scores) and 42.035 (mean level of satisfaction) which were greater than the critical F-value of 2.60 indicate that there was a significant difference (as p-values < 0.05) among the mean scores and mean levels of satisfaction between patients that went to the private hospital and patients who went to the public hospital. Therefore, there is a difference in the level of patients' satisfaction between the private and the public hospitals, patients having to express better satisfaction with the private hospital pertaining to radiological services.

As presented in the cross-tabulation (Table 4) and in line with the results presented in the chi-square (Table 5), which gave a Chi-Square value of 55.033 > Chi-square (critical value) of 9.49 and p < 0.05, respondents' level of satisfaction is associated with the type of hospital where they received their radiological services, patients who attended the private hospital having to express higher satisfaction level compared with patients who attended the public hospital.

Analyzing for the predictive indicators/factors for radiological services that accounted for overall satisfaction in the public and the private hospitals

Public hospital

It was also important to understand the indicators of

Table 1. Socio-demographic statistics of the respondents.

Demographic characteristics	Options	Frequency	Percent
Age	under 30	142	47.3
	31-40	61	20.3
	41-50	42	14.0
	over 50	55	18.3
Type of centre	Public	145	48.3
	Private	155	51.7
Gender	Male	92	30.7
	Female	208	69.3
Highest level of education	no school	17	5.7
	Elementary	37	12.3
	high school	110	36.7
	college/university	115	38.3
	higher education (professional or post-graduate)	20	6.7
	literacy classes only	1	.3
Marital status	Married	63	21.0
	Separated	2	.7
	Divorced	2	.7
	married with children	122	40.7
	married without children	32	10.7
	Single	79	26.3
	Length of time as radiological service patient	one month	154
two months		11	3.7
three to six months		27	9.0
seven months to two years		25	8.3
three years to 5 years		23	7.7
five years and above		24	8.0
can't say		36	12.0
Occupation		Student	56
	government employee	54	18.0
	private employee	41	13.7
	Unemployed	41	13.7
	self employed	39	13.0
	Retired	5	1.7
	Teaching	3	1.0
	Trader	49	16.3
	Applicant	2	.7
	Farming	8	2.7
	Rev. sister	1	.3
Priest	1	.3	
Average monthly income	no income	92	30.7
	#5,000 and below	36	12.0
	#5,000 and #20,000	51	17.0
	#21,000 and #50,000	67	22.3
	#51,000 - #100,000	39	13.0
	#101,000 - 200,000	9	3.0
	#201,000 - 400,000	3	1.0
	#401,000 - #600,000	3	1.0

Table 1. Cond.

	Insurance	16	5.3
	Self-pay	261	87.0
	free medical care	12	4.0
Main source of payment for radiological services	Children	1	.3
	Parents	6	2.0
	Pension	1	.3
	Allowance	1	.3
	NHIS	2	.7
First experience with centre	Yes	200	66.7
	No	100	33.3

Table 2. Showing differences in the level of patients' satisfaction between the private and the public hospitals: Descriptive statistics.

Parameter	Type of radiology service centre	N	Mean	Std. deviation	Std. error	95% Confidence Interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Mean score	Public	145	3.4085	0.80828	0.06712	3.2758	3.5412	1.00	5.00
	Private	155	3.9578	0.51692	0.04152	3.8758	4.0398	1.15	5.00
	Total	300	3.6923	0.72655	0.04195	3.6098	3.7749	1.00	5.00
Mean level of satisfaction	Public	145	3.4345	0.84009	0.06977	3.2966	3.5724	1.00	5.00
	Private	155	3.9613	0.54515	0.04379	3.8748	4.0478	1.00	5.00
	Total	300	3.7067	0.75000	0.04330	3.6215	3.7919	1.00	5.00

Table 3. Showing ANOVA test for significance in patients' satisfaction levels between the private and the public institutions.

Parameter	Type of radiology service centre	Sum of squares	df	Mean square	F	Sig.
Mean scores	Between groups	22.607	1	22.607	49.819	0.000
	Within groups	135.227	298	0.454		
	Total	157.834	299			
Mean level of satisfaction	Between groups	20.791	1	20.791	42.035	0.000
	Within groups	147.395	298	0.495		
	Total	168.187	299			

Table 4. Cross-tabulation between type of institution and satisfaction.

Radiology service centre	Mean level of satisfaction					Total
	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied	
Public	3 2.1%	12 8.3%	61 42.1%	57 39.3%	12 8.3%	145 100.0%
Private	1 0.6%	0 0.0%	20 12.9%	117 75.5%	17 11.0%	155 100.0%
Total	4 1.3%	12 4.0%	81 27.0%	174 58.0%	29 9.7%	300 100.0%

Table 5. Chi-square tests.

Parameter	Value	df	Asymp. Sig. (2-sided)
Pearson chi-square	55.033 ^a	4	0.000
Likelihood ratio	61.081	4	0.000
Linear-by-linear association	36.963	1	0.000
Number of valid cases	300		

^a2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.93.

Table 6. Descriptive statistics on indicators of satisfaction- public hospital.

Variable	Mean	Std. deviation	N
What is your overall satisfaction of care received	3.6897	1.13967	145
Making an appointment	3.2759	1.16358	145
Choice of appointment times	3.3172	1.23437	145
The preparation for your specific test/exam were adequately explained	3.5241	1.20233	145
Registration process at the front desk/courtesy of staff	3.3931	1.21505	145
Explanation of the billing process and procedure	3.3034	1.15063	145
Waiting time before procedure	3.1448	1.19594	145
Courtesy of the nurse/radiographer	3.7034	1.15545	145
Explanation of what to expect during the exam	3.2414	1.08830	145
How questions were answered by the staff	3.5103	1.00773	145
Explanation of what to expect after the exam	3.0207	1.06373	145
The level of attention provided by the nurse/radiographer	3.6552	1.10792	145
The physical appearance of the facilities and the quality of the equipment	3.5310	1.06102	145

Selecting only cases for which is this a private or public radiology service center = public.

Table 7. Model summary for public hospital.

Model	R		R square	Adjusted R square	Std. error of the estimate
	Is this a private or public radiology service center = public (Selected)				
1	0.850 ^a		0.722	0.696	0.62801

satisfaction that had predictive values for overall satisfaction in the public and the private hospitals. As presented in the Table 6 descriptive statistics on indicators, Table 7 the model summary, Table 8 the ANOVA analysis, and Table 9 showing the coefficients, the indicators of the radiological services that had significant and predictive effect on the overall satisfaction of care received by patients that used the public radiology hospital were adequate explanation of the preparation for specific test/exam ($p < 0.05$) and the physical appearance of the facilities and the quality of the equipment ($p < 0.05$). Other indicators as assessed by the respondents were not significant and as such the radiographer's performances in them were seen as sources of dissatisfaction. Some of the areas of dissatisfaction include ease of making appointment ($p > 0.05$), choice of

appointment time ($p > 0.05$), registration process at the front desk ($p > 0.05$), explanation of the billing process ($p > 0.05$), waiting time before procedure ($p > 0.05$) and courtesy of the radiographer/nurse.

Private hospital

As presented in Table 10 showing the descriptive statistics, Table 11 showing the model summary, Table 12 showing the ANOVA, Table 13 showing the coefficient, the indicators that had significant and predictive effect on the overall satisfaction of care received by patients that used the private facility were the level of attention provided by the radiographer/nurse ($p < 0.05$) and the physical appearance of the facility and the quality of the

Table 8. ANOVA^{b,c} for public hospital.

	Model	Sum of squares	df	Mean square	F	Sig.
1	Regression	134.974	12	11.248	28.519	0.000 ^a
	Residual	52.060	132	0.394		
	Total	187.034	144			

Predictors: (Constant), the physical appearance of the facilities and the quality of the equipment, choice of appointment times, explanation of what to expect after the exam, the preparation for your specific test/exam were adequately explained, explanation of what to expect during the exam, waiting time before procedure, how questions were answered by the staff, courtesy of the nurse/radiographer, explanation of the billing process and procedure, making an appointment, registration process at the front desk/courtesy of staff, the level of attention provided by the nurse/radiographer; ^bDependent Variable: what is your overall satisfaction of care received; ^cSelecting only cases for which is this a private or public radiology service center = public

Table 9. Coefficients^{a,b} for public hospital.

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-0.299	0.239		-10.249	0.214
1 making an appointment	-0.005	0.067	-0.005	-0.081	0.936
choice of appointment times	-0.018	0.063	-0.019	-0.282	0.778
the preparation for your specific test/exam were adequately explained	0.208	0.063	0.219	30.280	0.001
registration process at the front desk/courtesy of staff	-0.026	0.064	-0.028	-0.405	0.686
explanation of the billing process and procedure	-0.006	0.065	-0.006	-0.097	0.923
waiting time before procedure	0.063	0.057	0.066	10.108	0.270
courtesy of the nurse/radiographer	0.083	0.070	0.084	10.180	0.240
explanation of what to expect during the exam	0.119	0.063	0.114	10.875	0.063
how questions were answered by the staff	0.159	0.070	0.141	20.280	0.024
explanation of what to expect after the exam	0.008	0.066	0.007	0.116	0.908
the level of attention provided by the nurse/radiographer	0.113	0.078	0.110	10.449	0.150
the physical appearance of the facilities and the quality of the equipments	0.441	0.073	0.410	60.021	0.000

^aDependent Variable: What is your overall satisfaction of care received; ^bSelecting only cases for which is this a private or public radiology service center = public.

equipment ($p < 0.05$). Some of the service areas that respondents saw as dissatisfying were making an appointment ($p > 0.05$), choice of appointment times ($p > 0.05$), preparation for specific exam/test ($p > 0.05$), registration at the front desk/courtesy of staff ($p > 0.05$), explanation of the billing process ($p > 0.05$), waiting time before procedure ($p > 0.05$) and courtesy of the nurse/radiographer ($p > 0.05$).

DISCUSSION

Though patients indicated satisfaction with radiographers/staff at the public and the private institutions, the mean level of satisfaction was better in the private hospital. The indicators of satisfaction that had significant and predictive effects on the overall satisfaction received by the patients that used the public radiology facility were adequate explanation of the preparation for their specific

test/exam ($p < 0.05$) and the physical appearance of the facilities and the quality of the equipment ($p < 0.05$). Indicators that had significant and predictive effect on the overall satisfaction of care received by patients that used the private facility were the courtesy of the radiographer/staff ($p < 0.05$), level of attention provided by the radiographer/staff ($p < 0.05$) and the physical appearance of the facilities and the quality of the equipment ($p < 0.05$). Respondents at both facilities (public/private) agreed on only one thing, the physical appearance of the facilities and the quality of the equipment as the indicator/factor that affected their overall quality perception and satisfaction with radiological services and saw nine indicators as sources of dissatisfaction that included making an appointment, choice of appointment times, explanation of the billing process and procedure, waiting time before procedure, explanation of what to expect during the exam, how questions were answered by the radiographer/staff and

Table 10. Descriptive statistics: Private hospital.

Variable	Mean	Std. deviation	N
What is your overall satisfaction of care received	4.4323	.72092	155
Making an appointment	3.6000	1.01674	155
Choice of appointment times	4.1032	1.04555	155
The preparation for your specific test/exam were adequately explained	4.0710	0.94738	155
Registration process at the front desk/courtesy of staff	4.4645	0.79182	155
Explanation of the billing process and procedure	4.3419	0.99635	155
Waiting time before procedure	3.1032	1.11759	155
Courtesy of the nurse/radiographer	4.4581	.85462	155
Explanation of what to expect during the exam	3.3548	.73628	155
How many questions were answered by the staff	3.8710	.91673	155
Explanation of what to expect after the exam	3.2323	.69150	155
The level of attention provided by the nurse/radiographer	4.4774	.73268	155
The physical appearance of the facilities and the quality of the equipment	3.9419	.91338	155

Selecting only cases for which is this a private or public radiology service center = private.

Table 11. Model summary: Private hospital.

Model	R	R square	Adjusted R square	Std. error of the estimate
	is this a private or public radiology service center = private (Selected)			
1	0.785 ^a	0.616	0.584	0.46523

Predictors: (Constant), the physical appearance of the facilities and the quality of the equipment, the preparation for your specific test/exam were adequately explained, how questions were answered by the staff, waiting time before procedure, explanation of the billing process and procedure, explanation of what to expect after the exam, choice of appointment times, courtesy of the nurse/radiographer, explanation of what to expect during the exam, making an appointment, the level of attention provided by the nurse/radiographer, registration process at the front desk/courtesy of staff

Table 12. ANOVA^{b,c} of private hospital.

Model	Sum of squares	df	Mean Square	F	Sig.
1 Regression	49.305	12	4.109	18.983	.000 ^a
Residual	30.734	142	.216		
Total	80.039	154			

Predictors: (Constant), the physical appearance of the facilities and the quality of the equipment, the preparation for your specific test/exam were adequately explained, how questions were answered by the staff, waiting time before procedure, explanation of the billing process and procedure, explanation of what to expect after the exam, choice of appointment times, courtesy of the nurse/radiographer, explanation of what to expect during the exam, making an appointment, the level of attention provided by the nurse/radiographer, registration process at the front desk/courtesy of staff. ^aDependent Variable: What is your overall satisfaction of care received; ^cSelecting only cases for which is this a private or public radiology service center = private.

explanation of what to expect after the exam.

The ease of making an appointment to see a provider or anybody for that matter is highly appreciated by patients and customers in general. When making an appointment is made difficult, patients and customers in general could be highly disappointed and that will certainly lead to loss of customers. Institutions highly interested about their customers and more so about their

business bottom lines will make making an appointment very easy to promote customer retention and improve on their bottom lines. Choice of appointment times shows flexibility on the side of the institution and also their willingness to put the customer first. The customer sees him/herself as having a voice in the way the business is operated. Many a time, the billing process could be confusing especially for the self-paying candidates, the

Table 13. Coefficients^{a,b} of Private hospital.

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.520	0.311		1.672	0.097
making an appointment	0.103	0.053	0.146	1.961	0.052
choice of appointment times	-0.034	0.047	-0.049	-0.719	0.474
the preparation for your specific test/exam were adequately explained	0.000	0.043	0.001	0.010	0.992
registration process at the front desk/courtesy of staff	0.016	0.090	0.018	0.178	0.859
explanation of the billing process and procedure	0.025	0.073	0.034	0.339	0.735
1 waiting time before procedure	0.021	0.037	0.032	0.564	0.574
courtesy of the nurse/radiographer	0.139	0.061	0.164	2.257	0.026
explanation of what to expect during the exam	-0.012	0.067	-0.012	-0.179	0.858
how questions were answered by the staff	0.033	0.049	0.042	0.674	0.501
explanation of what to expect after the exam	0.108	0.069	0.104	1.573	0.118
the level of attention provided by the nurse/radiographer	0.390	0.082	0.396	4.776	0.000
the physical appearance of the facilities and the quality of the equipment	0.160	0.051	0.203	3.107	0.002

a. Dependent Variable: what is your overall satisfaction of care received; b. Selecting only cases for which is this a private or public radiology service center = private.

uneducated and the elderly. Customers need to be educated up-front about a pending bill to enable them make an informed decision on whether to go on with a proposed encounter or not. This exercise encourages a customer to repeat his patronage with the organization. Waiting time before procedure must be well managed by businesses as this could determine the number of repeat customers. Time is highly valued by customers and they would like to spend as little of it as possible in any business engagement. Businesses that value their bottom lines seriously manage customers' time effectively. Excellent ways of doing this would be to space book appointment times for customers and also not to overbook customers in any given period. Explanation of what to expect during the exam, is highly valued by customers especially in radiology examination as customer are filled with anxiety because of the unknown. This is more so for the first timers in radiology examination and the elderly. How questions were answered by the radiographer/staff and explanation of what to expect after the exam equally are important for customer retention. Confused customers are liable to ask questions and they deserve answers that are effectively and politely communicated. Unfriendliness on the part of providers could drive customers away which invariably affects business bottom line. Also having to explain what to expect after radiology examination would manage post examination symptoms and feelings and that helps to relax patients in the event of any post examination feelings and symptoms as explained do manifest. If all the above items are well managed by an institution, they definitely will promote a sense of satisfaction after business encounter.

Statistical summation of the result equally revealed that

respondents were divided in their level of satisfaction with radiological services in the public and the private hospitals, the public hospital registering 3.43 mean level of satisfaction while the private hospital registered 3.96 mean level of satisfaction, showing that respondents were more satisfied with radiological services in the private hospital. This was confirmed by the ANOVA result that showed F-values of 49.819 (mean scores) and 42.035 (mean level of satisfaction) which were greater than the critical F-value of 2.60 which indicates that there was a significant difference (as p-values < 0.05) among the mean scores and mean levels of satisfaction between patients that went to the private hospital and patients who went to the public hospital in favour of the private hospital. Our result is similar to the result (Chingarande et al., 2013) where it was found that patients from the private hospital as against the public hospital viewed their interactions with radiographers more favourably than those from the public hospital. That study showed greatest differences in overall satisfaction, adequate time allocation for examination and favourable communication of results between radiographers and patients. Equally our result is also supported by Zamil (2012) and Salam et al. (2010) that found that there was a significant statistical difference of the impact of health service quality on patient's satisfaction between hospitals of public and private organizations and the impact was found to be better in the private hospital organization. Respondents in the study (Hall, 1995) listed sources of satisfaction as cleanliness of the waiting area and the courtesy/respect of the radiographer/staff which is also similar to our finding. Overall cleanliness and comfort of the examination room and staff skill were seen as sources of dissatisfaction in that study as opposed to our study that

found the physical environment and quality of equipment as sources of satisfaction. Radiographers according to Beyer et al. (2010) were courteous, friendly and communicated well which were sources of satisfaction but patients were not satisfied with more than necessary exposure to radiation which partly supports our finding. As opposed to our study result, Ugwu et al. (2009) on patients' expectations of radiology staff noted that service delivery should be improved as a requirement, that relatives should be present during examination, that friendliness should be improved and that radiology staff should be more courteous. A small percentage from that survey suggested that meals should be provided after examination and some believed that proper instruction would increase their satisfaction.

We can reliably assume that customer awareness and education on radiological services are needed in Nigeria to improve patient satisfaction with health care services as in the western countries. Radiographers equally need trainings in provider/patient relations and professional conduct to effect positive changes in the way patients perceive their services in the radiology departments. More so, strict enforcement of the professional rules/code of conduct for radiographers is highly needed to improve patients' satisfaction with radiological services. Patient/provider relations including patient-centred care organized through seminars and inclusion within the curricula of radiographers while still in the university are highly recommended to foster better patients' perception and satisfaction with radiological services.

Conclusions

Our study has shown that there are differences in satisfaction level with radiological services between the public and the private healthcare institutions. But more so, respondents at both facilities (public/private) did not see services in nine areas used as measures of radiologic satisfaction as sources of overall satisfaction with radiological services because they the patients were not impressed by the performance of radiographers/staff in these areas. Much and urgent work is needed to improve patients' satisfaction with radiological services especially as it affects the bottom lines of these institutions. Radiographers in the short run are to attend seminars and workshops on provider/patient relationships and patient-centred care. In the long run, professional/ethical conduct for radiographers needs to be included in the curricula for the benefit of radiographers while still in the university as it is not presently there.

Study limitations

Our study has a limitation that may affect its being generalized to the general population in that only two hospitals were included in the study. It would have been

more appropriate to increase the number of facilities studied to forestall this problem. Other than that, the study represents a hallmark in that valuable information has been gained concerning how patients' satisfaction could be bettered in radiological examinations taking into consideration the differences in the conduct of radiographers in the public and private hospitals.

RECOMMENDATIONS

Future studies could improve on our findings by increasing the number of hospitals to be studied and more so, more rural hospitals should be included in patients' satisfaction surveys to enable urban/rural comparisons in radiological examinations.

Conflict of Interests

The authors have not declared any conflict of interests.

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REFERENCES

- Anastasios M, Angeliki A, Evdokia A, Maria H, Michalis R, Evridiki P (2013). Assessment of patient satisfaction in public hospitals in Cyprus: a descriptive study. *Health Sci. J.* 7(1):28-40.
- Ayat N, Khalid M (2009). Consumer Satisfaction in social security institution Hospital: A case study of Punjab Employees Social Security Institution Hospital, Rawalpindi. *Pakistan Dev. Rev.* pp. 675-699.
- Beyer L, Diedericks P (2010). The attitude of radiographers towards patients in government hospitals in Bloemfontein. *South Afr. Radiographer* 48(2):22-27.
- Charan J, Biswara T (2013). How to calculate sample size for different study designs in medical research. *Indian J. Psychol. Med.* 35(2):121-126.
- Chingarande GR, Estina M, Mahachi CM, Majonga E, Karera A (2013). A comprehensive analysis of the effectiveness of communication between radiographers and patients at two hospitals. *Int. J. Adv. Res. Manage. Soc. Sci.* 2(6).
- Eze CU, Okaro AO (2006). Survey of patient satisfaction with obstetric ultrasound service at University of Nigeria Teaching Hospital, Enugu, Nigeria. *Niger. J. Health Biomed. Sci.* 5(1):93-97.
- Hall MF (1995). Patient satisfaction or acquiescence? Comparing mail and telephone survey results. *J. Health Care Mark.* 15(1):54-61
- Hoe J (2007). Quality service in radiology. *Biomed. Imag. Intervent J.* 3(3):24.
- Iliyasu Z, Abubakar IS, Abubakar S, Gajida UM (2010). Patients' satisfaction with services obtained from Aminu Kano Teaching Hospital, Kano. *Niger. J. Clin. Pract.* 13(4):371-376.
- Johansson P, Oleni M, Fridlund B (2002). Patient satisfaction with nursing care in the context of health care: a literature study. *Scand. J. Caring Sci.* 16(4):337-344.
- Laschinger HS, Hall LM, Pedersen C, Almost JA (2005). Psychometric analysis of the patient satisfaction with nursing care quality: an

- actionable approach to measuring patient satisfaction. *J. Nurs. Care Qual.* 20(3):220-230.
- Nyongesa MW (2014). Determinants of clients' satisfaction with healthcare services at Pumwani Maternity hospital in Nairobi-Kenya. *Int. J. Soc. Behav. Sci.* 2(2):011-017.
- Ochonma OG, Eze CU, Eze SB, Okaro AO (2015). Patients' reaction to the ethical conduct of radiographers and staff services as predictors of radiological experience satisfaction: a cross-sectional study. *BMC Medical Ethics.* 16:68 DOI 10.1186/s12910-015-0062-4
- Pat A, Basu JA, Ruiz-Wibbelsmann SB, Spielman VF, Van D, Jarrett K, Rosenberg JK, Glazer GM (2011). Creating a Patient-Centered Imaging Service: Determining What Patients Want. *Am. J. Roentgenol.* 196:605-610. 10.22/ARJ.10.5333
- Peteet JR, Stomper PC, Ross DM, Cotton V, Truesdell P, Moczynski W (1992). Emotional support for patients with cancer who are undergoing CT: semi structured interviews of patients at a cancer institute. *Radiology* 182:99-102.
- Rajani A, Salam B, Shayam SM, Ariwa IM (2011). Do we need to improve? A customer satisfaction survey in ultrasound suite. *Pak. Jr.* 21(2):84-88.
- Salam AA, Alshekteria AA, Alhadi HA, Ahmed M and Mohammed A (2010). Patient satisfaction with quality of primary health care in Benghazi, Libya. *Libyan J. Med.* 5. 10.3402/jm v.50 4873-Do.3402.
- Salazar G, Quencer K, Aran S, Abujudeh H (2013). Patient Satisfaction in Radiology: A Qualitative Analysis. *J. Am. College Radiol.* 10(7):513-517 www.JACR.org
- Ugwu AC, Shem SL, Erondu OF (2009). Patient's perception of care during special radiological examinations. *Afr. J. Primary Health Care Fam. Med.* 1(1):3.
- Zamil AM, Areiqat AY, Tailakh W (2012). The impact of health service quality on patients' satisfaction over private and public Hospitals in Jordan: A comparative study. *Int. J. Market. Stud.* 4(1):123.