ORIGINAL ARTICLE

EVALUATION OF PATIENT SATISFACTION WITH THE RADIOLOGICAL SERVICES IN UCTH, CALABAR

Authors

Samuel Archibong Efanga[1], Akintunde Olusijibomi Akintomide[1], Christiana Ifeyinwa Obiora[2], Rekpene Bassey Ezeume[2], Itoro Efanga[3].

Affiliations

[1]Radiology Department, University of Calabar, Calabar, Cross River State, Nigeria.
[2]Radiology Department, University of Calabar Teaching Hospital, Calabar, Cross-River State, Nigeria
[3]Radiography and Radiological sciences Department, University of Calabar, Calabar, Cross River State, Nigeria.

Corresponding author

Dr Samuel Archibong Efanga. Radiology Department, University of Calabar, Cross River State, Nigeria.
Email: samuelefanga@rocketmail.com

Abstract

Background: In contemporary health care service delivery, patient satisfaction is utmost in regulating the policies that are reflected in the everyday activity of the hospital. Radiology department has a nexus with virtually every other Departments in the hospital and the role it plays in molding the level of patient satisfaction of services is quite significant due to the accompanying influx of patients. It is therefore, important to get feed-back from these patients on the aspects of the services rendered in all the Radiologic units that are not satisfactory. The aim of this study is to evaluate patient satisfaction with the Radiological services provided in University of Calabar Teaching Hospital, Calabar, Nigeria.

Material and Methods: This was a prospective cross sectional observational study conducted over a period of one month in the Radiology Department of University of Calabar Teaching Hospital, Calabar, Nigeria that involved 306 patients. Relevant questions covering the major areas of patient satisfaction with Radiological services were presented to each participant by use of a pre-tested Questionnaire. SPSS version 23.0 was used to analyze the data and Chi-square tests were done. Ethical approval was obtained for this study.

Results: The mean patient satisfaction was 94.8%. The patient satisfaction of the services rendered in the Radiology department was significantly associated with patient waiting time (*P* 0.009), patient age (*P* 0.000) and employment status (*P* 0.011). Patient waiting time between 5 to 60 minutes produced more satisfaction in participants (41.67%). Patient satisfaction was high in the unemployed (90.91%) and individuals aged below 40 years (93.61%).

Conclusion: The patient satisfaction with the Radiological services provided in UCTH, Calabar is high. The level of patient satisfaction is associated with a patient waiting time less than one hour, age lower than 40 years and an unemployed status of the patient who receives Radiological services. The quality of the waiting area and health provider-patient interactions contribute to the degree of patient satisfaction.

Key words: Patient satisfaction, Radiology, Health care services,

Introduction

Patient satisfaction is defined as the extent to which patients feel that their needs and expectations are being met by the service provider. It is a critical component of assessing performance improvement and clinical effectiveness. Legal expectation about service quality also serves as an important tool in understanding patients' ambition and need for better health care. [1, 2] The health care industry has evolved to the point where the wishes and needs of patients take a prior place in the administration of services. [1] Ensuring excellent service to all the patients is essential for the health care provider to achieve a competitive advantage and to

distinguish themselves in the market. This quality service should not be stagnant but should always be ascending in its degree. [3]

Radiology is part of the health service industry and as a service provider one needs to understand the delivery of quality, which includes knowledge of customer service, customer satisfaction and all its related issues. [4] Radiological services can be defined as the services which are rendered to a patient who is visiting the Radiology department either for routine services which are carried out on a day-to-day basis or some special examination that require the use of contrast medium. The range of patient care extends from the activities carried out before, during and after Radiological diagnostic and interventional procedures and each stage contributes to the ultimate extent of patient satisfaction. [1] Satisfied patients are more likely to comply with treatment, seek medical advice, keep follow-up appointments and maintain a continuing relationship with medical practitioners. [4, 5]

The 5 key factors that determine customer satisfaction are; Reliability – This relates directly to the provision of consistently accurate interpretation of Radiological examinations that are specifically relevant and suitable to the clinical context in which the examination was ordered for. Responsiveness – This relates to the willingness and ability to help customers get their examinations done within a short time and to expedite the reports. Assurance – This relates to the sense of confidence, competence and courtesy that the provider offers. Customers want to feel that they are dealing with the best. Empathy – This relates to the degree of caring and attention shown by health care providers to the patients. Consistent interaction with customers is important. Tangibles – This relates to the availability of modern equipment requisite to produce quality images in a very ethereal environment that soothes the customers. [6, 7, 8]

Patients usually react negatively to delays in getting attended to, neglect, inadequate explanation of a procedure, lack of post-procedure counselling, use of harsh words on them, discomfort of the waiting area, non-acknowledgement of concerns, poor patient safety culture due to unnecessary repeat and preferential treatments. As a result, most patients who return to the Radiology department are often worried about the impending maltreatment or have an aggressive attitude. [1, 5, 9, 10]

Poor maintenance culture within Radiology department presents with improper functioning of medical imaging equipment and frequent equipment breakdown which causes unnecessary prolongation of the patient waiting time. [5]

Minimal commitments have been given to patient satisfaction studies over the years in developing countries. There is therefore need to understand, document and inculcate awareness in health care providers and users on satisfaction and its significance for future enhancement. Training of staffs to make modifications in their language and behavior during health care service delivery can significantly impact patient satisfaction. [4, 11, 12]

The aim of this research is to evaluate patient satisfaction with the Radiological services provided in UCTH, Calabar and to compile the recommendations that will be employed as interventions to improve the degree of patient satisfaction.

Materials and Methods

Study design

This research was a prospective cross-sectional observational study which was carried out at the Radiology Department, University of Calabar Teaching Hospital, Calabar, Cross River State. Calabar is the capital city of Cross River State which is situated in the south–south zone of Nigeria. The city stands on latitude 4^0 57 north and longitude 8^0 20 east with an estimated population of 350,000 inhabitants. The University of Calabar Teaching Hospital is a tertiary health care provider which has about 800 bed spaces for the admission of patients in about 21 wards. The services offered by the Radiology department of the University of Calabar Teaching Hospital include; Conventional Radiography, Ultrasound scan, Computerized Tomography scan (CT scan) and Special examinations. The average patient throughput on a weekly basis in the Radiology department, is over 160 in number. This was a one-month study done between 17th May 2021 to 11th June 2021.

Inclusion criteria

The participants that were engaged in this study met the following criteria.

- Patients who visit the radiology department on an out-patient or in-patient basis with request for Radiological services made by Physicians in other departments of the University of Calabar Teaching Hospital.
- The age of the participants ≥ 16 years and above.
- Patients who were not from the ICU.
- Patients who were not from the emergency surgical and medical units.
- Patients who were conscious and could communicate.

Sample size

The patients who met the inclusion criteria were approached so that they will be recruited into the research. All together 327 patients consented but 306 participated. There were 21 defective questionnaires which were excluded. The participants consisted of 154 in the Ultrasound scan unit, 128 in the Conventional Radiography unit, 16 in the CT scan unit and 8 in the Special procedure unit.

Data collection tool and Procedure

The recruitment of the participants, administration of the consent, administration of the questionnaire and collection of the questionnaire were done on Mondays to Fridays within the period of the study, between the hours of 8.30 am to 4.00 pm.

A well-structured questionnaire written in English was developed by the Researchers who made use of the information in the Esperanto 2019 appendix-03 Radiology Patient satisfaction questionnaire and the plethora of regional and international literatures on patient satisfaction. The questionnaire was pre-tested before adoption for this research. The questionnaire was divided into 2 sections for the participants to tick using the 5-point Likert scale in Section A and Yes or No in Section B. The participants were expected to give reasons for any delay in undertaking the examination.

The researchers recruited 1 research assistant (who understands and speaks many languages) that was trained to explicitly explain the objectives of the study, the process of the study, the administration of the consent form and the administration of the questionnaire. The questionnaires were administered to each consenting patient immediately after their Radiological examination and the exercise did not exceed 15 minutes. Participants had the questions read to them and then decided on the appropriate box to tick. This was helpful for the participants who could not read and write. The participants who could not read and did not understand pidgin English had the contents interpretated in their own local language.

Ethical consideration

In strict compliance with the Helsinki declaration, the Researchers of this study ensured that, prior to the commencement of the study, an approval was obtained from the Health Research Ethics Committee of the University of Calabar Teaching Hospital, Calabar, Cross River State (UCTH/HREC/557).

Data analysis

The data obtained was analyzed using the SPSS version 23 (SPSS Inc., Chicago, IL). Appropriate descriptive (including simple proportions and percentages) and inferential statistical methods were used to analyze the data and tables and bar chart were the means of displaying the result where applicable. Continuous variables were reported as means and standard deviation (mean ± SD). Chi-square test of independence was used to analyze individual questions. Statistical significance will be defined at a P value that is less than 0.05.

Result

Table 1 shows the distribution of the socio-demographic characteristics of the participants who were clients in the Ultrasound unit. Age (in years) and educational qualification were significantly associated with the satisfaction of the services they received with P values of 0.004 and 0.009 respectively. There was more satisfaction in participants below 40 years (91.46%) with ordinary national diploma (OND) and above (90.19%) compared to those above 40 years (89.46%) with educational qualification below OND (88.33%).

Table 1: Socio-demographic characteristics and their association with patient satisfaction in the Ultrasound unit using Chi-square test

SERVICE UNIT	CHARACTERISTICS		PATIENT SATISFACTION			
			Frequency distribution (n)	Number of satisfied participants (n)	Percentage satisfied (%)	P value
Ultrasound unit	**Gender**					0.658
		Male	48	40	83.33	
		Female	106	94	88.68	
	Age groups (years)					0.004*
		15 - 19	8	8	100	
		20 - 24	14	14	100	
		25 - 29	38	26	68.42	
		30 - 34	18	16	88.89	
		35 - 39	26	26	100	
		40 - 44	18	16	88.89	
		45 - 49	6	6	100	
		50 - 54	12	10	83.33	
		>55	14	12	85.71	
	Educational qualification					0.009*
		FSLC	16	12	75	
		JSCE	2	2	100	
		SSCE	40	36	90	
		OND	16	16	100	
		1ST Degree	66	56	84.85	
		2nd Degree	14	12	85.71	
	Employment status					0.060
		Employed	66	58	87.88	
		Unemployed	88	76	86.36	

P value <0.05 is significant. FSLC – First School leaving certificate, JSCE – Junior secondary certificate examination, SSCE – Senior secondary certificate examination, OND – Ordinary National Diploma

Table 2 shows the distribution of the socio-demographic characteristics of the participants who were clients in the Conventional Radiography unit. Age (in years) and educational qualification were significantly associated with the satisfaction of the services they received with *P* values of 0.000 and 0.004 respectively. There was more satisfaction in participants below 40 years (95%) with educational level below ordinary national diploma (100%) compared to those above 40 years (89.75%) who have OND certificate and above (81.48%)

Table 2: Socio-demographic characteristics and their association with patient satisfaction in the Conventional Radiography unit using Chi-square test.

SERVICE UNIT	CHARACTERISTICS		PATIENT SATISFACTION			
			Frequency distribution (n)	Number of satisfied participants (n)	Percentage satisfied (%)	P value
Conventional Radiography unit	**Gender**					0.742
		Male	67	64	95.52	
		Female	60	54	90	
	Age groups (years)					0.000*
		15 - 19	8	8	100	
		20 - 24	4	4	100	
		25 - 29	30	30	100	
		30 - 34	16	12	75	
		35 - 39	14	14	100	
		40 - 44	10	10	100	
		45 - 49	12	8	66.67	
		50 - 54	8	8	100	
		>55	26	24	92.31	
	Educational qualification					0.004*
		FSLC	6	6	100	
		JSCE	2	2	100	
		SSCE	36	36	100	
		OND	18	12	66.67	
		1ST Degree	48	48	100	
		2nd Degree	18	14	77.78	
	Employment status					0.182
		Employed	66	58	87.88	
		Unemployed	62	60	96.77	

P value <0.05 is significant. FSLC – First School leaving certificate, JSCE – Junior secondary certificate examination, SSCE – Senior secondary certificate examination, OND – Ordinary National Diploma.

Table 3 shows the distribution of the socio-demographic characteristics of the participants who were clients in the Computerized Tomography scan unit. Gender and age (in years) were significantly associated with the satisfaction of the services they received with *P* values of 0.021 and 0.000 respectively. There was more satisfaction in participants above 40 years (50%) compared to those below 40 years (20%).

Table 3: Socio-demographic characteristics and their association with patient satisfaction in the Computerized tomography scan unit using Chi-square test.

SERVICE UNIT	CHARACTERISTICS		PATIENT SATISFACTION			
			Frequency distribution	Number of satisfied participants (n)	Percentage satisfied (n)	P value
CT Scan unit	Gender					0.021*
		Male	8	8	100	
		Female	8	8	100	
	Age groups (years)					0.000*
		15 - 19	0	0	0	
		20 - 24	0	0	0	
		25 - 29	0	0	0	
		30 - 34	8	8	100	
		35 - 39	0	0	0	
		40 - 44	0	0	0	
		45 - 49	0	0	0	
		50 - 54	4	4	100	
		>55	4	4	100	
	Educational qualification					0.069
		FSLC	0	0	0	
		JSCE	0	0	0	
		SSCE	4	4	100	
		OND	4	4	100	
		1ST Degree	8	8	100	
		2nd Degree	0	0	0	
	Employment status					.a
		Employed	16	16	100	
		Unemployed	0	0	0	

P value <0.05 is significant. FSLC – First School leaving certificate, JSCE – Junior secondary certificate examination, SSCE – Senior secondary certificate examination, OND – Ordinary National Diploma

Table 4 shows the distribution of the socio-demographic characteristics of the participants who were clients in the Special procedure unit. There was no significant association between these characteristics and the satisfaction of the services received by the participants.

Table 4: Socio-demographic characteristics and their association with patient satisfaction in the Special procedure unit using Chi-square test.

SERVICE UNIT	CHARACTERISTICS		PATIENT SATISFACTION			
			Frequency distribution (n)	Number of satisfied participants (n)	Percentage satisfied (n)	P value
Specials unit	**Gender**					.*
		Male	0	0	0	
		Female	8	8	100	
	Age groups (years)					.*
		15 - 19	0	0	0	
		20 - 24	0	0	0	
		25 - 29	0	0	0	
		30 - 34	0	0	0	
		35 - 39	4	4	100	
		40 - 44	0	0	0	
		45 - 49	4	4	100	
		50 - 54	0	0	0	
		>55	0	0	0	
	Educational qualification					.*
		FSLC	0	0	0	
		JSCE	0	0	0	
		SSCE	0	0	0	
		OND	4	4	100	
		1ST Degree	4	4	100	
		2nd Degree	0	0	0	
	Employment status					.*
		Employed	4	4	100	
		Unemployed	4	4	100	

P value <0.05 is significant. FSLC – First School leaving certificate, JSCE – Junior secondary certificate examination, SSCE – Senior secondary certificate examination, OND – Ordinary National Diploma

Table 5 shows the evaluation of patient satisfaction based on their responses from the section A of the questionnaire. The Ultrasound scan (*P* 0.046) and Conventional Radiography (*P* 0.048) clients were satisfied with the cleanliness of the toilets in the waiting areas of the corresponding units. The level of satisfaction with patient waiting time was significant in the Ultrasound scan unit (*P* 0.027) and Conventional Radiography unit (*P* 0.044). The participants in the Conventional Radiography unit were significantly satisfied with the interesting items that are present in the patient waiting area (*P* 0.016) while the patient satisfaction with the cost for the procedures in Ultrasound scan unit was significant (*P* 0.045).

Table 5: Evaluation of patient satisfaction (Section A)

	Ultrasound					Conventional Radiography					CT scan					Special procedures				
	vs	s	u	vu	P value	vs	s	u	vu	P value	vs	s	u	vu	P value	vs	s	u	vu	P value
How satisfied were you with the Radiological examination you just did?	39	95	0	0	0.155	54	64	0	0	0.136	12	4	0	0	0.242	0	8	0	0	0.374
How satisfied were you with the Radiology department reception staff, were they friendly?	68	70	2	2	0.121	54	62	4	2	0.127	16	0	0	0	0.374	4	4	0	0	0.178
How satisfied were you with the help offered by the Radiology department reception staff?	66	74	2	0	0.130	58	58	0	2	0.127	16	0	0	0	0.374	4	4	0	0	0.178
How satisfied were you with	60	78	6	0	0.125	52	58	4	4	0.102	8	4	0	0	0.099	4	4	0	0	0.178

the comfort of the Radiology department waiting area?																				
How satisfied were you with the cleanliness of the Radiology department waiting area?	76	70	0	0	0.150	60	48	6	4	0.096	4	8	0	0	0.099	0	8	0	0	0.374
How satisfied were you with the cleanliness of the Radiology department toilets?	30	56	8	6	0.046*	30	56	6	8	0.048*	4	0	0	0	0.099	0	4	4	0	0.178
How satisfied were you with the time you had to wait before the Radiological	44	58	18	8	0.027*	36	54	14	4	0.044*	8	8	0	0	0.178	0	4	4	0	0.178

examination that you came for was done?																				
How satisfied were you with the interesting items (TV, pamphlets, posters etc.) in the Radiology department waiting area?	46	74	8	2	0.080	30	34	14	8	0.016*	4	4	0	0	0.099	4	4	0	0	0.178
How satisfied were you with the directions provided for finding the Radiology department? (Information letters, website, signs in the hospital)	46	86	4	0	0.126	48	48	14	0	0.056	8	8	0	0	0.178	0	4	0	0	0.178

How satisfied were you with the costing of the radiological examination that you did?	42	64	16	2	0.045*	42	60	10	4	0.077	8	0	0	0	0.178	4	0	0	4	0.178
How satisfied were you with the privacy accorded to you during the radiological examination?	60	58	12	0	0.064	44	62	8	2	0.093	8	8	0	0	0.178	0	8	0	0	0.500

*P value < 0.05 is significant. vs = Very satisfied, s = Satisfied, u = Unsatisfied, vu = Very unsatisfied.

Table 6 shows the evaluation of patient satisfaction based on their responses from the section B of the questionnaire. The clients in the Ultrasound scan unit significantly agreed that Radiological procedures were clearly explained to them before the examination commenced (*P* 0.025).

Table 6: Evaluation of patient satisfaction (Section B)

	Ultrasound			Conventional Radiography			CT scan			Special procedures		
	Yes	No	P value	Yes	No	P value	Yes	No	P value	Yes	No	P value
Did a member of staff involved in your radiological examination introduce themselves clearly?	68	86	0.074	70	58	0.060	12	4	0.295	8	0	0.500
Were you given a clear explanation of the radiological examination and what was involved before it started?	80	74	0.025*	72	56	0.079	16	0	0.500	8	0	0.500

Did the radiology member of staff take time to answer your questions?	114	40	0.285	98	30	0.311	12	4	0.295	8	0	0.500
Did the radiology member of staff take time to inform you of ionizing radiation produced by X-rays and CT procedures or the radiation of ultrasound?	48	106	0.229	44	84	0.193	12	4	0.295	0	8	0.500
Can you recommend the services of our Radiology department	140	14	0.437	114	14	0.422	16	0	0.500	8	0	0.500

to persons living in the state, in the country and outside the country?												
Do you recommend a quarterly assessment of patient satisfaction in our Radiology department?	132	22	0.395	112	16	0.410	16	0	0.500	8	0	0.500
Do you recommend a hard copy questionnaire document to be used for the quarterly patient satisfaction assessment?	130	24	0.384	104	24	0.356	16	0	0.500	8	0	0.500

Do you recommend a soft copy questionnaire document installed in a machine to be used for the quarterly patient satisfaction assessment?	94	60	0.138	84	44	0.193	12	4	0.295	4	4	0.387
Do you recommend a patient complaint box to be conspicuously placed in our Radiology department?	132	22	0.395	112	16	0.410	12	4	0.295	8	0	0.500

*P value < 0.05 is significant.

Table 7 shows the mean patient waiting time in the four units of the Radiology Department and their association with patient satisfaction. The least patient waiting time was seen in the CT scan unit (89.50±112.43 minutes) while the longest patient waiting time was noted in Specials unit (124.00±79.20 minutes). The mean patient waiting time in both Ultrasound unit and Conventional Radiograph unit were significantly associated with patient satisfaction with *P* values of 0.043 and 0.016, respectively

Table 7: Descriptive statistics of patient waiting time and its association with patient satisfaction

	Minimum PWT (minutes)	Maximum PWT (minutes)	Mean PWT (minutes)	Standard deviation	P value
Ultrasonography	5.00	260.00	108.94	±58.78	0.043*
Conventional Radiograph	10.00	255.00	99.33	±76.87	0.016*
CT Scan	10.00	169.00	89.50	±112.43	.[a]
Specials	68.00	180.00	124.00	±79.20	.[a]

*P value <0.05 is significant. PWT = Patient waiting time.

Table 8 shows the distribution of the socio-demographic characteristics of the participants in all the units and their association with patient satisfaction. PWT, age (in years) and employment status were significantly associated with the patient satisfaction of the Radiological services offered with *P* values of 0.009, 0.000 and 0.011 respectively. There was more satisfaction in participants who had a PWT between 5 and 60 minutes (41.67%) than those that waited longer. Unemployed participants (90.91%) below 40 years (93.61%) were noted to be more satisfied than those above 40 years (89.92%) who were employed (89.47%).

Table 8: Socio-demographic characteristics and their association with patient satisfaction of Radiological services using Chi-square test.

RADIOLOGY SERVICES	CHARACTERISTICS		PATIENT SATISFACTION				
			Frequency distribution	Patient waiting time range (minutes)	Number of satisfied participants (n)	Percentage satisfied (n)	P value
PWT							0.009*
				05 - 60	25	41.67	
				61 - 120	13	21.67	
				121 - 180	10	16.67	
				181 - 240	6	10	
				241 - 300	6	10	
	Gender						0.973
		Male	124		112	90.32	
		Female	182		164	90.11	
	Age groups (years)						0.000*
		15 - 19	16		16	100	
		20 - 24	18		18	100	
		25 - 29	68		56	82.35	
		30 - 34	42		36	85.71	
		35 - 39	44		44	100	
		40 - 44	28		26	92.86	
		45 - 49	22		18	81.82	
		50 - 54	24		22	91.67	
		>55	30		28	93.33	
	Educational qualification						0.056
		FSLC	22		18	81.82	
		JSCE	4		4	100	
		SSCE	80		76	95	
		OND	42		36	85.71	
		1ST Degree	126		116	92.06	
		2nd Degree	32		26	81.25	
	Employment status						0.011*
		Employed	152		136	89.47	
		Unemployed	154		140	90.91	

P value <0.05 is significant. FSLC – First School leaving certificate, JSCE – Junior secondary certificate examination, SSCE – Senior secondary certificate examination, OND – Ordinary National Diploma

Figure 1 shows the patient satisfaction of the services rendered in the four units of the Radiology Department. The satisfaction displayed by the CT scan and Special procedure respondents produced a patient satisfaction of 100% each while Ultrasound participants had the least patient satisfaction (87.01%). The mean patient satisfaction of the entire work done for the clients in the Radiological department was 94.8%.

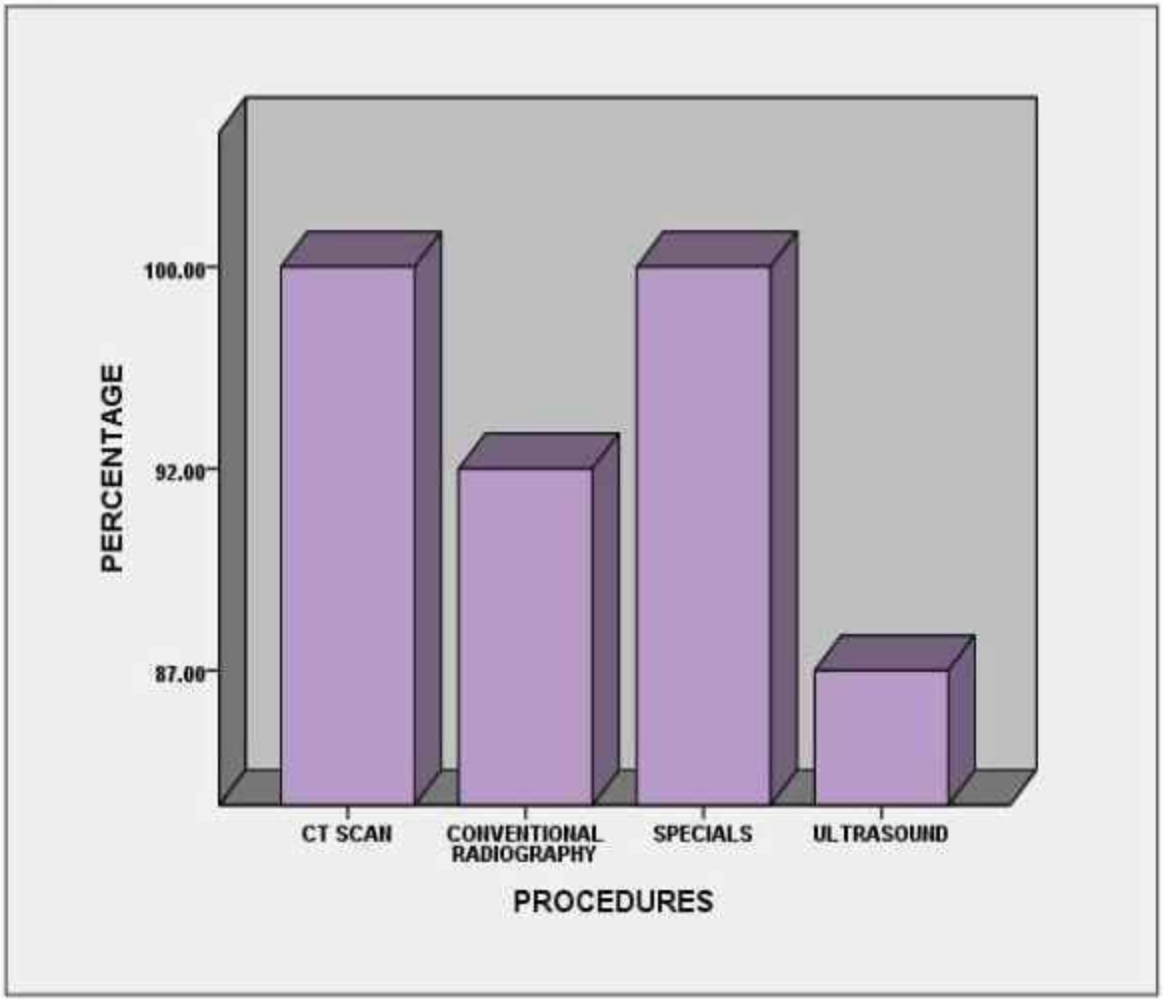

Figure 1: The bar chart illustrates the patient satisfaction with the services provided in the different units of the Radiology Department

Discussion

The mean Patient satisfaction of the Radiological services expressed in this study was 94.8%. Furthermore, it was observed that patient satisfaction was associated with PWT (*P* 0.009), age (P 0.000) and employment status (*P* 0.011). A relative lower patient satisfaction was noted in Mulisa et al's [1] in Ethiopian based research, as they found that 71.6% of the respondents were satisfied with the Radiological services that they received. In addition, educational attainment had an important part to play in patient satisfaction as they noted that the respondents who had finished high school were 95% less likely satisfied than those who were illiterates. The reason being that illiterates usually have a low expectation of the services rendered to them. It was also noted in their study that the unemployed respondents were about 93.3% less likely satisfied probably due to lingering frustrations of being unemployed. This was a stark contrast with what was obtained from this study as it was discovered that the unemployed were more satisfied with the services rendered probably because they may likely not be the ones paying the bills and end up feeling privileged.

In the index study, more satisfaction was shown by participants below 40 years of age (93.61%). In an Egypt based research conducted by Wahed et al, [3] 75% of the respondents were satisfied with the Radiological services they received and in alignment with our study, the perception of satisfaction was significantly associated with younger age (83.1%) of respondents and lower educational level (90.2%). This is in keeping with the highlighted effect of age and educational level on patient satisfaction in Mulisa et al's study. [1]

The participants' expression of satisfaction with the services provided by the four units in the Radiology Department of this study were as follows; Ultrasound scan unit - 87.01%, Conventional Radiography unit – 92.19%, CT scan unit – 100% and Special procedure unit – 100%. Waheed et al, [3] in consonance with our findings, revealed that CT scan services produced the highest degree of satisfaction with a rating of 53.6% while Ultrasound scan was the least with 32.2%. This outcome in their study was majorly influenced by the quality of the work station of each imaging modality within the Department and the CT workstation was found to be satisfactory to 96.4% respondents, Ultrasound scan workstation was satisfactory to 81.2% and the Conventional Radiography workstation was satisfactory to 84.4% respondents. [3] In the Department where this study was conducted, the Ultrasound scan unit and Conventional Radiography unit workstations were not as impressive as that of the CT suite. Ugwu et al [13] in a multi-center study, found that the patient perception of care rating before, during and after special procedures were 76.25%, 76.75% and 78.25% respectively with an overall patient satisfaction of 80.5% but no significant relationship was seen between patient satisfaction and quality of the workstation.

Patient satisfaction with access to the Radiology department where this study was done, were noted to be as follows in the four units; The Ultrasound scan participants had 85.71% satisfaction, the Conventional Radiography participants had 75% satisfaction, the CT scan participants had 100% satisfaction while the Special procedure participants had 50% satisfaction. The average patient satisfaction with access to the Department was 77.68%. It seems that the patients referred for CT scan procedures often get more assistance in locating the Radiology Department than other patients. The management of the Hospital have to ensure that signposts for direction are conspicuously placed at appropriate locations (including corridors) as this will consequently accelerate the treatment process of patients. Similarly, Mulisa et al [1] observed a considerable satisfaction (84.5%) with the access to Radiological services in their study. Kumar et al [14] further noticed that 80.5% of their respondents were satisfied with the assistance offered in guiding them to the Radiology Department and 61.5% said that the sign boards for direction were adequate.

The attitude and behaviour of the staff at the front desk portray the first and indelible impression of the Radiology Department to the clients. The patient satisfaction with the friendliness of the Ultrasound front desk staff in this study was 89.61% while the friendliness of the front desk staff of the Conventional Radiography unit and the CT scan unit were 90.63% and 100% respectively. This was impressive for a public hospital. The patient satisfaction with the helpfulness of the front desk staff was also excellent and they were rated as

follows; Ultrasound scan unit – 90.91%, Conventional radiography unit – 90.63% and CT scan unit – 100%. Mulisa et al [1] discovered that about 78.7% were satisfied with the level of communication that the patients had with the front desk staffs, which was a marginal reduction to the value obtained in this study but still excellent. In likewise, Rajani et al [15] noticed that patient satisfaction with the front desk service in their study was rated as 76.5% good and very good. Disagreeing with this trend, Dako et al [16] observed that their respondents were least satisfied with the quality of reception offered by the front desk personnel. This demonstrates the need for increased attention and resources to be directed at ensuring that structures and processes at the front desk are optimized to maximize patients' perception of quality and satisfaction. [16]

Ochonma et al [9] found out that in a private hospital, there was more patient satisfaction with the courtesy of staffs at the front desk (61.3%) and the explanation of billing processes and Radiological procedures (60.6%) than in a public hospital which resonates the need for more sensitization or training for improved customer relation and patient-provider interactions. [9] Gana et al, [2] in congruence, noted that there was more satisfaction obtained from the respondents who visited a private hospital (80%) than those who had been attended to in a public hospital (47.8%) and this difference was significant (*P* 0.000). [2] Kyei et al, [4] also in agreement, noticed that there was more satisfaction with the services offered to the respondents in a private hospital (92%) compared to the satisfaction of services delivered in a public hospital (68%). The degree of patient satisfaction with Radiological services was high in the public Hospital where this study was conducted (98.4%) and this value was more than the level of patient satisfaction in all the afore-mentioned private Hospitals.

There was a relative reduction in the level of satisfaction with the cost of procedures done in this study. Patient satisfaction with the amount of money paid in the four units were as follows; Ultrasound scan – 68.83%, Conventional Radiography - 79.69%, CT scan – 50%, Special procedure – 50%. This suggests that the Hospital management should conduct an appraisal of the cost of procedures with the aim of reducing the price of examinations except that of Conventional Radiography, but ensure that marginal profit is achieved. Kyei et al [4] also noticed an excellent rating as the patient satisfaction with the cost of procedures in a public Hospital, which was utilized for their study, was 78%.

The time interval between the conclusion of the registration for a procedure at the front desk and when one is called in for the requested Radiological procedure is called the patient waiting time (PWT). In this study the patient satisfaction with PWT in the Radiology Department was as follows; Ultrasound scan unit – 66.23%, Conventional Radiography unit – 70.31%, CT scan unit – 100% and Special procedures – 50%. PWT was found to be associated with patient satisfaction in the Ultrasound unit (*P* 0.043) and Conventional radiography unit (*P* 0.016). Mulisa et al's [1] study indicated that more than half (59.7%) had to wait for more than 12 hours and about 26.8% had to wait for less than 6 hours before getting Radiological service. [1] This could mean that the respondents in Mulisa et al's [1] study were comfortable with the extremely long waiting time since it did not come to bear on the overall patient satisfaction obtained, which was very good (71.6%). In this study, the patient satisfaction with PWT was influenced by the cleanliness of the waiting area and the interesting items, like a functional television, that was present in the waiting area.

Similarly, Kumar et al [14] observed in their research that 82% of the respondents were of the opinion that the time taken for the MRI examination was reasonable. About 74.5% of the respondents felt that the PWT was reasonable. However, only 21.3% and 63% were satisfied with the PWT in Waheed et al's [3] and Okafor et al's [5] research respectively. Ochonma et al [9] amazingly found out that the respondents in a public hospital were shown to be more satisfied with the PWT than those in a private hospital (*P* 0.000). [9] Kyei et al's [4] results, which was in congruence with majority opinion, showed that 82% of respondents from the private hospital were satisfied with how promptly they were attended to and only 45% of respondents from the public hospital expressed satisfaction with how promptly they were attended to upon arrival.

The mean PWT and PWT range that were reported by the participants in the four units assessed in this study were as follows; Ultrasound scan - 108.94 minutes with a range of 5.00 to 260.00 minutes, Conventional Radiography – 99.33

minutes with a range of 10.00 to 255.00 minutes, CT scan – 89.50 minutes with a range of 10.00 to 169.00 minutes, Special procedure – 124.00 minutes with a range of 68.00 to 180.00 minutes. The mean PWT in Akintomide et al's [17] research was 132.11 minutes, which was higher than the value noticed in this study, but with a range of 62.68 to 220.58 minutes daily. Reduced PWT was observed in the patients who came late for their appointments (from 11.00 am onwards). [17] Onwuzu et al [18] also observed that late arrival to the department by a patient for a radiography procedure was associated with a short PWT. In this study such pattern was not demonstrated.

Umar et al [19] noted that the mean PWT noticed in their study was 85 minutes, which was lower than the value in this study. They vehemently believed that the length of the PWT was due to the disproportionate number of the patients compared to the Doctors. They observed that during the working hours the population of patients keep on increasing, causing congestion, while the number of doctors available for consultation remains relatively the same. The patients in their study were of the opinion that 30 minutes was ideal for the PWT. [19]

Akintomide et al, [17] on the other hand, observed that the major cause of congestion in the ultrasound unit was because of the flawed appointment scheduling pattern which was adopted for their patients. They discovered that 18.25% of the booked patients did not turn up for their appointments and 91.82% came late for their appointments. They inferred that these events occurred because of the lack of opportunity for patient input in the decision-making processes involved in booking patients. Patients should be able to choose an appropriate day and time for a Radiological procedure and accordingly adjust when they have other pressing issues provided it does not delay the readiness of the report for presentation to the managing Physician. [17, 20] Moreover, emergency cases were also implicated as a cause of congestion since they usually affect the planned flow of scheduled patients. [17] It is pertinent to note that critical clinical information may be lacking in the request forms issued to the patients by the managing physicians and these are necessary for optimum discharge of duties by the Radiologists. The time spent by the patients to return back to the referring physicians and obtain the requisite information causes delay in commencing the Radiological procedures they were billed for and this was a common reason for increase in PWT in this study. [20] In addition, power supply to the Radiology Department where this study was conducted was erratic and delayed, which contributed to an increased PWT.

In this study, it was observed that the patient satisfaction with the cleanliness of the patient waiting area and the presence of interesting items, eg. a television, in the waiting area were as follows; Ultrasound scan unit – 94.81% and 77.92%, Conventional Radiography unit – 84.38% and 50% and CT scan unit – 75% and 50%. Interestingly, Gana et al [2] showed that the cleanliness of the waiting area alone does not influence patience satisfaction when they noted that about 56% of the respondents in a private hospital were very dissatisfied with the lack of a functioning television in the waiting area which makes the place uninteresting, tiring and upsetting especially when the patients are kept waiting. [2] The presence of a television in the Ultrasound scan unit of this study might have positively influenced the level of satisfaction of the patients. Exactly 50.4% of the respondents in the research of Hamed et al [16] showed dissatisfaction with the state of cleanliness of the waiting area which emphasizes how crucial the degree of neatness of the waiting area is to the overall patient satisfaction of Radiological services.

The results of Hamed et al [21] showed that giving information about the waiting time and information on the different stages to go through during nuclear medicine examinations was extremely necessary. It was reported that over half of the respondents were not aware that information regarding radiation dose exposure from CT scan and X-ray procedures should form a part of the report. [22] In this study the proportion of participants who agreed that they were informed of the dangers of ionizing radiation that some of the image modality utilizes was average overall and was as follows; 31.17% in the Ultrasound unit, 34.38% in the Conventional Radiography unit, 75% in the CT Scan unit and 100% in the Special procedure unit. However, these information were passed to the participants inside the workstations of the service providers and not in the patient waiting areas.

Kumar et al [14] realized that about 87.5% of the respondents desired to have the MRI procedure

explained to them before the examination and 85.5% of the respondents were of the opinion that radiation education of patients should be done during the waiting time with brochures and pamphlets which they believed will reduce patient fear and anxiety before MRI procedures [14] and other Radiological examinations. It is important for the Radiology Department where this study was done to have visible posters/pamphlets which provides a step-by-step elucidation of the procedures that the patients will undertake because communication availability should be a departmental goal in service provision. [22]

With regards to the degree of satisfaction with the information of the Radiological procedures presented by the service providers within the workstations, the respondents in both Waheed et al [3] and Kyei et al [4] researches displayed a poor 29.3% and a very good 63% satisfaction level, respectively. It was not surprising when Ochonma et al [9] discovered that the satisfaction with the explanation of procedures to patients in a private center (60.6%) was more than what was obtainable in a public facility and the difference was significant (P<0.001). Private hospitals most often, drill their staffs to be eager to please the clients and one of the ways of achieving this is a meticulous description of the Radiological procedures that concern them. In this study the Radiology service provider-patient relationship was good. This was reflected in the result of the participants who agreed that the Radiological examinations were explained to them in the workstations, which were as follows; Ultrasound scan unit – 51.95%, Conventional Radiography unit – 56.25%, CT scan unit – 100% and Special procedure – 100%.

The participants in this study noted that the service providers in the Special procedure unit and CT scan unit were quite receptive as 100% and 75% of them respectively, agreed that they introduced themselves before commencing the procedure. Only 44.16% of the participants agreed that the Radiologists introduced themselves. In a reverse outcome, Rajani et al [13] observed that 69% of their clients responded that the Radiologists they met introduced themselves. Kyei et al [4] noticed in their research that the courtesy shown by Radiologists was shockingly higher in the public sector (98%) than in the private sector (83%) which was against the trend of multiple studies. This fashion was replicated in an Indian Teaching Hospital, which is a public facility, as 86.5% were satisfied with the degree of service provider communication with the patients. [14]

The patient satisfaction with the amount of privacy accorded participants during Radiological examination in this study was as follows; Ultrasound scan unit – 76.62%, Conventional Radiography unit – 82.82%, CT scan unit – 75%, Special procedure unit – 100%. In a profound contrast, Mulisa et al [1] showed that an extremely low number of respondents (0.3%) exhibited satisfaction with privacy techniques of Radiological services. Kyei et al [4] however, observed that about 63% of the respondents were satisfied with staff respect for privacy. It has been noted that patients often have a sense of intrusion when staffs walk in on them without their consent during procedures. [3] It is important to mention here that Radiologists/Radiographers should not assume that every patient will be comfortable with the presence of a Chaperone in Radiological procedures that require one. It was found in a study that 84 respondents (which made up 41.2% of the subjects) were against the notion of having a Chaperone present in an intimate Radiological examination like a transvaginal ultrasound scan. [23] Patients' privacy should be highly respected. Staff education and training on patient privacy is necessary to keep on producing a considerable patient satisfaction. [24]

The privacy scores noted in a Canadian Teaching Hospital research were appreciable; 96% for CT scan procedures, 94% for ultrasound scan procedures and 92% for conventional radiography procedures. Which were all higher than the values seen in our study. The major concern of the subjects in their study, which did not affect the resulting high privacy scores, was the small size of the waiting area and the examination rooms that allowed other patients to hear their discussions with the Radiologists. [24]

The participants who agreed that they will recommend this Radiological center to other persons in the country or outside the country were as follows; Ultrasound scan unit – 90.91%, Conventional Radiography unit – 89.06%, CT Scan unit – 100%, Special procedure unit – 100%. In several studies the proportion of the respondents who were interested in recommending the Radiological services to other people were similarly

encouraging. Mulisa et, [1] Waheed et al [3] and Kyei et al [4] all found out that 92.8%, 98% and 60% respectively, were disposed to endorsing their facility to others for use.

It is essential to implement a process that will continuously assess the degree of patient satisfaction by employing a standardized survey. [20] There was a considerable support of the idea for a quarterly assessment of patient satisfaction with the Radiological services provided as 100% of the CT scan and Special procedure participants, respectively, were in full agreement while 85.71% and 87.5% of the respondents in the Ultrasound scan unit and Conventional Radiography unit, respectively, also agreed. This exercise can be done with hard copies of questionnaires or with electronic kiosks/touch-screen computers. The computers that have the questionnaires already installed or hard copies of the questionnaire can be sited at the front desk, waiting area or in the changing rooms. This will ensure continuous feed-back from patients immediately after each procedure to monitor improvements in the quality-of-service delivery or provide cause for the implementation of an interventional measures. [25]

The major limitation of this study is the sample size which was small. Moreover, the survey does not have open-ended structured questions and this impede the respondents from elaborating on their thoughts and to be more specific in their feedback.

Conclusion

The patient satisfaction with the Radiological services provided in UCTH, Calabar is high. The level of patient satisfaction is associated with a patient waiting time less than one hour, age lower than 40 years and an unemployed status of the patient who receives Radiological services. The quality of the waiting area and health provider-patient interactions contribute to the degree of patient satisfaction.

Recommendations

- Maintenance of the quality of the workstation in the Ultrasound and Conventional Radiography units.
- Access to the Radiology Department should be improved by placing visible sign-posts for directions
- There should be a marginal reduction in the cost of Radiological procedures
- It is important to educate referring Physicians on the importance of providing clinical information of the patient in the request forms
- Power supply to the Radiology Department of the Hospital where this study was done should be made available between 7.30 am and 8.00 am
- Posters designed to explain every step involved in the services provided in the units of the Radiology Department should be visibly placed
- Radiologists should imbibe the habit of being courteous to patients.

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