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RESEARCH ARTICLE

ASSESSMENT OF PATIENTS' AWARENESS AND ATTITUDE TOWARDS RADIATION EXPOSURE IN NNAMDI AZIKIWE UNIVERSITY TEACHING HOSPITAL, NNEWI, ANAMBRA STATE, NIGERIA

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ABSTRACT

Radiation exposure have been proven to be one of the major means of diagnosis which have gone a long way in improving health care services in diagnosis, treatment and patient management in severe cases. The aim of this study is to ascertain patients' awareness and attitude towards radiation exposure in Nnamdi Azikiwe University Teaching Hospital Nnewi, Anambra state Nigeria. This is a prospective cross sectional survey design of 284 respondents consisting of (50.4% male and 49.6% female) using a well-structured questionnaire. The result of this study indicated that 61.3% of the respondents had good academic qualification. 67.6% and 74.6% respectively showed respondents significant awareness and knowledge to the use of ionizing radiation. 27.5% where of the opinion that CT and Fluoroscopy uses higher ionizing radiation dose. 8.1% of the respondents agreed that one of the effect of radiation exposure is fetal anomaly. While 64.4% of the respondents feel relaxed in the diagnostic rooms. Therefore, a higher percentage of 74.6% revealed that the referring clinicians explained the importance of radiation exposure for their examination. The study further revealed that there is significant good knowledge and positive attitude to the use of ionizing radiation and towards radiation exposure within the population.

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INTRODUCTION

Radiation is defined as energy in motion. Which can be transmitted as a wave, it emanates from a source and can travel through a space and some materials (Woodside, 1997). Based on energy level and ionization potential, radiation is of two types, ionizing radiation and non-ionizing radiation (Maccia, 2015). Radiation exposure is a measure of the ionization of air by ionizing radiations such as gamma rays, X-rays and alpha particle. It is defined to be the electric charge freed by the radiation divided by the mass of the air (Glen, 2010). Radiation occurs naturally in sunlight and is also made by man for use in X-rays, cancer treatment, and for nuclear facilities and weapons (Vano *et al.*, 2011). Long-term exposure to small amounts of radiation can lead to gene mutation and increase the risk of cancer, while exposure to a large amount over a brief period can lead to radiation sickness (Rehani and Ciraj-Bjelac, 2010). Because of radiation danger, there is a need to

reduce radiation absorbed dose and at the same time produce a quality diagnostic image this is the concept of ALARA principle. Justification and optimization is therefore a key to radiation protection. There are records of numerous radiation damages caused by mainly inadequate use of radiation and accidental exposures. Some of this effect of radiation is life threatening while some causes congenital abnormalities which directly or indirectly causes pain and financial burden to the family. Nevertheless, radiation damage or danger are a time over estimated and misinterpreted that it introduces unnecessary fear to patients and the public and this can affect the attitude of patients undergoing radiological procedures (Satake *et al.*, 1997). Attitude according to Webster's Universal Dictionary is said to be a settled way of thinking or feeling about someone or something, typically one that is reflected in a person's behavior. Also it is the manner of thinking, feeling, or behaving that reflects a state of mind or disposition (Stall cup, 2006). It seems invariably that the patients may have different level of knowledge or awareness about radiation exposure and its effects which most often is reflected on their attitude. Some patients do not seem to obey radiation signs and direction in radiology department, probably

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because they are not sufficiently aware of radiation danger. Different patients have different information, perception and knowledge about x-ray radiation which affects their attitude towards radiographic exams. Many of them do not have a sufficient good knowledge of the basic modalities of the x-ray department. The researcher observed that there is paucity of data in assessing patients' awareness and attitude towards radiation exposure in the selected tertiary hospital. Therefore, there is need to assess patients' awareness and attitude towards radiation exposure and their awareness to the use of different X-ray imaging modalities and radiation safety measures in the hospital.

Objective of study

- To ascertain the awareness level of patients coming for radiological investigation towards the use of ionizing radiation and its danger.
- To assess the knowledge/awareness of the patients to the use of each modalities and on radiation safety measures.
- To assess the patient's attitude to radiological investigation and find the factors that influences it more.

Research methodology

Research design

A prospective cross-sectional design was adopted for this study.

Area of study

The research was carried out at Nnamdi Azikiwe University Teaching Hospital, Nnewi Anambra State, Nigeria.

Target population

The population of this study was conscious adult male and female patients who came for radiological investigations in Nnamdi Azikwe University Teaching Hospital, Nnewi, Anambra State and those whose consent were obtained.

Sample size

A convenience sampling technique was adopted to obtain a sample size of Two hundred and eighty four (284) patients who participated in the study.

Equipment and materials

A twenty two item structured questionnaire was used as the research instrument.

Procedure for data collection

Official permission was obtained from the Radiology department of the hospital before distributing the questionnaires to the patients that accepted to participate in the study. The questions where explained to those patients who could not understood them so that they can fill them properly. Three hundred questionnaires were distributed but two hundred and eighty four were collected returned.

Data analysis

Data was analyzed using the statistical package for social sciences (SPSS) version 21.0. The values were expressed using percentage and represented in tables.

RESULTS

This chapter analyzed the data obtained from the questionnaires distributed to the patients that came for different radiological examination at Nnamdi Azikiwe University Teaching Hospital (NAUTH). The results were represented in frequency tables, charts and percentage as shown below. A total number of three hundred (300) questionnaires were distributed to patients coming for different radiological examinations, two hundred and eighty-four (284) questionnaires were returned with 143 male respondents at a percentage of 50.4% and 141 female respondents at a percentage of 49.6%. It was observed that the highest number of respondent were individuals within the age range of 21-25 years having a frequency of 109 respondents and 38.4%. The lowest age group that responded is those that are greater or equal to 36-40 years of age with a percentage of 6.7%.

Table 1. Distribution of the respondents demographics data

Variables	Response	Frequency	Percentage (%)
Gender	Male	143	50.4
	Female	141	49.6
	Total	284	100
Age	21-25	109	38.4
	26-30	59	20.8
	31-35	21	7.4
	36-40	19	6.7
	40&Above	45	15.8
	Total	284	100
Marital status	Married	94	33.1
	Single	172	60.6
	Divorced	9	3.2
	Separated	7	2.5
	No response	2	0.7
	Total	284	100
Academic qualification	Higher Institution	174	61.3
	Secondary	64	23.6
	Primary	21	7.4
	None	22	7.7
	Total	284	100
Employment	Self employed	19	6.7
	Unemployed	2	9.9
	Civil servant	46	16.2
	Business	62	21.8
	Retired	10	3.5
	Student	119	41.9
	Total	284	100

From Table 1 above, it was also noted that based on their academic qualification the highest of the respondents to the survey were mostly from higher institution with the frequency of 174 and percentage value of 61.3%, while the lowest was from primary school with the frequency of 21 and percentage value of 7.4%.

In Table 2 above, the knowledge of the patient was assessed on the use of ionizing radiation 192 respondents were aware of its uses with the percentage of 67.6%. The frequency of 220 and the percentage rate of 77.5% said radiation is important in their investigation. It was noted when the respondents knowledge about the modalities used in the radiology department that uses ionizing radiation the frequency of 78 respondents and 27.5 % of the respondents said CT and fluoroscopy uses ionizing

radiation, 61 and 21.5% said only x-ray uses ionizing radiation, it was noted that a total number of 22 and 7.7% said all modality uses ionizing radiation. 52.5% agrees at radiation exposure can cause all the effects as stated in the research question.

Distribution of the respondents knowledge to radiation and it's uses

Variables	Response	Frequency	Percentage (%)
Which exam	Fluoroscopy	43	15.1
	Mammography	12	4.2
	CT.	44	15.5
	Ultrasound	12	4.2
	Total	284	100
Aware	Yes	192	67.6
	No	92	32.4
	Total	284	100
Important	Yes	220	77.5
	No	64	22.5
	Total	284	100
Modalities	X- ray	61	21.5
	Fluoroscopy	34	12.0
	X- ray +Mammo+ Flu	40	14.1
	CT+ Fluoroscopy	78	27.5
	Ultrasound	3	1.1
	None	46	16.2
	All	22	7.7
	Total	284	100
	Adverse reaction	Cancer	17
Fetal anomaly		23	8.1
Cataract		7	2.7
Cell d+ca+fa+catar		15	5.3
Leision+Ca+fa+catar+ cell death		24	8.5
All		149	52.5
None		41	14.4
Others		8	2.8
Total	284	100	

Distribution of respondents attitude to radiation and its uses

Variable	Response	Frequency	Percentage (%)
Feeling	Normal	183	64.4
	Scared	45	15.8
	Never thought about it	56	19.7
	Total	284	100
Briefed	Yes	212	74.6
	No	70	24.6
	No response	2	0.7
P measure	Total	284	100
	Yes	194	68.3
	No	90	31.7
Effect	Total	284	100
	Yes	211	74.3
	No	73	25.7
Obey/abide	Total	284	100
	Yes	195	68.7
	No	89	31.3
X ray	Total	284	100
	Diagnosis	141	49.6
	No idea	74	26.1
	Harmful	58	20.4
	Not good	11	3.9
Total	284	100	

In the above table, the level of patients' attitude coming for radiological examination was assessed. On the question that assessed respondents feeling in the diagnostic room a total number of 183 and 64.4% of the respondents said they feel normal in the diagnostic room. While the frequency of 45 respondents and 15.8% said they are scared. Finally, in the respondent's response to radiation and its uses, the frequency

of 141 and 49.6% said radiation is good for diagnosis. 58 and 20.4% said it's harmful and a greater percentage of 68.7% was observed to obey radiation signs and direction ensured by the department.

DISCUSSION

The application of radiation helps with medical diagnosis of the patents but the exposure must be reasonably low enough to keep the statistical probability of the stochastic effect of radiation below the acceptable level and to eliminate deterministic effect (UNSNRC, 2010). Although several researches have been carried out to assess patients' awareness and attitude towards radiation exposure yet none has yielded a higher positivity rate as observed by the researcher. This study revealed that a great percentage of 68.0% have under gone x-ray investigations with the frequency of 193. Also, most of all the respondents were seen to have undergone one or more of the radiological examinations listed in the questionnaire. Of the respondents were mostly students and fall within the age range of 21-25 years at 61.3%, this is thought to be due to the location of the research. A high proportion of the respondents had good but varied knowledge towards radiation exposure (74.6%), this is in consonance with a study done by Yucel *et al.* (2009). Where the respondents' educational statuses do not affect their knowledge on radiation exposure. Twenty nine percent (29.5%) of the respondents identified general conventional x-ray to use ionizing radiation while 1.1% identified ultrasonography machine to use ionizing radiation too. This is in disagreement with the work done by (Yucel *et al.*, 2009), where they observed that 50% of the respondents they use in their survey knew that ultrasound do not use ionizing radiation. Work done by Lee (2004), observed that the referring clinicians do not inform these patients on the effect of ionizing radiation and its importance, this research finding disagrees with this work by (Lee 2004) where 74.6% agrees that the referring clinicians explains the importance of their diagnosis with the use of ionizing radiation. Explaining these importance of ionizing radiation to their diagnosis will fill up various holes in the public negative attitude to radiation exposure. To the informed patients, this does not only help in improving their knowledge but enhances their attitude of which was noted in 64.4% which said they feel relaxed in the diagnostic rooms because of the importance of ionizing radiation to their investigation.

Conclusion

In this study, the aim was to assess patients' awareness and attitude to radiation exposure. Significant good knowledge and positive attitude was recorded to the use of ionizing radiation and towards radiation exposure within the study population.

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