

Undergraduate Radiology from the Final Year Medical Students' Knowledge, Perception and Practice of Diagnostic Imaging in Makurdi, North-Central Nigeria

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ABSTRACT

Background: The role of radiology in medicine is globally expanding, but medical students' knowledge, perception, and practice of diagnostic imaging is limited. We aim to examine the status of undergraduate radiology from the final-year medical students' knowledge, perception, and practice of diagnostic imaging and to identify factors influencing their interest in radiology in our environment. **Methodology:** This was a 3-month prospective study from 1st September to 30th November 2021, assessing the status of undergraduate radiology among final-year medical students at a public teaching hospital. Data was collected through a well-structured questionnaire and analyzed using statistical package for social sciences (SPSS) version 23, with statistically significant level pegged at $p < 0.05$. The findings were presented in tables. **Results:** Forty-six (46) final year medical students completed the questionnaire, of which 35 (76.1%) were males and 11 (23.9%) females, aged 24 to 38, with a mean age of 28.5 ± 2.33 years. Males were more interested in radiology, as evidenced by 41 (89.1%) students who liked this specialty, with a male-to-female (M: F) ratio of 3.1:1. Twenty-four students (52.2%) expressed interest in specializing in radiology. Half 23 (50.0%) of the students listed six imaging modalities, demonstrating their remarkable knowledge of diagnostic imaging modalities. The scores on knowledge of radiology showed exceptional and good knowledge by 17 (37.0%) and 26 (56.5%) students respectively. Perception of radiology scores revealed that 41 (89.1%) and 5 (10.9%) students had negative and positive perception, respectively. As for the practice of radiology scores, safe and unsafe practices were exhibited by 5 (10.9%) and 41 (89.1%) students, respectively. All 46 (100.0%) students had completed their radiology posting. **Conclusion:** Despite having acceptable knowledge of radiology, the students' perception and practice of diagnostic imaging were limited. The interest in radiology was because majority of students considered it important in patients' management and useful as a diagnostic tool.

Keywords: Imaging, Knowledge, Perception, Practice, Students.



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INTRODUCTION

Radiology is a branch of medicine that employs diagnostic imaging, such as ultrasound, radiography, magnetic resonance imaging (MRI), computed tomography (CT), nuclear medicine, including positron emission tomography (PET) and recently interventional radiology to diagnose and treat disorders that may be seen inside the body.^[1]

No other medical specialty has such a unique potential to play an integrative role in modern medical practice with such a diverse range of medical disciplines in the hospital setting as radiology. Despite the relevance of these services, radiology is repeatedly under-represented in medical school curricula. According to recent surveys, just 5% of overall teaching time in medical education is devoted to radiology. Furthermore, the subject is often times taught by non-professionals who employ teaching materials that do not reflect the contemporary role of radiologists in patient care or include the most recent technological advancements.^[2,3]

Previous studies on medical students' specialty preferences found that just about 5% of them were interested in radiology. These students cited a lack of postgraduate (PG) courses as well as insufficient knowledge provided on ionizing radiation and radiation protection during medical training as explanations for their lack of interest in radiology as a career.^[4]

During their posting in radiology, undergraduate medical students apply what they've learned in class into practice. This is an excellent time for clinical educators to observe how their students respond to and value radiological instructions. Medical students' knowledge, perceptions, and practice during clinical placements in radiology has been the subject of several primary research investigations. No study, however, has logically brought these findings together to offer a blueprint for educators to construct a group of evidence-based clinical supervision strategies.^[5,6] Furthermore, there is no community-based

research in our environment that has chronicled the level of undergraduate radiological knowledge imbibed by the medical students during radiology postings, as well as how they perceive and practice radiology at the end of the posting.

According to a study conducted in Pakistan, many undergraduate medical students lack the basic knowledge of radiology and related imaging modalities. Newcastle University researchers came up with a similar conclusion in their investigations. In Ethiopia, more than 70% of medical students wrongly believed that ultrasound and magnetic resonance imaging (MRI) emit ionizing radiation!^[7,8]

On the African continent, many universities have medical schools that offer training and a degree in medicine. Only a few of these universities, however, provide radiology courses as part of their undergraduate medical programs.^[8]

A two-week clinical posting in diagnostic imaging at the public teaching hospital, where this research was conducted, is part of the final year medical students' degree program. Because this course accounts for less than 2.0% of a medical student's overall score in surgery, the 46 final year undergraduate students in this class are unlikely to consider it a significant medical specialty, resulting in possible low attendance and participation in the programme of study.

The goal of the current study is to use a questionnaire survey to examine the status of undergraduate radiology from the standpoint of final-year medical students' knowledge, perception, and practice of diagnostic imaging and to identify the factors that influence their interest in the choice of radiology as a medical specialty.

METHODOLOGY

This was a 3-month prospective survey from 1st September to 30th November 2021, assessing the knowledge, perception, and practice of diagnostic imaging among the final year medical students,

who had just recently completed their clinical postings in radiology. The students' university's medical college offers a variety of programs, the most popular of which is the Bachelor of Medicine and Surgery (MBBS). These students' study for six years, the first three (3) of which are pre-clinical and the remaining three (3) are clinical rotations.

The inclusion criteria were medical students in their final year of study, who were of sound mind and willing to participate in the study.

The exclusion criteria were students that were mentally challenged or those who were unwilling to participate in the study. Those who were not directly enrolled at the institution under discussion but registered at other universities, such as students on exchange programs, were equally exempted.

All participants signed a term of free and informed consent before taking part in the research. Codes were used instead of participants' names. The questionnaire was piloted prior to actual data collection and all necessary corrections were made. The eventual assessment instrument was a well-structured self-reporting 5-section (A-E) questionnaire with 24 items divided into subheadings, some of which were multiple-choice type and some open-ended. The sections began by looking at the final year medical students' 6-item demographic data, such as their institution and year of study, among others, as well as other aspects of their daily practice related to the theme of the study, to see if there were any gaps in their knowledge, perception, and practice of diagnostic imaging.

Based on a systematic scoring methodology of the remaining 18 item questionnaire's subheadings, the students were graded on their knowledge (bad, average, good, or exceptional), perception (negative or positive), and aspects of daily practice of diagnostic imaging (unsafe or safe), awarding one mark for each answered question, while "don't know," incorrect answers, or unanswered questions received no marks.

Students with scores of 1-6.1, 6.2-12.1, 12.2-18.1, and 18.2-24.1 out of a possible maximum of 24 marks on individual item subheadings representing approximately 1-25, 26-50, 51-75, and 76-100 %

of their understanding of radiology were rated to have had a bad, average, good, or exceptional knowledge of the topic matter, respectively.

Those who scored ≤ 6 out of a possible maximum of 12 marks, that is 50% or lower on specific item subheadings describing perception of radiology, were considered to have had a negative perception of radiology as a profession, while those who scored 7-12 marks i.e., greater than 50% had a positive perception.

Students who scored, ≤ 5 out of a possible 10 marks, that is 50% or less on particular item subheadings describing the practice of radiological imaging were regarded to have had unsafe practice of diagnostic imaging, whereas those who scored ≥ 6 i.e., more than 50% were considered to have a safe practice.

The data from the structured questionnaire was entered into a computer to create a computerized database, which was then analyzed and processed with the Statistical Package for the Social Science (SPSS) version 23.0, IBM Inc., Chicago, Illinois, United States of America (2015). The findings were presented in tables.

The institutional health ethical committee approved the protocols.

RESULTS

The questionnaire was completed by all the 46 final year medical students, consisting of 35 (76.1%) males and 11 (23.9%) females, whose ages ranged between 24-38 years, with a mean age of 28.5 ± 2.33 years. Majority, 26 (56.5%) students were in the 24-28 years age group, followed by 17 (37.0%) in the 29-33 years age group, with the age group of 34-38 years having the least number 3 (6.5%) of students as shown in table 1.

Table 2 shows the distribution of knowledge of radiology core basics among final-year medical students who had all completed radiology posting. Except for 1 (2.2%) student, the remaining 45 (97.8%) undergraduates were knowledgeable about what radiology entailed as a medical specialty. The two-week duration of radiology

posting was adequate for 27 (58.7%) students; although, 16 (34.8%) disagreed. The teaching time was satisfactory to majority 32(69.6%) of the students. About 26(56.5%) of student preferred interactive case-based method of teaching, while 9(19.6%) were in favor of a mixture of interactive case-based, system-based and topic-based methods. PowerPoint presentation was obviously the favorite of 35 (76.1%) students, whereas lecture outline/notes were preferred by 3 (6.5%) others. Thirty-five (76.1%) students said the number of radiologists involved in their training was adequate, however, 7(15.2%) disagreed. The students' knowledge of imaging modalities in radiology was impressive, with half of them 23(50.0%) listing six such modalities, followed by 10 (21.7%) and 8 (17.4%) students listing five and four imaging modalities respectively. There was limited knowledge of imaging modalities linked with ionizing radiation with half, 23(50.0%) of the students listing only two such modalities. All the 46 (100.0%) final year medical students correctly identified MRI and US as imaging modalities that make use of magnetic and acoustic properties, respectively. The three most important sources of information on radiology included both lectures and radiology posting, radiology posting alone, and radiology lectures as testified by 20 (43.5%), 11 (23.9%), and 9 (19.6%) students, respectively. Table 3 depicts distribution of knowledge of radiology scores with age and gender in which 17 (37.0%) students, made up of 11 males and 6 females, displayed exceptional knowledge of radiology because they scored between 18.2-24.1 marks (76-100%) out of the total possible 24 marks on specific item subheadings of this subject matter. Eight (8) of the students were from the 24-28 and 29-33 age groups respectively, while one student was from the 34-38 age group. Twenty-six (56.5 %) students had good knowledge of radiology having scored 12.2-18.1 marks (51-75%). Three students (6.5 %), all males, had an average score of 6.2-12.1 marks (26-50 %) based on specific item subheadings seeking to know their knowledge of radiology.

Table 4 demonstrates the distribution of perception of radiology core basics in which majority 41(89.1%) of students liked radiology as a medical specialty, while 3(6.5%) did not. This interest was mainly because a group of students 18(39.1%) and 15(32.6%) believed that radiology was important in patient's management and useful as a diagnostic tool, respectively. A combined number of 15 (32.6%) students did not have interest in radiology because they complained that the subject was too broad, with inadequate teaching time, poor radiation protection measures and lacked postgraduate courses for career progression. Despite these complaints, more than half of the students, 24 (52.2%), still considered specialization in radiology because of monetary gains 6 (13.0%), friendly radiology lecturers 2(4.3%), light workload 1(2.2%), and the fact that the practice was less time-consuming and important in the patient management as opined by 9(19.6) others respectively. A handful of students still did not consider specialization in radiology, due to radiation hazards 12(26.1%) and primary interest in another specialty 5(10.9%). Table 5 presents the distribution of perception of radiology scores with age and gender. Forty-one (89.1%) students, made up of 30 males and 11 females had negative perception of radiology, having scored 6 or lower marks ($\leq 50\%$), out of a possible

Table 1: Distribution of demographic variables of the respondents

Variable	Frequency	Percentage (%)
Age group(yrs.)		
24-28	26	56.5
29-33	17	37.0
34-38	3	6.5
Total	46	100.0
Gender		
Male	35	76.1
Female	11	23.9
Marital status		
Single	42	91.3
Married	4	8.7
Nationality		
Nigerian	46	100.0
Others	0	0.0
Year of study		
Final year	46	100.0
Others	0	0.0

Table 2: Distribution of Knowledge of Radiology core basics(n=46)

Variable	Frequency	Percentage (%)
What is radiology?		
Imaging animals mainly	1	2.2
Imaging to diagnose/treat diseases	45	97.8
Don't know	0	0.0
Radiology posting		
Yes	46	100.0
No	0	0.0
Adequacy posting duration		
Yes	27	58.7
No	16	34.8
Don't know	3	6.5
Adequacy teaching time		
Yes	32	69.6
No	14	30.4
Don't know	0	0.0
Teaching method preferred		
Interactive Casebased	26	56.5
Interactive system-based	6	13.0
Interactive topic-based	5	10.9
All of above	9	19.6
Presentation preferred		
PowerPoint	35	76.1
Lecture outline/note	3	6.5
All above	8	17.4
Adequacy training consultants		
Yes	35	76.1
No	7	15.2
Don't know	4	8.7
Mention radiology imaging modalities		
One	1	2.2
Two	1	2.2
Three	2	4.3
Four	8	17.4
Five	10	21.7
Six	23	50.0
Don't know	1	2.2
Modalities utilizing ionizing radiation		
One	4	8.7
Two	23	50.0
Three	12	26.1
Four	3	6.5
Don't know	4	8.7
Modalities utilizing magnetism		
Convec Rad	0	0.0
CT	0	0.0
Mammo	0	0.0
Nuc	0	0.0
MRI	46	100.0
Don't know	0	0.0
Modalities utilizing sound pptides		
Convec Rad	0	0.0
CT	0	0.0
Mammo	0	0.0
US	46	100.0
MRI	0	0.0
Don't know	0	0.0
Radinfo		
Lectures	9	19.6
Rad posting	11	23.9
E-learning	1	2.2
Journals	1	2.2
Textbooks	2	4.3
Tv	1	2.2
PExperience	1	2.2
Lectures& posting	20	43.5

Table 3: Distribution of Knowledge of Radiology scores with age and gender

	Knowledge of Radiology scores			Total 46(100.0%)
	Average 3 (6.5%)	Good 26 (56.5%)	Excellent 17 (37.0%)	
Age (yrs.)				
24-28	2	16	8	26
29-33	1	8	8	17
34-38	0	2	1	3
Total	3	26	17	46
Gender				
Male	3	21	11	35
Female	0	5	6	11
Total	3	26	17	46

Table 4: Distribution of Perception of Radiology core basics(n=46)

Variable	Frequency	Percentage (%)
Is Radiology a field of medicine that you like?		
Yes	41	89.1
No	3	6.5
Not sure	2	4.3
Why do you have interest in Radiology?		
Imp in pt. mgt	18	39.1
Advanced clinical anatomy	1	2.2
Useful in diagnosis	15	32.6
Satisfaction	3	6.5
All of above	7	15.2
No reply	2	4.3
Why don't you have interest in Radiology?		
Too broad	4	8.7
Poor radiation protection in training	9	19.6
Lack of PG courses	1	2.2
Inadequate teaching	1	2.2
Don't know	4	8.7
No reply	27	58.7
Are you considering specialization in radiology?		
Yes	24	52.2
No	15	32.6
Don't know	7	15.2
Why do you consider specialization in radiology?		
Monetary gains	6	13.0
Less time-consuming practice	9	19.6
Lecturers' friendly	2	4.3
Imp in pt. mgt	9	19.6
Lightest work	1	2.2
Don't know	3	6.5
No reply	16	34.8
Why are you not considering specialization in radiology?		
Radiation hazard	12	26.1
Too demanding	1	2.2
No interest	2	4.3
Interested in another specialty	5	10.9
Expensive imaging modalities	1	2.2
Workload too difficult	1	2.2
Don't know	6	13.0
No reply	18	39.1

Table 5: Distribution of Perception of Radiology scores with age and gender

	Perception of radiology score		
	Negative	Positive	Total
	41 (89.1%)	5 (10.9%)	46(100.0%)
Age (yrs.)			
24-28	24	2	26
29-33	14	3	17
34-38	3	0	3
Total	41	5	46
Gender			
Male	30	5	35
Female	11	0	11
Total	41	5	46

Table 6: Distribution of Practice of Radiology core basics(n=46)

Variable	Frequency	Percentage (%)
What are occupational hazards associated with radiological practice?		
Ionizing radiation	21	45.7
Cancers from radiatic	4	8.7
Contrast media splas	1	2.2
Poor hazard allowanc	1	2.2
All of above	19	41.3
How much impact does practice of Radiology have on other fields of medicine?		
Minimal	1	2.2
Tremendous	21	45.7
Key diagnostic tool i medicine	18	39.1
Changes pt. mgt for better	1	2.2
Similar to P/E	1	2.2
More than P/E	1	2.2
Don't know	3	6.5

Table 7: Distribution of Practice of Radiology scores with age and gender

	Practice of Radiology score		
	Unsafe	Safe	Total
	41 (89.1%)	5 (10.9%)	46(100.0%)
Age (yrs.)			
24-28	23	3	26
29-33	16	1	17
34-38	2	1	3
Total	41	5	46
Gender			
Male	31	4	35
Female	10	1	11
Total	41	5	46

maximum 12 marks on specific item subheadings on the questionnaire. Majority of these students (24/41) were of the 24-28 age group, followed by 14 and 3 students from the 29-33 and 34-38 age groups respectively. Only 5(10.9%) students, all of them males, had a positive perception of radiology having scored greater than 7marks ($\geq 50\%$) out of a possible maximum 12 marks on the questionnaire. Table 6 displays the distribution of practice of radiology core basics, in which ionizing radiation is a source of concern for 21(45.7%) students, while the combined effect of ionizing radiation, cancers, contrast media splashes, and poor hazard allowance was disturbing to 19(41.3%) other students. Overall, 21 (45.7%) students believe that the practice of diagnostic imaging has a tremendous impact on other branches of medicine, while 18 (39.5%) others felt it was a key diagnostic tool in medicine. Table 7 presents the distribution of practice of radiology scores with age and gender, in which 41(89.1%) students, consisting of 31 males and 10 females, made entries that were considered unsafe in the practice of diagnostic imaging. They scored 50% or lower, that is ≤ 5 out of a possible maximum 10 marks on the questionnaire. Majority of these students were of the 24-28 age group, while 16 and 2 students were from the 29-33 and 34-38 age groups respectively. Only 5(10.9%) students, 4 males and 1 female, made submission that were adjudged safe to the practice of radiology because their entries scored greater than 50% out of a possible maximum 10marks on the questionnaire.

DISCUSSION

According to our research, there were 46 undergraduate students in the final year medical class, of which 35 (76.1%) were males and 11 (23.9%) were females, indicating an unbalanced gender distribution with a male to female (M: F) ratio of 3.2:1. This ratio corroborates findings by Drazil *et al*,^[9] that despite accounting for 46% of the total medical student population, only about

27% of females, with a M: F ratio of about 3:1, were pursuing radiology residency. Other researchers^[1,10] differed with a ratio of 2:1, still with males outnumbering females. The gender inequality is most probably due to the shortage of female mentors in radiology to encourage others to pursue the same career, coupled with the increasing numbers of women in other competing medical specialties such as paediatrics, internal medicine, surgery, orthopaedic surgery, obstetrics/gynaecology, psychiatry, and family medicine. Besides, the longer period required for specialization in radiology, may not be appealing to these women.^[9,11]

The average age of our students was 28.5 ± 2.33 years, with a minimum and maximum age of 24 and 38 years, respectively. More than half 26 (56.5%) of the students were between the ages of 24 and 28, in accordance with the unified tertiary matriculation examination (UTME) age eligibility criteria of 16 years and above for Nigerian university admission policy, and to accommodate for the unforeseen regular disruption of the school calendar due to student protests and staff strikes.^[10,12]

Seventeen (37.0%), 26 (56.5%), and 3 (6.5%) students in our survey exhibited exceptional, good and average knowledge of radiology, consecutively. However, in terms of knowledge of radiology scores, we found no significant differences between genders ($p=0.23$). Other researchers^[4] also reaffirmed our findings by reporting that males and females had comparable knowledge scores with no significant differences between genders. Corroborative results were obtained by Alnajjar *et al*^[13] in a related subspecialty of interventional radiology, which indicated that Saudi medical students, regardless of gender, were well-knowledgeable in radiology.

When asked what radiology is, 45 (97.8%) undergraduates answered correctly, except 1(2.2%) student. The impressive response was most likely because all the 46 (100%) final year medical students had completed their radiology posting, a solid foundation in undergraduate radiology curriculum that should lead to more efficient

healthcare by eliminating unnecessary tests and reducing patient's harm.^[14] According to our research, 27 (58.7%) students believed that the duration of the radiology posting was adequate, while 16 (34.8%) disagreed. This differed from the findings of Salaam et al.^[10] in which more than half 66 (53.2%) of the students were dissatisfied with the duration of radiology posting compared to 51 (41.1%) others who were satisfied. The teaching time during the posting was similarly adequate as affirmed by 32(69.6%) students. When it came to teaching methods, interactive case-based discussions were clearly preferred by 26 (56.5%) students above all other methods. Six (13.0%) students ranked interactive system-based conversations second. Our findings echoed those of Nyhsen et al,^[7] who also found that medical students preferred interactive case-based discussions above all other teaching methods. The second most popular option was interactive system-based conversations. This shows that students preferred interactive components in teaching, which is consistent with another research,^[15] which found that case-based education coupled with interactivity increased concentration and enjoyment, thus providing better learning results in radiology. Majority 35(76.1%) of our students preferred PowerPoint presentations over lecture outlines or copying notes. The reason is not far-fetched as PowerPoint presentations, are an effective teaching tool, when used correctly, especially with the integration of interactive components into a slide show.^[7] When this data was been collected, there were three consultant radiologists in the department, with an approximate student-to-radiologist (S: R) ratio of about 15:1. The response from majority 35(76.1%) of students indicated that the number of consultants was adequate. This was in contrast to the research by Salaam et al,^[10] in which five consultant radiologists were on ground, yet majority 80(64.5%) of students complained that they were inadequate. This discrepancy may be due to our smaller sample size and S:R ratio compared to the researchers^[10] larger sample size and S:R ratio of

25:1. Our final year medical students were asked to list six imaging modalities, which comprised conventional x-ray, ultrasound, fluoroscopy, computed tomography, magnetic resonance imaging, and nuclear medicine. Half of the students 23(50.0%) listed all the six imaging modalities, followed by 10(21.7%) who listed five, then 8(17.4%) who listed four. This was impressive by all standards, but contradicted the findings by Salaam et al^[10] in which only 14(11.3%) students could list six imaging modalities with the highest response from 46(37.1%) students, listing four (4). Sadly, our students exhibited limited knowledge of imaging modalities involved with ionizing radiation, as only 3 (6.5%) of them could name four such modalities. The final year medical students' knowledge of imaging modalities utilizing magnetic and acoustic properties was remarkable, as all 46 (100.0%) of them cited MRI and Ultrasound, respectively. This was comparable to the findings by Alchallah et al,^[4] however they reported lower percentage values than our study, with 51.3% and 27.9% of their student's identifying ultrasound and MRI as not associated with ionizing radiation, respectively. The ease of identifying these two modalities based on their properties was most probably due to the fact that both ultrasound and MRI are typically safer imaging modalities that are suited for use in diagnostic imaging,^[16] with the former being readily available and extremely cheap. The three major sources of information on radiology for our students were lectures and radiology posting 20 (43.5%), radiology posting alone 11 (23.9%), and lectures 9 (19.6%). Our findings, differ slightly from that by Alchallah et al^[4] who, reported that majority of their students chose the internet 90(33.5%), social media 82(30.5%), and lectures 65(24.2%). In a related discipline of interventional radiology, Wang et al^[17] cited new media 152(42.8%), a teacher or textbook 131(36.9%), and a friend 116(32.7%), as the top three methods medical students learned radiology. These researchers^[4,17] used a slightly different methodology than we did, surveying all the undergraduate medical students rather than only

final-year medical students, which most likely explains the disparities.

Five (10.9%), and 41(89.1%) students exhibited positive and negative perception of radiology, respectively. Our findings, however revealed no significant differences in the perception of radiology between genders ($p= 0.196$). Forty-one (89.1%) students liked radiology as a medical specialty, with a M:F ratio of 3.1:1, implying that male students were more interested in the field of radiology. This compared favorably with findings by Salaam et al ^[10] in which male students were more interested in radiology, with over 90% of them showing interest compared to only 66% of the females. These low female numbers are nothing new and have remained stagnant over the past decade. Efforts to attract more career-oriented women to radiology have been made in some regions, and organizations such as the American Association for Women Radiologists (AAWR) are taking the lead by providing regular networking and mentoring to women in the field.^[9] The question on why the final year undergraduates had interest in radiology was asked. The reply was obvious. More than ever, radiology is a department that provides answers and has now become an important link in the medical health chain, so physicians often order radiology tests even before seeing the patients!^[3] The interest in radiology did not, therefore, come as a surprise as a good number of students 18 (39.1%) perceived it as important in patient's management, while 15 (32.6%) others were interested in the field because of its usefulness in diagnosis. A cross-section of 15 (32.6%) medical students advanced reasons for their lack of interest in radiology, including the broad nature of the course, poor radiation protection facilities, inadequate teaching, and lack of post-graduate prospects. According to our survey, 24(52.2%) students indicated interest in specializing in radiology, while 15(32.6%) did not. Our findings re-echoed that of Saidu et al ^[18] in which majority 51(82.3%) of students considered specializing in radiology against 3(4.8%) who did

not. Our results however, contradicted that of Salaam et al, ^[10] in which 27 (21.8%) students expressed interest in specializing in radiology, against the majority 97 (78.2%) others who showed no interest. Those who considered specializing in radiology in our index study had good reasons for their decision, which included light workload 1(2.2%), friendly radiology lecturers 2(4.3%), monetary gains 6(13.0%), and the fact that to them the practice was less time consuming 9(19.6%). It is quite inspiring and comforting to know that most students think it is necessary to specialize. That means that even if the distribution of specialization is not done uniformly among the various specialties, we will still not lack experts in radiology in the near future.^[18] Radiophobia was the main reason cited by 12(26.1%) students who did not consider specialization in radiology. Practicing radiologists, on the other hand, have rarely heard of harmful radiation exposure in current diagnostic imaging.^[18] Five (10.9%) students who did not wish to specialize in radiology had made up their mind to specialize in another field of medicine.

Five (10.9%) students, M: F=4:1 and 41(89.1%) others, M: F=3.1:1 exhibited safe and unsafe practice of radiology, respectively. We found significant differences ($p=0.03$) in the practice of radiology between males and females. Ionizing radiation was identified as the major occupational hazard associated with radiological practice by 21(45.7%) students. To reduce these risks, any physician requesting radiological imaging examinations must have significant clinical experience and a thorough grasp of the procedures and their possible dangers to the target groups.^[4] Concerns about cancer risks were raised by 4 (8.7%) students. Some students were, however worried about poor hazard allowances and suggested that radiology staff should be paid commensurate allowances to encourage more people to be involved in the practice of radiology. If we have any prospect of making radiology practice safe in our environment, we need the radiology department to take these observations seriously. Majority of our students acknowledged the impact

of radiological practice on other medical specialties as tremendous 21(45.7%) and a key diagnostic tool 18(39.1%) in medicine. Indeed, no other medical profession interacts with such a broad range of medical specialties on a regular basis, like radiology.^[3]

CONCLUSION

The study confirmed the good knowledge, but limited perception and practice of clinical radiologic practice amongst students. In addition, radiology as a subspecialty has a bright future through, regular update in clinical lecture methods and didactic posting lectures. Instituting radiation protection protocols and tools will go a long way in attracting students to specialize in radiology and give the required services to our teeming patients in the hospitals.

Conflict of interests

The authors did not provide such information. No research funding was received.

Limitation of study

This study provided essential information on the subject matter; however, it was conducted at only one facility and may not be representative of the broader situation in the country. Furthermore, the small sample size of our research may not accurately reflect the position of all final year Nigerian medical students, which makes generalization difficult.

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