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Perception of final year radiography students towards the proposed six-year Doctor of Radiography/Medical Imaging program

E. Fiagbedzi*[1], P.N. Gorleku[1], S. Nyarko[1], B. Frimpong[1], A. Adjei[2], A. Nkrumah[1]

[1] University of Cape Coast, College of Health and Allied Sciences, Department of Medical Imaging Technology and Sonography, Cape Coast, Ghana.

[2]Kwame Nkrumah University of Science and Technology, School of Allied Health Science, Department of Medical Diagnostics, Kumasi-Ghana.

*Corresponding author e-mail address: emmanuel.fiagbedzi@ucc.edu.gh

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Abstract

Introduction: Medical imaging or radiography as a profession has evolved considerably. As a result, the radiography/medical imaging program would need to be upgraded to keep up with the changes. The purpose of this study was to find out how final-year radiography students feel about the proposed six-year Doctor of Radiography/Medical Imaging program.

Methods: From June to October 2021, a cross-sectional study of final-year radiography students was undertaken at the University of Cape Coast. All students received pilot tested questionnaires through email. There were 29 questions in all, grouped into three sections A, B and C. Data was analyzed statistically with the Statistical Package for Social Sciences (SPSS) version 25.

Results: This survey drew a total of 83 students, with 62 males (75%) and 21 females (25%) participating. The mean of all the listed items in section B was 1.78 while C was 1.77. This indicated strong optimistic about the proposed program's ability to generate high-quality, exceptional and diverse imaging specialists.

Conclusion: The final year students had a favorable perception toward the proposed six-year Doctor of Radiography/Medical Imaging program. As a result, they are confident that the program would result in more flexible imaging experts than the four-year bachelor's degree.

Introduction

Medical imaging is the science of using ionizing or non-ionizing radiation and biomedical technology equipment to acquire images of internal structures of the human body for diagnostic or therapeutic purposes. This is a constantly evolving profession in the healthcare sector, and as a result, there is an ongoing desire to suit all of these always-changing needs [1,2]. Radiographers' role may now consist of performing barium enema exams; contrast administration; leading radiographer-review clinics; counseling and reporting both radiographs and sonograms. With future innovations in our profession, what sort of training would we be prepared with to carry out these demands accurately?[3]. Even among radiographers who have had common professional training, the profession requires regular adaptation to new imaging procedures, newly improved modalities, new technology, and new modes of work; a great deal of diversification in responsibilities and duties, as well as new job descriptions [4,5].

Radiography education and training serves as the foundation of the profession and is a vital component in producing radiographers who can competently practice. Training curricula are mostly based on a country's regulatory guidelines, requirements and healthcare service's needs. Such vital drivers are constantly evolving due to advancements in healthcare and imaging equipment.[6,7]

A survey conducted by the European Federation of Radiographer Societies (EFRS) stated that the majority of radiography courses were at Bachelor level. Nonetheless, the EFRS stated significant differences in courses duration, format and curriculum[6,8]. Similar differences were also reported in other regions[8–10]. The International Society of Radiographers and Radiologic Technologists (ISRRT) which is the umbrella body of all radiography societies in the world stated that many institutions across Europe, Africa, America and Asia/Oceania undertake undergraduate training for radiographers and the duration of the program varies from one and half to five years as well as the scope of work varies significantly.[11]

In West Africa, many countries did not have radiographers until 1913 and 1914, when Nigeria had the opportunity to install two conventional X-ray machines in the country's capital. Until 1930, when proper radiographic services became accessible, it was still fairly primitive. Because, with the exception of one, all radiographers practicing in Nigeria throughout WWII, from 1935 to late 1940, were immigrants. As a result, the country began training employees classified as technicians to continue with radiography at the time [4]. The Republic of Ghana, for example, recruited persons who were trained abroad and designated as radiographers to take the radiographic profession for a length of time before the

establishment of the x-ray school by the Ministry of Health and the subsequent establishment of the bachelor's degree program by the University of Ghana. Radiography education began as a diploma training program in Ghana in the late 1900s until it was taken over by the University of Ghana as a bachelor's program, which for a long time was the only recognized institution in the country to produce the country's radiographers for two decades. Radiography has gone a long way over the years, and it's clear that there have been tremendous improvements in the education, training and scope of work in Ghana [12]. As of now, the Allied Health Profession Council, specifies a number of imaging modalities under the authority of medical imaging experts in Ghana.

Nonetheless, there is still a need to satisfy these important shifting needs, which can be done indirectly through an upsurge imaging program provided at various universities around the country and around the world [6,13,14]. Radiography education and training, like that of other universities outside of Ghana, lasts four years [12,15,16]. However, this is not the situation in Nigerian universities, where radiography education is offered as a five-year bachelor's degree program [17]. Radiographers' education and training varies within Europe, Africa and worldwide with significant differences in duration and content [7,18]. Proposals are currently being considered to harmonize this education especially in West Africa through the proposed six-year Doctor of Radiography/Medical Imaging.

Recognizing the need for versatile and skilled medical imaging experts, the notion of making the radiography curriculum a six-year program arose, with the proposed six-year radiography program's final product being exceptional professionals. In view of this, there is an urgent need to focus attention to this program[19]. Medical imaging has seen significant alterations in recent years, according to Lawal et al.[5] The Doctor of Radiography/Medical Imaging is designed to introduce students to new modernized areas such as forensic radiography, supply chain management, counseling skills, procurement skills, film reporting and entrepreneurial abilities which is a job extension for radiographers [19,20]. Unlike the standard bachelor's program, which lasts three, four or five years, the Doctor of Radiography program/Medical Imaging is intended for six years. Other health professions, such as pharmacy, medical laboratory, and optometry, have been successful with this. (ie. Doctor of Pharmacy, Doctor of Medical Laboratory, Doctor of Optometry) [4]. This is to be academically consistent with other health professional groups. Medical imaging scientists with professional and scientific competence, and appropriate administrative skill are expected to thrive in diagnostic services in hospitals, public health services, research, and academia as a result of the Doctor of Radiography/Medical Imaging program. As a result, this program would produce graduates who can work alone or in partnership with other health professionals[19]. Finally, the Doctor of Radiography/Medical Imaging is intended to generate top-notched professionals who could be members of the health care group which makes policies at national and international levels [20].

The aim of this study was to assess the perceptions and thoughts of final-year radiography students at the University of Cape Coast's medical imaging department about the proposed six-year Doctor of Radiography/Medical Imaging program.

Methods

This study was a cross-sectional survey. It was conducted in the department of Medical Imaging at the University of Cape Coast. The study population comprised of all final year medical imaging/radiography students (n = 96) in the University of Cape Coast. The university runs a four-year bachelor's degree radiography/medical imaging program with two directions, which are Diagnostic Imaging Technology and Diagnostic Medical Sonography. Each direction has 46 and 50 final year students respectively making a total of 96. First to third year radiography students as well as non-radiography students were not part of the study. A convenience sampling which is a non-purposive sampling technique was used in gathering the data.

Data was collected using a questionnaire. It consisted of 29 questions grouped into three portions and similar to that used by Maduka et al [19]. The students' demographic information was gathered in Section A, which included their gender, age, and program. Section B of the survey included data on graduates' perceived versatility in all radiography disciplines. Section C collected data on the perceived quality of radiographers who would be produced as a result of the program. Respondents were required to rate their level of perception on a 5-point Likert scale: 1 = strongly agree (SA) to 5 = strongly disagree (SD) for section B and C. The questionnaire was pilot tested by three colleagues from three different universities. The questionnaire was designed using Google forms with a link.

The link was issued to all 96 final-year medical imaging students through email. The students received weekly reminders for a month and two weeks. Notifications of the students' responses was received through an e-mail account developed and specifically allocated for the study. After two months, eighty-three students correctly filled out the questionnaire, resulting in an 86.5 percent response rate.

Ethical clearance was approved by the institutional review board of the University of Cape Coast (IRB). Collected data was managed safely and confidentially. Participants were allowed to consent to participating in the study and were free to withdraw whenever they wanted to. No participant's particulars or responses were published, and there was no collection of participants' names or pictures. Any information provided was confidential.

Statistical analysis was performed using Statistical Package for Windows Version 25 (SPSS V.25 Inc, Chicago, USA). Frequencies, percentages and charts were used to explain section A. Mean and standard deviation were used to explain section B and C summarized and presented in tables.

Results

Figure 1 summarizes the demographic characteristics of all the respondents of this study. A total of 83 final year students, 62 males (75%) and 21 females (25%) participated in the study. Of the 83 final year students who participated in the study, 41 (49.4%) majored in Diagnostic Imaging Technology and 42 (50.6%) majored in Diagnostic Medical Sonography. Age group 21–25 years had the highest frequency of 67 (81%) among the other age ranges. The other ranges had the following frequencies; 15-20 years 5 (6.0%), 26-30 years 8 (10.0%) and 31-35 years 3 (3.0%). The first table (Table 1) shows the perception of the final year students on the versatility of the professionals that will be produced by the Doctor of Radiography/Medical Imaging program. The mean of all the variables in the section B (table 1) was 1.78 (a mean of >1.00 denote an agreement while a mean of <1.00 denote a disagreement). This indicates that the respondents agree that the Doctor of Radiography/Medical Imaging program will produce professionals who are versatile in all medical imaging specialties, either by focusing on a particular area of interest or by studying all specialties under medical imaging as is done in the current basic bachelor's degree. The second table (Table 2) depicts final-year students' perceptions for the quality of radiographers that will be created by the Doctor of Radiography/Medical Imaging program. The mean of all the items in the section C (table 2) was 1.77 (a mean of >1.00 denote an agreement while a mean of <1.00 denote a disagreement). This indicates that respondents believe the Doctor of Radiography/Medical Imaging program will generate high-quality medical imaging specialists in a variety of specializations who will be able to advance to the highest level both in the government and private sector.

Figure 1 Demographic data of the respondents thus, program major, gender and age distribution.

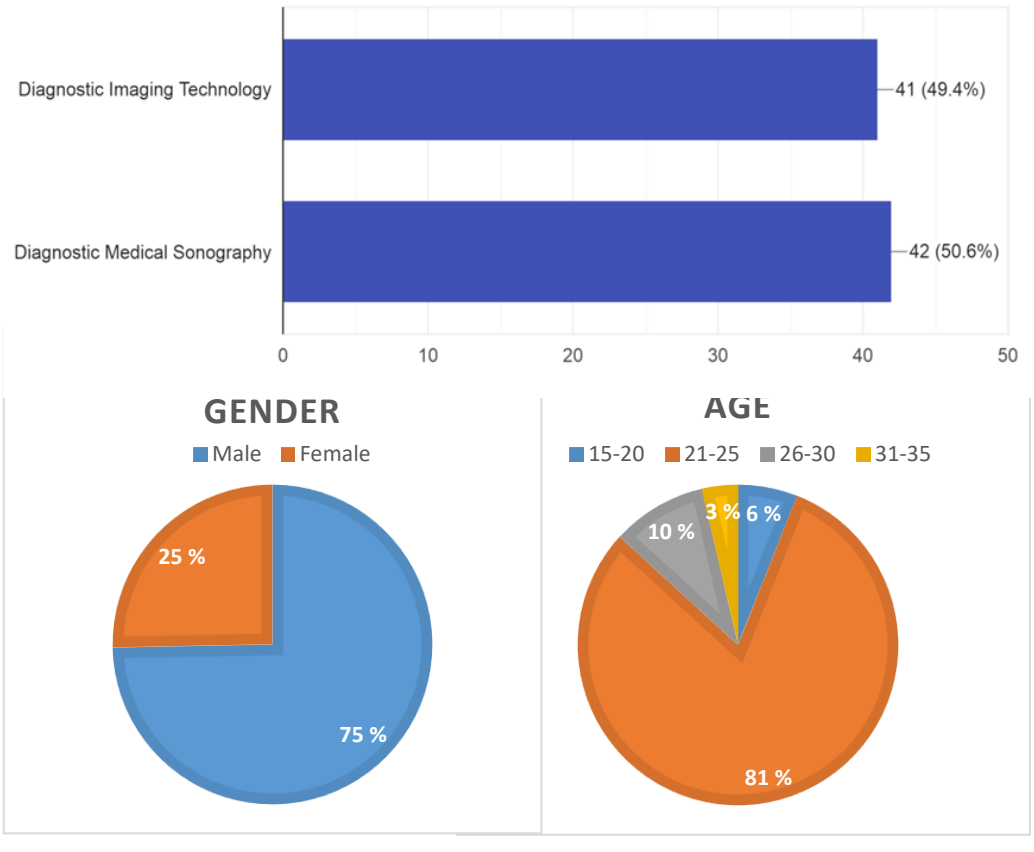

Table 1 Perception on versatility of radiographers that would be produced by the program

ITEM ON VERSATILITY	SA	A	N	D	SD	Mean	S.D.
Increased knowledge	45 (54.2%)	30 (36.1%)	8 (9.7%)	0 (0.0%)	0 (0.0%)	1.55	0.667
Increased versatility	29 (34.9%)	36 (43.4%)	18 (21.7%)	0 (0.0%)	0 (0.0%)	1.87	0.745
Coverage of more content	42 (50.6%)	26 (31.3%)	12 (14.5%)	3 (3.6%)	0 (0.0%)	1.71	0.849
Greater exposure to ideas	44 (53.0%)	29 (35.0%)	6 (7.2%)	4 (4.8%)	0 (0.0%)	1.64	0.820
Better opportunity to research deeply	35 (42.2%)	36 (43.4%)	10 (12.0%)	1 (1.2%)	1 (1.2%)	1.76	0.805
Ability to focus on their interest area	39 (47.0%)	30 (36.1%)	11 (13.3%)	3 (3.6%)	0 (0.0%)	1.73	0.828
Effective discussion on issues pertaining to their area of interest	44 (53.1%)	28 (33.7%)	9 (10.8%)	2 (2.4%)	0 (0.0%)	1.63	0.776
Ability to address problem areas in medical imaging	35 (42.2%)	31 (37.3%)	14 (16.9%)	3 (3.6%)	0 (0.0%)	1.82	0.843
Ability to compete favorably in the Ghanaian labor market	32 (38.5%)	33 (39.8%)	14 (16.9%)	4 (4.8%)	0 (0.0%)	1.88	0.861
Ability to meet up with the demands of the modern health sector	33 (39.7%)	32 (38.6%)	13 (15.7%)	5 (6.0%)	0 (0.0%)	1.88	0.889
Ability to compete favorably with their contemporaries internationally	30 (36.1%)	38 (45.8%)	14 (16.9%)	1 (1.2%)	0 (0.0%)	1.83	0.746
In-depth scientific background to enrich medical imaging practice	39 (47.0%)	32 (38.5%)	12 (14.5%)	0 (0.0%)	0 (0.0%)	1.67	0.718
Production of medical imaging experts with higher professional competence	38 (45.8%)	33 (39.8%)	8 (9.6%)	4 (4.8%)	0 (0.0%)	1.73	0.828
Production of medical imaging scientists with sufficient management abilities	32 (38.6%)	32 (38.6%)	16 (19.2%)	3 (3.6%)	0 (0.0%)	1.88	0.847
Possession of basic entrepreneurial skills	23 (27.7%)	37 (44.6%)	20 (24.1%)	2 (2.4%)	1 (1.2%)	2.05	0.854
Production of medical imaging experts that can effectively report medical images	37 (44.6%)	28 (33.7%)	17 (20.5%)	1 (1.2%)	0 (0.0%)	1.78	0.812
Ability to coordinate the activities of other medical imaging scientists	32 (38.6%)	37 (44.6%)	10 (12.0%)	3 (3.6%)	1 (1.2%)	1.84	0.862

[SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD – Strongly Disagree]

Table 2 Perception on quality of radiographers that would be produced by the program

ITEM ON QUALITY	SA	A	N	D	SD	Mean	S.D.
Competence in the modality of specialty	48 (57.8%)	29 (34.9%)	6 (7.3%)	0 (0.0%)	0 (0.0%)	1.49	0.632
Ability to rise to the highest level in public service	34 (41.0%)	30 (36.1%)	17 (20.5%)	1 (1.2%)	1 (1.2%)	1.86	0.871
The medical imaging scientists can contribute to policy formulation	35 (42.2%)	29 (34.9%)	16 (19.3%)	3 (3.6%)	0 (0.0%)	1.84	0.862
The medical imaging scientists can enhance policy implementation	29 (34.9%%)	32 (38.6)	22 (26.5%)	0 (0.0%)	0 (0.0%)	1.92	0.784
Ability to command respect like their medical counterparts	32 (38.6%)	31 (37.3%)	17 (20.5%)	3 (3.6%)	0 (0.0%)	1.89	0.856
Ability to perform effectively in hospital diagnostic services	41 (49.4%)	32 (38.6%)	9 (10.8%)	1 (1.2%)	0 (0.0%)	1.64	0.725
Ability to perform effectively in public health services	34 (41.0%)	32 (38.5%)	15 (18.1%)	2 (2.4%)	0 (0.0%)	1.82	0.814
The medical imaging experts can function independently in the discharge of their duties	39 (47.0%)	29 (34.9%)	11 (13.3%)	4 (4.8%)	0 (0.0%)	1.76	0.864
They can collaborate with other members of the healthcare team	39 (47.0%)	33 (39.8%)	10 (12.0%)	1 (1.2%)	0 (0.0%)	1.67	0.734
						1.77	**0.80**

[SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD – Strongly Disagree]

Discussion

The study included a total of 83 final-year students, with 62 males (75%) and 21 females (25%) participating. The mean for increased versatility and knowledge was 1.78, indicating that final-year students believe that the Doctor of Radiography/Medical Imaging program will produce medical imaging specialists with a broad focus in many diverse disciplines of medical imaging as well as their areas of interest. According to this study and a similar study by Maduka et al.[19], graduates of the Doctor of Radiography/Medical Imaging program would not only have more knowledge but wider focus in diverse fields of specialization when compared to graduates of the bachelor's program. If the curriculum encompasses all specialties under medical imaging, the graduates will have more practical skills in different modalities and become exceptional professionals due to the increased duration of the program. Similarly, if the curriculum is constructed in such a way that students can choose a specialty, these students would be unmatched in their field since they will receive in-depth

knowledge in that specialty and will be versatile in any element of it. This would be one of the goals that the Doctor of Radiography/Medical imaging program is expected to achieve. Lehto et al,[21] conducted a study on a palliative medicine undergraduate program in Tampere regarding extending course duration. It was shown that increasing the palliative medicine training duration provided to medical students, resulted in increased student knowledge.[21]

The mean for the production of high-quality medical imaging professionals at the end of the program was 1.77, which indicates that final year students believe that the Doctor of Radiography/Medical Imaging program will result in the production of high-quality and exceptional medical imaging professionals who can rise to the highest levels regardless of the type of health sector they work in, whether government or public, in order to better contribute to policies. These graduates would be equal with colleagues who would have studied advanced medical imaging programs because of their better expertise. This is because, medical imaging has different fields of specialization such as conventional radiography, mammography, diagnostic ultrasonography, reporting radiography, magnetic resonance imaging, fluoroscopy, computed axial tomography, nuclear medicine and radiation therapy. These fields exist as major or sub-units in radiology departments in many medical institutions across the world.[22]

From the assessment of the final year students, it can be stated that the program would introduce new areas and courses that are significant to the medical imaging profession. Therefore, professionals that would be produced by the program would be very versatile in all diverse fields of radiography than that of the bachelor's program. They would have in-depth knowledge in areas of specialty such as radiography reporting. This points to a similar study conducted by Wuni et al.[15], on radiographer reporting and role extension in Ghana, where radiographers as part of their advancement programs will be trained on reporting radiographic images in an area of interest and will have the adequate knowledge to report medical images in this in area, either in conventional x-ray reporting, computed tomography brain reporting or any of the areas. This will go a long way to enhance efficient medical care.

Conclusion

The final year students expressed a positive perception towards the proposed Doctor of Radiography/Medical Imaging program. The study highlighted the fact that the Doctor of Radiography/Medical Imaging program when introduced might create radiographers who possess broader focus in all areas of medical imaging as well as specialized areas of their choice when compared to the bachelor's program. Furthermore, it might produce top-notch experts that could match-up to the highest levels in the government and private sectors in terms of policy making and implementation.

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