

The Motivational Factors of Choosing Diagnostic Radiology as a Profession Among Saudi Radiography Students

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Purpose: To identify factors influencing Saudi students to choose radiography as their academic major and future career field.

Material and Method: This study involved quantitative (online questionnaire) and qualitative (semi-structured interview) approaches. An online questionnaire was distributed among (n = 308) students. The questionnaire contained 30 questions covering the following three domains: economy, vocational and personal. A total of 25 individual semi-structured interviews were conducted with purposive sampling of radiography students in seven universities (public and private) across the western region of Saudi Arabia. Interview responses were coded, and main themes were extracted based on Miles and Huberman's framework.

Results: The findings demonstrated that radiography was the first option as profession for 44% of the study participants. Several factors that study participants considered important were in the realm of patient care, helping patients, radiographer-patient relations, science-based profession, and the desire to work in the healthcare system. A few participants (14%) reported that they are planning to change their profession to another medical speciality. Four themes were identified from the interviews: 1) Profession decision-making, 2) changing career", 3) difficulties and challenges, and 4) recommended radiography as a profession.

Conclusion: The results of the study support the need to bridge the gap between high school, universities, and employment through a collaborative network to assist students in exploring their career path by providing sufficient information and experience.

Keywords: motivation, profession, radiography, career, education

Introduction

In 1976, radiography education was designed and introduced to Saudi students and provide the basic aspects of the radiological science.¹ Many international benchmarking has been used to design radiography programmes in Saudi Arabia such as American society for radiologic Technologist and International Society for Radiographers and Radiologic technologists.¹ Several public and private universities provide students a bachelor's degree (BSc) in diagnostic imaging,² and recently some of these universities provide courses that focused on specialised diagnostic imaging modalities at postgraduate level (eg Master degree). In addition, there are opportunities to study these specialities abroad through the scholarship programme provided by Ministry of Education.³ The radiography course is offered as full-time on-campus study (minor portion of the course can be delivered through blackboard). There is a good collaboration between Hospitals of Ministry of Health, Armed force, national guard, security force and King Faisal Specialist Hospital & Research Center to provide access for clinical practice and training for the students.

Radiography is a profession of vital importance. This profession has been identified as a field with very good prospects and high future employment growth.⁴ Radiographers play a significant role in patients' diagnosis and treatment.⁵ They are responsible for the management and care of patients undergoing the spectrum of scanning procedures including their emotional, physical, and psychological needs pre- and post-radiological examinations.⁶ The shortage of radiographers in healthcare systems is of worldwide concern.^{5,7} Similarly, lack of Saudi trained healthcare professionals and heavy reliance on foreign workers are substantial aspects for policymakers to consider and deal with,⁸ and this will pose a number of challenges to the education system.

Motivation is a factor that might affect student decision, academic achievement, and future career success.⁹ Therefore, understanding students' reasons for joining a particular school is essential as it can help in developing approaches to promote the retention of undergraduate students, and designing appropriate and effective recruitment materials.^{10,11} It has been also suggested that having an insight into students' motivational factors for their profession choice may help in the evaluation of school curricula and facilitate a fruitful communication between students and teachers.¹² In the present study, the focus is on undergraduate students' motivation in choosing radiography to study and as a profession. Choosing a future career/profession is crucial in ensuring that individuals are motivated by their profession and being productive.¹³ Being interested in a particular profession is essential in decision-making as the wrong decision can change the fate of an individual, which may lead to resultant failure, disappointment, and lower productivity. Several pieces of research have investigated the relationship between motivational factors and learning. The studies showed that students' motivational factors were associated with their learning outcomes, behaviour, and academic success.^{14,15} Besides, motivated students are more persistent in pursuing the academic programme than other students.¹⁶

Choosing a profession is not straightforward; it requires a complicated decision-making process that could be influenced by numerous factors. Several studies targeting the medical, pharmacy, dentistry, and nursing profession have explored students' reasons for choosing their profession. Previous studies in the literature showed that the top-ranked motivational factors for the majority of students to choose a profession are social status and security factors.^{17,18} Additional studies showed that altruism and intellectual challenges are the main motivational factors for some students, such as those pursuing dentistry.^{17,19} This indicates that the desire to help and serve the public is not the most important motivational factors for choosing dentistry as profession.¹⁷ Wilkes et al indicated that the students' reasons for choosing the nursing profession were both personal factors (eg love of nursing) and career-related factors (eg being able to help people).²⁰ Similar findings were determined by Bernabe et al and Raja'a et al, who found that professional and vocational factors were the reasons behind choosing a profession among students.^{21,22} A study conducted by Bamba et al in Australia showed that the top three factors influencing students to choose radiography as a profession are helping patients, desire to work in healthcare and technology.⁴

In Saudi Arabia, for instance, factors such as high-school grades and other qualifying tests scores, which affect acceptance at Saudi universities, can play an important role in choosing a speciality.²³ The qualifying tests focus on students' knowledge of mathematics, Arabic language skills, and basic science.²⁴ Research conducted among Saudi medical students found that family and friends' encouragement, culture, income, employment opportunities, and the profession's social acceptability were the top-ranked motivational factors for choosing their studies and profession.^{1,21,23,25,26} Although a few studies have investigated the factors that could influence Saudi medical students' career choices,^{24,25,27} the motivational factors for choosing radiography as a profession among Saudi students have been sparse in the literature. The aim of this study was to identify factors influencing Saudi students to choose radiography as their academic major and future career field.

Materials and Method

Ethical Consideration

Ethical approval was obtained from the institutional review board in College of Applied Medical Science at Taibah university (Reference Number: 2020/85/314/RAD). Participation in this study was voluntary and informed consent was obtained. All methods were carried out in accordance with relevant guidelines and regulations. Informed consent was obtained from all participants in this study.

Study Design and Participants

This study involved a mixed-methods design to achieve its aim. First, quantitative data was collected by administering a validated questionnaire. All students from diagnostic radiography programmes in public and private universities in the western region of Saudi Arabia were specifically targeted and included in this study and other students were excluded. The results of the questionnaire were then used as a guide for the qualitative phase of the study. The qualitative phase aimed to gain deep understanding and underlying reasons for students' perceptions of the profession choice.

Prior to commencing data collection, there was a need to calculate the total number of radiography students in the western region in Saudi Arabia. All diagnostic radiology departments in these universities were contacted via email or phone (available in their website) to calculate the total number of the radiography students. The sample size targeted for this study was 278 radiography students. The calculation was based on the total number of radiography students in the western region of Saudi Arabia ($n = 1000$), with 5% margin of errors and 95% confidence level.²⁸ Participation in this study was voluntary, and a total of 308 radiography students agreed to participate.

Quantitative Data Collection: Questionnaire

An online questionnaire (*Surveymonkey platform*) was distributed among radiography students via social media channels and through professional network with universities from February to April 2021. The instrument was designed in accordance with previous studies,^{4,24} and was adjusted and tailored to verify its current appropriateness to the participants' field of study. This adjusted questionnaire was validated before embarking on the main study with two academic lecturers and 30 radiography students to ensure that each question was clearly listed, easy to understand and currently suitable. Minor revisions were made based on the pilot comments received. This pilot study was not included in the main study.

Cronbach's alpha test was used to measure the internal consistency of the questionnaire. Participants were provided an information statement that outlined the aims, requirements, and confidentiality of the study. The initial question to the survey was an informed consent agreement that the participant was required to complete before access to the questionnaire was granted. The survey was presented to participants in Arabic and English.

Demographic background information about participants' gender, type of universities, and years at universities was collected. The questionnaire contains 30 items covering three domains: (a) economic, (b) professional/vocational, and (c) personal, which explored students' motivational factors in choosing radiography as a profession. A five-point Likert scale was used to indicate the level of agreement among students, with five representing strong agreement that a factor influenced their choice. This scale has been used by Bamba et al and Al Subait et al to investigate factors that influence career choice among medical students.^{4,24}

Qualitative Data Collection: Semi-Structured Interview

To gain a better understanding of the answers provided in the questionnaires, 25 individual semi-structured interviews were conducted with purposive sampling of radiography students in seven universities (public and private) across the western region of Saudi Arabia. This sampling technique is determined by the purpose of the study and the research group which has particular characteristics and features relevant to the study (inclusion criteria mentioned above). Interview questions were designed to gain deeper understanding of themes identified in the questionnaire.

Due to the restrictions in Saudi Arabia during COVID-19 pandemic, the researcher conducted virtual semi-structured interviews (video call) with each student. This interview was conducted in English and scheduled in 60 minutes sessions. Permission was requested to record the interview responses using a digital record. The recorded interviews were manually transcribed by the researcher into a Microsoft Word document. Transcripts were de-identified and codes were used for quotes to protect the anonymity of the participants. Upon completion of the transcribing, data went through process of coding by the researcher: a) descriptive phase and code what participants said, b) categorisation and reordering of codes, and c) merging and filtering codes to extract the main themes.

Data Analysis

Quantitative Likert scale data were analysed using IBM SPSS version 25, and a P value of <0.05 was considered statistically significant. Frequencies and percentages of sociodemographic variables were calculated. Mean and standard deviation (SD) was calculated for the level of agreement. An ANOVA with repeated measure was used to evaluate the differ in the overall mean scores among participants for all domains. A pair-wise comparison was also used to determine the most important domain among students. A nonparametric test has been considered appropriate as the independent variable on ordinal dependent variable (eg, Likert scales a 5-point scale from “strongly agree” through to “strongly disagree”). Mann–Whitney *U*-test and Kruskal–Wallis test were used to examine the level of agreement between sociodemographic variables. An inductive thematic analysis of interviews was conducted. Interview responses were coded, and common themes were extracted based on Miles and Huberman’s philosophical underpinnings.²⁹

Results

Quantitative Data Related to the Choice of Profession

Findings were analysed to determine the level of agreement among radiography students in the western region of Saudi Arabia concerning factors motivating them to choose radiography as a profession. Internal consistencies for the three domains of the motivational factors have acceptable coefficients ($\alpha > 0.70$), domain one ($\alpha > 0.83$), domain two ($\alpha = 0.77$) and domain three ($\alpha > 0.80$). A total of 308 questionnaires were completed by radiography students in this study. The demographic data showed that 104 (33.8%) of the participants were male and 204 (66.2%) were female. The participants’ responses were distributed based on the type of university in which the students are enrolled. The analysis showed that 272 (88.3%) students were from public universities, while 36 (11.7%) were from private universities (Table 1).

Table 2 illustrates the combined responses of radiography students across all domains. For domain one, the results show a similar level of agreement among students across all factors in this domain. In domain two, students strongly

Table 1 Demographic Characteristics of the Study Sample

Demographic		N (%)
Gender	Male	104 (33.8%)
	Female	204 (66.2%)
Type of university	Public	272 (88.3%)
	Private	36 (11.7%)
Years at university	First (Level 3 and 4)	78 (25.3%)
	Second (Level 5 and 6)	70 (22.7%)
	Third (Level 7 and 8)	117 (38%)
	Forth (Internship student)	43 (14%)
Radiography was first option	Yes	136 (44.2%)
	No	172 (55.8%)
Plan to change profession	Yes	43 (14%)
	No	265 (86%)
Recommend radiography as a profession	Yes	273 (88.6%)
	No	35 (11.4%)
Total		308 (100%)

Table 2 Students' Level of Agreement Concerning Motivational Factors to Choose Radiography as a Profession

Factors		SD	D	U	A	SA	Mean (SD)	CI-95%	Level of Agreement	Significantly>3.5 (Towards Agreement)
		N (%)								
Domain 1 Economic	Employment/career opportunities	5(1.6)	19(6.2)	73(23.7)	146(47.4)	65(21.1)	3.80(0.90)	(3.7–3.9)	Agree	Yes
	Well-paying career	5(1.6)	13(4.2)	51(16.6)	178(57.8)	61(19.8)	3.90(0.82)	(3.8–3.9)	Agree	Yes
	Ensure financial independence	6(1.9)	7(2.3)	65(21.1)	166(53.9)	64(20.8)	3.89(0.82)	(3.8–3.9)	Agree	Yes
	Job security	8(2.6)	14(4.5)	66(21.4)	156(50.6)	64(20.8)	3.82(0.90)	(3.7–3.9)	Agree	Yes
	Overall score							3.85(0.70)	(3.78–3.93)	
Domain 2 Professional/ Vocational	Challenging and interesting field	4(1.3)	14(4.5)	39(12.7)	131(42.5)	120(39)	4.13(0.89)	(4.03–4.2)	Agree	Yes
	Science-based profession	4(1.3)	5(1.6)	34(11)	136(44.2)	129(41.9)	4.24(0.81)	(4.2–4.3)	Strongly Agree	Yes
	Cutting-edge technology	5(1.6)	10(3.2)	52(16.9)	123(39.9)	118(38.3)	4.10(0.91)	(4–4.2)	Agree	Yes
	Advancement opportunities	3(1.0)	11(3.6)	41(13.3)	120(39)	133(43.2)	4.20(0.87)	(4.1–4.3)	Agree	Yes
	Not much “on call” work	7(2.3)	50(16.2)	103(33.4)	95(30.8)	53(17.2)	3.44(1.03)	(3.3–3.6)	Agree	No
	Working hours	8(2.6)	15(4.9)	94(30.5)	136(44.2)	55(17.9)	3.70(0.91)	(3.6–3.8)	Agree	Yes
	Interaction with all medical staff	-	12(3.9)	53(17.2)	140(45.5)	103(33.4)	4.08(0.81)	(3.9–4.2)	Agree	Yes
	Direct interaction with patients	-	12(3.9)	31(10.1)	135(43.8)	130(42.2)	4.24(0.79)	(4.2–4.3)	Strongly Agree	Yes
	Helping patients	-	1(0.3)	20(6.5)	105(34.1)	182(59.1)	4.52(0.63)	(4.5–4.6)	Strongly Agree	Yes
	Nature of patient care	2(0.6)	3(1.0)	29(9.4)	146(47.4)	128(41.6)	4.28(0.73)	(4.2–4.4)	Strongly Agree	Yes
	Involvement in research	6(1.9)	28(9.1)	65(21.1)	111(36)	98(31.8)	3.87(1.03)	(3.8–3.9)	Agree	Yes
Overall score							4.07(0.47)	(4.02–4.13)	Yes	Yes

(Continued)

Table 2 (Continued).

Factors	SD	D	U	A	SA	Mean (SD)	CI-95%	Level of Agreement	Significantly>3.5 (Towards Agreement)	
	N (%)									
Domain 3 Personal	Encouragement from family	14(4.5)	61(19.8)	57(18.5)	109(35.4)	67(21.8)	3.50(1.17)	(3.4–3.6)	Agree	No
	Encouragement from friends	21(6.8)	67(21.8)	66(21.4)	102(33.1)	52(16.9)	3.31(1.18)	(3.2–3.6)	Undecided	No
	Radiographers in family or among close relatives	68 (22.1)	93(30.2)	39(12.7)	71(23.1)	37(12)	2.73(1.35)	(2.6–2.8)	Undecided	No
	Forced by family/parents	154(50)	76(24.7)	34(11)	26(8.4)	18(5.8)	1.95(1.22)	(1.8–2.09)	Disagree	No
	Jealous of friends/cousins in the medical field	144 (46.8)	80(26.0)	30(9.7)	34(11)	20(6.5)	2.05(1.26)	(1.9–2.2)	Disagree	No
	Experience of attending lecture to decide what I want	66 (21.4)	75(24.4)	54(17.5)	76(24.7)	37(12)	2.81(1.34)	(2.6–2.9)	Undecided	No
	Gain a high utility/satisfaction from doing the job	5(1.6)	11(3.6)	63(20.5)	142(46.1)	87(28.2)	3.96(0.88)	(3.9–4.1)	Agree	Yes
	Well respected by people	7(2.3)	29(9.4)	61(19.8)	132(42.9)	79(25.6)	3.80(1)	(3.7–3.9)	Agree	Yes
	Personal interest/like the field	6(1.9)	19(6.2)	52(16.9)	132(42.9)	99(32.1)	3.97(0.96)	(3.9–4.1)	Agree	Yes
	Working in the medical field	4(1.3)	5(1.6)	26(8.4)	125(40.6)	148(48.1)	4.32(0.80)	(4.2–4.4)	Strongly Agree	Yes
	Fewer years of formal education	21(6.8)	50(16.2)	75(24.4)	103(33.4)	59(19.2)	3.42(1.17)	(3.3–3.5)	Agree	No
	University academic index	22(7.1)	35(11.4)	79(25.6)	114(37)	58(18.8)	3.49(1.13)	(3.4–3.6)	Agree	No
	Knowledge of the profession	18(5.8)	43(14)	58(18.8)	126(40.9)	63(20.5)	3.56(1.14)	(3.4–3.6)	Agree	No
	Passion for radiological science	17(5.5)	33(10.7)	61(19.8)	115(37.3)	82(26.6)	3.69(1.14)	(3.6–3.8)	Agree	Yes
	The only best choice (profession) was available	21(6.8)	50(16.2)	51(16.6)	102(33.1)	84(27.3)	3.58(1.24)	(3.4–3.7)	Agree	No
Overall score						3.34(0.58)	(3.28–3.41)	No	No	

agreed that working in a science-based profession (mean = 4.24, SD = 0.8), direct interaction with patients (mean = 4.24, SD = 0.79), helping patients (mean = 4.52, SD = 0.63), and the nature of patient care (mean = 4.82, SD = 0.73) are the main factors that motivated them to choose radiography as a profession over other factor.

With regard to personal factors (domain three), most students reported that they were not forced by their families or motivated by jealousy of their friends or cousins working in medical fields when choosing their profession. In contrast, students were more likely to be motivated by their willingness to work in the medical field. In addition, the results show that interesting aspects of the profession, family encouragement, high utility, respect from the public, years of formal education, and grade point average (GPA) motivated students to choose radiography (Table 2).

To evaluate the significance of certain mean response for an item, a mid-point of “3.5” was used as a threshold to distinguish between low or high mean response. For domain 1, domain 2, radiography students agreed that the factors are important to choose radiography as a profession. This was inferred from the 95%-CI’s, having ranges above 3.5 (ie, more towards agreement). For domain 3, six out of 15 factors (encouragement from family, encouragement from friends, fewer years of formal education, university academic index, knowledge of the profession and the only best choice (profession) was available) were not decisively expressed by radiography students as important, since their corresponding 95%-CIs for the mean response are overlapping between values below 3.5 and values above 3.5. However, the agreement level (agree + strongly agree) among participants for these factors was higher than 50%. Four factors including “radiographers in family or among friends”, “experience of attending lecture” and “forced by family” and “jealous of others” were decisively thought of expressed by radiography students as not much important (ie, moderately/not important), since the 95%-CIs of their mean response is below 3.5. On the other hand, radiography students have decisively expressed their agreement that “gain a high utility/satisfaction from doing the job”, “well respected by people”, “personal interest/like the field”, “working in the medical field” and “passion for radiological science” are important factors. This is inferred from their 95%-CI of their mean response, with ranges of the CI above 3.5 (ie, more towards agreement) (Table 2).

A review of data showed that the mean and 95% CI’s of the 3 overall scores (for the 3 domains) are: (3.85, CI: 3.78–3.93), (4.07, CI: 4.02–4.13) and (3.34, CI: 3.28–3.4), respectively. The mean overall scores of the domain 1 and domain 2 are significantly away from our threshold “3.5”, which indicates that these two mean overall scores (ie, 3.85 and 4.07) are high, and expressing high evaluation for the economic and professional domains. In contrast, the 95%-CI for the mean overall score of domain 3 contains the value 3.5, which indicates that the mean overall score of domain 3 is non-significantly away from 3.5.

An ANOVA with repeated measure showed significant difference in participants overall evaluation of the three domains ($p < 0.05$). A pair-wise comparison was used between each domain to determine the most important domain among students. The results showed that mean overall score of each domain is significantly different from the mean overall score of any other domain ($p < 0.05$). The results show that students see domain two (mean = 4.07) as the most important, followed by domain one (mean = 3.85), and then domain three (mean = 3.34).

No significant difference was found between the level of agreement among students concerning motivating factors to choose radiography as a profession in domains one and two, and gender ($p > 0.05$). In contrast, a significant difference was identified between the level of agreement concerning motivating factors in domain three and gender ($p < 0.05$). Male students (mean = 3.4) showed a higher level of agreement than female students (mean = 3.2). No significant difference was noted in the level of agreement among students based on the type of university, cities, and university years across all domains ($p > 0.05$) (Table 3).

Qualitative Data Related to the Choice of Profession

Four overarching themes were identified from the individual semi-structured interviews: “Profession decision-making”, “changing career”, “difficulties and challenges”, and “recommended radiography as a profession”. These four themes comprised several subthemes that emerged during the interview responses.

Table 3 Comparison of Motivation Domains According to the Sociodemographic Variables

Variable Level			N (Mean)	SD	P value
Domain 1	Gender	Male	104(3.91)	0.67	0.359
		Female	204(3.83)	0.72	
	Type of university	Public	272(3.81)	0.70	0.072
		Private	36(4.19)	0.67	
	Year at university	First (Level 3 and 4)	78(3.80)	0.68	0.293
		Second (Level 5 and 6)	70(3.96)	0.76	
		Third (Level 7 and 8)	117(3.87)	0.65	
		Forth (Internship student)	43(3.72)	0.78	
Domain 2	Gender	Male	104(4.14)	0.47	0.063
		Female	204(4.04)	0.47	
	Type of university	Public	272(4.04)	0.46	0.070
		Private	36(4.35)	0.44	
	Year at university	First (Level 3 and 4)	78(4.08)	0.49	0.581
		Second (Level 5 and 6)	70(4.13)	0.45	
		Third (Level 7 and 8)	117(4.03)	0.48	
		Forth (Internship student)	43(4.07)	0.45	
Domain 3	Gender	Male	104(3.44)	0.58	0.034
		Female	204(3.29)	0.58	
	Type of university	Public	272(3.31)	0.57	0.064
		Private	36(3.60)	0.64	
	Year at university	First (Level 3 and 4)	78(3.40)	0.59	0.518
		Second (Level 5 and 6)	70(3.36)	0.53	
		Third (Level 7 and 8)	117(3.28)	0.57	
		Forth (Internship student)	43(3.37)	0.69	

Theme I: Profession Decision-Making

Of the participants, 44% reported radiography was their first option as a profession or/and career. Several factors contributed to this choice, such as the *science and physics behind radiology, cutting-edge technology use*, the ability to *work with different cases daily*, and *direct interaction and communication with patients*. Other students believe radiology is the “eye of medicine”.

"Radiography was my first option. I read about the profession, and I liked the depth and range of subjects undertaken by radiographic students, such as physics, anatomy, psychology and other advanced modalities aside from x-rays (MRI, US, etc)".
(Participant:2)

"Personally, becoming a radiographer will allow me to have direct interaction with patients, and help guide the physician with difficult diagnostic dilemmas and occasionally make a completely unexpected finding which changes the treatment plan dramatically". (Participant:10)

Theme 2: Difficulties and Challenges

Some students found the radiography profession difficult and challenging because of its *nature* (eg dealing with road traffic accidents and unconscious patients) and the *lack of job and research opportunities*.

"I think the most obvious difference is that radiographers often deal with scans and images of the patient, rather than the patients themselves. However, this is not true; as a radiographer you will have direct contact with the patient, and sometimes this is challenging especially when you handle uncooperative or critical cases". (Participant:3)

"Nowadays, radiographers will struggle in finding a job, due to the lack of job opportunities in hospitals or research centres". (Participant:15)

Theme 3: Changing Career

The findings showed that a few students (14%) planned to change their profession to another medical speciality, such as medicine and pharmacy. Students reported that they want to change their profession or career because of the *lack power and decision-making, low income, and limited job opportunities*. Other students reported that they feel that *their voices were not heard* as radiographers.

"Radiography was not my first choice as a profession; I was looking to study medicine. Being a doctor means that you will have more power, ability to make decision, and that your voice will be heard more than radiographers. Radiographers are always undervalued in terms of position and salary". (Participant:20)

"I am planning to join medicine programme when I graduate from radiography because as a doctor I will have more job opportunities and prestige". (Participant:1)

Theme 4: Recommended Radiography as a Profession

A total of 89% students reported that they would recommend radiography as a profession:

"I would highly recommend radiology as a profession. The last few years of my journey have been super and fun-filled. I have learnt about the human body and radiation. The demand for diagnostic radiology seems to be ever increasing, so it would be reasonable to expect that the demand for radiographers will increase as well". (Participant:3)

In contrast, a few students (11%) reported that they would not recommend radiography as a profession for other students due to the *lack of job opportunities, lack of power, lack of decision-making and limited development*.

"Honestly, I would not recommend radiography as a profession. For anyone considering radiography as a career, I would advise him to have a rotation in the radiology department and to read about responsibilities and the nature of the work. I think there is a huge misunderstanding among students between radiologists and radiographers". (Participant:1)

"I would not recommend radiography as a profession for future students due to the lack of job opportunities, especially for males". (Participant:13)

"Radiographers are always underpaid; their voices are unheard and their value is unrecognised". (Participant:23)

Discussion

The factors motivating radiography students in the western region of Saudi Arabia to join the profession were explored in this study. The findings showed a similar level of agreement with regard to economic factors. From a career perspective, students agreed that job and financial security attracted them to radiography as a profession. The results found by Raja'a et al and Mehmood et al showed that job vacancy was one of the most important reasons to pursue a profession.^{22,30} However, in this study, the participants did not cite monetary factors as a major reason for choosing radiography as a profession. This was in line with Bamba et al, who found that financial rewards were not significant in career decisions among radiography students in Australia.⁴ This might indicate that intangible motives for choosing a career might constitute stronger incentives than do

financial factors. This situation is in contrast to that of other allied health students, where the literature evidence confirms that financial assurance was the most important incentive in choosing their profession.^{31,33} This was reinforced later by Al Subait et al, who found that salary and job security are the main reasons for Saudi Arabian medical students choosing a career in order to achieve financial stability.²⁴

Recent study conducted in Oman found that nature of work, place of work, conditions of work may affect career choice decision among students.³² This may raise a critical question about would a desire to work in urban or smaller communities' impact on the desire to be a radiographer. This may warrant further investigation in future work, as this can be very important aspect in terms of underserved communities. The results showed that study participants see domain two (professional/vocational) as the most important factors that can influence their decision. The nature of the healthcare profession, helping patients, and the radiographer–patient relationship were found as the foremost motivations to choose a career in radiography in this study. The ability to help patients in the community and being involved in patient care system were also reported in the literature as important factors in choosing a profession for students.^{20,22,34,35}

Students (44%) in the current study reported that radiography was their first option as a future career, due to the scientific and technological side of this profession. This was similarly highlighted in the literature.^{4,36,37} It was found that research opportunities have the highest impact on Saudi medical students' choice of profession.³⁰ This was in line with the Saudi Vision 2030, which supports research in all sectors, particularly healthcare. Al-Subait et al found that on-call working hours motivated students in their career choice.²⁴ The findings in the current study demonstrated a reasonable level of agreement among radiography students' ratings regarding the influence of challenges in a profession, opportunities for career advancement, and research opportunities in their career choice. This is combined with the working hours and fewer "on-call shifts" compared to the medicine and multidisciplinary team approach:

"Diagnostic radiology has always adapted a multidisciplinary team approach. Radiographers are part of a team of radiologists, clinicians, and nurses. Working as part of a team is a wonderful experience". (Participant:5)

With regard to personal factors/domain, the study participants did not express high score to this domain compared to the rest. However, the research results showed an agreement among radiography students about the desire to work in the medical field. This was in line with Vosper et al, Jesson et al, and Abduekarem et al, who referred to the desire to work in the medical field as the main motive for choosing radiography as a profession.^{37–39} Almost 74% of the participants were not forced to become a radiographer either by family and friends or by jealousy of friends or cousins working in the same field (52%). In addition, the influence of friends and introductory lectures was minimal. This result was similar to a previous study conducted by Uyar et al, who found that the influence of friends was weaker than other factors of choosing a career.⁴⁰ This reveals that students might feel supported by their parents, and they have more confidence in their own ability to choose a career that would be interesting and exciting.

Studies have been conducted to explore the impact of gender on career choice.^{21,41} Bernab et al stated an association between level of agreement about vocational factors and gender, where female students ranked higher than male on vocational factors.²¹ In the current study, type of university and years at university were not associated with the level of agreement across all domains. However, the findings showed that level of agreement in personal factors was linked to gender, where male students expressed a higher level of agreement than female students about the influence of personal factors when choosing a profession. A review of the literature showed a positive relationship between career choice among students and the level of satisfaction, feeling respected, personal interest, passion, years of formal education, university academic index, and previous knowledge about the profession.^{12,21,23,31,41,42} Similarly, in the current study, the radiography students agreed that personal interest, sense of accomplishment, and feeling valued by the public have a positive impact on choosing a profession. This is combined with other factors, such as years of studying, university academic index, knowledge about the profession, and passion for radiological science.

Although that most of the listed factors were in generally significantly important for radiography students, may have positive impact on their decision, some of these factors were not decisively considered as important by students such as on call work, encouragement from family, encouragement from friends, years of formal education, university academic index, knowledge of the profession and the only best choice (profession) was available (Table 2).

The interview responses in this study indicated that the majority of students (88.5%) reported that they would recommend radiography as a profession for those who are interested in science and technology and want to use their knowledge to provide good healthcare to patients. However, study participants stated that choosing radiography as a profession might make students prone to working in a difficult and/or challenging environment (eg handling unconscious or road traffic patients), and they might have trouble finding a job due to limited vacancies. The interview responses showed a difference between female and male students in relation to job opportunities. For example, male students were more concerned than females about the lack of job vacancies in radiography. It seems that there are more job opportunities for females than males, and this may warrant further exploration regarding staff structure in diagnostic imaging departments across the country. Interestingly, few students indicated that they would not recommend radiography as a profession. This could be attributed to lack of knowledge about job opportunities and awareness of radiographers' role in diagnostic radiology departments.

Despite the fact that half of the participants reported that radiography was their first option as a profession or career, a few students (14%) plan to change their profession to another medical speciality, such as medicine or pharmacy. Study participants reported that they want to change their profession or career because of the lack of power, lack of decision-making, low income, and few job opportunities. Students reported that: *"I felt that our voices are not heard as radiographers, as we only follow radiologists' orders"*. It seems that feeling a sense of meaning, purpose, and prestige would influence their choice of profession. High income and professional status (prestige) were highlighted among medical and dentistry students in the literature as motivational factors for choosing a profession.^{24,43–46} Deciding on a profession/career path is probably one of the most difficult decisions a student has to make. All universities and colleges should organise induction workshops with the help of high schools to assist career counsellors in promoting radiography as a profession. The career counsellors need to be encouraged to help Saudi students to know and understand themselves and the world of work in order to make appropriate educational and professional decisions. To the best of the researchers' knowledge, the question concerning the role of high school and universities in students' decision-making regarding their choice of profession has not been properly addressed at the national level yet, and this warrants further investigation.

Conclusion

The study aimed to explore the motivational factors in choosing radiography as a profession among students in the western region of Saudi Arabia. The findings demonstrated that radiography was the first option as profession for almost half of the study participants. Several factors that study participants considered important were in the realm of patient care, helping patients, radiographer–patient relations, science-based profession, and the desire to work in the healthcare system. A few participants reported that they are planning to change their profession to another medical speciality, and they would not recommend radiography as a profession for other students. The results of the study support the need to bridge the gap between high school, universities, and employment through a collaborative network to assist students in exploring their career path by providing sufficient information and experience.

Limitation and Recommendations

A limitation of this study relates to the fact that it involved only radiography students who study at universities in the western region of Saudi Arabia. Therefore, the results may not be confidently generalised to the radiography students who study at universities in other regions across the country. An additional potential limitation is the lack of published research that focuses on the radiography profession, and this caused difficulties in comparing the study's findings; however, some of the more relevant studies for other professions, such as nursing and medicine, were identified. Therefore, further research in these areas is recommended. Such research could focus on the role of career counsellors and/or universities in assisting students to identify appropriate profession options.

Disclosure

The authors report no conflicts of interest in relation to this work.

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