

# Evaluating the attitudes of radiologic technology students and graduates toward their study major and career prospects: A cross-sectional study

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## Abstract

**Background and Objectives:** Understanding students' attitudes toward their study major and career prospects in healthcare is crucial. This study evaluates radiologic technology students and graduates' attitudes toward their study major and career prospects.

**Methods:** This cross-sectional study at Ahvaz Jundishapur University of Medical Sciences assessed 120 BSc radiologic technology students and graduates' attitudes toward their study major and career prospects using an online questionnaire. Data analysis was performed using SPSS 26, with results reported as mean  $\pm$  standard deviation (SD). Significance was determined using the independent sample t-test and one-way analysis of variance ( $p < 0.05$ ).

**Results:** Participants' age, averaged  $24.13 \pm 3.64$  years and were predominantly females (58.3%). Among radiologic technology students, the mean scores  $\pm$  SD for attitudes toward their academic major and career prospects were  $19.75 \pm 2.27$  and  $15.62 \pm 2.28$ , respectively. For graduates, these values were  $19.73 \pm 3.85$  and  $14.73 \pm 2.75$ , respectively. Most participants exhibited a positive attitude toward their study major (90.8%) and career prospects (85.0%). No statistically significant differences were observed in attitudes across demographic specifications for students and graduates, nor between the attitudes of students and graduates toward their study major and career prospects.

**Conclusions:** The evaluated students and graduates demonstrated a positive attitude toward their field of study and career prospects. Positive perceptions from peers and society and job opportunities for BSc graduates contribute to this. While our research highlights the prevailing positive attitudes within the radiologic technology profession, there is a clear need for ongoing evaluation and refinement to ensure continued success and satisfaction among students and graduates. Enhancing students' understanding of academic disciplines before major selection and providing effective counseling can reinforce these attitudes.

## KEYWORDS

academic field, future career, radiologic technology students attitudes, study major

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## 1 | INTRODUCTION

The educational system, particularly in universities, plays a crucial role in shaping individuals into skilled professionals capable of shouldering significant societal responsibilities. A competent professional is recognized as someone who correctly fulfills the duties in profession and occupation, contributing effectively and beneficially to individual and societal well-being.<sup>1</sup> A dedicated workforce enhances the quality of the organizations they are employed. The improvement of various organizations ultimately leads to the betterment and progress of society. Moreover, individuals need to have a positive attitude toward their field of study and future careers. The foundation for responsibility and success in various professions originated from the early stages of university entry and throughout the academic years, rooted in a deep understanding of the chosen field and a genuine interest in it.<sup>2</sup> Furthermore, this awareness and interest lead to an increased sense of personal responsibility and, consequently, better performance in provided services<sup>3</sup> and the advancement of the academic field in which one is studying or working.<sup>1</sup>

Due to the crucial importance of healthcare professions in public health and their significant role in achieving the goals of the public healthcare system, professionals in various health and medical fields must possess enough knowledge, a sense of responsibility, and enthusiasm. An adequate number of these professionals is mandatory for public health and the national medical system. An insufficient number of well-educated and skilled clinical practitioners will directly impact the quality and quantity of health and medical services, ultimately affecting the overall health of society.<sup>4</sup> Additionally, even at present, the number of specialized clinicians and healthcare professionals may be insufficient in deprived areas.<sup>5</sup> Therefore, it is crucial to explore factors affecting the motivations of individuals choosing a study major and profession needed for social healthcare and to evaluate their attitudes toward presented courses during their education as well as determining the attitudes of individuals toward their chosen study major and profession. Understanding the factors influencing these attitudes is essential for addressing potential challenges such as negative perceptions or inadequate workforce numbers within critical healthcare professions like radiologic technology. Theoretical underpinnings of negative attitudes, if present, could stem from various factors such as perceived job instability, inadequate career advancement opportunities, or challenges associated with technological advancements. Additionally, the mention of the inadequate number of skilled practitioners highlights a significant challenge facing the healthcare sector. In many regions, there is a growing demand for skilled healthcare providers to meet the needs of an aging population and advancements in medical technology. However, the current supply of trained professionals may not be sufficient to address this demand, leading to potential gaps in healthcare delivery. Addressing this shortage requires strategic workforce planning, investment in education and training programs, and efforts to attract and retain talent within the field.<sup>4-6</sup>

Today, medical imaging is considered one of the important foundations of disease diagnosis. The task of preparing suitable radiographic images is the responsibility of radiographers or radiologic technology technicians as a part of medical professions. The radiographic images offer valuable anatomical information for physicians to diagnose different disorders. Therefore, radiographers play a crucial role in the disease diagnosis process.<sup>7</sup> Since using ionizing radiation in the form of X-rays, in most imaging modalities such as conventional radiography and computed tomography (CT scan), insufficient knowledge and skills of radiographers can lead to repeated imaging, additional radiation exposure, and genetic and cancer-related issues.<sup>8</sup> These issues illustrate the significant role of well-educated expert radiologic technologists in preparing suitable radiographic images and radiation protection of patients exposed to ionizing radiation which is crucial for the public health of society.<sup>9</sup> It should be mentioned that the radiology technology major in Iran is a 4-year university major that is just provided by public universities related to the Ministry of Health, Treatment, and Medical Education. During the education, radiologic technology students will pass several theoretical and practical courses about physics, radiation physics, radiation protection, radiation dosimetry, different imaging physics and techniques, and radiobiology, in addition to a 1-year internship at different imaging departments of university educational hospitals.

To obtain the goal of educating expert and committed radiographers, evaluating the ideas and attitudes of radiologic technology students toward their major and career future along with the attitudes of graduated students in the job market is needed. Past studies showed that university students' attitudes toward their major and future careers vary among different study majors. Based on the results of these studies conducted by different researchers in various universities and to evaluate the attitudes of students in different study majors related to healthcare, generally, factors such as awareness of the academic major, academic semester, and the job market were the main factors that impacted the attitudes of students toward their study major and career prospects.<sup>10-13</sup> Although studies in this area have been conducted by various researchers at different universities, the daily changes occurring in various societies and their impact on the attitudes and interests of different generations regarding various issues, including academic fields and professional interests, prompted conducting this study. The aim was to assess the attitudes of radiologic technology students and graduates toward their academic major and career prospects. The study results can prove valuable for health professionals and authorities involved in the radiologic technology educational development planning. This includes considerations for required fields, student admission capacity, and decision-making regarding the courses and educational resources provided to radiologic technology students, to identify ways to monitor the current situation and improve it whenever needed. Moreover, the results may give insights to other researchers about radiologic technology major, the motivations, and needs of students in this field.

## 2 | MATERIALS AND METHODS

This research was a cross-sectional descriptive study. The study protocol was approved by the institutional ethics committee (ethics code: IR.AJUMS.REC.1402.464). Data collection was done utilizing an online questionnaire that had been previously used in the study by Samadi et al.<sup>14</sup> The study population for this research comprised radiologic technology BSc students in their second, third, and fourth years, as well as the BSc graduated radiologic technology students in last 10 years. The census method was used for the sampling of students. First-year students were excluded due to potential insufficient awareness of the entire major content and job opportunities. The inclusion criteria were enrollment in the second to fourth year of the radiologic technology program at Ahvaz Jundishapur University of Medical Sciences or having graduated in the last 10 years, in addition to participant informed consent. Exclusion criteria included being in the first year, providing incomplete questionnaire responses, or being graduated more than 10 years ago.

The questionnaire was provided to participants electronically (a link to the questionnaire was sent to participants via email as well as text messages). The data-gathering period spanned 1 month for students, while for graduates, sampling continued until the number of participating graduates equaled or exceeded the number of student participants, extending the duration by an additional 2 weeks. The questionnaire consisted of two sections. For students, the first section included six questions about demographic information (age, gender, academic semester, place of residency, marital status, and employment status). The second section comprised twelve questions, with one about the reason for choosing the radiologic technology major for studying, six focusing on attitudes toward the study major and five on attitudes toward future career and job prospects. Each question had five options for responses, scored on a 5-point Likert scale ranging from strongly disagree to strongly agree. The scoring system assigned scores of one to five, and the scores for other responses fell within this range. For prioritizing factors, the frequency percentage of responses from all sample individuals for each question (factor) was calculated and ranked from highest to lowest. The first part of the questionnaire was modified a little to match the demographic information of graduated participants. The gathered demographic information for this group included age, gender, marital status, years after graduation of BSc, employment status, work history if employed, imaging center type (public or private institute), and current educational status (BSc level, studying MSc or PhD, or being graduated from these higher levels).

The reliability and validity of the questionnaire were previously confirmed in a study by Samadi et al.<sup>14</sup> They established the reliability of the questionnaire by calculating a Cronbach's  $\alpha$  of 0.836. Quantitative variables were reported in terms of mean  $\pm$  standard deviation (SD), while qualitative variables were presented as counts (percentages). The normality of

quantitative variables was assessed using the Shapiro–Wilk test. The relationship between qualitative variables was examined through the  $\chi^2$  test. For comparing quantitative variables between two independent groups and among more than two independent groups, the independent t-test and one-way analysis of variance tests were employed, respectively. A significance level of 0.05 was considered. Data analysis was conducted using SPSS software version 26.

**TABLE 1** Demographic features of BSc radiologic technology students and graduated ones who participated in the study.

	Variable	Group	Number (%)
BSc students	Age (years)	18–20	6 (10%)
		20–22	40 (66.7%)
		22–25	14 (23.3%)
	Gender	Male	24 (40%)
		Female	36 (60%)
	Marital status	Single	59 (98.3%)
		Married	1 (1.7%)
	Academic year	Second year	17 (28.3%)
		Third year	23 (38.3%)
		Fourth year	20 (33.3%)
	Residency place	Student dormitory	36 (60%)
		Individual house	24 (40%)
Employment status	Hired	17 (28.3%)	
	Nonhired	43 (71.7%)	
Employment sector for hired students	Public	0 (0%)	
	Private	17 (100%)	
BSc graduated	Age	20 < age $\leq$ 25	33 (55%)
		25 < age $\leq$ 30	18 (30%)
		30 < age $\leq$ 35	8 (13.3%)
		35 < age $\leq$ 40	1 (1.7%)
	Gender	Male	26 (43.3%)
		Female	34 (56.70%)
	Marital status	Single	46 (76.7%)
		Married	14 (23.3%)
	Education level	BSc	45 (75%)
		MSc student	12 (20%)
		MSc or higher	3 (5%)
	Employment status	Hired	54 (90%)
Nonhired		6 (10%)	
Employment sector for hired graduates	Public	34 (62.96%)	
	Private	16 (37.04%)	

### 3 | RESULTS

A total of 60 out of 65 BSc radiologic technology students in their second, third, and fourth academic years participated in the study. During data gathering, a total of 68 BSc graduated radiologic technology participants, also completed the online questionnaire. Finally, all 60 completed questionnaires by the students along with 60 completed questionnaires by the graduates were included in the analysis. It should be mentioned that 7 of the questionnaires completed by graduates were excluded due to not having the inclusion criteria of being graduated in the last 10 years and one was excluded due to not being completed properly and inconsistent information.

Table 1 indicates the demographic specifications of radiologic technology students who participated in the study along with graduated ones. The mean  $\pm$  SD age of the 120 participants in the study was  $24.13 \pm 3.64$  years (ranges from 18- to 40-year-old) comprised of predominantly females (58.3%), and single (87.5%). The mean  $\pm$  SD age of the 60 BSc students and 60 graduated ones included in the study were  $21.90 \pm 1.28$  years (ranges from 18- to 25-year-old) and  $26.37 \pm 3.86$  years (ranges from 21- to 40-year-old), respectively.

Also, most of the evaluated students were unhired (71.7%), living in student dorms (60%), and in their third academic year (38.3%), while 90% of BSc graduated participants were employed mainly in public healthcare sector (56.7%). This suggests a successful transition from education to employment in the field. Furthermore, the mean  $\pm$  SD of years after these participants graduated and their work experience was  $3.59 \pm 3.12$  and  $3.28 \pm 3.66$  years, respectively.

Tables 2 and 3 represent the responses of BSc radiologic technology students to various questions assessing their attitudes toward their study major and career prospects, respectively. Tables 4 and 5 illustrate the responses of BSc graduated radiologic technology students to the mentioned questions, respectively.

Moreover, Tables 6 and 7 indicate a comparison of the mean  $\pm$  SD scores, revealing radiologic technology students and graduates' attitudes toward their study major and career prospects

across various demographic specifications. *p* Values are also provided in these Tables.

Furthermore, 77.5% of the participants (about 70% of BSc students and about 83% of BSc graduates) stated that they had chosen the radiologic technology major due to the limited options available in the national universities entrance exam and since it was the only option, they had. The comparison between students' and graduates' reasons for choosing radiologic technology majors reveals a shift in motivations, indicating greater career readiness and possibly different considerations like job prospects and personal interests. Understanding these differences is crucial for tailoring support services and curriculum development, necessitating further investigation to inform interventions for enhancing career readiness and satisfaction.

The majority of participants (about 65% comprised of 61.6% of BSc students and about 70% of graduates) found the courses offered in the BSc program in radiologic technology to align well with their future career needs. Furthermore, a significant proportion of participants (about 85%) including 80% of the students and about 90% of graduates, reported an increased interest in their study major after starting their education. These findings indicate a positive perception of the educational experience in radiologic technology, suggesting effective alignment of courses with career needs and a notable impact on students' and graduates' enthusiasm for the field.

Most participants (91.67%) believed that society currently has a positive view toward the field of radiologic technology (94.9% of students and 88.33% of graduates). Additionally, 90% of students thought that students from other fields also have a positive perception of the radiologic technology field while 86.67% of graduates reported a positive perception of the radiologic technology field among other healthcare staff. These findings suggest a favorable public image and positive interdisciplinary perceptions, which could contribute to the attractiveness and esteem of the profession.

Also, 53.33% of participants believed that radiologic technology major gains more value at higher academic levels (60% of students and 46.67% of graduates). The relatively different viewpoints

**TABLE 2** Responses of radiologic technology students to various questions assessing their attitudes toward their study major.

Questions for evaluating attitudes toward study major	Strongly agree	Agree	Relatively agree	Disagree	Strongly disagree
Q1 I am satisfied with choosing the radiologic technology study major	7 (11.7%)	27 (45.0%)	23 (38.3%)	1 (1.7%)	2 (3.3%)
Q2 The provided courses are in accordance with students' future needs and expectations of students from their study major	1 (1.6%)	12 (20.0%)	24 (40.0%)	18 (30.0%)	5 (8.3%)
Q3 I became more interested in radiologic technology major after starting to study in this field	10 (16.7%)	20 (33.3%)	18 (30.0%)	9 (15.0%)	3 (5.0%)
Q4 My field becomes more valuable at higher levels	3 (5.0%)	14 (23.3%)	19 (31.7%)	18 (30.0%)	6 (10.0%)
Q5 Students of other fields have a positive view of my study major	4 (6.7%)	27 (45.0%)	23 (38.3%)	5 (8.3%)	1 (1.7%)
Q6 People in the community have a positive view of my study major	10 (16.6%)	31 (51.6%)	16 (26.7%)	3 (5.0%)	0 (0.0%)

**TABLE 3** Responses of radiologic technology students to various questions assessing their attitudes toward their future career.

Questions for evaluating attitudes toward the future career	Strongly agree	Agree	Relatively agree	Disagree	Strongly disagree
Q1 The professors of radiologic technology provide advice tailored to radiologic technology career for students	5 (8.3%)	23 (38.3%)	22 (36.7%)	6 (10.0%)	4 (6.7%)
Q2 Incomes and benefits are appropriate for radiologic technology career	1 (1.6%)	14 (23.3%)	17 (28.3%)	21 (35.0%)	7 (11.6%)
Q3 There are sufficient job opportunities for graduates in radiologic technology	2 (3.3%)	23 (38.3%)	16 (26.7%)	13 (21.6%)	6 (10%)
Q4 The employment prospects in radiologic technology career are better for those with lower academic levels than higher ones	4 (6.7%)	20 (33.3%)	20 (33.3%)	13 (21.6%)	3 (5.0%)
Q5 I like working in the radiologic technology field as my specialization	7 (11.7%)	31 (51.7%)	15 (25.0%)	6 (10.0%)	1 (1.7%)

**TABLE 4** Responses of graduated BSc radiologic technology students to various questions assessing their attitudes toward their study major.

Questions for evaluating attitudes toward study major	Strongly agree	Agree	Relatively agree	Disagree	Strongly disagree
Q1 I am satisfied with choosing the radiologic technology study major	8 (13.3%)	26 (43.3%)	21 (35.0%)	2 (3.3%)	3(5.0%)
Q2 The provided courses are in accordance with students' future needs and expectations of students from their study major	1 (1.7%)	15 (25.0%)	26 (43.3%)	14 (23.30%)	4 (6.70%)
Q3 I became more interested in radiologic technology major after starting to study in this field	11 (18.3%)	26 (43.3%)	17 (28.3%)	5 (8.3%)	1 (1.7%)
Q4 My field becomes more valuable at higher levels	3 (5.0%)	9 (15%)	16 (26.7%)	20 (33.3%)	12 (20.0%)
Q5 Healthcare staff in other fields have a positive view of my study major	7 (11.7%)	29 (48.3%)	16 (26.7%)	5 (8.3%)	3 (5.0%)
Q6 People in the community have a positive view of my study major	6 (10.0%)	26 (43.3%)	21 (35.0%)	7 (11.7%)	0 (0%)

**TABLE 5** Responses of graduated BSc radiologic technology students to various questions assessing their attitudes toward their future career.

Questions for evaluating attitudes toward the future career	Strongly agree	Agree	Relatively agree	Disagree	Strongly disagree
Q1 The professors of radiologic technology provide advice tailored to radiologic technology career for students	1 (1.7%)	12 (20.0%)	22 (36.7%)	17 (28.3%)	8 (13.3%)
Q2 Incomes and benefits are appropriate in radiologic technology career	0 (0.0%)	5 (8.3%)	22 (36.7%)	23 (38.3%)	10 (16.7%)
Q3 There are sufficient job opportunities for graduates in radiologic technology	1 (1.7%)	11 (18.3%)	21 (35.0%)	18 (30.0%)	9 (15.0%)
Q4 The employment prospects in radiologic technology career are better for those with lower academic levels than higher ones	9 (15.0%)	23 (38.3%)	13 (21.7%)	14 (23.3%)	1 (1.7%)
Q5 I like working in the radiologic technology field as my specialization	11 (18.3%)	25 (41.7%)	18 (30%)	4 (6.7%)	2 (3.3%)

regarding the value of the radiologic technology major at a higher academic level between the two groups of students and graduates may originate from their different professional practical experiences and perceptions of real career situations.

Overall, 95.0% and 91.6% of students and graduates were satisfied with choosing the radiologic technology field of study, respectively.

Moreover, 70.83% of participants (83.3% of BSc students and 58.3% of BSc graduates) believed that their university professors provide advice tailored to radiologic technology career for students. From the comparison between students and graduates, the difference in perception could be influenced by the experiences of students and graduates. Students, who are actively engaged in their studies, may have more frequent interactions with professors and thus perceive a higher level of tailored advice. On the other hand, graduates may have had limited interactions with professors after graduating, leading to a lower perception of tailored advice.

Furthermore, 49.1% of participants (53.2% of BSc students and 45.0% of BSc graduates) believed that incomes and benefits are appropriate for radiologic technology career. Additionally, 61.6% of participants (68.3% of BSc students and 55.0% of BSc graduates) believed that there are sufficient job opportunities for graduates in radiologic technology, while 74.1% of participants (73.7% of BSc students as well as 75% of graduates) held the opinion that job prospects are better for those with lower academic levels than higher ones. In summary, 89.17% of the participants (88.3% of students and 90.0% of graduates) indicated their interest in pursuing a career specializing in radiologic technology.

Among radiologic technology students, the mean scores  $\pm$  SD for attitudes toward their academic major and career prospects were  $19.75 \pm 2.27$  (out of a maximum score of 30, ranging between 15 and 25) and  $15.62 \pm 2.28$  (out of a maximum score of 25, ranging between 12 and 21), respectively. For graduates, these values were  $19.73 \pm 3.85$  (out of a maximum score of 30, ranging between 10 and 28) and  $14.73 \pm 2.75$  (out of a maximum score of 25, ranging between 9 and 19), respectively. It should be stated that regarding the use of a 5-point Likert scale ranging from strongly disagree to strongly agree with scores of 1 to 5, the score of attitudes toward the academic major can be between 6 and 30 and the score of attitudes toward the future career can be between 5 and 25.

The majority of participants exhibited a positive attitude toward both their study major (95% of students and 86.7% of graduates comprised 90.8% of the total) and career prospects (93.3% of students and 76.7% of graduates comprised 93.3% of the total). It should be stated that for determining the positive or negative attitude, the obtained attitude score for each case was normalized to the maximum score (30 for attitude toward study major and 25 for attitude toward career prospects and multiplied by 100. The obtained percentages below 50% were considered negative, equal to 50% were considered neutral, and above 50% were assumed as positive attitudes

**TABLE 6** Comparison of radiologic technology students' attitudes toward their study major and career prospects across various demographic specifications, including mean  $\pm$  SD of scores and *p* Value.

Variable	Group	Attitude toward the study major		Attitude toward career future	
		Mean $\pm$ SD	<i>p</i> Value	Mean $\pm$ SD	<i>p</i> Value
Age	18–20	18.43 $\pm$ 1.90	0.26	15.14 $\pm$ 1.34	0.16
	20–22	19.90 $\pm$ 2.29		15.33 $\pm$ 2.30	
	22–25	20.0 $\pm$ 2.32		16.64 $\pm$ 2.44	
Academic year	Second year	20.18 $\pm$ 1.84	0.65	15.0 $\pm$ 1.32	0.42
	Third year	19.65 $\pm$ 2.14		15.78 $\pm$ 2.59	
	Fourth year	19.59 $\pm$ 2.76		15.95 $\pm$ 2.54	
Gender	Male	19.29 $\pm$ 1.97	0.19	15.42 $\pm$ 1.59	0.58
	Female	20.06 $\pm$ 2.44		15.75 $\pm$ 2.67	
Residency place	Student dormitory	19.42 $\pm$ 2.48	0.14	15.64 $\pm$ 2.29	0.93
	Individual house	20.25 $\pm$ 1.87		15.58 $\pm$ 2.32	
Employment status	Hired	19.82 $\pm$ 2.60	0.89	16.12 $\pm$ 2.34	0.30
	Nonhired	19.72 $\pm$ 2.16		15.42 $\pm$ 2.26	

Note: The score of attitudes toward the study major is calculated out of 30 and the score of attitudes toward career future is calculated out of 25.

## 4 | DISCUSSION

Interest in the academic major is one of the important factors for the advancement of science, while lack of interest in the academic field leads to disappointment and fatigue in continuing education.<sup>15</sup> In the context of diagnostic radiology science, evaluating the ideas and attitudes of radiologic technology students toward their major and career prospects are needed to obtain the goal of educating expert and committed radiographers. The present study was conducted to evaluate the attitudes of BSC radiology technology students and graduates toward their study major and career prospects.

Based on the results, no statistically significant differences were observed in attitudes across demographic specifications for students and graduates, nor between the attitudes of students and graduates toward their study major and career prospects. In general, the findings underscore a mix of perceptions and attitudes among both students and graduates with relatively small differences toward careers in radiologic technology and optimism prevails with a significant majority expressing interest in specializing in the field. These insights highlight the nuanced considerations and varied expectations within the radiologic technology profession, suggesting a need for tailored support and guidance to address concerns and capitalize on opportunities for career advancement.

As mentioned, according to the observed average scores of attitudes, most participants demonstrated a positive attitude toward both their study major and career prospects. The positive attitudes of radiologic technology students and graduates often derive from their perceptions of favorable outlooks among peers in different healthcare disciplines, as well as from the supportive stance of community

members toward this field. This finding is consistent with the results of the study by Alizadeh et al.<sup>11</sup> on midwifery students and the study by Abdollahzade et al.<sup>16</sup> on operating room students at Tabriz University and also Talebi et al.<sup>17</sup> on operating room students of Hamedan University.

The findings from our study highlight the significant role of peer and community support in fostering positive attitudes among radiologic technology students and graduates. This is while, the results of the study by Andersson et al.<sup>6</sup> underscore the need for increased public awareness about the radiologic technology profession, particularly through media representation. While our study emphasizes the influence of positive perceptions within healthcare disciplines and communities, this study draws attention to the lack of portrayal of the profession in mainstream media despite its importance and technological advancements.

Also, in another study conducted by Watt et al.<sup>18</sup> at the University of Pennsylvania, the attitude of the majority of medical students toward their study major and career plans was positive. However, Navidjouy et al.<sup>19</sup> reported a negative attitude of radiologic technology students toward their field of study at Urmia University of Medical Sciences (west Azerbaijan, Iran). Also, Moradian et al.<sup>20</sup> showed a negative attitude of allied medical sciences students toward their field of study.

According to our results, radiologic technology students' attitudes toward their career prospects were also positive, as documented by Jafari et al.<sup>21</sup> on dental students at the University of Tehran, Avramova et al.<sup>10</sup> on dental students at Medical University of Sofia and Moradi et al.<sup>22</sup> on Optometry Students at Mashhad University.

**TABLE 7** Comparison of graduated BSc radiologic technology students' attitudes toward their study major and career future across various demographic specifications, including mean  $\pm$  SD of scores and  $p$  Values.

Variable	Group	Attitude toward the study major		Attitude toward career future	
		Mean $\pm$ SD	$p$ Value	Mean $\pm$ SD	$p$ Value
Age	20 < age $\leq$ 25	20.06 $\pm$ 4.46	0.91	14.73 $\pm$ 2.79	0.85
	25 < age $\leq$ 30	19.39 $\pm$ 3.43		15.06 $\pm$ 3.04	
	30 < age $\leq$ 35	19.25 $\pm$ 2.12		14.00 $\pm$ 2.20	
	35 < age $\leq$ 40	-		-	
Education level	BSc	19.16 $\pm$ 3.81	0.13	14.64 $\pm$ 2.66	0.89
	MSc student	21.50 $\pm$ 3.92		14.92 $\pm$ 3.06	
	MSc or higher	21.33 $\pm$ 2.08		15.33 $\pm$ 3.79	
Gender	Male	20.81 $\pm$ 4.28	0.07	14.69 $\pm$ 2.72	0.92
	Female	18.91 $\pm$ 3.32		14.77 $\pm$ 2.81	
Marital status	Single	20.02 $\pm$ 4.20	0.30	14.90 $\pm$ 2.89	0.44
	Married	18.79 $\pm$ 2.30		14.29 $\pm$ 2.27	
Employment Status	Hired	19.91 $\pm$ 3.84	0.34	14.94 $\pm$ 2.72	0.95
	Nonhired	18.17 $\pm$ 3.92		12.83 $\pm$ 2.48	
Years after graduation	$\leq$ 5 years	19.98 $\pm$ 4.11	0.35	15.08 $\pm$ 2.77	0.06
	5 < years $\leq$ 10	18.85 $\pm$ 2.70		13.46 $\pm$ 2.33	
Work experience	$\leq$ 5 years	19.73 $\pm$ 4.14	0.89	14.88 $\pm$ 2.94	0.72
	5 < years $\leq$ 10	20.00 $\pm$ 2.71		14.10 $\pm$ 1.97	
	10 < years	18.50 $\pm$ 0.71		14.50 $\pm$ 0.71	

Note: The score of attitudes toward the study major is calculated out of 30 and the score of attitudes toward career prospects is calculated out of 25. For some graduated participants work experiences are more than years after BSc graduation because they had been employed with their radiologic technology 2-year advance diploma which is common in our country, or they have worked during their BSc courses. Attitudes toward study major and career status were constant for age groups of 35 < age  $\leq$  40 and it has been omitted.

However, contrary to our findings, research by Ghaderi et al.<sup>12</sup> on laboratory sciences students, Safaei et al.<sup>13</sup> on students of food safety and hygiene, Mokhtari Kia et al.<sup>23</sup> Samadi et al.<sup>14</sup> and Rajabi et al.<sup>24</sup> on environmental health students, Ahmadi et al.<sup>15</sup> on the nursing student of Kabul university showed negative attitudes of students toward their future careers.

Additionally, the Pearson  $\chi^2$  test revealed a statistically significant difference in opinions between male and female students regarding the proportionality of courses provided for the radiologic technology major and future student needs ( $p = 0.02$ ). Specifically, the mean  $\pm$  SD scores for males and females for this question were 2.38  $\pm$  0.82 and 2.92  $\pm$  0.91, respectively (out of a maximum score of 5). The results of studies conducted by Faraji et al.<sup>25</sup> demonstrated a correlation between the gender variable and expectations from the academic field and the future career variables, which is consistent with the findings of the current study. However, it did not align with the results of studies conducted by Ghaderi et al.<sup>12</sup> and Mokhtari Kia et al.<sup>23</sup>

Although almost the entire considered students participated in this study, due to the limited number of radiologic technology

students at our university, the generalizability of the findings was affected. Therefore, the BSc graduated students of radiologic technology were added to the evaluation. Additionally, some students might not express their true opinions. Considering these factors, it is recommended that, to enhance the validity of the results, similar studies be conducted at different universities with a same or a larger sample size to obtain a more general overview. Also, to motivate the participants to complete the online questionnaire, a simple questionnaire with a limited number of questions was utilized for data collection. Therefore, exact analysis of participants' attitudes may be difficult. To conduct a more accurate evaluation, using a more detailed questionnaire including more questions related to attitudes toward study major and career prospects is suggested. Although studies demonstrate that questionnaire-based research provides valuable insights into the opinions and attitudes of students, we should acknowledge the potential limitations of relying solely on questionnaire data and recognize the value of incorporating qualitative methodologies to enrich our understanding of the phenomena under investigation. It is recommended to consider the possibility of integrating qualitative components, such as interviews or focus



groups, to complement the quantitative data obtained through questionnaires in future studies. Also, exploring potential differences between radiologic technology students' attitudes and their peers in other health professions could yield valuable insights and is recommended for future investigations.

## 5 | CONCLUSION

Our study evaluated the attitudes of radiologic technology BSc students and graduates toward their study major and career prospects. Both groups demonstrated a positive attitude, highlighting the favorable outlook within the field. Positive perceptions from peers and society, coupled with ample job opportunities for BSc graduates, contribute significantly to this optimistic perspective.

While our findings underscore the consistency of positive attitudes among students and graduates, there are important implications for future action. To ensure continued success and satisfaction within the radiologic technology profession, it is essential to consider potential adjustments to the curriculum based on comprehensive data. Conducting comparisons between health professions can provide valuable insights into the unique aspects of radiologic technology education and career prospects, enabling us to tailor educational programs and support services accordingly. Moreover, exploring factors influencing student and job satisfaction within the field can offer additional avenues for improvement. Enhancing students' understanding of university academic disciplines before choosing a major and offering effective counseling are crucial steps in reinforcing positive attitudes. By fostering a supportive and conducive learning environment, educational institutions can empower individuals with a positive attitude toward their field of study and future careers. Such individuals are more likely to navigate challenges effectively during their education and employment, thereby fostering a positive attitude among others, including individuals at lower educational levels.

In conclusion, while our study highlights the prevailing positive attitudes within the radiologic technology profession, there is a clear need for ongoing evaluation and refinement to ensure continued success and satisfaction among students and graduates. By addressing the suggestions outlined above, we can further enhance the educational experience and career prospects for individuals within the radiologic technology field.

### AUTHOR CONTRIBUTIONS

**Fatemeh Mazaheri:** Conceptualization; investigation; methodology; validation; formal analysis; data curation; writing—review and editing; writing—original draft. **Marziyeh Tahmasbi:** Conceptualization; methodology; validation; investigation; formal analysis; data curation; supervision; writing—review and editing.

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### CONFLICT OF INTEREST STATEMENT

We declare that the Ahvaz Jundishapur University of Medical Sciences as the supporter of the study was not involved in the study design; collection, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication. The remaining authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### TRANSPARENCY STATEMENT

The lead author Marziyeh Tahmasbi affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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