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Research Article

Radiology as the Most Popular Specialty among Iranian Medical Residents: What are the Influencing Factors in Choosing this Specialty?

Seyed Saeid Seyedian[1], Abdolhussein Shakurnia[2*]

[1] Internal Medicine Department, Alimentary Tract Research Center, Imam Khomeini Hospital Clinical Research Development Unit, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

[2] Immunology Department, Medical Faculty, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

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***Corresponding author:**
Immunology Department, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Golestan St, Ahvaz, Iran.
Email: shakurnia@yahoo.com

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Abstract

Background: Medical residents choose to pursue their careers based on multiple internal and external factors. These factors, in turn, affect not only their personal future but the overall status of the health care system in every region.

Objectives: To determine the factors affecting radiology residents' choice of specialty career choice.

Methods: This research was a cross-sectional study. The statistical population was all radiology residents (N=48) of Ahvaz Jundishapur University of Medical sciences studying during the academic year 2018-2019. The data were collected by a researcher-made questionnaire. The validity of the questionnaire was confirmed by the experts, and its reliability was calculated using Cronbach's alpha ($\alpha = 0.71$). Data were analyzed using descriptive and analytical tests (Mann-Whitney U test) by SPSS version 18.

Results: The mean age of participants was 30.7±2.6 years. The most important factors influencing the choice of radiology specialty were: "Acquiring knowledge and competency for better treatment" (mean 4.18 out of 5), "convenience and lack of emergency" (3.90), and "good career future" (3.88), respectively; While "family and friends' advice" (3.18) and "possibility of continuing education and fellowship" (3.07) were the least important factors. "Higher income" was significantly more important in the specialty choice among male residents ($P< 0.05$).

Conclusion: This study provided valuable information on the factors influencing the choice of radiology specialty. Understanding specific factors that influence decisions to enter the specialty of radiology may provide proper guidance for human resources planners to consider the needs of the community's health system.

Keywords: Medicine, Residents, Attitude, Specialty Selection, Radiology

Background

The specialty of radiology as a career choice is frequently cited as a preferred choice among many medical students in recent years (1-3). In Iran, radiology was considered as one of the most highly competitive medical specialties, and it is the first choice of many best medical students (3, 4).

In some studies, it has been reported that medical students' interest in radiology has been increased. In the study conducted in the UK, it has been reported that the interest in radiology specialty among medical students has risen (5). Hussein J Nayef in Iraq showed that radiology was the top choice of specialty among medical students (6). The increase in radiology preference is probably a multifactorial issue that involves awareness and lifestyle economic factors.

Several studies have reported factors affecting medical students' decisions on their career choices (7). Some of these factors include interest, serving the community and people, income, working hours, lifestyle, and the flexibility of a specialty (8-12). Khosravi, in a review article in 2018, indicated that income and controllable lifestyle have been two critical factors influencing students' career choices (13).

Career choices of medical students usually affect the

distribution of the healthcare force in different specialties across the countries; thus, investigating the causes of the attractiveness of radiology specialties among medical students requires further study. Researchers believed that this shift in the number and distribution of radiology applicants have been associated with the labor market, income, and lifestyle changes (13, 14). Many studies have investigated the reasons for choosing different medical specialties; however, only a few have focused on radiology specialties among residents.

According to the Iranian Ministry of Health and Medical Education, radiology was the first and foremost choice of medical students in 2018 (15). The increasing interest of medical students in radiology has led to intense competition in this field; thus, the reasons for the attractiveness of this specialty need to be clarified. Awareness of motive residents in choosing radiology has implications for the health care system.

Objectives

Since the understanding of motive residents in choosing radiology has implications for the community's health system, we investigated the motivating factors influencing the choice of radiology as a career among residents in Ahvaz Jundishapur University of Medical Sciences (AJUMS), Iran in 2018. Our findings can provide useful information for medical schools and governments about the residents' motives for choosing radiology to balance the number of graduates in the healthcare setting.

Methods

A descriptive-analytical cross-sectional study was conducted on all the radiology residents (n=48) in the medical college in AJUMS, Iran, from August to October 2018. The residents were invited to participate in the study without considering their gender or educational grade. No resident was excluded from this study except those who refused to participate. Data were collected using a researcher-made questionnaire. This instrument was used in a previous study in AJUMS (16). The validity of the instrument was confirmed by six faculty members and radiology residents, and the reliability of the questionnaire using Cronbach's alpha was found to be 0.71. The questionnaire consisted of two sections. The first section included demographic characteristics of the participants (age, gender, marital status, educational grade, and satisfaction status regarding radiology). To measure the satisfaction of the residents, a 5-point Likert question with a numerical value of 1 (lowest satisfaction) to 5 (highest satisfaction) was designed. The second section consisted of 16 specific questions related to factors influencing the choice of radiology specialty and was rated on a five-point Likert scale from the lowest important (score 1) to the highest important (score 5).

Data were calculated by summing up individual scores: "1" for not important at all, "2" for slightly important, "3" for somewhat important, "4" for very important, and "5" for extremely important. In order to summarize the residents' opinions and draw a better conclusion, some of the questionnaire items were merged with respect to their subject. Finally, the questions were summarized in 10 items, entitled "factors influencing the choice of radiology" for easy interpretation (Table 2).

The residents were informed about the study objective and verbal consent was obtained. The samples' anonymity and confidentiality of information were taken into account. The present study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences (IR.AJUMS.REC.1397.914).

Data were analyzed by SPSS version 18.0 (IBM SPSS Statistics, Armonk, NY) using descriptive statistics (frequency, mean, and standard deviation) and analytical tests (Mann-Whitney U test) to compare the different groups. The results of the Kolmogorov-Smirnov test indicated the non-normal distribution of data. Therefore, nonparametric tests were used.

Table 1. The frequency of the demographic data and satisfaction rate of radiology residents

Variable		No. (%)
Gender	Male	21(46.7)
	Female	24(53.3)
Marital status	Single	15(33.3)
	Married	30(66.7)
Educational grade	1	14(31.1)
	2	12(26.7)
	3	12(26.7)
	4	7(15.6)
Accepting radiology as which choice	1st	40(88.9)
	2nd	5(11.1)
	3th	0(0.0)
	4th and more	0(0.0)
Satisfaction status	Very low	0(0)
	Low	1(2.3)
	Moderate	10(22.2)
	High	23(53.6)
	Very high	9(21.9)

A p-value < 0.05 was considered significant.

Results

Forty-five percent of the residents completed the questionnaires (response rate of 93.7%, 45/48). The mean age of the participants was 30.7±2.6 years; twenty-four (53.3%) residents were female, and 30 (66.7%) were married. More than three-fourths of the participants (88.6%) reported radiology as their first choice, and more than two-thirds (73.8%) were highly satisfied with the admission and education in radiology (Table 1).

Respondents were asked to rank factors that influenced their radiology specialty. "Acquiring knowledge and competency for better treatment", with a mean of 4.18±0.87 (out of 5) was ranked first among all the respondents, followed by "convenience and lack of emergency" with a mean of 3.90±69 and "good career future" with a mean of 3.88±0.98. The factors that were considered less important were "the possibility of continuing education and fellowship" and "family and friends' advice" with a mean of 3.05±0.81 and 3.14±1.17, respectively. A summary of these findings is shown in Figure 1.

Comparison of factors influencing the choice of specialty showed that there is a significant difference in terms of income between male and female residents. (Table 2). The mean score of males was 3.95±0.740, and the mean score of females was 3.50±0.72 (*P*= 0.04). Comparison of the opinions of single and married residents also showed a significant difference in the mean score of 'high income' between single and married residents. The mean score of single and married residents regarding the factor of 'high income' was 3.40±0.83 and 3.87±0.86, respectively (*P*= 0.04).

Discussion

The findings of this study, which was done to identify the residents' motives of choosing radiology, showed that three top factors influencing the residents' choice of radiology

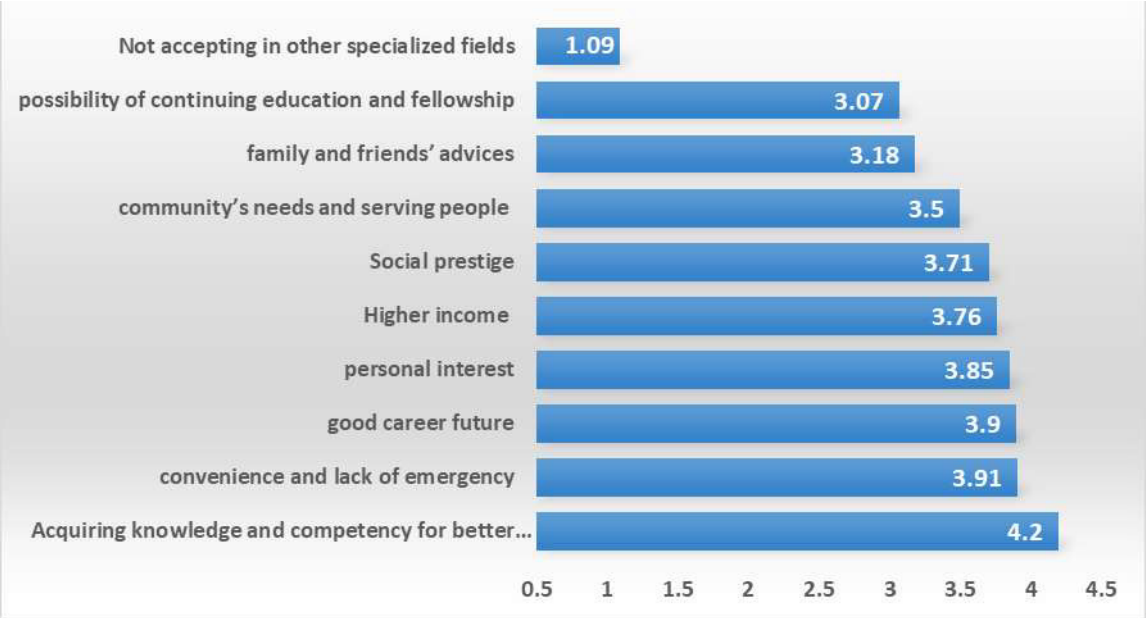

Fig 1. The mean score of Factors influencing residents' decision in choosing radiology

Table 2. Comparison of the Factors influencing residents' decision in choosing radiology by sex

Category/factor	Gender		P
	Male Mean (SD)	Female Mean (SD)	
Improving knowledge and the treatment modality	4.05 (1.03)	4.30 (0.75)	0.40
Convenience and lack of emergency	4.00 (0.73)	3.83 (0.61)	0.32
Good career future	3.72 (1.07)	4.04 (0.93)	0.37
Personal interest	3.78 (1.31)	3.91 (0.95)	0.98
Higher income	3.95 (0.74)	3.50 (0.72)	0.04
Social prestige	3.44 (1.15)	3.91 (0.99)	0.15
The need for community and serving people	3.46 (0.85)	3.53 (0.80)	0.91
Family and friend's advice	2.97 (1.08)	3.35 (1.32)	0.29
Possibility of continuing education and fellowship	2.94 (1.43)	3.17 (1.19)	0.75
Not accepting in other specialized fields	1.10 (0.31)	1.09 (0.29)	0.84

were "Acquiring knowledge and competency for better treatments", "convenience and lack of emergency", and "good career future". These findings are partly consistent with the results of previous studies (17-19).

Acquiring knowledge and competency for better treatments, identified as the most important factor in choosing radiology in this study, has been also recognized as one of the most important factors in choosing radiology in other studies (9, 17). This indicates the residents' devotion to their career, which should be highly admired, as it reflects their commitment and professionalism, as well as dedication to providing high-quality services to patients. In a previous study in the US, Arleo (2016) reported that medical students considered intellectual challenges in medical knowledge and patient care as important factors in choosing radiology (9). Moreover, assessment of Canadian medical students' motives in choosing radiology by Zener (2016) showed that increasing knowledge is the second most important factor in choosing this specialty (17); this finding is in part consistent with the present study, which indicated the physicians' professional attitude towards treatment and commitment to fulfill their responsibilities towards their patients.

In this study, "convenience and lack of emergency", which can reflect the individual's lifestyle, was introduced as the second most effective factor in choosing radiology. Controllable lifestyle, which has been recently identified in many studies as a key factor in choosing a medical specialty (7), is not only important in medicine but also in other specialties and fields. In studies conducted in Australia (2010), the US (2018), and France (2017), controllable lifestyle was reported as one of the major factors in choosing radiology (18-20). This finding is highly consistent with the results of the present study and indicates the importance of this factor in choosing radiology around the world.

Moreover, Dorsey et al. reported that up to 60% of medical students' career choice is associated with factors of controllable lifestyle and income (7). According to their study, a controllable lifestyle is strongly influential in the specialty choice among both male and female physicians. Since radiology is associated with a better lifestyle in comparison with other fields, it provides an opportunity for physicians to balance their work and family life. In fact, one of the main reasons for medical student's inclination towards radiology is the flexibility of this career, which has been the subject of many studies in recent years worldwide (17, 20, and 21).

The factor of "good career future", which was the third reason for choosing radiology, is one of the main concerns of educated people around the world. All University graduates expect appropriate job opportunities and good income; this issue has also been noted in many previous studies as an important factor (7). It is in line with the findings reported by Lei Feng in US (2003), who reported job opportunities as the third most important factor in choosing radiology (21). In most studies, job opportunities after graduation have been identified as one of the priorities for medical students in choosing a career around the world (7, 14).

In the present study, three factors of personal interest, income, and prestige were not very important for the radiology residents; this finding is contrary to some studies, highlighting the significance of these factors for residents. In studies by Zener (2016), Ram (2018), and Feng (2003), the factor of income was one of the three most important reasons in career choice; this finding is not in accordance with the findings of the present study and may be due to differences in the cultural, social, and economic features in different communities (17, 19, 21).

The finding of this study showed that the community's needs and serving people were of very low importance in choosing radiology. The low level of residents' attention to the community's needs and serving people is a very important issue, which cannot be overlooked. The medical students' inattention to the community's need in choosing their field of specialty may have negative effects on the quality and quantity of workforce required by the community's health system, leading to an insufficient workforce in certain fields of specialty. These findings were somewhat unexpected. Khosravi, in a review article in the US in 2018 showed an increase in the percentage of students matching into the high-income controllable lifestyle than low-income controllable lifestyle specialties over 24 years. It is believed that the lifestyle influence on specialty choice may be representative of the larger societal trend for medical students than other factors (13).

The factor of family and friends' advice was not highly important in choosing radiology, which reflects the independence and autonomy of residents in choosing their field of specialty. Similarly, the importance of this factor was reported low in most previous studies (7, 14, 21), which is in accordance with the findings of the present study and indicates the residents' independence in choosing the specialty.

In the current study, the least important factor in choosing radiology was the possibility of continuing education and fellowship. In Iran, the radiology job opportunity is not saturated yet, and most graduate residents are employed by the private sector, with a high rate of income and more convenient conditions. Moreover, some radiology fellowships are associated with considerable inconvenience and distress for the radiologist, which usually prevents them from continuing their studies. Therefore, fellowships are not very important for radiology residents, and this factor is clearly insignificant in choosing the field of specialty. In another study, Feng in the US (2003) showed that residents who are employed by the private sector are less likely to pursue academic education (21). These radiologists mostly spend their time on therapeutic issues outside the academic environment; this is partly consistent with the results of the present study.

The present study also considered gender differences, which might affect choosing radiology. In terms of gender differences, the only significant difference was attributed to the factor of income, which was more important

for male residents. A few recent studies on Canadian (2016) and French (2017) radiology residents have also reported similar findings, underlining the importance of financial issues in men's decision-making (17, 20). Overall, considering the importance of men's role in family income, financial issues are more important for men than women. Although several studies have reported lifestyle and convenience as important factors in females' choice of radiology specialty (17, 20); in our study, there was no significant difference in terms of lifestyle and convenience between the two genders. The discrepancy between the findings may be due to differences in cultural and economic features of different communities or the small number of samples in the present study.

Research on the factors influencing the choice of specialty in all countries can help health system officials and policymakers. Applying a large number of students for specialties, such as radiology and dermatology, and not welcoming specialties, such as emergency medicine and anesthesia, which have been observed in Iran in recent years, is one of the most important issues in medical education (3, 4, 22). Certainly, identification of the students' motivations for choosing these specialties provides valuable information for health system policymakers.

This study had several limitations. It was done in a single medical school, and the sample size was small. Therefore, caution should be taken in generalizing the results of the study. Nevertheless, more studies with a larger sample size in other areas are needed to clarify and confirm the influential factors in choosing a radiology specialty. Despite these limitations, since this study was carried out for the first time in a large university in Iran, the results can be useful for medical universities and health planners to help medical students choose their field of career.

The finding of this study showed that the most common reasons for choosing radiology were "acquiring knowledge and competency for better treatments", "convenience and lack of emergency", and "good career future". This study provided valuable information on the factors influencing the choice of radiology specialty. Understanding specific factors that influence decisions to enter the specialty of radiology may provide proper guidance for human resources planners in the healthcare system to consider the needs of the community's health system.

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