

Factors Affecting the Choice of Specialty in Medical Students in Iran

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Abstract

Background: Medical students are a country's future physician reservoirs. Knowing how they choose their specialties is the key in enforcing a balance in distributing physicians in different medical specialties. The purpose of this study was to determine Shiraz University of Medical Sciences students' choices of specialty in respective order and to investigate the factors influencing these choices to determine if further education on medical specialties is needed.

Methods: Convenience sampling was conducted for this cross-sectional and descriptive-analytic study among 250 of fifth, sixth and seventh-year medical students who were in clinical settings. A questionnaire with confirmed validity and reliability was used. Collected data were analyzed using SPSS software.

Results: The students' mean age was 23.7 ± 1.54 years; 45.6% were men and 54.4% were women. 35.2% of them were fifth-year students, 33.6% were externs and 31.2% were interns. Overall students' favorite specialties were Dermatology (20.4%), Ophthalmology (14.4%) and Orthopedics and Cardiology (10%), respectively. Female students' choices were Dermatology, Ophthalmology and Cardiology, while male students chose Orthopedics, Ophthalmology and Dermatology. Fifth-year students' favorite specialties were Internal medicine, Dermatology and General Surgery, while externs and interns chose Dermatology and Ophthalmology. Education level, sex, age, and students' military status were significantly associated with their specialty choice. "Personal factors" (2.79 ± 0.87) and "economic factors" (2.78 ± 0.99) were deemed the most important factors in choosing their specialties.

Conclusion: Based on this study, some specialties, though vital for society, were not favored by medical students which shows the need for further education on these specialties. Respective authorities could use these influencing factors to try to make these specialties more favorable, hence students would be more willing to choose them.

Keywords: STUDENTS, MEDICAL, CHOICE BEHAVIOR, MEDICINE, ATTITUDE, SPECIALTY

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Introduction

Iran is an Eastern Mediterranean country with an estimated population of 80 million people. It has a physician to population ratio of 14.9/10,000 population (1). The World Health

Organization (WHO) recommends a ratio of 23/10,000 healthcare workers for adequate health care services (2). Indeed, the shortage of health professionals whether due to poor distribution or insufficient admission quota, has become a significant problem in many countries, including Iran (3). Iran's Ministry of Health and Medical Education (MOHME) often announces scarcity of specialists in various fields, such as Neurosurgery, Ophthalmology and Otorhinolaryngology.

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This shortage of specialist workforce has led to many problems and even shut downs in many hospitals and health centers in Iran (4). In 1985 Iran established MOHME to improve the country's development of human resources for health and to better match health education to population health needs. There has been an enormous progress in ensuring the availability of a health workforce with the right number and suitable mix of skilled health workers. As a result, from 1985 to 2000 the number of medical students increased by approximately 27000 and the number of other health profession students by approximately 60,000 (5). However, this has not yet been quite sufficient for the population health needs; and the distribution of physicians in various specialties has also been uneven. Indeed, the supply of health workers can be affected by choice of professional training, and the individual choice of specialization may not meet the market demands resulting in the shortage of labor in some sectors and surplus in others (6). Undoubtedly, medical students are a potential reservoir of each country's physicians. Their choices decide the manpower distribution among different medical specialties. Determining how the graduates of these schools select their areas of specialization is essential to achieve a balanced distribution of physicians among all specialties. Medical students consider many factors when selecting a specialty, including career planning, economic and non-economic factors (7).

The issues of what specialties are favored by medical students, and what factors influence these choices have been increasingly researched in different countries worldwide with various implications and conclusions. For example, a study was carried out by Dossajee and colleagues to determine career preferences of final-year medical students in a medical school in Kenya (8). Internal Medicine, Surgery, Obstetrics and Gynecology and Pediatrics accounted for most of the choices of specialization. Female students were less likely to select Obstetrics and Gynecology

and Surgery but eight times more likely to select Pediatrics, due to the 'Ease of raising a family'. Another study was done by Kawamoto and co-workers to research gender differences in preference of specialty as a career choice among Japanese medical students (9); the study showed that women significantly preferred Pediatrics, Obstetrics and Gynecology, and psychology while men significantly preferred Surgery and Orthopedics. For both genders, "work-life balance" was positively associated with preference for controllable lifestyle specialties. There is lack of data on career preferences of medical students in Iran. One study was done by Shakurnia and co-workers to determine factors influencing choice of specialty by medical residents (and not pre-graduate medical students) in Ahvaz, Iran, which revealed that the most important reasons for their choice of specialty were "personal development and to provide better service" and "personal Interests", followed by "helping people and health promotion", "income and social prestige" and "easiness and being comfortable" (10). Another research was carried out by Alizadeh and co-workers in Guilan University of Medical Sciences, Iran, to determine the factors associated with medical students' tendency to choose a medical specialty (4). The results revealed that Dermatology, Radiology and Ophthalmology were the most favored specialty choices and "personal and economic factors" were the most important factors in their choice. However, second-year medical students who had not yet entered hospitals and clinical settings were included in this study. In order for a medical student to become a general physician in Iran, they need to study medicine for seven years. In Shiraz University of Medical Sciences, the first four years are mostly theoretical, and students enter hospital services in the fifth year. In this study, we speculated that since medical students have had no clinical exposure prior to the fifth year, only fifth, sixth and seventh year students should be included in this study as they have had clinical experience

and have probably started giving some thought to selecting their favorite specialties with a more informed mind. We aimed to determine favorite specialties among students in both genders and explore the factors that they perceive as influential in their choice and finally determine if further education in medical specialties is required in this Iranian medical school.

Methods

This was a descriptive-analytic, cross-sectional study conducted in Shiraz University of Medical Sciences, Shiraz, Iran during 2015-16. The questionnaires, the validity and reliability of which were confirmed in a previous study (4), were administered to 250 medical students who were at clinical settings (i.e. 5th, 6th and 7th year) at the time. The students were selected on the basis of their availability in groups at a single site, such as classrooms, hospital wards or dormitories (convenience sampling). The students were handed the questionnaires, filled them voluntarily and were asked to return them to the distributor after completing them.

The questionnaire consisted of three parts. The first part covered demographic characteristics such as student's sex, age, parents' jobs, marital status, military status and education level (whether they were fifth, sixth or seventh-year students).

The second part was an open question asking which three specialties they preferred to get accepted in in the future, in respective order of their desire. A list of all available medical specialty choices in Iran was attached to the questionnaire. These 28 specialties were: Orthopedic Surgery, Urology, Internal Medicine, Infectious and Tropical diseases, Cardiology, Anesthesiology, Pathology, Community Medicine, Forensic Medicine, Nuclear Medicine, Sports Medicine, Dermatology, General Surgery, Neurosurgery, Ophthalmology, Radiotherapy, Radiology, Psychiatry, Obstetrics and Gynecology, Emergency Medicine, Geriatric Medicine,

Occupational Medicine, Aerospace Medicine, Physical Medicine and Rehabilitation, Basic Sciences, Pediatrics, Otorhinolaryngology and Neurology.

The third part consisted of 17 factors that were potentially influential in the students' specialty choices. These factors were categorized into four groups. The first group was "personal factors" including "personal interest" (in the specialty) and "personal experience and skills". The second group was "occupational factors" including "possibility of working independently after graduation", "(length of) work hours", "number of hospital shifts", "length of training program", "difficulty of the training program", "scientific and research opportunities", "job prestige", "being accepted as a faculty member", "occupational hazards", and the "possibility of further education (fellowship programs)". The third group was "economic factors" including "future income" and "(good) job market". The fourth and last group was "social factors" including "family and close relatives' expectations", "influences of (their) advising professor", "influences of experienced individuals". The students were asked to mark the degree of influence of these factors on their specialty choice with the options "not at all", "to some extent", "moderately", "a lot", "quite a lot".

The Statistical Package for Social Sciences software (SPSS, version 24) was used to analyze the data. Differences in means were analyzed using independent sample t-test. Differences in proportions were analyzed using Chi-square test. A P-value of less than 0.05 was considered statistically significant.

Results

Basic Demographics

The mean±SD age of the respondents was 23.7±1.54 years. Of the 250 students, 136 (54.4%) were women and 114 (45.6%) were men. 214 (85.6%) of them were single and 36 (14.4%) were married. Among the students' parents, 14 (5.9%) fathers and 5 (2.1%) mothers

had occupations in the medical field; some students had left this question blank and were, therefore, not included in the analysis. Among the 114 male students, 68 (59.6%) were eligible for the compulsory national military service and 46 (40.4%) were exempted from it. 88 (35.2%) of the students were fifth-year students, 84 (33.6%) were sixth-year students (externs) and 78 (31.2%) were seventh-year students (interns). These socio-demographic characteristics are shown in Table 1.

Table 1: Socio-demographic Characteristics

Socio-demographic characteristic		N (%)
Age	≤23	131 (52.4%)
	>23	119 (47.6%)
Gender	Male	114 (45.6%)
	Female	136 (54.4%)
Marital Status	Single	214 (85.6%)
	Married	36 (14.4%)
Father's Occupation	In the medical field	14 (5.9%)
	Others	224 (94.1%)
Mother's Occupation	In the medical field	5 (2.1%)
	Others	235 (94%)
Military Status	Eligible	68 (59.6%)
	Exempted	46 (40.4%)
Education Level	5 th year (student)	88 (35.2%)
	6 th year (extern)	84 (33.6%)
	7 th year (intern)	78 (31.2%)

Specialty Preference

In their first priority of favorite specialties, Dermatology was overall the students' most preferred choice with 51 (20.4%) students choosing it. Then there was Ophthalmology with 36 (14.4%), Orthopedic Surgery with 27 (10.8%) and Cardiology with 25 (10%) students (Figure 1). Of all the participants, 241 had filled the second option (priority) of favorite specialties. Among these, Radiology was the most favorite specialty with 37 (15.4%) students choosing it; then, Dermatology with 34 (14.1%), and Ophthalmology with 29 (11.6%) were the second and third popular choices, respectively. In the third option of priorities, among 242 participants who had filled it, Radiology

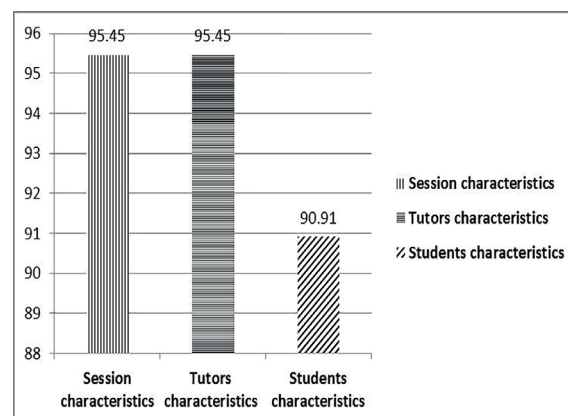


Figure 1: First Priority Specialty Choices

with 29 (12%) and Cardiology, Obstetrics and Gynecology and General Surgery with 23 (9.5% each) were the most popular choices. Community Medicine, Forensic Medicine, Nuclear Medicine, Infectious Diseases, Radiotherapy, Sports Medicine, Geriatric Medicine, Occupational Medicine, Aerospace Medicine and Basic Sciences were not chosen by any of the students in any of the priorities. Among female students, Dermatology (27.2%), Ophthalmology (14%) and Cardiology (11.8%) were the most favorite specialties, respectively. Among male students, Orthopedic Surgery (23.7%), Ophthalmology (14.9%) and Dermatology (12.3%) were the most popular options.

Fifth-year medical students' most favorite specialties in their first priority were Internal Medicine (18.2%), Dermatology and General Surgery (12.5% each) in respective order. Sixth-year (extern) medical students' most popular choices were Dermatology (26.2%) and Ophthalmology (19%). Seventh-year (intern) students' most desirable choices were Dermatology (23.1%), Ophthalmology (23.1%) and Orthopedic Surgery (12.8%), respectively (Table 2).

Factors that Influence Specialty Preference

As mentioned above, the third part of the questionnaire contained 17 questions categorized into 4 groups containing "personal

Table 2: Specialty Preference Among Medical Students by Sex and Education Level

Variable	Total n (%)	Female n (%)	Male n (%)	5 th Year n (%)	6 th Year n (%)	7 th Year n (%)
Orthopedic Surgery	27 (10.8)	0 (0)	27 (23.7)	10 (11.4)	7 (8.3)	10 (12.8)
Urology	8 (3.2)	0 (0)	8 (7)	2 (2.3)	4 (4.8)	2 (2.6)
Internal Medicine	19 (7.6)	11 (8.1)	8 (7)	16 (18.2)	0 (0)	3 (3.8)
Infectious Diseases	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Cardiology	25 (10)	16 (11.8)	9 (7.9)	10 (11.4)	7 (8.3)	8 (10.3)
Anesthesiology	1 (0.4)	1 (0.7)	0 (0)	0 (0)	0 (0)	1 (1.3)
Pathology	5 (2)	3 (2.2)	2 (1.8)	2 (2.3)	1 (1.2)	2 (2.6)
Community Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Forensic Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Nuclear Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Sports Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Dermatology	51 (20.4)	37 (27.2)	14 (12.3)	11 (12.5)	22 (26.2)	18 (23.1)
General Surgery	17 (9.2)	5 (3.7)	12 (10.5)	11 (12.5)	4 (4.8)	2 (2.6)
Neurosurgery	3 (1.2)	2 (1.5)	1 (0.9)	3 (3.4)	0 (0)	0 (0)
Ophthalmology	36 (14.4)	19 (14)	17 (14.9)	8 (9.1)	16 (19)	12 (15.4)
Radiotherapy	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Radiology	23 (9.2)	14 (10.3)	9 (7.9)	8 (9.1)	6 (7.1)	9 (11.5)
Psychiatry	1 (0.4)	0 (0)	1 (0.9)	1 (1.1)	0 (0)	0 (0)
Obstetrics and Gynecology	8 (3.2)	8 (5.9)	0 (0)	3 (3.4)	3 (3.6)	2 (2.6)
Emergency Medicine	1 (0.4)	0 (0)	1 (0.9)	1 (1.1)	0 (0)	0 (0)
Geriatric Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Occupational Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Aerospace Medicine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Physical Medicine and Rehabilitation	2 (0.8)	2 (1.5)	0 (0)	0 (0)	0 (0)	2 (2.6)
Basic Sciences	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Pediatrics	6 (2.4)	5 (3.7)	1 (0.9)	1 (1.1)	3 (3.6)	2 (2.6)
Otorhinolaryngology	8 (3.2)	4 (2.9)	4 (3.5)	0 (0)	5 (6)	3 (3.8)
Neurology	9 (3.6)	9 (6.6)	0 (0)	1 (1.1)	6 (7.1)	2 (2.6)
Total	250 (100)	136 (100)	114 (100)	88 (100)	84 (100)	78 (100)

factors”, “occupational factors”, “economic factors” and “social factors”. The amount of influence of each factor ranged from “not at all” which was given a zero point to “quite a lot” which was assigned four points. In each category the points from the participants’ answers were added up and then divided by the number of questions of each category to result in an arithmetic mean of their inclination. Consequently, “personal factors” with a mean of 2.79 ± 0.87 and “economic factors” with a mean score of 2.78 ± 0.99 were considered the most important factors. “Occupational factors” accounted for 2.10 ± 0.7 and “social

factors” gained a score of 1.48 ± 0.85 . Figure 2 demonstrates the mentioned results. Among “personal factors”, “personal interest” was deemed the most important factor (3.1 ± 0.98) and among “economic factors”, “job market” (2.8 ± 1.03) was considered the most important by the participants.

Kruskal-Wallis test showed that being a fifth-year student was significantly related to choosing “social factors” ($P=0.031$) and being in the sixth year was related to choosing “economic factors” ($P=0.038$) while being a seventh-year student was not significantly related.

Furthermore, Chi-squared test was used to

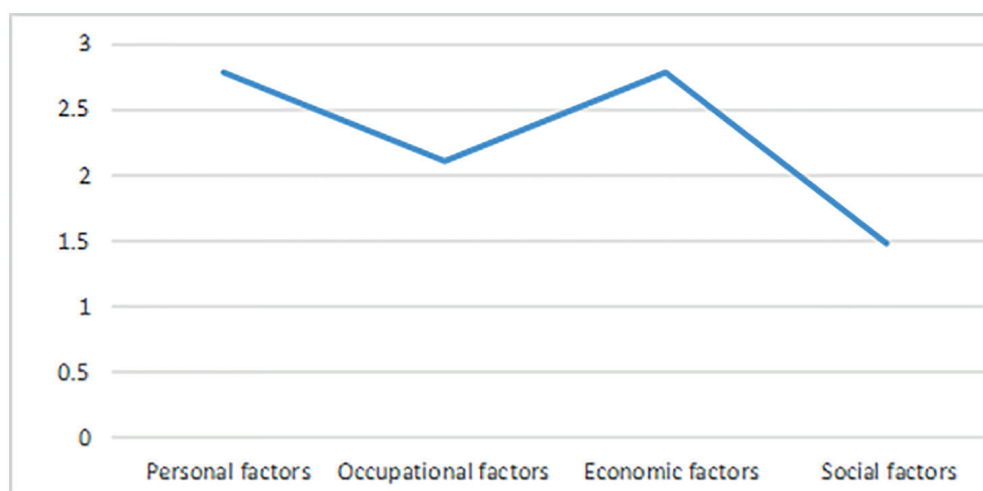


Figure 2: The amount of influence of various factors on students' specialty choice

analyze other variables and among them educational level ($P < 0.001$), sex ($P < 0.001$), age ($P = 0.3$), whether a first-degree relative was a physician ($P < 0.001$) and military status of male students ($P = 0.04$) had a valuable significance in choosing their specialty. Parents' jobs were not significantly related.

Discussion

Medical schools are the centers of education for physicians in all countries. To know what specialties medical students are more interested in and what factors influence their choices is a clue to determine the potential distribution of specialist workforce in the country. This information can particularly be important in medical education planning and medical workforce and health policies. Therefore, in this study, we investigated medical students' favorite specialties and the influencing factors in Shiraz University of Medical Sciences, Shiraz, Iran. In this study, the most preferred specialties overall in respective order were Dermatology, Ophthalmology, Orthopedic Surgery, and Cardiology. These results were most similar to a study done in another university in Iran (Guilan University of Medical Sciences) where Dermatology, Radiology and Ophthalmology were the most favorite choices by medical students (4). However, results in other

countries differ from this study and students seem to lean more towards other major medical specialties. For example, in a study in Kenya, Internal Medicine, Obstetrics and Gynecology, General Surgery and Pediatrics were the most popular choices (8). Another study in Nigeria showed that Surgery, Pediatrics, Obstetrics and Gynecology and Internal Medicine were the most desirable choices among medical students (11). Another study in United Arab Emirates in 2013 showed that students had mostly chosen Internal Medicine, Pediatrics, Emergency Medicine and Family Medicine, while Urology, Ophthalmology, Obstetrics and Gynecology were the least popular choices (12). This noteworthy difference in popular specialties could stem from international and regional differences in medical education and residency programs and also various levels of income and job market necessities for each specialty in different countries. In Iran, Dermatology and Ophthalmology are considered by students to have a rather easier residency with a good future outcome compared with specialties such as Internal Medicine and Pediatrics. Community Medicine, Forensic medicine, Nuclear Medicine, Sports Medicine, Geriatric Medicine, Occupational Medicine, Infectious Diseases, Radiotherapy, Aerospace Medicine and Basic Sciences were not chosen by any of the students in any of their priorities; this could

result from the participants' unfamiliarity with these specialties and the scarcity of residency programs in the country for most of them. Emergency Medicine, Psychiatry and Anesthesiology were only chosen by one student each. This displays the necessity of educational programs for the promotion of these important specialties in Shiraz University of Medical Sciences, among other medical universities in Iran.

The most preferred specialties by female students in this study turned out to be Dermatology, Ophthalmology and Cardiology respectively. In male students, it was Orthopedic Surgery, Ophthalmology and Dermatology respectively. The reason for the difference in female and males' first choice could be that Dermatology, as mentioned before, is known amongst students to have a comparatively relaxed residency program with fewer shifts and a bright professional future, so female students are drawn towards it. On the other hand, Orthopedics is more physically demanding and has a busier and more difficult residency program; then, again it is a surgical specialty with a good occupational outcome, so male students are more likely to choose it. This result was also similar to the other study conducted in Iran (4). Female medical students of Guilan University of Medical Sciences had chosen Dermatology, Radiology and Cardiology and male students had chosen Orthopedics, Ophthalmology and Cardiology. Other studies in other countries showed different results. For example, a similar study in Nepal revealed that male students mostly chose General Surgery, Internal Medicine and Orthopedics and female students chose Obstetrics and Gynecology and Ophthalmology (13). Another study in New Zealand revealed that female students preferred Obstetrics and Gynecology, Pediatrics and Geriatric Medicine and male students preferred Emergency Medicine and General Surgery (14). The difference between the results of the mentioned studies and this study could stem from regional and international differences

previously discussed. In this study no male student had chosen Obstetrics and Gynecology which is most likely due to the prohibition of male students to study in this specialty after the Islamic revolution in Iran.

In this study we included fifth, sixth and seventh-year medical students who were in clinical settings and had some clinical experiences. It was observed that fifth-year students who have only recently entered clinical settings where more interested in specialties such as Internal Medicine and General Surgery, but sixth and seventh-year students preferred Dermatology and Ophthalmology. The reason could lie in the idealistic views of inexperienced students who were interested in major and rather more difficult and basic specialties but as they start rotating and working shifts in these wards and gaining experience, they start to lean towards specialties that are supposedly easier with a superior financial outcome.

Students' military status was shown to be a significant factor in specialty choice as indicated in Alizadeh's research (4). It's probable that occupational superiority of graduates with a specialty degree in their military service (such as working in capital cities) and uninterrupted education leading to higher chances of success in the specialty entering exam could be influential aspects.

Regarding influential factors in students' specialty choice, "personal factors" and "economic factors" were found to be the most significant factors in this study. Among "personal factors", "personal interest", and among "economic factors", "job market" was deemed the most important. These results are quite similar to Alizadeh's study, where personal and economic factors were also the most important factors considered by students (4). Personal factors were shown to be important in many other studies worldwide. For instance, a study in Nepal revealed that personal interest in the specialty, security in future and good doctor-patient relationship were the most important influencing factors (13). Or a 2013 research in Sudan also revealed

that the most common reason for choosing a specific specialty was “personal Interest” followed by being “helpful to the community” (15). Economic factors were also found to be important in a study published in 2008 in turkey where the most important reasons for the choice of specialty were “better financial opportunities” and “prestige” (16). On the other hand, a study conducted in Northern Taiwan showed that “personal intelligence and/or ability preference” was the most important factor; while economic factors, such as future income, were ranked lower (17). The reason for these differences could arise from different cultural, educational and occupational circumstances in different countries and also the difference in research questionnaires.

Some other studies including the study conducted in Northern Taiwan showed that having a helpful advising professor was an important influential factor; while in the present study along with Alizadeh’s study (4), it was not considered an important at all (0.96 ± 1.1) (17). It seems that the inadequacy of the contact between students and their advisors, lack of knowledge of advisors and students of the potentially influential role of the advisor, and also the fact that many of these university-assigned advisors are not specialists and even physicians, could play a role in students’ negative attitude towards this subject.

It is quite probable that a balance of factors operating before, during and after medical school education is involved in any individual’s career decision. Future studies should consider the influential factors in the specialty preference of students from many schools and over many years. Further research is undoubtedly needed to identify which unidentified factors affect graduates’ career preferences and which of these can be manipulated to influence career preferences in a particular direction, bearing in mind that influencing career preference in one direction may have unpredictable and unwanted effects on preferences in another direction (18). However it is clear that further education and training programs for several

medical specialties in medical schools are required in order for medical students to get more familiarized with them and consider them as their future career.

Conclusion

The most preferred specialties among Shiraz University of Medical Sciences students were Dermatology, Ophthalmology and Orthopedic Surgery while many other specialties were not popular at all. Sex and education level were important variables in the students’ specialty choices. The most influential factors in specialty choice were personal and economic factors. All of this information demonstrates the necessity of familiarizing students with less popular specialties through (possibly) educational classes and interactive programs in the clinical settings of these specialties leading to a hopefully increased interest in them, resulting in a more even distribution of medical graduates in various specialties. Health policymakers could also focus on improving economic factors of unpopular specialties, so medical graduates would be more likely to consider them as a future career. Undoubtedly, future studies should consider influential factors of the specialty preferences of students from other universities and training programs.

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Conflict of Interest

The author declares no conflict of interest.

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