



Factors Influencing Brain Drain: Perspectives from a Medical School in Turkey

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Abstract

Aim: This study aimed to explore 6th-year medical students' opinions on brain drain, its associated factors, reasons, and potential solutions.

Method: A cross-sectional study was conducted from February 1 to April 30, 2024, through voluntary face-to-face interviews. The study assessed students' views on brain drain and the factors influencing them. The questionnaire included sociodemographic data, reasons and barriers identified from the literature, and the "Attitude Scale Towards Brain Drain."

Results: Of 236 final-year medical students, 32.6% (n=77) expressed a desire to work abroad. Among these, 75.3% (n=58) planned to return to Turkey eventually. Among those planning to work abroad, 75.3% stated they intended to return to Turkey, while 24.7% planned to emigrate permanently. The average score on the Attitude Towards Brain Drain Scale was 53.2±8.92. The primary motivating factors for emigration included poor working conditions in Turkey (16.6%), the frequency of violence in healthcare settings (16.1%), better living standards and higher income opportunities abroad (14.6%), and dissatisfaction with Turkey's healthcare policies (12.3%).

Conclusion: One-third of students expressed an interest in living or working abroad, highlighting a risk of losing skilled professionals. Addressing the underlying factors driving brain drain through targeted policies could mitigate this issue and retain future medical talent.

Keywords: Brain Drain; Medical Students; Opinions

Abbreviations

WHO: World Health Organization; TMA: Turkish Medical Association.

Introduction

Every year, thousands of young doctors in Turkey leave their country in search of better living and working

conditions. It is now inevitable to examine the causes and solutions of this brain drain trend that threatens Turkey's healthcare system. The meaning of 'brain drain' refers to the emigration of highly skilled individuals from developing countries to developed nations that offer better living conditions, education, and professional opportunities. Although this phenomenon has existed throughout history, it has become more pronounced in the 20th century with globalization. The migration of educated individuals

negatively impacts the economic development and social progress of source countries, while providing significant advantages to destination countries [1,2].

Push and pull factors play a critical role in individuals' decision-making processes regarding migration. Push factors include poor working conditions, low income levels, and issues like violence in healthcare, while pull factors involve better living standards, higher salaries, and advanced research and career opportunities. The recent increase in brain drain in Turkey, especially in the healthcare sector, highlights the difficulties faced by professionals in this field [3,4].

The rising brain drain in healthcare has exacerbated shortages of health workers in low- and middle-income countries, as noted by the World Health Organization (WHO). Physicians, in particular, are driven by the desire for better living conditions and safer work environments, leading them to migrate to developed countries. In Turkey, factors such as increasing violence in healthcare, mandatory service requirements, and heavy workloads have been key drivers of this migration [5].

Brain drain not only contributes to the diversification of medical education in developed countries but also increases the tendency of highly qualified medical students from developing countries to migrate. This phenomenon results in the loss of skilled labor in developing countries, where medical education is often limited by resources, and better educational opportunities are found abroad. While developed countries benefit from an influx of highly qualified students and healthcare professionals, this process creates a global inequality in access to medical education. At the same time, the strengthening of healthcare systems in developed countries exacerbates the weakening of healthcare services in developing countries. Brain drain deepens global health inequalities and forces a reconsideration of medical education policies, highlighting the need for new strategies to develop sustainable healthcare solutions worldwide.

What happens when a country's brightest minds no longer wish to stay? This question lies at the heart of Turkey's growing brain drain in the healthcare sector. The emigration of a country's brightest minds not only affects the future of these individuals but also deeply shakes the country's healthcare sector and society. The decrease in the number of doctors, the increase in the number of patients per doctor, the growing workload, and deteriorating working conditions further strengthen the push factors driving brain drain. This situation leads to a reduction and delay in treatment and examination opportunities, which creates unrest and paves the way for violent actions. This process not only threatens the safety of healthcare workers but also significantly reduces the quality of healthcare services.

Violence in the healthcare sector has become one of the most pressing reasons for migration in Turkey in recent years. Our study shows that one of the most common reasons healthcare workers consider migrating is violence. According to data from the Turkish Medical Association, 90% of doctors in Turkey have experienced violence during their careers, and 60% of them have faced such incidents within the past year [6]. These statistics highlight the widespread and serious nature of violent events. The high rates of violence in Turkey have become a significant factor driving healthcare workers to emigrate. Moreover, violence directly affects the quality of healthcare services; those who experience violence have reduced motivation, and burnout and psychological issues increase. Therefore, violence should not be viewed as an individual problem but as a phenomenon that deeply impacts and harms the healthcare system.

The number of doctors leaving Turkey has increased in recent years, but the exact number of emigrating doctors is not fully known due to the limited studies on this topic. However, some conclusions can be drawn from the available data. For example in 2022, 2,685 doctors applied for the "Good Standing Certificate" from the Turkish Medical Association (TMA), which is required to practice medicine abroad [7]. In the first three months of 2023, it is known that 700 doctors applied for the same certificate. Doctors who are Turkish citizens and wish to work abroad must obtain a certificate from the TMA showing that they have no negative records related to their professional activities. In this regard, applications for the certificate have been examined over the years. The number of applications, which was 59 in 2012, surpassed previous years in August 2022. This situation shows that migration abroad is not limited to young general practitioners, but also includes specialists in critical and scarce fields. Brain drain should not only be perceived as a loss; processes such as reverse brain drain present opportunities to mitigate these losses. The return of individuals, who have been educated and gained experience abroad, can support knowledge and technology transfer. However, for this return to occur, source countries must offer attractive working conditions, economic stability, and appropriate policies to encourage these individuals to come back [8-10].

The psychological aspects of migration are also significant. People often feel compelled to migrate due to poor living standards and a lack of future prospects in their home country. This tendency is particularly prevalent among young and educated individuals. Research conducted in Turkey shows that a significant portion of medical students consider working abroad, with many being determined to pursue this path [11].

Policies addressing brain drain can either encourage or mitigate the process. While developed countries often

implement policies to attract skilled workers, developing countries need to establish mechanisms to retain their talent. For example, offering competitive salaries, favorable working conditions, and opportunities for professional development can effectively reduce migration tendencies [10,12,13].

As a result, brain drain is a complex phenomenon that profoundly impacts the economic, social, and healthcare systems of developing countries. This study focuses on the perspectives of medical students regarding brain drain and the factors influencing their decisions. The aim is to provide data how physical and social factors such as low income, mobbing and violence affect the brain drain of which can contribute to the development of effective policies on this issue.

Materials and Method

This volunteer-based research was conducted as a cross-sectional and descriptive study at Adnan Menderes University School of Medicine, between February 1 and April 30, 2024. A total of 236 sixth-year medical students (called as interns) participated in the study. The data were collected via face-to-face questionnaire and also with a validated instrument. Before the main data collection process, a pilot study was conducted with 20 medical students to test the clarity and comprehensibility of the questionnaire. Based on the results of the pilot study, minor adjustments were made to the questionnaire, and its relevance to the target audience was ensured. The content of the questionnaire was reviewed by a panel of experts, including academic scholars and healthcare professionals. Based on the feedback received, minor adjustments were made to enhance the clarity and scope of the questionnaire. The questionnaire consisted of three sections. The first section, Sociodemographic Information, included five questions to gather basic demographic data. The second section, Reasons and Barriers to Emigration, contained 21 questions developed based on a comprehensive

literature review to explore participants' motivations and deterrents for migration. The third section, Attitude Scale Regarding Brain Drain, featured a 16-item scale designed to evaluate participants' attitudes towards brain drain. This scale included two subscales: a 12-item subscale for pull factors and a 4-item subscale for push factors. The Cronbach's Alpha reliability of the scale is 0.91 for the overall score and 0.88 and 0.86 for its subcomponents. The corrected item-total correlations range between 0.81 and 0.34. Higher scores demonstrate higher tendency to brain drain. It was validated by Oncu, et al. [14]. The scale used as a data collection tool in the study was utilized with the permission of its developer. This study was approved by the Ethical Committee, School of Medicine (Approval Date: Feb 1st 2024, Approval Number: E-53043469-050.04-489500).

Statistical analysis was performed using SPSS 25.0 software. Therefore, Independent t-tests and ANOVA tests, which are parametric tests, were applied to determine whether there were significant differences between the scale, its sub dimensions, and various variables of the participants. Pearson Chi-Square test and Fisher's Exact test were used for the comparison of categorical variables. Finally, a Multivariate Linear Regression Analysis was used to examine the relationship between the Attitude Scale towards Brain Drain and the independent variables. A p value smaller than 0.05 was considered as statistically significant.

Results

Of the total 236 sixth-year medical students, all of them participated in the study. The mean age of the participants was 24.4 ± 1.2 , with 47.5% being female and 52.5% male. Among the participants, 67.4% expressed a preference to stay in Turkey after graduation, while 32.6% indicated a desire to work abroad. Among those planning to work abroad, 75.3% stated they intended to return to Turkey, while 24.7% planned to emigrate permanently (Table 1).

Variables	n	%
Do you want to work abroad after graduation?		
No	159	67,4
Yes	77	32,6
When did your desire to work abroad develop?		
High school	6	7,8
1st-3rd year university	18	23,4
4th-6th year university	53	68,8
Is there anyone who influenced your desire to work abroad?		
No	33	42,9

Yes	44	57,1
Who are the people that influence your decision to work abroad?		
Academic and professional networks	33	28,2
People living/working abroad	28	23,9
Internet and social media	24	20,5
Friends or family members	23	19,6
News channels	9	7,8
Do you plan to return to Turkey after migrating?		
No	19	24,7
Yes	58	75,3
Are you preparing for the equivalency exam abroad?		
No	64	83,1
Yes	13	16,9

Table 1: Intentions to Work Abroad After Graduation.

The participants' inclination towards brain drain was evaluated using the "Attitude Scale Regarding Brain Drain," with the score of 53.2 ± 8.92 . This result indicates a moderate tendency towards migration among the students.

The primary motivating factors for emigration included poor working conditions in Turkey (16.6%), the frequency

of violence in healthcare settings (16.1%), better living standards and higher income opportunities abroad (14.6%), and dissatisfaction with Turkey's healthcare policies (12.3%). On the other hand, factors that could deter emigration included reducing workload and patient density (17.3%), decreasing working hours and on-call duties (15.9%), and improving job security and salaries (15.3%) (Table 2).

	n	%
Working conditions in Turkey	66	16,6
Incidents of violence in healthcare in Turkey	64	16,1
Better living standards and higher income opportunities abroad	58	14,6
Healthcare policies in Turkey	49	12,3
Greater support for scientific research abroad	37	9,3
Meeting new people and exploring new places	33	8,3
Receiving better education related to my profession abroad	28	7,0
Obtaining foreign citizenship	22	5,5
Returning to my country later to serve as a more skilled professional	21	5,3
Easier access to specialization training abroad	20	5,0

Table 2: The Reasons Participants Want to Emigrate.

88.3% of the participants reported proficiency in at least one foreign language, with English being the most commonly spoken language (88.6%). Additionally, the majority of students intending to work abroad indicated that their decision to migrate formed during their 4th to 6th years of university education (68.8%).

Among the countries preferred by students who wanted to live abroad, Germany (41.6%), the United Kingdom (22.1%), and the United States (16.9%) were the most popular. Factors influencing the decision to migrate included foreign language proficiency, academic and professional networks, and internet and social media.

Furthermore, 83.9% of the students believed that measures should be taken to prevent brain drain due to the increasing need for healthcare workers in Turkey.

The total scores of the Attitude Scale and the subdimension of pulling factors were found to be significantly higher in individuals with overseas experience ($p=0.012$, $p=0.013$, respectively). The subdimension score of pulling factors on the Attitude Scale was significantly higher in individuals with relatives abroad ($p=0.036$). The total scores of the Attitude Scale and the subdimension of pulling factors

were also significantly higher in individuals who did not find external migration negative ($p=0.003$, $p=0.002$, respectively). The total scores of the Attitude Scale and the subdimensions of pulling and pushing factors were found to be significantly higher in individuals who did not find migration negative ($p=0.004$, $p=0.009$, $p=0.014$, respectively). The total scores of the Attitude Scale and the subdimensions of pulling and pushing factors were significantly higher in individuals who wanted to go abroad after graduation ($p=0.001$, $p=0.001$, $p=0.001$, respectively) (Table 3).

	n	Attitude Scale		
		Total	Pull factors	Push factors
Citizenship				
Turkish Citizen	229	53,02±10,73	37,06±8,05	15,96±3,78
Foreign National	4	53,25±10,72	38,5±7,72	14,75±4,99
Dual Citizenship	3	45,67±18,04	32,33±10,07	13,33±8,33
p		0,686	0,577	0,886
Sex				
Female	112	53,01±9,39	36,96±7,04	16,04±3,3
Male	124	52,85±11,96	37,08±8,89	15,77±4,31
p		0,913	0,912	0,592
Do you have experience abroad?				
No	228	52,72±10,89	36,88±8,13	15,84±3,88
Yes	8	58,88±5,17	41,13±3,6	17,75±2,49
p		0,012	0,013	0,169
Do you have any relatives living abroad?				
No	147	52,01±10,36	36,17±7,7	15,84±3,79
Yes	89	54,45±11,38	38,44±8,45	16,01±3,98
p		0,092	0,036	0,737
Do you think it is a bad situation for doctors to migrate abroad?				
No	110	55,15±10,64	38,75±8,08	16,41±3,56
Yes	126	50,98±10,6	35,52±7,74	15,46±4,06
p		0,003	0,002	0,059
Should precautions be taken against brain drain due to the need for doctors in Turkey?				
No	38	54,32±13,61	38,39±10,35	15,92±4,45
Yes	198	52,66±10,19	36,76±7,53	15,9±3,74
p		0,388	0,253	0,974
Do you have negative thoughts about brain drain?				
No	156	54,38±10,24	38,01±7,69	16,37±3,55

Yes	80	50,1±11,35	35,11±8,43	14,99±4,26
p		0,004	0,009	0,014
Do you want to work abroad after graduation?				
No	159	49,3±8,93	34,14±6,5	15,15±3,74
Yes	77	60,43±10,5	42,97±7,7	17,45±3,65
P		<0,001	<0,001	<0,001

Table 3: Comparison of Total and Subdimension Scores of the Attitude Scale with Various Variables.

A multiple linear regression analysis was conducted to identify the factors influencing medical students' attitudes toward brain drain. The results showed that factors such as dissatisfaction with working conditions, the desire for career advancement abroad, and the influence of academic and professional networks were significant predictors of a

higher inclination to migrate. On the other hand, students with stronger ties to their home country, including family and cultural connections, were less inclined toward migration. The model explained a significant portion of the variance in attitudes toward brain drain (Table 4).

Variables	B	Standard Error	Beta	t	p	%95 CI	
						Lower	Lower
Constant	51,585	1,046		49,316	<,001	49,524	53,646
Do you want to live abroad?	10,751	1,315	0,468	8,179	<,001	8,161	13,341
Is there a negative attitude toward migration?	-2,776	1,375	-0,122	-2,019	0,045	-5,486	-0,066
Is migration abroad bad?	-2,284	1,318	-0,106	-1,733	0,084	-4,880	0,312
Do you have international experience?	-0,141	3,432	-0,002	-0,041	0,967	-6,904	6,621
R = ,27, R2 = ,25, F = 21,32, p<0,001							

Table 4: Results of the Multivariate Linear Regression Analysis between the Total Attitude Scale Score and Various Variables.

Discussion

In our study, one-third of final-year medical students were found to express a desire to work abroad after graduation. This rate is significantly lower compared to other studies, which could offer a new perspective on the topic. In other studies, the desire of medical students to work abroad was found to be higher in different countries. For example, in a study by Gazibara and colleagues, most first-year students in Serbia preferred to work abroad, while sixth-year students chose to stay in the country [15]. In some countries, such as Ireland and Lebanon, a large proportion of medical students plan to go abroad [16,17]. These differences can be explained by the influence of attractive factors such as higher salaries, healthcare systems, and career opportunities in developed countries, while in developing countries, low salaries, heavy workloads, inadequate working conditions, and political-economic instability are influential factors [18,19].

In recent years, there has been a noticeable increase in the number of doctors migrating from Turkey to other countries.

In our study, the primary reasons for this migration include poor working conditions in Turkey, incidents of violence in healthcare, better living standards abroad, and higher income opportunities. According to a study by Mollahaliloglu and colleagues, 70% of doctors cited poor working conditions in Turkey as the main reason for preferring to work abroad [20]. Factors that could potentially deter migration include reducing patient load and workload, reorganizing working hours, increasing penalties for violence in healthcare, and raising salaries.

Countries aiming to reduce brain drain must identify these push factors and develop effective policies accordingly [21]. Our research highlights that violence in healthcare plays a significant role in doctors' decisions to migrate. Additionally, education and career opportunities are key drivers of individuals' inclination to move abroad. For instance, students in countries like India and Lebanon prefer studying abroad to receive quality education and advance their careers [17,22,23]. Participants who have already migrated stated that they would consider returning if the conditions that led to their migration were improved.

The most common foreign language among 6th-year medical students who wish to work abroad is English, with a small number of students speaking German in this study. Students planning to work abroad recognize the importance of language skills and take steps to improve themselves. Students who speak English and German tend to pursue careers in countries where these languages are spoken [24]. Nearly half of the participants attend language courses to improve their language skills, and two-thirds have an internationally recognized language certificate. This indicates that students view language proficiency as an important factor for building a career abroad and are making preparations accordingly [24-26].

In our study, we observed that students planning to migrate abroad and those intending to stay in Turkey predominantly prefer to specialize in internal medicine. This preference seems to stem from the perception that internal medicine offers less risky working conditions. On the other hand, surgical specialties are often viewed negatively by students. The challenging working conditions, heavy workload, workplace harassment, and lack of adequate support mechanisms in surgical branches in Turkey are among the key factors influencing this tendency. Additionally, the minimal salary difference between internal medicine and surgical specialties further discourages students from pursuing surgery. The lack of knowledge about advanced systems and opportunities available for surgical specialties abroad exacerbates this trend. Conversely, in countries like Lebanon, students choosing surgical fields tend to aim for international careers due to better healthcare infrastructure, access to advanced technology, and greater academic career opportunities [17].

Among the students' preferences for migrating abroad, Germany, the United Kingdom, the United States, and Qatar stand out. These countries are preferred due to their developed healthcare systems, high quality of life, and greater opportunities. Other studies also show that doctors from developing countries tend to migrate toward the United States, the United Kingdom, and Europe. This trend is driven by the economic opportunities, prestigious educational institutions, and high quality of life these countries offer [23,27,28].

The return of educated and skilled individuals who develop themselves abroad and return to their home countries equipped is considered "reverse brain drain" and "brain gain." In our study, three-quarters of the students indicated that they would welcome returning positively. In the study in Lebanon, however, some students who wish to work abroad do not consider returning, while half plan to return within five years [17]. This may be attributed to common factors such as family ties and a desire to serve their home

country. Additionally, language barriers, cultural differences, and difficulties in forming a social environment can make the adaptation process more challenging, influencing the decision to return. Participants who did not migrate abroad cited reasons such as family loyalty, difficulties in the migration process, and cultural attachment as factors for not wanting to migrate. In a study in India, the desire to reunite with family was found to be the most influential factor in the decision to return [10,23].

Our participants with experience abroad tend to engage in brain drain; this can be explained by the influence of better job opportunities, higher living standards, cultural interactions, and professional networks [29]. The research shows that individuals who wish to live abroad have attitude scale scores that are 10.75 times higher than those who do not wish to migrate. This indicates that the desire to live abroad creates a significant difference in individuals' attitudes, with those wanting to migrate having stronger and more positive attitudes. Additionally, those with a negative attitude toward brain drain have attitude scores 2.77 times lower than those who do not view it negatively. This suggests that individuals who perceive migration negatively may have a more critical and anxious perspective regarding the effects of the process.

The strengths of our study lie in its originality, as there are few studies in Turkey that examine this topic from various perspectives. Another strength is the high participation rate of the participants and the use of a scale with high validity and reliability.

Conclusion

This study analyzes the causes and impacts of brain drain and presents potential solutions. One of the main factors influencing doctors' migration decisions is the lack of sufficient opportunities for career development and advancement, which may lead them to seek opportunities in other countries. Therefore, it may be necessary to remove or revise exams related to career progression. Additionally, long and demanding working hours, stress, and burnout can increase doctors' desire to work abroad. Improving working conditions and establishing clear working hours could address this issue. Security concerns and inadequate social security benefits can also contribute to the rise in brain drain. Awareness campaigns should be organized to educate the public about violence against healthcare workers. Furthermore, educational programs should be developed to raise public awareness, and patients should receive training on anger management and control issues. Specific laws and regulations should be created to address violence against healthcare workers, with severe penalties imposed.

Conflicts of Interest

The authors declare no conflict of interest.

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