

# Great risk for education cost: Brain drain (Resident physicians case)

Eğitim Maliyetlerinde Büyük Risk: Beyin Göçü (Asistan Hekimler Örneği)

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## Abstract

**Background:** One of the biggest losses with regard to the education costs is the brain drain seen among resident physicians, who are a part of the qualified labor force. Brain drain has at the same time a rather adverse effect on the health systems. Difficulties in the education and working conditions of resident physicians may lead to brain drain.

**Aim:** The present study aimed to compare the intent of brain drain in resident physicians by a range of variables (age, gender, marital status, dependents, socio-economic status, professional experience, and job satisfaction) and to investigate the reasons for their intention to migrate.

**Study Design:** Descriptive study.

**Method:** A total of 161 resident physicians working in university and state hospitals in Ankara city center were included in the study. The research data were collected using the questionnaire about the views of resident physicians on brain drain and the Minnesota Job Satisfaction Scale.

**Results:** More than half of the resident physicians participating in the study desired to attend to medical specialty programs abroad (83/161, 51,6%) and to work abroad (89/161, 55,3%). Germany, United States of America, England, and Canada were the most frequently preferred countries for education and employment opportunities. There was a statistically significant relationship between specialty education abroad and gender ( $p=0.016$ ) and socio-economic status ( $p=0.016$ ). While one of the main reasons for attending a medical specialty program abroad is that the education conditions abroad are better, the main reason for the desire to work abroad is the better working and living conditions.

**Conclusion:** More than half of resident physicians in Turkey, want to attend a medical specialty program abroad and work abroad for better education, employment, and living conditions. This poses a great risk for educational costs.

**Key words:** Education Cost, Residency, Brain Drain, Medical Education, Job Satisfaction

## Öz

**Arka Plan:** Eğitim maliyetlerinde en büyük kayıplardan biri nitelikli iş gücü olan asistan hekimler arasında görülen beyin göçüdür. Beyin göçü aynı zamanda sağlık sistemlerini de oldukça olumsuz etkilemektedir. Asistan hekimlerin eğitim ve çalışma koşullarındaki güçlükler beyin göçüne neden olabilmektedir.

**Amaç:** Bu araştırmanın amacı asistan hekimlerde beyin göçü niyeti, bu niyetin çeşitli değişkenler açısından (yaş, cinsiyet, medeni durum, bakmakla yükümlü olduğu kişiler, sosyo ekonomik statüleri, mesleki deneyimleri ve iş doyumları) karşılaştırılması ve göç etme niyetlerinin nedenlerinin belirlenmesidir.

**Çalışma Türü:** Betimsel araştırma

**Yöntem:** Araştırmaya Ankara il merkezinde bulunan üniversite ve devlet hastanelerinde görevli 161 asistan hekim dâhil edildi. Araştırma verileri Asistan Hekimlerin Beyin Göçüne Dair Görüşlerine İlişkin Anket Formu ve Minnesota İş Doyum Ölçeği ile toplandı.

**Bulgular:** Araştırmaya katılan asistan hekimlerin yarısından fazlası yurtdışında uzmanlık eğitimi (%51,6, 83/161) almayı ve yurtdışında çalışmayı (%55,3, 89/161) istemektedir. Eğitim ve çalışmak için en fazla gidilmek istenen ülkeler Almanya, Amerika Birleşik Devletleri, İngiltere ve Kanada olarak sıralanmaktadır. Yurtdışında uzmanlık eğitimi ile cinsiyet ( $p=0,016$ ) ve sosyo ekonomik statü ( $p=0,016$ ) arasında istatistiksel olarak anlamlı bir ilişki saptanmıştır. Yurtdışında uzmanlık eğitimi için en temel nedenlerin başında yurtdışında eğitim koşullarının daha iyi olduğu düşüncesi gelirken, yurtdışında çalışmak isteğinde ise çalışma ve yaşam koşullarının daha iyi olması gelmektedir.

**Sonuç:** Türkiye’de asistan hekimlerin yarısından fazlası daha iyi eğitim, çalışma ve yaşam koşulları nedeni ile yurtdışında uzmanlık eğitimi almak ve yurtdışında çalışmak istiyor. Bu durum eğitim maliyetleri açısından büyük bir risk teşkil etmektedir.

**Anahtar sözcükler:** Eğitim Maliyeti, Asistan Hekim, Beyin Göçü, Tıp Eğitimi, İş Doyumu

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## Introduction

Education and training of labor force in a country is a challenging process associated with significant individual and social costs. The labor market theories suggest that (1), offsetting this cost to the economy by the introduction of qualified labor force is an important factor in the growth and development processes of countries. Although the education and training costs vary among the labor force, it can be suggested that medical education and physician training process is one of the high-cost fields. It was reported in a study on the cost of medical education at Gülhane Military Medical Academy, Turkey, that the cost of the 6-year medical education per student was approximately 270 thousand TL (USD 123.288 based on the average exchange rate of USD in 2014) (2). It can be assumed that the cost of education is much higher due to extra individual expenditures and the opportunity cost (3).

In addition, the transfers between educational levels, and university placement and interdepartmental transfers are based on exam-oriented success in Turkey. Upon a review of the success rates in the university placement exams, only the candidates, who rank within the most successful 1%, have a chance to be placed in medical faculties of public universities as a result of an exam taken by approximately two and a half million students (4). In other words, young people with the highest academic success rates mostly prefer the medical faculties within the scope of central placement exams. These results are an important indicator of the high qualifications of the labor force with medical education. The brain drain of highly qualified physician labor force is a loss of economic, social, and cultural resources for relevant countries. The migration of health workers, which has significant negative effects on health systems, is an increasingly debated issue (5, 6). This migration, which is claimed to have reached a worrying level, has become a global health problem (7,8). Relevant studies suggest that almost half of the healthcare workers in underdeveloped or developing countries want to migrate (6, 9, 10, 11, 12). The migration of healthcare workers has significant adverse effects on the functioning and quality of health systems in these countries (5, 6, 8, 10, 11, 13, 14).

Health worker migration is considered within the scope of brain drain in the literature (13,15). The causes of brain drain are divided into two as 'repulsive factors' associated with poor working and living conditions, and as 'attractive factors' associated with good working and living conditions (15,16). One of the repulsive factors is the low job satisfaction. Among the physicians, the group with the lowest job satisfaction level was reported to be the resident physicians (17). Holding both a student and an employee status during their specialty education, resident physicians encounter many problems in terms of education and employment conditions (18,19). Among the repulsive factors that may cause brain drain, the main problems were the lack of education, mobbing, jobs that can be described as drudgery, the high number of shifts, inadequate physical conditions, violence against the physicians, and low wages (17, 19).

Upon a literature review on brain drain in Turkey, it was seen that most of the studies focused on engineers and physicians and the same was not directly investigated in the case of resident physicians. In general, information about the increase in brain drain among physicians is reflected to the public. While the number of physicians abroad who requested a registration certificate from the Turkish Medical Association (TTB) for working abroad in 2012 was 59, this number increased to 1405 in 2021 (20).

It is of great importance to investigate the level of intention to work abroad in the resident physicians, which is a great risk of loss for both healthcare provision, and education and placement costs, and the underlying reasons in order to develop policies aimed to prevent brain drain of the resident physicians. Accordingly, the present study aimed to compare the intent of brain drain in resident physicians by a range of variables (age, gender, marital status, dependents, socio-economic status, professional experience, and job satisfaction) and to investigate the reasons for their intention to migrate.

## Method

The present study on brain drain and job satisfaction in resident was designed as a descriptive study. A total of 161 (3,06%) respondents out 5259 assistant physicians employed in the university and state hospitals

in Ankara city center (21) were included in the study. The participants of the study were selected by snowball sampling method. The sample is formed based on certain questions, including "Who can I get information about this subject from?" and "Who else can I get information about this subject from?" in cases, where it is difficult to reach the whole universe (22, 23). Within the scope of this research, 'who to get information about the interview from' question was asked. Later, the interviewees were asked the same question again and new participants were reached.

Data were obtained using a questionnaire form and Job Satisfaction Scale. The "Questionnaire Form Regarding the Opinions of Assistant Physicians on Brain Drain" was developed by the researchers by examining the relevant literature (5,10,12,14,17) and taking expert opinion. With this form, data as regards the participants' desire for attending a medical specialty program abroad, the country they want to attend that program, the reasons for attending such a program, information about their post-training plans and their desire to work abroad, the country they want to work in and the reasons for working abroad were collected.

"Minnesota Job Satisfaction Scale" which was adapted into Turkish by Aslı Baycan in 1982 was used in data collection (24). With this scale, data were obtained on residents' inner job satisfaction based on such variables as success, motivation, recognition, and responsibility; outer job satisfaction based on such variables as working conditions, job hierarchy, management, and wage, and general job satisfaction, where both were evaluated together.

Ethics committee approval was obtained from Ethics Committee of Ankara University for the study upon the decision dated 07/01/2020 and numbered 01/05. Subsequent to the ethical approval, research data were collected between January 15, 2020 - June 30, 2020.

Data analysis was performed with Statistical Package for the Social Sciences (SPSS) version 21 software. Assessment for the distribution of normality was examined by using visual (histograms and probability plots) and analytical methods (Kolmogorov-Smirnov / Shapiro-Wilk

tests). Descriptive statistics were calculated using mean and standard deviation for normally distributed numerical variables, and median and interquartile range (IQR) for non-normally distributed variables. Student t-test was used for binary comparison of normally distributed numerical variables, and Mann Whitney U test was used for binary comparison of non-normally distributed numerical variables. Proportions in diverse group comparisons were made using Chi-square or Fisher tests depending on whether there was a difference between the groups in terms of frequencies. In the comparisons, where the p value was less than 0.05 were considered as statistically significant results.

## Results

### Selected Characteristics

Sixty-five (40,4%) of the resident physicians participating in the study were females. The mean age of the participants was  $27,8 \pm 2,3$ . In total 108 (67,1%) of the participating assistants were single, 74 (45,6%) of them stated that they had no dependents. More than half of the participants (55,3%) defined their socioeconomic status as middle class. The professional experiences of the resident physicians participating in the study show a balanced distribution according to percentage distributions between 1-5 years. The overall job satisfaction score of the participants was 62,7, where the internal and external job satisfaction scores were 38,9 and 23,8, respectively (Table 1).

### Intention to Study Abroad

Eighty-three (51,6%) of the resident physicians participating in the study wanted to attend a medical specialty program abroad. Germany (41,0%), USA (33,7%), England (26,5%) and Canada (19%) were the leading countries, where the resident physicians preferred to receive specialty education abroad. A total of 27 (32,5%) the participants, who wanted to study abroad did not plan to return to country after completing their education, on the other hand the rate of those, who stated that they want to turn back after the training was 19,3% (Table 2).

The reasons raised by the participants, who stated that they wanted to attend a medical specialty program abroad, included the opportunity to perform more academic studies (91,6%), higher value for new ideas and inventions (91,6%),

Table 1. Selected characteristics			
Selected characteristics	f (%)	Selected characteristics	f (%)
<b>Sex</b>		<b>Socioeconomic status</b>	
Female	65 (40,4)	Lower middle class	7 (4,3)
Male	96 (59,6)	Middle class	89 (55,3)
<b>Total</b>	<b>161 (100,0)</b>	Upper middle class	61 (37,9)
<b>Age groups</b>		Upper class	4 (2,5)
<27	52 (32,3)	<b>Total</b>	<b>161 (100,0)</b>
27-29	83 (51,6)	<b>Professional experience</b>	
≥ 30	26 (16,1)	< 1 year	25 (15,5)
<b>Total</b>	<b>161 (100,0)</b>	1 - <2 years	28 (17,4)
<b>Marital status</b>		≥2 - <3 years	33 (20,5)
Married	53 (32,9)	≥3 - <4 years	22 (13,7)
Single	108 (67,1)	≥4 - <5 years	28 (17,4)
<b>Total</b>	<b>161 (100,0)</b>	≥ 5 years	25 (15,5)
<b>Dependents (Spouse, Child(ren), Parents and/or Other)</b>		<b>Total</b>	<b>161 (100,0)</b>
Yes	87 (54,0)	<b>Job satisfaction</b>	
No	74 (46,0)	MSQ* – Overall, mean (SD)	62,7 (13,4)
<b>Total</b>	<b>161 (100,0)</b>	MSQ – Intrinsic, mean (SD)	38,9 (8,1)
		MSQ – Extrinsic, mean (SD)	23,8 (6,0)

Except where indicated otherwise, values are the number (%) of participants.  
 \*MSQ; Minnesota Job Satisfaction Questionnaire, SD; standard deviation.

better technological infrastructure (89,2%), better social conditions (88,0%), and emphasis on education (86,8%) (Table 3).

### Intention to Work Abroad

Eighty-nine (55,3%) of the resident physicians participating in the study wanted to work abroad. The most preferred countries to work abroad were Germany (41,6%), USA (39,3%), Canada (25,8%) and England (21,4%), respectively (Table 2).

The primary reason for migration of resident physicians, who stated their request to work abroad included higher living standards (93,3%), better working conditions (88,9%), and no violence against healthcare workers (86,7%), more abundant and accessible job and career opportunities (84,3%), and higher income opportunities (76,4%) (Table 3).

### Relationship between Intention to Study Abroad and Selected Characteristics

There was a significant relationship between

the participant resident physicians' intention to study abroad and their gender ( $p=0.016$ ) and economic status ( $p=0.033$ ). On the other hand, a review of frequency and percentage values indicated that the intention to attend to a medical specialty program abroad (63,1%) was higher in the female resident physicians, who participated in the study. With respect to age, the intention to study abroad was higher among resident physicians aged under 27 years (63,5%). As regards professional experience, the highest rate (67,9%) was found in residents with  $\geq 2$  to  $<3$  years (63,6%) of professional experience (Table 1). The relationship between job satisfaction and brain drain among resident physicians participating in the study was evaluated using the Minnesota Job Satisfaction Scale. Accordingly, there was no statistically significant relation between job satisfaction and intention to study abroad. Similarly, there was no statistically significant relation between the job satisfaction as measured by the inner (MSQ-Intrinsic) and outer (MSQ-Extrinsic) subdomains and the intention to study abroad (Table 4).

**Table 2.** Intention of the participants to continue medical education and/or to work abroad

<b>Regarding to Attend to a medical specialty program at abroad</b>	<b>f (%)</b>	<b>Regarding to Work abroad</b>	<b>f (%)</b>
Yes	83 (51,5)	Yes	89 (55,3)
No	78 (48,1)	No	72 (44,7)
<b>Total</b>	<b>161 (100,0)</b>	<b>Total</b>	<b>161 (100,0)</b>
<b>Country of Medical Specialty Program</b>		<b>Country of Employment</b>	
Germany	34 (41,0)	Germany	37 (41,6)
USA	28 (33,7)	USA	35 (39,3)
UK	22 (26,5)	Canada	23 (25,8)
Canada	16 (19,3)	UK	19 (21,4)
Other	7 (8,4)	Other	3 (3,4)
<b>Plans following the specialty program</b>			
Turning back after completion of the program	16 (19,3)		
Work for less than 5 years and turning back	17 (20,5)		
Working for 5-10 years and turning back	14 (16,9)		
Working for more than 10 years and turning back	4 (4,8)		
Do not want to turn back	27 (32,5)		
Other	5 (6,0)		
<b>Total</b>	<b>83 (100,0)</b>		

### Relationship between Intention to Work Abroad and Selected Characteristics

There was no statistically significant relation between the intention to work abroad and selected variables in the participant resident physicians. Whereas as regards frequency and percentage distribution, the female participants had a higher rate of intention to work abroad (61,5%). With respect to age, the intention to work abroad was higher among resident physicians aged 30 years and above 25 years. The rate of intention to work abroad (57,7%.) was higher in resident physicians, who had to look after their spouse, child (or children), mother, father and/or other dependents. As regards professional experience, the highest rate (67,9%) of intention to work abroad was in the resident physicians with 1-2 years of professional

experience (66,7%). There was a statistically significant relation between job satisfaction and the intention to work abroad. Similarly, there was no statistically significant relation between the job satisfaction as measured by the inner (MSQ-Intrinsic) and outer (MSQ-Extrinsic) subdomains and the intention to work abroad (Table 4).

### Discussion

In the present study, which aimed to investigate the brain drain intention in resident physicians, compare the said intention by a range of various variables, and investigate the reasons for their intention to migrate, the intention to study and work abroad, the country of destination, the reasons for brain drain, and the relationship between brain drain and job satisfaction were discussed.

<b>Table 3. Reasons for participants' brain drain intentions</b>					
	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Unsure</b>	<b>Agree</b>	<b>Strongly Agree</b>
	f (%)	f (%)	f (%)	f (%)	f (%)
<b>Distribution of Data Regarding the Reasons for Intention to Attend to a Medical Specialty Program Abroad (n=83)</b>					
Asistant training more qualified	3 (3,6)	2 (2,4)	12 (14,5)	40 (48,2)	26 (31,3)
More pratice possibilities during assistant training	4 (4,8)	10 (12,0)	17 (20,5)	35 (42,2)	17 (20,5)
Possibility to join more academic studies	2 (2,4)	2 (2,4)	3 (3,6)	30 (36,1)	46 (55,5)
Less workload	4 (4,8)	8 (9,6)	18 (21,7)	18 (21,7)	35 (42,2)
Education is more promiment	1 (1,2)	2 (2,4)	8 (9,6)	27 (32,5)	45 (54,3)
Giving more value to new ideals and inventions	2 (2,4)	2 (2,4)	3 (3,6)	28 (33,7)	48 (57,9)
Technological infrastructure is better	2 (2,4)	2 (2,4)	5 (6,0)	22 (26,5)	52 (62,7)
Academic hierarchy is not too strict	2 (2,4)	8 (9,6)	34 (41,0)	17 (20,5)	22 (26,5)
Academic promotion criteria to be more objective	2 (2,4)	3 (3,6)	19 (22,9)	25 (30,1)	34 (41,00)
No worries about future	2 (2,4)	5 (6,0)	16 (19,3)	23 (27,7)	37 (44,6)
Social conditios are better	1 (1,2)	4 (4,8)	5 (6,0)	25 (30,1)	48 (57,9)
My personal attention and desire to be training abroad	2 (2,4)	9 (10,8)	12 (14,5)	28 (33,7)	32 (38,6)
High job satisfaction	1 (1,2)	9 (10,8)	21 (25,4)	27 (32,5)	25(30,1)
<b>Distribution of Data Regarding the Reasons for Working Abroad (n=89)</b>					
Saleries of asistants' are higer	3(3,4)	7 (7,9)	19 (21,3)	39 (43,8)	21 (23,6)
No compulsory service obligation after residency	3(3,4)	7 (7,9)	19 (21,3)	36 (40,4)	24 (27,0)
No performance anxiety during healthcare	4 (4,5)	5 (5,6)	18 (20,2)	32 (36,0)	30 (33,7)
Easier and more accessible job and career opportunities	3(3,4)	3(3,4)	8 (9,0)	36 (40,4)	39 (43,8)
My personal attention and desire isto work abroad	3(3,4)	7 (7,9)	15 (16,9)	30 (33,7)	34 (38,1)
Having high income oportunities abroad	3(3,4)	3(3,4)	15 (16,9)	37 (41,6)	31 (34,7)
Better working conditions	4 (4,5)	2 (2,2)	3(3,4)	28 (31,5)	52 (58,4)
No violence against healthcare professionals	5 (5,6)	3(3,4)	3(3,4)	20 (22,3)	58 (65,2)
The political conditions are more suitable dor my lifestyle/philosophy	3(3,4)	12 (13,5)	17 (19,1)	25 (28,0)	32 (36,0)
High living standards	3(3,4)	1 (1,1)	2 (2,2)	25 (28,0)	58 (65,3)

**Table 4.** Relationship between selected characteristics and intention of the participants to continue medical education abroad and to work abroad

Selected characteristics	Attend to a Medical Specialty Program			Want to Work Abroad		
	Yes	No	p	Yes	No	p
	f (%)	f (%)		f (%)	f(%)	
<b>Sex</b>			0.016			0.189
Male	42(43,8)	54(56,3)		49(51,0)	47 (47,0)	
Female	41 (63,1)	24 (36,9)		40 (61,5)	25 (38,5)	
<b>Age groups</b>			0.113			0.381
<27	33 (63,5)	19 (36,5)		30 (57,7)	22 (42,3)	
27-29	38 (45,8)	45 (54,2)		42 (50,6)	41 (49,4)	
≥ 30	12 (46,2)	14 (53,8)		17 (65,4)	9 (34,9)	
<b>Marital status</b>			0.657			0.920
Single	57 (52,8)	51 (47,2)		60 (55,6)	48 (44,4)	
Married	26 (49,1)	27 (50,9)		29 (54,7)	24 (45,3)	
<b>Dependents (Spouse, Child(ren), Parents and/or Other)</b>			0.962			0.544
Yes	45 (51,7)	42 (48,3)		50 (57,5)	37 (42,5)	
No	38 (51,4)	36(48,6)		39 (52,7)	35 (47,3)	
<b>Socioeconomic status</b>			0.016			0.763
Lower middle + Middle	42 (43,8)	54 (56,3)		54 (56,3)	42 (43,8)	
Upper middle + upper	41 (63,1)	24 (36,9)		35 (53,8)	30 (46,2)	
<b>Professional experience</b>			0.516			0.481
< 1 year	12 (50,0)	12 (50,0)		11 (45,8)	13 (54,2)	
1 - <2 years	17 (56,7)	13 (43,3)		20 (66,7)	10 (33,3)	
≥2 - <3 years	21 (63,6)	12 (36,4)		19 (57,6)	14 (42,4)	
≥3 - <4 years	11 (50,0)	11 (50,0)		9 (40,9)	13 (59,1)	
≥4 - <5 years	13 (44,8)	16 (55,2)		17 (58,6)	12 (41,4)	
≥ 5 years	9 (39,1)	14 (60,9)		13 (56,5)	10 (43,5)	
<b>Job satisfaction</b>						
MSQ – Overall, mean (SD)	61,6 (14,4)	63,9 (12,2)	0.274	61,4 (13,6)	64,3 (13,0)	0.181
MSQ – Intrinsic, mean (SD)	38,4 (8,7)	39,5 (7,3)	0.200	38,1 (8,3)	39,89 (7,8)	0.262
MSQ – Extrinsic, mean (SD)	23,2 (6,5)	24,4 (5,5)	0.389	23,3 (6,1)	24.38 (6,0)	0.166
<b>f(%) within selected characteristics</b>						

According to the results obtained from the research findings, more than half of the resident physicians wanted to attend to a medical specialty program and work abroad. This rate is higher than the results obtained in research conducted in other developing countries like Turkey. In a study conducted in Croatia in 2015, the rate of medical students, who wanted to study abroad, was found to be 27%, and a study published in Peru in 2019 found the same rate to be 7,4% (5, 9). In another study from Pakistan in 2016, the rate of medical students / resident physicians, who wanted to work abroad, was found to be 52,9%, where the same rate was 44,6% in a study conducted in Uganda in 2015, and 28,9% in a study in South America in 2013 (7,10,25). The above rather high rate in Turkey may be associated with the challenges during education and working conditions of the resident physicians (YÖK, TTB), and the effect of attractive factors found within the scope of this study.

The participant resident physicians mostly preferred Germany, USA, England, and Canada, respectively to attend a medical specialty program. Similarly, Germany, USA, Canada, and England came to the fore as regards the choice of venue for working abroad. These results are indicative of the fact that resident physicians in Turkey intend to receive specialty training and work in developed countries, which would provide better education and working conditions. This is consistent with the research results suggesting that the brain drain is directed to North America and Western European countries (6,9, 10, 12, 15, 26).

In this study, approximately one third of the participant assistants, who stated that they wanted to go abroad for specialty education did not intend to return. This rate is higher than the results of similar studies conducted at home and abroad (6,15). A decreased hope of resident physicians for a solution to the problems within the health system may account for the above.

According to the results of the present study, the main reasons of why the resident physicians wanted to attend to a medical specialty program abroad included the fact that new ideas and inventions were more valued along with more opportunities to perform academic studies, better technological infrastructure, better social

conditions, and emphasis on education. These results showed that resident physicians, who wanted to study abroad, were not satisfied with the current education and demanded a better education. The report conducted by the TTB on resident physicians in 2015 also clearly demonstrates this situation (19). According to this report, 66,6% of the residents stated that the quality of the education was not high, 67% had two hours or less education per week, 58,1% did not get enough guidance regarding their future careers, 53,2% stated that the current education resources were not adequate for a specialty program (19). Problems and shortcomings encountered by the resident physicians in Turkey associated with the education process were also demonstrated in a study by the Higher Education Council (YÖK) in 2017 (18). According to the YÖK's study, some of the problems as regards the education of the resident physicians were as follows: the inadequate number and quality of instructors, lack of sufficient support from the institutions as regards attending congresses, that most of the assistant physicians can spare only one hour to one and a half hours a week for academic and scientific studies, and that one fourth of the institutions do not have a visit practice (18). Studies conducted in developing countries indicate that medical students also want to study abroad for similar reasons (6, 9, 14).

According to the findings of the present study, the main reasons for why the resident physicians wanted to work abroad, included higher living standards, better working conditions, no violence against healthcare workers, more abundant and accessible job and career opportunities, and higher income opportunities. These results primarily suggest the dissatisfaction of the participant residents with the living and working conditions in our country. In the report conducted by YÖK, it was concluded that the rate of dissatisfaction of the resident physicians with the living conditions in our country was 67% (18). Consistent with similar studies in the literature, economic reasons play an important role in the desire of physicians and medical students to work abroad (7, 9, 10, 27, 28). In our study, violence against healthcare workers stands out among the causes of brain drain. In the study conducted by YÖK on resident physicians; it was found that 84.6% of resident physicians experienced verbal violence and 28% experienced physical



violence at least once (18). It was suggested that violence against physicians was an important factor in brain drain in Pakistan (10). Other driving factors that cause brain drain in physicians were suggested in the literature, including unemployment, excessive workload, low wages, infrastructure and equipment deficiencies, unethical behavior, low quality of life, poor job satisfaction, low job motivation, political and economic instabilities and conflicts, and risky working conditions (5, 7, 10, 16, 27, 29). On the other hand, the attractive factors included better living standards, better health services, emphasis on scientific and academic studies, higher quality of working conditions and education system, more financial rewards, and improved working conditions at abroad (5, 10, 14, 16, 29).

In the present study, there was a statistically significant relationship between specialty education abroad and gender and socioeconomic status. However, in terms of frequency and percentage distributions, the intention for specialty education abroad was higher in female, young residents, and residents with a middle-upper, and upper socio-economic status and 2-3 years of professional experience. Although there was no statistically significant relationship between the intention to work abroad and various categories (age, gender, marital status, dependent persons, socio-economic status, and professional experience), the rate of intention to work abroad was higher in female resident physicians and residents, who aged 30 years or above, who had dependents, who defined themselves in middle and middle-lower socioeconomic status, and who had 1-2 years of professional experience. One of the reasons associated with the higher rate in the female participants as regards intention to study and work abroad is the status of women in business life and the fact that violence against women is more common in Turkey. In the literature, the desire of women to migrate was found to be higher in a study conducted in Pakistan (10). On the other hand, the desire to work abroad was higher among men in the study conducted in Uganda (6). In terms of age and professional experience, there are studies suggesting that young physicians are more likely to leave the country compared to the senior physicians (13). In our current study, it was concluded that the desire to work abroad was higher in young

physicians with 1-2 years professional experience. This may suggest that young people in Turkey are not comfortable with the current situation, are not happy, and are desperate for the future. (30) In a study conducted in South Africa in 2013, there was a relationship between young age, male sex, single status, and low job satisfaction and the desire to migrate (25). In contrast to a study conducted in Saxony, Germany in 2016, which suggested that the family factor had a lowering effect on the desire to migrate, the physicians, who had children, had a higher desire to work abroad in our study (31). This suggests that the resident physicians in Turkey have future anxiety with regard to their children.

According to the results of current study, there was no statistically significant relationship between job satisfaction and their desire to study and work abroad in resident physicians. However, the general job satisfaction scores (62.7) of the resident physicians are very close to the neutral 60 points according to the Minnesota Job Satisfaction Scale. Low job satisfaction is one of the driving factors causing brain drain. Relevant studies in the literature reported low job satisfaction scores in resident physicians. (32,33,34) The low job satisfaction scores in the resident physicians may account for the higher rates of intention to study and work abroad.

COVID-19 outbreak began to spread rapidly in Turkey, when the data collection for the purposes of the study was still underway. The outbreak negatively affected the educational processes of medical students (35). It started new discussions about the deficiencies the medical students encounter in education (28-36). The training processes of resident physicians, who continue their medical specialty training, were also negatively affected by the extraordinary conditions created by the outbreak of the COVID-19. The pandemic also put great pressure on the working conditions of resident physicians. It was seen that the COVID-19 pandemic brings along problems such as feeling in danger, loneliness, lack of self-confidence, and fear of infecting loved ones, in addition to the problems currently experienced by resident physicians (37).

It can be stated that this situation creates novel adverse effects on the job satisfaction, working and living conditions of the resident physicians.

Studies showed that problems with adverse effects on working and living conditions also lead to an inverse relationship between the job satisfaction of physicians and job alienation and leaving the job (27, 38). The fact that the desire of the resident physicians in Turkey to attend to a medical specialty program abroad and work abroad is higher in Turkey compared to other countries, suggests the effects of the controversies created by the pandemic process.

The present study found very high rates of intention to brain drain in the resident physicians in Turkey. The intentions to work or study abroad may not prove to be a true migration (9). Yet it is important as an indication of the brain drain potential. The size of the said potential is associated with high risk as regards education costs.

The present study, which investigated the intention to study and work abroad, has certain limitations. The first is the fact due to the intensity and obstacles associated with the COVID-19 outbreak, the sample selection was limited to the state and university hospitals in the city center of Ankara, and thus the number of participants was limited as well. Furthermore, the study is limited to the responses of the participants to the items included in the questionnaires. This research aimed to reveal the current situation at a particular moment. Prospective studies with a similar sample size that would more comprehensively investigate how much of the desire to study and work abroad has become a reality and the determinant variables in this process would be instructive. Despite this limitation, the present study will contribute to the literature as a pioneering study of brain drain in resident physicians in our country. At the same time, this study can help politicians and administrators with improving both the education and working conditions of healthcare professionals, based on the results of the study. The persons and institutions involved in the medical specialty education may be encouraged to revise their educational policies and practices. Therefore, it may contribute to reducing the rate of the intent to work abroad turns into reality, reducing the brain drain and preventing likely losses in education costs.

## Conclusion

The results of the present study on the example

of resident physicians as a part of the highly qualified workforce indicates the risk of loss in education costs. This study showed that more than half of the resident physicians wanted to attend to a medical specialty program abroad and considered brain drain. It was seen that more than one-third of resident physicians, who wanted to work abroad, did not want to return Turkey again. These results can be evaluated as an opportunity to reverse the trends in the migration of resident physicians in Turkey, which may have potentially serious consequences on the functioning of the health system. Taking into consideration the high desire for brain drain in resident physicians, the officials may implement policies that would improve the education, working, and living conditions of the resident physicians education on the basis of reasons of migration.

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