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# Asistan hekimlerin beyin göçüne yönelik tutumlarının yaşam doyumları ve proaktif kişilik özellikleri ile ilişkisi

# *The Relationship between resident doctors' attitudes towards brain drain and their life satisfaction and proactive personality traits*

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## Özet

**Amaç:** Bu çalışmanın amacı, İstanbul/Türkiye'deki asistan doktorlarda beyin göçü eğilimlerinin şiddetini ve etkileyen faktörleri araştırmaktır.

**Gereç ve Yöntem:** Bu kesitsel çalışma için yerel etik kuruldan (07.01.2022/09.2022.141) ve Marmara Üniversitesi Dekanlığı'an onay alınmış ayrıca katılımcıların bilgilendirilmiş onamları alınmıştır. Veriler, Ocak-Şubat/2022 döneminde Beyin Göçü Tutum Ölçeği (ASBD), Yaşam Doyumu Ölçeği (SWLS) ve Kısa Proaktif Kişilik Ölçeği (APPS) içeren bir anket aracılığıyla toplanmıştır. Hesaplanan örneklem büyüklüğü 263 kişi olup, tabakalı örnekleme yöntemiyle seçilmiştir.

**Bulgular:** Medyan yaş 28,0 yıl (ortalama ± standart sapma: 28,4 ± 2,5, aralık: 23-41) idi. Katılımcıların beyin göçü eğilimi (62,8 ± 9,4) ve proaktif kişilik özellikleri (medyan: 51,0) yüksek ancak yaşam doyumları düşüktü (17,1 ± 6,2). Proaktif kişilik özellikleri ile beyin göçü eğilimi arasında pozitif yönlü (r: 0,20, p = 0.002) ancak yaşam doyumu ile ters yönlü bir korelasyon (r: -0,42, p = 0.001) saptandı. Proaktif kişilik özellikleri (OR: 1,03, %95 GA: 1.00-1.06) ve yaşam doyumu (OR: 0,8, %95 GA: 0,82-0,93) beyin göçünü etkileyen iki faktör olarak bulunmuştur.

**Sonuç:** Çalışmamızda, asistan hekimlerin yaşam memnuniyetleri düşük, proaktif kişilik özellikleri yüksek ve beyin göçü eğilimleri yüksek bulunmuştur.

**Anahtar kelimeler:** Uluslararası göç, insan göçü, sağlıkta şiddet, sağlık çalışanları, beyin göçü.

## Summary

**Aim:** Our objective was to investigate the magnitude of brain-drain trends and influencing factors in a group of resident medical doctors in Istanbul/Türkiye.

**Materials and Methods:** Data were collected in January-February/2022 through a questionnaire containing the Attitude Scale for Brain Drain (ASBD), Satisfaction with Life Scale (SWLS), Abbreviated Proactive Personality Scale (APPS). The calculated sample size was 263 and was selected by stratified-sampling. Approvals were received from the Dean of Marmara University, local ethics committee (07.01.2022/09.2022.141), and also informed consent forms were collected from the participants for this cross-sectional study.

**Results:** The median-age was 28.0 years (28.4±2.5, 23-41). A high tendency toward brain-drain (62.8±9.4) and highly proactive personality traits (median: 51.0) were found, where as levels of satisfaction with life were low (17.1±6.2). The tendency towards brain-drain showed a positive correlation (r: 0.20, p=0.002) with the proactive personality traits and an inverse correlation with life satisfaction (r:-0.42, p=0.001), Only proactive personality traits (OR: 1.03, %95CI 1.00-1.06) and satisfaction with life (OR: 0.8, %95CI 0.82-0.93) measures seem to affect the brain-drain.

**Conclusion:** We found that the resident doctors have a low level of satisfaction with their lives, have high proactive personal traits and have a high tendency toward brain drain.

**Keywords:** International migration, human migration, violence in health, healthcare workers, brain drain.

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## Introduction

'Brain drain' is defined as migration of productive individuals, who have had higher education or who are competent in their professions, to countries with better socioeconomic conditions than the country they're in for the purposes of living and working[1] for the countries, the technology they have developed, the intellectual accumulation created through collective memory and qualified workforce are decisive factors for the struggle in development.[2] The strategies elaborated by developed countries to attract brain drain result in already trained and employed or promising qualified individuals in less developed countries to leave as they are unable to attain the opportunities and conditions of work that they seek.[3] Countries that face rapid brain drain also lose the investments that they have made in human capital and in their future.[4]

It is very important, especially for the developing countries, to understand the causes of brain drain, in order to determine the affecting factors and to develop solutions against them. Why would a person tend to leave the society that he/she was born into and raised in? Does everybody have this tendency? Why is it that especially well-educated people choose to live in other lands? Türkiye has just a few studies analyzing the concept of brain drain in general.

While the studies dating back to the late 1960s and 1970s attribute the brain drain to essentially economic reasons, in the 2000s, the driving factors stand out to be the low value attributed to the science/academy personnel, poor working conditions, political instability in addition to low income inspite of high inflation rates and concerns over career development. On the other hand, in the last decade, restrictions in academic freedom and scientific policies and the problems faced in the education system have been the main factors of the brain drain. Migration, mostly towards the west, seems to be resulted from the differences in living standards and the gap in the level of income between Türkiye and the "chosen country" have become secondary factors in the decision of the qualified individuals to migrate/and not to return.[5,6]

In Türkiye, being a medical doctor is the profession that anybody would yearn for as one of the most trusted, the most charismatic and the most respectable professions.[7,8] After 6 years of study at the school of medicine, which is accessible by a national entrance exam following a difficult and onerous high school education, a compulsory service of a mandatory approximately 2 year-period of work follows of which the service location is decided through a draw. To be able to start a specialization training one should pass another difficult exam. Specialist training takes 3 to 6 years depending on the branch and is followed by another compulsory service term of 2 years.

Also taking into consideration the compulsory military service for male medical doctors lasting 16 months, it is only possible for a medical doctor to start professional life after a difficult 15 to 16 years of training and service.[9] The expectations of this professional group, with so much hard work dedicated to the profession, would be to be equipped with the latest medical knowledge in order to be able to serve the best quality and

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the safest medical practice to society, in fair and secure working environments, in which they are fairly rewarded for their hard work.[10,11]

Since 2010, parallel to the neoliberal economic transformation worldwide, privatization in healthcare services has been encouraged in Türkiye by the implementation of the Transformation in Healthcare Program. The change that came about in the perception of healthcare services has resulted in the medical doctors being forced to work in environments that do not support them from the perspective of their rights and benefits as well as their physical and mental health.[12,13] Medical doctors are in the high-risk profession group. As it is known, many medical doctors were infected with the COVID-19 virus during the pandemic and some of them lost their lives.

In countries such as Italy, France, Belgium, South Africa, Canada and Malaysia, Covid-19 infections have been considered as occupational injuries/occupational diseases. However, Covid-19 is not considered yet as an occupational disease in Türkiye, further increasing the distrust and frustration among the health personnel. In addition, the gradual incline of the social and physical violence inflicted on the health personnel, with respect to which the local laws prove to be inadequate, has further enhanced the discontent among the medical doctors, leading them to seek something new.[14]

According to the figures disclosed by the Turkish Medical Association, the professional organization for the medical doctors in Türkiye, the number of medical doctors demanding a certificate of 'good standing' in order to work abroad reached 1405 in 2021, and 1171 the first 6 months in 2022 as compared to 59 in 2012. The number of migrating specialist medical doctors seems to be on a rising trend in the last years.[15]

Proactive people are people, who seize opportunities, take initiative, take action and make effort decisively until they attain an important change. No research has been found inquiring into the relationship between the proactive personality traits, defined as individual traits making an individual able to start a change that he/she considers necessary on his/her free will, without taking orders- and migration, a serious and demanding change in life.[16,17,18]

Another factor possibly causing migration is that the individuals are not as satisfied with their lives as much as they would like to be. Satisfaction with life, on the other hand, is the expression of such satisfaction through an assessment made by the persons themselves on a cognitive level, based on subjective criteria.[19] The concept of brain drain of the medical doctors probably has a complex nature, affected by many push and pull factors.[20]

In this study, the purpose is to inquire about the attitudes regarding brain drain of the resident doctors training to become specialists in internal subspecialty branches and surgical medicine branches at a medical school of a public university in Istanbul and factors that may have an effect on their attitudes, such as "proactive personality traits and satisfaction with life".

## Materials And Method

This cross-sectional study was conducted in January and February 2022 in a medical school of a public university in Istanbul.

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Approval was received from the local ethics committee (07.01.2022/09.2022.141), authorization was received from the Dean's Office of the School of Medicine and informed consents have been received from the participants.

The universe of the study is constituted by the 828 resident doctors training to become specialists on internal medicine subspecialty branches and surgery specialties. Minimum sampling size was calculated as 263 people in Open-EPI program with a confidence level of 95%. The number of people in the sampling was stratified based on the number of resident doctors training in each branch; and the target was set as 191 resident doctors from internal medicine subspecialty branches and 72 resident doctors from surgery branches specialties.

Data were collected through face-to-face interviews, inviting to the study and were given a self-administered questionnaire online. Pandemic conditions were taken into consideration at the stage of data collection and requirements for masks, social distancing and hygiene were duly observed.

A questionnaire consisting of 4 parts was used as the tool for collecting data. The first part of the questionnaire includes questions on certain experiences (such as suffering from verbal, physical, economic violence etc.) in professional life in addition to socio-demographic characteristics (20 items). The second part features the Satisfaction with Life Scale (SWLS), the third part features the Attitude Scale for Brain Drain (ASBD) and the last part features the Abbreviated Proactive Personality Scale (APPS).

Satisfaction with Life Scale; is a 5-item, 1-7 Likert-type scale developed by Diener et al. in 1985, with respect to which validity-reliability study in Turkish was conducted by Dağlı and Baysal (Cronbach Alpha coefficient 0.88).[19] Scores from the scale vary between 7 to 35. The higher scores from the scale, means greater satisfaction with life.

The Attitude Scale for Brain Drain developed by Öncü et al. in 2018 for nursing students was used to determine the attitude towards brain drain (Cronbach Alfa coefficient: 0.91).[21] In this 6-item, 1-5 Likert type scale, 2 items are reversely-coded. A minimum of 16 and a maximum of 80 can be scored on the scale and the tendency towards brain drain increases as the score increases.

The Abbreviated Proactive Personality Scale finalized by Claes et al. in 2005, with Turkish version proven to be valid and reliable by Akın et al. in 2011 (Cronbach Alfa coefficient: 0.86) contains 10 items of 1-7 Likert type, with the score varying between 10 and 70. A higher score from scale points out to more proactive personality traits.[22]

SPSS program was used to analyze the data. At first, Kolmogorov-Smirnov normality test was done. The characteristics of participants were compared using the chi-square test for categorical variables and the Student t-test/ Mann- Whitney U, One-way ANOVA for continuous variables. For analyzing correlation, Pearson and Spearman Correlation tests were done.

Odds ratios (ORs) for each variable with the potential to affect attitudes towards brain drain were estimated using Binary Logistic Regression model. The median score of the participants on the attitude scale for

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brain drain was accepted as the cut-off point. The group that scored below the median value was chosen as the indicator group. The enter method was used while creating the logistic regression model.

The suitability of the model to the data was demonstrated by the Hosmer-Lemeshow test. The following variables, which were found to have a statistically significant relationship with the attitude towards brain drain in pair wise comparisons ($p<0.05$), were included in the model; age, status of having children, income status, verbal violence, economic violence, SWLS score and APPS score. Income status is placed in the model by expressing it as a dummy variable.

## Results

Two hundred and twenty-eight out of the targeted 263 resident doctors were accessed for the study (response rate: 87 %). Most of the participants were citizens of the Republic of Türkiye (88.4%) and 59.7% of the participants were female. The median age of the participants was 28.0 (28.4±2.5, range:23-41). Socio-demographic characteristics of the participants are presented in **Table 1**. Among our participants, 72% of them were from internal medicine subspecialties (n/N=164/602), while 28% were from surgical specialties (n/N=64/226) (**Table 1**).

The participants had a median professional duration of 4.0 years (range:1.0-16.0 years), and the median time they spent in specialty training was 18 months (range:1-69 months). The findings regarding professional preferences of the participants as a medical doctor and their future plans are presented in **Table1**.

Approximately half of the participants (46%) said they want to live and work abroad permanently, while 32% participants said they want to live abroad temporarily for educational purposes, and only 15% said they wanted to remain in Türkiye. Half (48.3%) of the participants, who said that they wanted to go, stated that they wanted to leave Türkiye for economic reasons. The reasons that followed as reasons to migrate were the poor working conditions in Türkiye (38.6%), low welfare level in Türkiye (25%), workplace violence in healthcare (15.9%), low prospects of attaining the level of respectability deserved (8.5%), and career and educational opportunities abroad (9.7%).

On the other hand, 51.5% (n=17) of the 36 participants that wanted to remain in Türkiye said they must stay in Türkiye for family reasons. The reasons that followed were love for the country (30.3%) and social groups (12.1%). Other than these three reasons, the language barrier, plans for the future, fear of being alone and unwillingness to live abroad were also pronounced as the reasons for staying in Türkiye (**Table1**).

### a. Attitude for Brain Drain:

The participants' mean score of Attitude Scale for Brain Drain (ASBD) is 62.8±9.4 (range:31-80). Female and male medical doctors were found to have a similar tendency towards brain drain ($ASBD^{Female}$: 62.8±9.2, $ASBD^{Male}$: 62.8±9.7, p=0.999).

The medical doctors aged younger than 26 years were found to have a lower tendency towards migration as compared to the medical doctors of older age groups ($ASBD^{\leq 26}$: 60.1±9.5, $ASBD^{27-29}$:63.8±9.02, $ASBD^{\geq 30}$:63.7±9.7; p=0.035). The medical doctors training on internal medicine subspecialties and sur-

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**Tablo 1: Participant's socio-demographic characteristic, medical profession preferences, experiences, and future plans**

| Sex** | n | % |
|---|---|---|
| Female | 135 | 59.7 |
| Male | 91 | 40.3 |
| **Nationality*** | | |
| Republic of Türkiye (RT) | 199 | 88.4 |
| Non- RT | 26 | 11.6 |
| **Marital status** | | |
| Never married or Divorced | 152 | 66.7 |
| Married or Living together | 76 | 33.3 |
| **Age groups (year)** | | |
| ≤ 26 | 58 | 25.4 |
| 27-29 | 106 | 46.5 |
| ≥ 30 | 64 | 28.1 |
| **Children** | | |
| Yes | 21 | 9.2 |
| No | 207 | 90.8 |
| **Branch** | | |
| Internals | 164 | 71.9 |
| Surgicals | 64 | 28.1 |
| **Income**** | | |
| Less than expenses | 80 | 35.4 |
| Equal to expenses | 102 | 45.1 |
| More than expenses | 44 | 19.5 |
| **Total** | 228 | 100.0 |

** 1 participant did not answer this question.*

| Sex** | n | % |
|---|---|---|
| **Person who made the decision to study in medical faculty**** | | |
| Only her/himself | 104 | 46.0 |
| With the family | 113 | 50.0 |
| Only family | 9 | 4.0 |
| **Verbal/Phychological violence exposure at work** | | |
| Yes | 184 | 80.7 |
| No | 44 | 19.3 |
| **Physical violence exposure at work** | | |
| Yes | 17 | 7.5 |
| No | 211 | 92.5 |
| **Economic violence exposure at work** | | |
| Yes | 98 | 43.0 |
| No | 130 | 57.0 |
| **Future professional plan** | | |
| Desire to work and live abroad | 107 | 46.9 |
| Desire to go abroad for a limited time to study | 74 | 32.5 |
| Desire not to work as a physician in Turkey | 36 | 15.8 |
| Indecisive | 5 | 2.2 |
| Desire not to work as a physician anywhere | 3 | 1.3 |
| Desire to return to own country | 3 | 1.3 |
| **Total** | 228 | 100.0 |

*** 2 participants did not answer this question.*

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gery specialties have similar tendencies towards brain drain ($ASBDS^{Internal\ Medicine}$: 62.8±9.3, $ASBD^{Surgery}$: 62.9±9.9; p=0.921).

Medical doctors of other nationalities were also found to have a tendency towards brain drain that is similar with the medical doctors who are Turkish citizens ($ASBD^{TR}$: 62.8±9.7, $ASBD^{Foreign}$: 62.3±7.2; p=0.486). ASBD scores of the participants by their marital statuses are similar (p=0.477). However, it was found that the participants that do not have children tend more towards brain drain as compared to participants with children ($ASBD^{children}$: 56.6±10.5, $ASBD^{no\ children}$: 63.5±9.1; p=0.008). The participants, who declare that their income exceeds their expenses, are found to have a lower tendency towards brain drain as compared to the participants with income matching expenses or expenses exceeding income ($ASBD^{Income<Expenses}$: 65.0±9.4, $ASBD^{Income=Expenses}$: 63.5±8.3, $ASBD^{Income>Expenses}$: 57.8±10.1; p=0.001).

It was found that the participants, who have suffered from verbal/psychological violence in their professional lives, tend more toward brain drain as compared to those, who have not; and the participants, who have suffered from economic violence, tend more towards brain drain as compared to those, who have not ($ASBD^{Verbal\ Violence}$:63.4±9.3, $ASBD^{No\ Verbal\ Violence}$: 60.2±9.4, $p^{Verbal\ Violence}$=0.042; $ASBD^{Economic\ Violence}$: 66.0±9.0, $ASBD^{No\ Economic\ Violence}$: 60.4±9.0,$p^{Economic\ Violence}$=0.001 (Table 2). No such difference could be found between the medical doctors, who have suffered from physical violence, and those, who have not.

**b. Satisfaction with Life:**

Mean score of the participants on the satisfaction with life scale (SWLS) is 17.1±6.2 (Range: 5-35, n: 179). It was found that the participants, who have suffered from economic violence, are less satisfied with their lives as compared to those, who have not ($SWLS^{Economic\ Violence}$: 16.1±6.5, $SWLS^{No\ Economic\ Violence}$: 18.2±5.8; p=0.010).

It was found that the satisfaction with life of the participants were similar in terms of variables such as age, sex, nationality, marital status, having children, duration in the profession, the branch of work, being the main decision-maker in their choice for the profession, having suffered from verbal or physical violence at work (**Table 2**).

The group with higher income as compared to their expenses was found to have the highest satisfaction with life, while the group with higher expenses than income was found to have the lowest satisfaction with life ($SWLS^{Income<Expenses}$: 15.2±6.6, $SWLS^{Income=Expenses}$: 17.2±5.4, $SWLS^{Income>Expenses}$: 20.0±5.6, p=0.001). The medical doctors, who plan to reside abroad temporarily or permanently, are less satisfied with their lives as compared to the medical doctors planning to stay in Türkiye ($SWLS^{intending\ to\ leave}$: 16.4±5.8, $SWLS^{intending\ to\ stay}$: 20.4±7.5, p=0.002).

A negative correlation was found between scores of the SWLS and their scores of ASBD (r:-0,42, p=0.001) (Figure 1/1A). But there is no correlation between scores of Proactive Personality Scale and scores of the satisfaction with life scale (r: 0.039 p: 0.604, n:179).

**c. Proactive Personality:**

The median score of the participants from Abbreviated Proactive Personality Scale is (APPS) 51.0 (48.1±12.3, range:10-70).

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**Tablo 2: The distributions of the scores of the scales through socio-demographic characteristics of participants**

| Variables | The Scales Scores | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | the Brain Drain Attitude Scale Scores | | | | | | the Proactive Personality Scale Scores | | | | | | the Satisfaction with Life Scale Scores | | | | | |
| | n | Min | Max | Medyan | Mean±SD | *p* | n | Min | Max | Medyan | Mean±SD | *p* | n | Min | Max | Medyan | Mean±SD | *p* |
| **Sex (n:226) *** | | | | | | | | | | | | | | | | | | |
| Male | 91 | 37.0 | 80.0 | 63.0 | 62.8±9.7 | 0.999 | 91 | 11.0 | 70.0 | 52.0 | 47.6±14.5 | 0.479 | 69 | 5.0 | 31.0 | 18.0 | 17.9±6.2 | 0,212 |
| Female | 135 | 31.0 | 80.0 | 62.0 | 62.8±9.2 | | 135 | 10.0 | 70.0 | 50.0 | 48.5±10.5 | | 109 | 5.0 | 30.0 | 17.0 | 16.7±6.3 | |
| **Age Groups (year)** | | | | | | | | | | | | | | | | | | |
| ≤ 26 | 58 | 31.0 | 80.0 | 60.0 | 60.1±9.5 | **0.013** | 58 | 11.0 | 70.0 | 48.0 | 45.6±12.4 | 0.097 | 51 | 5.0 | 35.0 | 19.0 | 18.6±6.2 | 0.053 |
| 27+ | 170 | 37.0 | 80.0 | 64.0 | 63.8±9.3 | | 170 | 10.0 | 70.0 | 52.0 | 48.9±12.2 | | 128 | 5.0 | 31.0 | 16.0 | 16.6±6.3 | |
| **Nationality(n:225) **** | | | | | | | | | | | | | | | | | | |
| Republic of Türkiye (RT) | 199 | 31.0 | 80.0 | 63.0 | 62.8±9.7 | 0.486 | 199 | 10.0 | 70.0 | 51.0 | 48.5±11.7 | 0.399 | 158 | 5.0 | 31.0 | 17.0 | 17.1±6.3 | 0,283 |
| Non- RT | 26 | 50.0 | 78.0 | 60.5 | 62.3±7.2 | | 26 | 11.0 | 67.0 | 53.0 | 44.2±16.0 | | 18 | 9.0 | 26.0 | 20.5 | 18.8±5.5 | |
| **Marital status** | | | | | | | | | | | | | | | | | | |
| Never married or Divorced | 152 | 31.0 | 80.0 | 62.0 | 62.5 ± 9.3 | 0.477 | 152 | 10.0 | 70.0 | 52.0 | 47.9±13.0 | 0.373 | 116 | 5.0 | 35.0 | 17.0 | 16.9±5.9 | 0.478 |
| Married or Living Together | 76 | 37.0 | 80.0 | 64.0 | 63.5 ± 9.7 | | 76 | 19.0 | 68.0 | 49.0 | 48.6±10.9 | | 63 | 5.0 | 31.0 | 17.0 | 17.6±7.0 | |
| **Children** | | | | | | | | | | | | | | | | | | |
| Yes | 21 | 37.0 | 71.0 | 59.0 | 56.6±10.6 | **0.008** | 21 | 20.0 | 60.0 | 50.0 | 47.0±11.2 | 0.772 | 14 | 5.0 | 30.0 | 18.5 | 18.6±7.6 | 0,374 |
| No | 207 | 31.0 | 80.0 | 63.0 | 63.5±9.1 | | 207 | 10.0 | 70.0 | 51.0 | 48.2±12.4 | | 165 | 5.0 | 35.0 | 17.0 | 17.0±6.2 | |
| **Person who made the decision to study in medical faculty (n:226)** | | | | | | | | | | | | | | | | | | |
| Only her/himself | 104 | 31.0 | 80.0 | 62.0 | 62.4± 9.6 | 0.628 | 104 | 12.0 | 70.0 | 53.0 | 48.8±12.2 | 0.234 | 85 | 5.0 | 35.0 | 18.0 | 17.5±6.7 | 0,428 |
| With the family | 113 | 41.0 | 80.0 | 63.0 | 63.2 ± 9.4 | | 113 | 10.0 | 70.0 | 49.0 | 48.0±12.2 | | 88 | 5.0 | 31.0 | 17.0 | 17.0±6.0 | |
| Only family | 9 | 52.0 | 80.0 | 62.0 | 65.1±9.0 | | 9 | 20.0 | 58.0 | 49.0 | 43.7±14.4 | | 5 | 12.0 | 16.0 | 13.0 | 13.8±1.6 | |
| **Verbal/Psychological violence exposure at work** | | | | | | | | | | | | | | | | | | |
| Yes | 184 | 31.0 | 80.0 | 63.0 | 63.5±9.4 | **0.042** | 184 | 10.0 | 70.0 | 51.5 | 48.3±12.7 | 0.360 | 144 | 5.0 | 35.0 | 17.0 | 16.9±6.2 | 0,431 |
| No | 44 | 37.0 | 79.0 | 60.0 | 60.3±9.4 | | 44 | 18.0 | 61.0 | 48.5 | 47.3±10.4 | | 35 | 5.0 | 30.0 | 18.0 | 17.9±6.6 | |
| **Economic violence exposure at work** | | | | | | | | | | | | | | | | | | |
| Yes | 98 | 37.0 | 80.0 | 66.5 | 66.0±9.0 | **0.001** | 98 | 10.0 | 70.0 | 53.0 | 49.6±13.3 | 0.162 | 79 | 5.0 | 29.0 | 16.0 | 15.8±6.6 | **0.010** |
| No | 130 | 31.0 | 80.0 | 60.5 | 60.5±9.0 | | 130 | 12.0 | 67.0 | 50.0 | 47.0±11.4 | | 100 | 7.0 | 35.0 | 18.0 | 18.2±5.9 | |
| **Physically violence exposure at work** | | | | | | | | | | | | | | | | | | |
| Yes | 17 | 49.0 | 80.0 | 66.0 | 66.9±9.1 | 0.650 | 17 | 22.0 | 61.0 | 51.0 | 49.5±10.0 | 0.723 | 12 | 5.0 | 21.0 | 15.5 | 14.8±5.4 | 0,174 |
| No | 211 | 31.0 | 80.0 | 62.0 | 62.5±9.4 | | 211 | 10.0 | 70.0 | 51.0 | 48.0±12.5 | | 167 | 5.0 | 35.0 | 17.0 | 17.3±6.3 | |
| **Total** | 228 | 31.0 | 80.0 | 62.0 | 62.9±9.5 | | 228 | 10.0 | 70.0 | 51.0 | 48.1±12.3 | | **179** | **5.0** | **35.0** | **17.0** | **17.1±6.2** | |

** 2 participants did not answer this question. / ** 3 participants did not answer this question.*

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It was found that the proactive personality traits of the participants were similar in terms of variables such as sex, nationality, marital status, having children, duration in the profession, being the main decision-maker in their choice for the profession, having suffered from verbal or physical violence at work, income status and plans for the future (**Table 2**).

However, medical doctors aged twenty six and less are found to have less proactive personality traits as compared to other age groups ($APPS^{\leq 26}$: 45.6±12.3, $APPS^{27\text{-}29}$: 49.5±12.3, $APPS^{\geq 30}$: 47.9±12.0;p=0.032).

The resident doctors, who have suffered from economic violence at work, are found to get higher scores of proactive personality traits compared to those who have not suffered ($PPS^{\text{Economic Violence}}$: 49.5±13.3, $PPS^{\text{No Economic Violence}}$: 47.1±11.3, p=0.029).

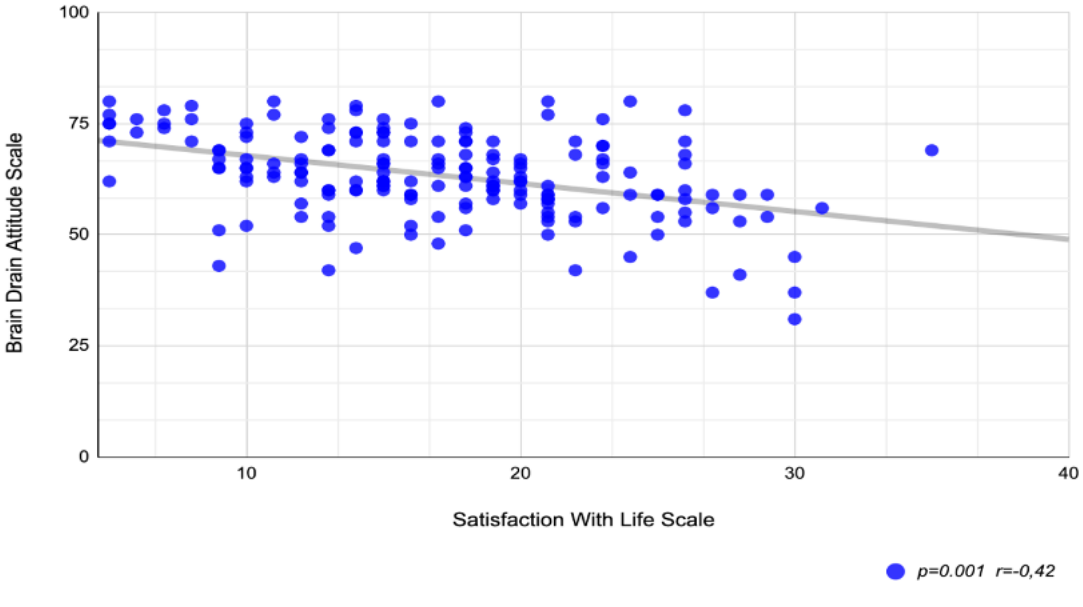
The participants with the more proactive personality traits are found to have a higher tendency towards brain drain; r: 0.20, p=0.002, **Graph 1/1B**.

**d. Factors determining the attitude toward brain drain:**

Age, having children, income status, having suffered from economic violence, having suffered from verbal/psychological violence, SWLS score, APPS score, which had already been found to affect the ASBD during univariate analyses, were analyzed through a multivariate analysis to be able to do a model and find the main factors to affect the brain drain of the participants.

The model is based on the direct effect of each independent variable on the resulting variable, ASBD. The median value of the ASBD score was determined as the point estimate, and the participants, who did not respond to the Satisfaction with Life Scale, were eliminated from the analysis. The values for the model

**Graph1 A:** The relationship between the scores of the Satisfaction with Life Scale and the Brain Drain Attitude Scale



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are: $X^2$=39.375, df: 8, and p=0.001, Pseudo $R^2$ (Cox-&Snell)=0.198; and it is shown that the model explains 26% of the variation. The model estimates 69.3% of all observations correctly. As a result of multivariate analysis, it was found that the tendency toward brain drain in our study group was determined only by proactive personality traits (OR:1.03, 95%CI 1.00-1.06, p=0.020) and satisfaction with life levels (OR:0.88, 95%CI 0.82-0.93, p=0.001) (**Table 3**).

## Discussion

In this study, our purpose was to determine the attitudes of the resident doctors toward brain drain in Türkiye in 2022 and the correlation of this attitude with other factors, such as satisfaction with life and proactive personality traits. The resident doctors at a university hospital in Istanbul were given a self-administered questionnaire online. Although there are many studies in the literature on brain drain, our study is strengthened by the fact that it is the first study that clearly establishes the relation of brain drain with proactive personality or satisfaction with life. Inclusion of the open-ended questions that we asked in relation to the causes of brain drain into the analysis and responding to the questionnaires anonymously have allowed the people to clearly express their opinions, revealing certain push and pull factors for brain drain.

Also, the brain drain involving medical doctors in Türkiye is currently a snowballing problem for our country that needs to be addressed rapidly; the timing of our study overlaps with the timing of the negative political discourse targeting the medical doctors in this respect and the growing unionization and strike move-

**Tablo 3: Logistic regression results of variables affecting participants' attitudes towards brain drain**

| Variables | OR (%95 CI) | *P* |
|---|---|---|
| **Age (year)** | 0.87 (0.85-1,14) | 0.873 |
| **Children** | | |
| No (Referans) | ---------- | |
| Yes | 0.42 (0.09-1.99) | 0. 280 |
| **Economic violence exposure at work** | | |
| No (Referance) | ---------- | |
| Yes | 1.47 (0.72-3.02) | 0. 280 |
| **Verbal/Phychological violence exposure at work** | | |
| No (Referance) | ---------- | |
| Yes | 1.19 (0.51-2.78) | 0. 670 |
| **Satisfaction with Life Scale Score** | 0.881 (0.82-0.93) | 0. 001 |
| **Proactive Personality Scale Score** | 1. 03 (1.00-1.06) | 0. 020 |

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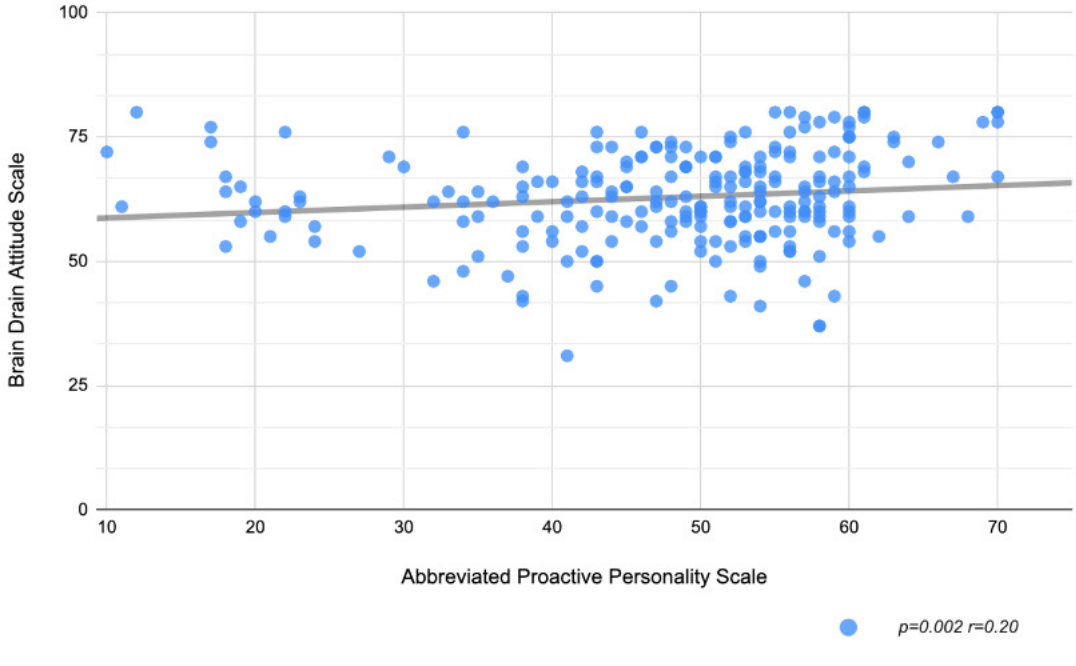
ments among the medical doctors. And it is strength of our study that it reveals the effects of such mobilization targeting the rights of the medical doctors in Türkiye and the current tendency of the resident doctors with scientific data.

In our study, we found that resident doctors have a high tendency to brain drain and taking all variables into account, the most significant determinants for the attitudes of the resident doctors toward brain drain are the level of satisfaction with life and proactive personality traits. We, as the researchers, could not access any publication of the literature, in Turkish or in English, inquiring into the correlation between brain drain, proactivity, and satisfaction with life.

In Türkiye, a school of medicine is a department that only the most successful students in the university entrance exam can access. In addition to success in the entrance exams, the students go through many hardships during their medical education as well. The young medical doctors have to first pass the English proficiency test, and then for specialization in any branch of medicine have to take the Medical Residency Entrance exam (TUS), which is a central exam covering the entire medical curriculum prepared by the higher education institution, and succeed in it.

All these processes are only possible only if the students can move further ahead of the society that they are in. Our participants are resident doctors, who successfully completed such processes and have taken the risk of becoming "resident doctors" in Istanbul. Istanbul is the largest, the most crowded, the most developed and the most expensive city and the most difficult-to-live

**Graph1 B:** The relationship between the scores of the Abbreviated Proactive Personality Scale and the Brain Drain Attitude Scale



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in, in Türkiye. This is why it would be already expectable for our participants to display high proactive personality traits under the given circumstances.

Given the decisive attitude of proactive people to attain their goals, those planning to migrate indeed could be highly likely to migrate. Considering the nature of the proactive people moving their environment further ahead together with themselves, the loss of such brains can sadly be predicted as a reason for regression for development in Türkiye.[16,17,23,24]

We found in this study the attitude toward brain drain is similar between both female and male resident doctors. Mollahaliloğlu's 2009 study, which inquired into the preference of the medical doctors in terms of migration through 3690 recently-graduated medical doctors throughout Türkiye, found that the male medical doctors are 1.5 times likelier to desire to migrate as compared to their female counterparts.[25]

The reason why no difference was found between the genders in our study may be due to the fact that women in Türkiye desire to move away from the country more now, than in the past due to the increasing gender inequality and violence they face in social life year by year.[26] Worsened living and working conditions in Turkey which forced the medical doctors to migrate maybe affected both sexes equally recently. Another difference should be that our participants are medical doctors who have taken the risk of being resident doctors in Istanbul which is the most expensive city.

Our study finds similar tendencies among the resident doctors based on marital status. However, the medical doctors with no children are found to have a higher tendency toward migration. The questionnaire study conducted about brain drain and reverse brain drain in Türkiye by Tansel in 2002 with 2078 participants, the thesis prepared by Öneri via review of literature on brain drain from Türkiye dating between 2007 and 2017, and the qualitative interviews conducted by Kaçar in 2016 with people, who have migrated from Türkiye, have all analyzed the effect of marital status and having children.

The findings indicate that married people with children have more social capital* to live abroad, facilitating the process of adaptation for them. Most of the participants in the above mentioned studies said that they wanted their children to be born and to get education abroad.[27,28,29] This differentiation between the finding in our study and the past studies can be attributable to the fact that the number of participants with children is low in our study.

In addition to the fact that the participants may have postponed having a child due to the busy work and schedule during their specialty training in Türkiye, the possibility that the trainers may have a negative attitude towards the female resident doctors, who become pregnant during this process, this may have also affected the female doctors' decision to have a child.[30]

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** The basis underlying the term social capital is, put very simply and comprehensibly: the investment made in social relations with a certain return expected from the market (Lin, 2001). According to Woolcock (2001), "the basic idea of "social capital" is that one's family, friends, and associates constitute an important asset, one that can be called upon in a crisis, enjoyed for its own sake, and/or leveraged for material gain." We can call it the whole network of social relationships that we accumulate in order to be able to tap into at times of difficulty.*

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Also, according to the results of Turkey Demographic and Health Survey 2018, the median age at first-birth in Turkey is 23.3 years among 25-49 women and it is constantly rising.[31] It is likely that our participants have also postponed having children in line with the general trend in Türkiye lately.

Our study found the attitudes of residents from internal medicine and surgical specialties toward brain drain to be entirely similar. In the existing literature, a descriptive study involving 270 resident doctors working at a university hospital in our country as participants finds that mobbing and the feelings of burnout, which are push factors for migration, tend to have a higher rate of reporting in the surgical specialties.[32]

On the other hand, a study conducted in 2018 with a similar population also found the reporting incidence of violence to be higher in internal medicine subspecialties.[33] The fact that the resident doctors from internal medicine subspecialties and surgical specialties have similar tendencies to brain drain in our study may be attributable to the heavy deterioration of the economic living conditions in İstanbul. The salary of a specialist medical doctor, which was equivalent to 1662 USD in 2011, is now equivalent to 591 USD, and this is an important indication of the declining purchasing power of the medical doctors.

More than half of the participants in our study have stated that they plan to work and live abroad. The reasons stated as the most prioritized ones are economic status, violence to healthcare workers, conditions of work and the generally low levels of welfare. Career goals and despair are found as secondary reasons. A quantitative study inquiring into the attitude of the young medical doctors conducted in Greece in 2018 also found the medical doctors have a high tendency to seek a job abroad, similar to our study.

The strongest motives contributing to the decision of the medical doctors to migrate in the future are despair, career goals, low remuneration, and seeking for a chance for a better life. In contrast, it was found that the participants had a lower likelihood to migrate on grounds of social exclusion, high marginalization, crime rate or being treated as second-class citizen.[34] Again, in line with our study, a study that analyzed the data recorded by 22 countries evaluating brain drain among medical doctors, who migrated between the years 1990 and 2014, states that the brain drain is strongly influenced by the economic characteristics of the countries.[20]

Our study found that the economic violence and/or verbal/psychological violence suffered by the participants increase their tendency to migrate. Being subjected to physical violence is found not to affect the attitude toward migration. This result may be attributable to the fact that the number of medical doctors, who have stated that they suffered from physical violence, is low.

A qualitative study conducted for a reverse brain drain underlined the expectations of the participants from the relevant authorities such as ensuring security against the risk of violence against healthcare staff, treatment of the universities and academicians with the worth that they deserve, protected rights of the employees and a reformed educational system. As shown by both that study and our study, the problem of workplace

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violence in healthcare can be one of the important determinants of brain drain.[3]

We would like to inform few limitations about our study; The resident doctors had difficulty in sparing the time to fill in the questionnaire as their schedule was too busy and some of the participants did not fully respond to the Satisfaction with Life Scale. This study was conducted with the residents, who could take the risk of training in a university hospital in the most developed and the most expensive city in Türkiye and data were gathered during the pandemic period. Moreover, it should also be taken into consideration that the desire to migrate may have been enhanced as the conditions of work have become even more difficult under the conditions of the COVID-19 pandemic.

## Conclusion

In conclusion, in our study we found that the resident doctors have a low level of satisfaction with their lives, have high proactive personal traits and have high and similar tendencies with other countries toward brain drain. And, the resident doctors with less life satisfaction and more proactive personality traits were more likely to brain drain. It was determined that the major factors affecting the decision of brain drain were economic conditions, psychological and violence experience in health units. Brain drain is a serious problem that is becoming more and more important for developing countries such as Türkiye, where educated manpower is very valuable.

However, it has not been possible to find sufficient number of studies conducted in our country regarding specifically on the brain drain that our country is facing in the field of health. The results of our study reveal that action to enhance the satisfaction with life of medical doctors, providing a safe working environment in the workplace, improving economic conditions would be effective factors that may prevent brain drain of medical doctors.

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**Conflict of Interests:** There is no conflict of interests between the authors.

**Ethic:** Permissions were obtained from the Marmara University Ethics Committee (07.01.2022/09.2022.141), the Dean's, and informed consent from the participants for this cross-sectional study.

**Author contributions:**

**Consept:** Ayşe Nilüfer Özaydın; Desing: Ayşe Nilüfer Özaydın;

**Supervision:** Ayşe Nilüfer Özaydın;

**Data collection and/or processing: Analysis and/or interpretation;** Ayşe Nilüfer Özaydın,

**Literature search:Writing:** Ayşe Nilüfer Özaydın, Critical review: Ayşe Nilüfer Özaydın.

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