



Research Article

Assessment of gender equality among graduates of anesthesiology residency in the last decade: A national data analysis

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ABSTRACT

Aim: Despite the global upward trend in the representation of female doctors, certain medical specialties continue to exhibit a notable gender disparity. The presence of an equitable gender distribution within the healthcare sector has been shown to enhance the overall quality of service provision and has the potential to enhance performance outcomes. The objective of our research is to examine the gender composition of anesthesiology and reanimation professionals in Turkey.

Methods: Data was collected regarding physicians who successfully completed their anesthesiology and reanimation specialization training and subsequently participated in the state service obligation lottery since the year 2013. Data provided by the General Directorate of Management Services of the Republic of Turkey Ministry of Health. The gender of the specialist physicians in the specified time period and the type of hospital they trained in were collected.

Results: There were 1249 males and 1400 females among the 2649 specialists with no difference in the gender distribution. Upon conducting separate annual evaluations, there were significant increases in the proportions of men in the years 2017 and 2021, as well as women in the years 2019 and 2023. Additionally, 852 of them had received specialization from training hospitals and 1797 from university hospitals. Over the course of a decade, there was an absence of variation in the hospital preferences of anesthesiologists with regards to gender distribution. However, in the subsequent years of 2018, 2021, and 2023, female anesthesiologists exhibited a significantly higher preference for these hospitals. In 2019, a notable trend was observed wherein female anesthesiologists from university hospitals, while in 2021, male anesthesiologists demonstrated a similar inclination.

Conclusions: In Turkey, the field of anesthesiology and reanimation demonstrates a balanced gender distribution in terms of expertise. There is no discernible disparity in the gender distribution among anesthesiologist' hospital preferences.

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1. Introduction

Although there are instances where women may be favored in certain professions, it is widely acknowledged that there are other professions where women are not preferred, irrespective of their abilities and qualifications [1]. The medical profession still lacks gender equal-

ity, particularly in senior positions. Despite the equitable distribution of genders within medical faculties, there exists a notable underrepresentation of women in academic and leadership roles. The pervasive lack of female representation in academic and professional spheres frequently serves as a source of discouragement for women [2].

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The presence of a gender-balanced healthcare team is advantageous due to the inherent complementarity of interpersonal skills. The promotion of gender equality within the realm of healthcare yields numerous advantages with respect to the advantages it confers upon the patient. A workforce characterized by diversity and inclusivity enhances the probability of delivering healthcare services to marginalized and underserved populations.

The divergence in practice styles between male and female physicians presents a distinctive and advantageous circumstance for the patient population [3–5]. It has been known for a long time that the promotion of gender equality contributes to the advancement of the physician workforce, enhances physician-patient interactions, augments patient satisfaction, and ultimately enhances overall patient outcomes [6,7]. The presence of a gender-balanced team has been found to enhance overall performance and has the potential to positively impact per operative outcomes [8].

Despite the progressive growth in the representation of female physicians, a notable gender disparity persists within specific medical specialties [9]. In numerous countries, female physicians tend to gravitate towards areas of specialization such as gynecology and obstetrics, as well as pediatrics. Conversely, their male counterparts exhibit a greater preference for departments such as orthopedics and urology [9]. The preferences for specialization among physicians exhibit a strong correlation with their respective lifestyles. Female physicians often exhibit a preference for professional settings that afford them the opportunity to allocate more time towards domestic responsibilities, such as caring for their children, and exert greater control over their work schedules [8].

The aim of this study to examine the gender distribution among anesthesiology and reanimation specialists over the past decade, utilizing data on the gender distribution of anesthesiology and reanimation residency students in Turkey.

2. Materials and Methods

The study was carried out following the approval of the Samsun University Clinical Research Ethics Committee (SÜKAEK-2023 13/9), by analyzing the data provided by the General Directorate of Management Services of the Republic of Turkey Ministry of Health (<https://yhgm.saglik.gov.tr>). This system has been utilized to access the data pertaining to anesthesiologist who have successfully completed their specialization training in anesthesiology and reanimation, and subsequently participated in the state service obligation lottery, starting from the year 2013.

The study aimed to determine the distribution of anesthesiologist across different time periods, the hospitals where this anesthesiologist received their training, and the gender composition of the anesthesiologist. The study aimed to assess the influence of gender distribution on the hospital preferences of students pursuing anesthesiology and reanimation residencies. Additionally, the study examined the gender distribution of male and

female anesthesiology and reanimation specialization students across different years.

The archival records of the General Directorate of Management Services within the Ministry of Health were subjected to a scanning process, where in the selection criteria encompassed anesthesiologists who successfully fulfilled their specialized training in Anesthesia and Reanimation within the time frame spanning from 2013 to 2023.

Inclusion criteria; it was stated in the article as ‘Anesthesiologists appointed as a result of the state service obligation lottery between 2013 and 2023’. Exclusion criteria; People whose gender we could not determine with the data we obtained (ministry records, hospital records, social media platforms, i.e.) were excluded from the study.

2.1. Statistics

The statistical analysis was conducted utilizing SPSS 21 software. In the context of statistical analyses, a significance level of $p < 0.05$ was deemed to be statistically significant. The frequencies and percentages of gender and hospital preference were computed. A cross-tabulation analysis was conducted to examine the relationship between gender and hospital preferences over different years. Subsequently, a Pearson Chi-square test was employed to assess the statistical significance of this relationship. Furthermore, the years were organized into clusters of three, and these clusters were then subjected to cross-tabulation based on gender. Subsequently, a chi-square test was conducted.

3. Results

The research revealed that 2649 specialist physicians completed the anesthesiology and reanimation specialization program between 2013 and 2023 and were placed through the state service obligation lottery. Among these anesthesiology specialist students, 1249 were male and 1400 were female. Upon examination of the aggregate figure, it is evident that there was an absence of disparity in relation to the distribution of genders. Among a total of 2649 specialist physicians, it was found that 852 individuals expressed a preference for training and research hospitals, while the remaining 1797 individuals favored university hospitals. There was no significant difference in physicians' hospital preferences in relation to gender distribution throughout the entire duration of the study ($p = 0.289$) (Table 1).

Table 1. Gender and hospital preferences.

Gender	Training and Research Hospital	University Hospital	Total	
	n	n	n	%
Male	389	860	1249	47.15
Female	463	937	1400	52.85
Total	852	1797	2649	100.0

*:Pearson Chi-Square; $P = 0.289$; n: number.

Upon analyzing the gender distribution across different years, a notable disparity was observed. Specifically, there was a substantial overrepresentation of males in the

years 2017 and 2021, while females were more prevalent in 2019 and 2023 ($p < 0.001$). The provided visual representation, denoted as Fig. 1, is presented for reference.

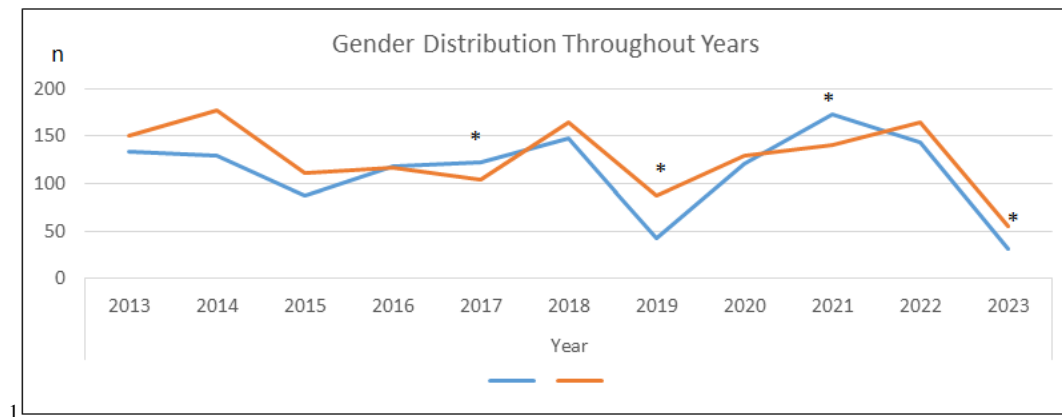


Fig. 1. Gender distribution throughout years (*: $p < 0.001$; n: number).

Upon conducting a separate evaluation of the association between hospital preferences and gender across different years, it was observed that male physicians exhibited a greater preference for training and research hospitals in both 2016 and 2017. Conversely, female physicians demonstrated a higher preference for such

hospitals in 2018, 2021, and 2023. This association was found to be statistically significant ($p = 0.008$). The data indicates that female physicians exhibited a higher preference for university hospitals in 2019, while male physicians displayed a similar preference in 2021 ($p = 0.012$) (Fig. 2).

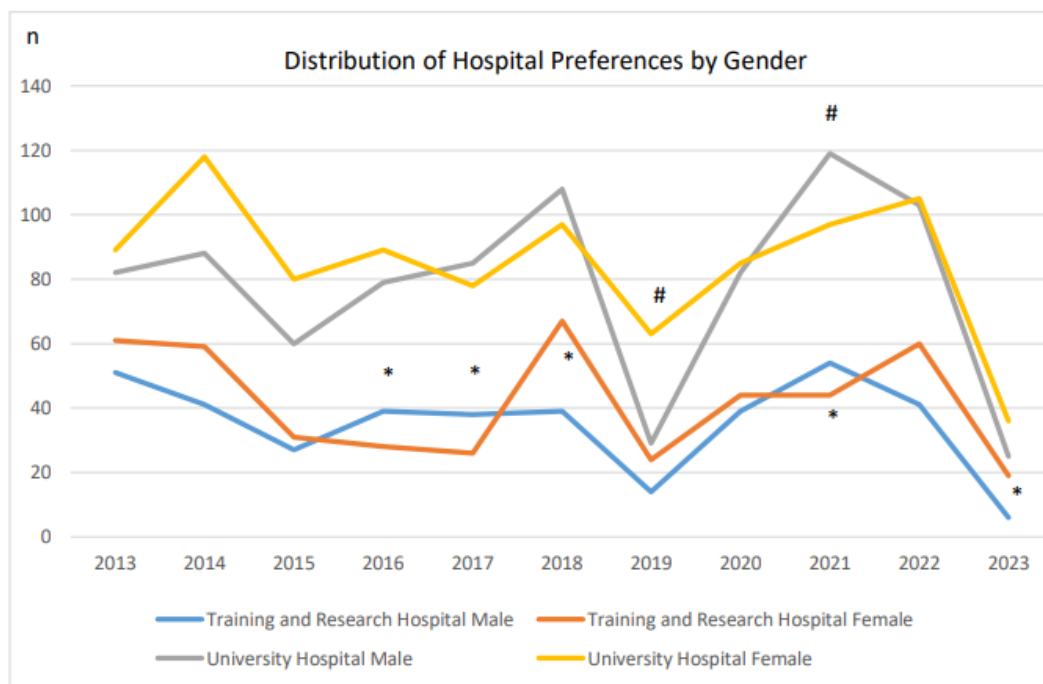


Fig. 2. Distribution of Hospital Preferences by Gender throughout the years. The gender's institute preference that causes a statistical difference in the evaluations is indicated with * and # signs (*: $p < 0.05$ n: number).

No significant gender differences were observed when the years were categorized as Group 1 (2013-2015), Group 2 (2016-2018), and Group 3 (2019-2021). Nevertheless, it was noted that Group 1 exhibited a greater proportion of female physicians, while Groups 2 and 3 displayed a higher representation of male physicians. Upon comparing the first group with the second

group, it was observed that the proportion of female physicians was notably greater than that of male physicians, as indicated in Table 2. No statistically significant difference was found between these groups when analyzing the preference tendencies of male and female physicians for training and research hospitals and university hospitals ($p = 0.058$).

Table 2. Comparison of the preferences of male and female physicians when years are grouped.

Years	Male		Female		Total		p
	n	%	n	%	n	%	
Group 1 (2013-15)	349	44.3	438	55.7	787	100	
Group 2 (2016-18)	388	50.2	385	49.8	773	100	0.058*
Group 3 (2019-21)	337	48.6	357	51.4	694	100	

*:Pearson Chi-square; n: number.

4. Conclusions

In the present investigation, an examination was conducted on the gender composition of anesthesia residency trainees from 2013 to 2023. The findings revealed that there was a greater representation of male individuals in the years 2017 and 2021, while female individuals exhibited higher numbers in 2019 and 2023. Upon analyzing the hospital preferences of physicians, it was noted that male physicians exhibited a greater inclination towards training and research hospitals in the years 2016 and 2017. Conversely, female physicians displayed a preference for such hospitals in the years 2018, 2021, and 2023. The data indicates that female physicians exhibited a higher preference for university hospitals in 2019, while male physicians demonstrated a greater preference for university hospitals in 2021. When examining the historical development of anesthesia specialist medicine in Turkey, it is evident that among the initial cohort of six physicians who obtained specialization in 1957, one was female while the remaining five were male [10]. Upon examining the data pertaining to the influx of specialist physicians entering the field of anesthesiology since 2013, it has been observed that the distribution of female and male practitioners stands at 1400 and 1249, respectively. Consequently, the proportion of female anesthesiologists among the newly established cohort amounts to 52.8%. In 2010, the proportion of female to male permanent anesthesiologists in the United States (USA) was 75.5% and 24.3% respectively. However, in 2021, this proportion shifted to 68.84% for females and 31.16% for males [11]. In a separate publication presenting empirical evidence from the United States, the proportion of women practicing as anesthesiologists was documented as 32.8% during the period of 2007-2008, subsequently decreasing to 32.4% in the timeframe of 2017-2018 [12]. The findings of our study indicate a higher proportion of female anesthesiologists within our sample. Based on the 2023 data provided by the Turkish Society of Anesthesiology and Reanimation, it was observed that out of the total registered anesthesiologists, 2225 were identified as female, while 1790 were identified as male. Consequently, the female-to-male ratio was determined to be 55.4% to 44.6% respectively. The numerical values align with the data that was acquired during our research investigation. There is no indication of gender inequality within the field of anesthesiology in Turkey.

In the academic year of 2004-2005, an examination of medical school enrollment in Canada revealed a notable disparity between the number of male and female stu-

dents. Specifically, the male student population surpassed that of their female counterparts, a trend that was particularly pronounced within the field of anesthesia [13]. According to data from the 'Medical Workforce Census Report 2020' in the United Kingdom, 31.2% of permanent anesthesiologists are female. The current rate of representation exceeds that of 2007 [14].

The field of anesthesia requires a high level of expertise, as it encompasses various challenges. These challenges include enduring extended working hours, being constantly available for duty, operating within confined spaces, maintaining continuous vigilance, being exposed to high levels of noise, radiation, and electromagnetic fields, as well as collaborating and effectively communicating with other units [15]. The field of anesthesiology may experience reduced preference due to certain disadvantages associated with female physicians, including considerations related to maternity status, increased responsibilities in household tasks, particularly in light of long working hours, and the nature of working in a confined environment. Particularly amidst the Covid-19 pandemic, mothers experienced a heightened burden of mental and physical responsibilities compared to fathers, primarily attributed to factors such as the limited availability of babysitters. Additionally, the implementation of social distancing measures resulted in a decreased need for domestic assistance, while also negatively impacting the productivity of female scholars [16].

In a separate investigation concerning the perception of parental leave within the anesthesiology residency program in the United States, it was noted that female residents experienced a greater impact compared to their male counterparts when faced with the arrival of a child patient. Furthermore, it has been determined that individuals who delay their plans for childbearing until the later stages of their specialization tend to perceive an escalation in infertility issues and encounter conflicts between breastfeeding and their professional obligations [17]. The prevalence of female anesthesiologists in our nation may be attributed to the prevailing traditional family structure and societal expectations placed upon women, as well as the relative resilience of female anesthesiologists in the face of these challenging circumstances. Gender equality in the field of anesthesiology appears to have been attained within our nation, in contrast to prevailing global norms.

We acknowledge the presence of certain limitations within our study. Our research focused on the assessment of anesthesia residencies on a nationwide scale. It is important to note that within the realm of anesthesia training, numerous subspecialty programs exist, includ-

ing pain medicine, perioperative medicine, and intensive care, each of which may exhibit distinct characteristics and variations based on regional factors.

Within these specialized domains, there exists the potential for gender-related disparities and evaluations in gender equity. We must acknowledge that our study may have unintentionally omitted valuable insights by not directly engaging with subject matter experts. Furthermore, we did not account for individuals who chose not to disclose their gender orientation or the LGBTQ+ community. It is imperative to clarify that our approach in this regard should not be misconstrued as an act of discrimination or marginalization. Rather, it was necessitated by the study's design and constraints. Nevertheless, we recognize the importance of further exploration and sensitivity in addressing gender-related aspects in future research endeavors."

In conclusion, it is evident that gender inequality persists as a significant issue within the field of anesthesiology on a global scale. Based on the analysis of data pertaining to graduates specializing in the field after 2013, our findings indicate the absence of gender inequality. The field of anesthesiology remains equally favored by both male and female physicians.

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Conflict of Interest

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this manuscript.

Data Availability

The datasets created and/or analyzed during the current study are not publicly available, but are available from the corresponding author upon reasonable request.

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