

Evaluation of gender bias in thoracic surgery in Türkiye: A descriptive study

Türkiye’de göğüs cerrahisinde cinsiyet ön yargısının değerlendirilmesi: Tanımlayıcı bir çalışma

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ABSTRACT

Background: This study aims to investigate the challenges that female thoracic surgeons in Türkiye faced to due to gender bias in their professional lives.

Methods: Between January 2024 and April 2024, a total of 73 female thoracic surgeons (mean age: 37.1±7.4 years; range, 25 to 53 years) who were working in Türkiye and completed a 44-question survey were included. The online questionnaire was sent by email. It was also shared and disseminated in communication groups (WhatsApp).

Results: Of the 73 participants, 45.2% thought that their academic progress was made more difficult due to being women, 49.3% thought that female surgeons were less likely to have influence in their department, and this perception was more prevalent among specialists than among residents (p=0.029). A total of 64.4% of the participants reported being subjected to mobbing in their professional life due to being women. In addition, 56.2% participants thought that they were taken less seriously by patients, as they were women, and this thought was particularly more prevalent among resident physicians (p=0.038). Totally 75.3% of the participants were subjected to verbal or physical violence by patients or their relatives, and 85% thought that the career of female surgeons would be more affected when they had children compared to male surgeons with children. Also, 42.5% of the participants postponed or would postpone pregnancy to a later time.

Conclusion: Our study highlights the urgent need for change by revealing the challenges faced by female thoracic surgeons in Türkiye, including obstacles in training, professional advancement, and achieving a balance between work, children, and family life, all of which are exacerbated by gender bias.

Keywords: Gender bias, thoracic surgery, woman.

ÖZ

Amaç: Bu çalışmada Türkiye’de kadın göğüs cerrahlarının meslek yaşamlarında toplumsal cinsiyet ön yargısı nedeniyle yaşadığı zorluklar araştırıldı.

Çalışma planı: Ocak 2024 - Nisan 2024 tarihleri arasında Türkiye’de çalışan ve 44 soruluk anketi dolduran toplam 73 kadın göğüs cerrahı (ort. yaş: 37.1±7.4 yıl; dağılım, 25-53 yıl) çalışmaya alındı. Çevrimiçi anket e-posta yoluyla gönderildi. Ayrıca haberleşme grupları ile paylaşıldı ve yaygınlaştırıldı (WhatsApp).

Bulgular: Yetmiş üç katılımcının %45.2’si kadın olmaları kaynaklı akademik ilerlemelerinin zorlaştırıldığını düşünürken, %49.3’ü çalıştıkları bölümde kadın cerrahların nüfuz sahibi olma olasılığının daha düşük olduğunu düşünmekteydi ve bu düşünce uzman hekimlerde asistan hekimlere kıyasla daha baskındı (p=0.029). Katılımcıların toplam %64.4’ü meslek hayatlarında kadın olmaları kaynaklı mobbinge maruz kalmıştı. Bununla birlikte, katılımcıların %56.2’si kadın olmaları nedeniyle hastalar tarafından daha az ciddiye alındıklarını düşünmekteydi ve bu düşünce özellikle asistan hekimler arasında daha baskındı (p=0.038). Katılımcıların toplam %75.3’ü meslek hayatlarında hastalar veya yakınları tarafından sözel veya fiziksel şiddete maruz kaldıklarını belirtti ve %85’i kadın cerrahların çocuk sahibi olduklarında kariyerlerinin, çocuk sahibi olan erkek cerrahlara kıyasla daha fazla etkileneceğini düşünüyordu. Ayrıca katılımcıların %42.5’i gebeliği daha ileri bir zamana ertelediğini veya erteleyeceğini ifade etti.

Sonuç: Çalışmamız, Türkiye’deki kadın göğüs cerrahlarının eğitim, mesleki ilerleme ve iş-çocuk-aile dengesi kurma konularında karşılaştıkları zorlukları ortaya koyarak, toplumsal cinsiyet ön yargısıyla daha da derinleşen bu sorunların değişim gerekliliğini acil bir şekilde ortaya koymaktadır.

Anahtar sözcükler: Cinsiyet ön yargısı, göğüs cerrahisi, kadın.

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Gender bias is an important factor in the emergence of inequalities that women are exposed to in their working lives. Bias is the preference of one group over another based on a set of assumptions or stereotypes about groups.^[1] This may appear as explicit/obvious or implicit/automatic biases. Explicit biases are associated with explicitly endorsed personal beliefs about women. Examples of this include believing that women in academic medicine are less committed to their careers than men or that women are less effective leaders than men. Although the acceptability of explicit biases is decreasing, they continue to influence decision-making processes, resource allocation, and opportunities for women in medicine. The second type, implicit biases, is more complex and difficult to understand, since individuals are often unaware that they are doing so, and this may even influence the decisions and actions of those who explicitly and reportedly believe in gender equality.^[2-4] Given the continued existence of widely shared cultural stereotypes about women and men, implicit biases persist with little change.

According to the 2021 health statistics report of the Organization for Economic Co-operation and Development (OECD), the proportion of female physicians in all OECD countries has increased in the past two decades. However, it has been shown that female physicians mostly work in specialties such as general medicine or pediatrics, and less in surgical specialties.^[5] Currently, women constitute approximately half of medical school graduates. Nevertheless, surgical specialties such as thoracic surgery, orthopedics, and neurosurgery, are still male-dominated fields with a very small number of women.^[6-8] For instance, 5% of cardiothoracic surgeons and 8% of thoracic surgeons in the United States are women.^[9] In addition, it has been reported that female surgeons are more frequently ignored professionally by patients and other physicians, and women are less likely to receive academic promotion and leadership positions than men.^[10,11] In a study evaluating the status of female thoracic surgeons in Europe,^[12] there was an imbalance between men and women in terms of academic positions, the proportion of women in professional associations is in the minority, and women rarely take part in leadership positions. Taken together, female thoracic surgeons are still disadvantaged in many countries of the world.

In the present study, we aimed to investigate the challenges that female thoracic surgeons in Türkiye were exposed to in their training, professional life, career development, balance between work and

child and family life, professional associations, and scientific meetings due to gender bias.

MATERIALS AND METHODS

This descriptive survey study was conducted at Ege University Faculty of Medicine, Department of Thoracic Surgery between January 22nd, 2024 and April 22nd, 2024. A 44-question online survey was designed to investigate gender bias in thoracic surgery in Türkiye. The questionnaire was accompanied by an information note explaining the study objectives and obtaining the consent of the participants ([Supplementary Material 1](#)). To reach all female thoracic surgeons registered in the Turkish Society of Thoracic Surgery (TSTS),^[13] e-mail addresses were obtained, and the online questionnaire was sent via e-mail. In addition, it was shared and disseminated in the communication groups (WhatsApp) established to ensure communication between residents, specialists and female surgeons in the association. To avoid repetitive questionnaires, e-mails of the participants were requested on the opening page of the online survey. Thus, it was checked that a participant answered the questionnaire only once with her e-mail address. The questionnaire consisted of five sections: (i) demographic data, (ii) training, (iii) professional life, (iv) family life and, (v) professional associations and scientific meetings. The sections consisted of multiple-choice questions or questions scored on a five-point Likert-like scale, except for two open-ended questions. The current study had no exclusion criteria and attempted to include all female thoracic surgical residents and specialists registered in the TSTS. All responses were anonymous and consisted of responses from voluntary participants who consented to participate in the questionnaire study. Of a total of 230 female thoracic surgeons registered in the TSTS. Of them, 73 (mean age: 37.1±7.4 years; range, 25 to 53 years) who completed the survey were included. A written informed consent was obtained from each participant. The study protocol was approved by the Ege University Medical Research Ethics Committee (date: 11.07.2024, no: 24-7T/33). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical analysis

Statistical analysis was performed using the IBM SPSS version 25.0 software (IBM Corp., Armonk, NY, USA). Descriptive data were presented in mean ± standard deviation (SD), median (min-max) or number and frequency, where applicable. The chi-square test and post-hoc analyses were used to

evaluate statistically significant differences between the groups. A *p* value of <0.05 was considered statistically significant.

RESULTS

Demographic data

Of the respondents, a total of 67.1% were married and 72.6% were living at home with a partner or family member. Considering their income status, 8.2% of the participants answered “Not enough at all”, 26% answered “Always enough”, and 65.8% answered “Sometimes enough, sometimes not enough”. Demographic characteristics of the participants are summarized in Table 1.

Training and professional life

A total of 64.4% of the participants received their education at a university hospital and 35.6%

at a training and research hospital. During the training, 50.7% of the participants stated that they were subjected to mobbing, as they were women. In addition, 34.2% reported that their decisions about marriage or having children were interfered during residency. Considering the reasons for choosing thoracic surgery as a specialty, the main factor was “compatibility with character/lifestyle/goals” (64.4%), followed by “role models” (20.5%) and “opportunity to experience before” (16.4%) (Table 2).

Among the participants, 57.5% were in the thoracic surgery community including residency for one to nine years, 28.8% for 10-19 years, and 13.7% for 20-29 years. Currently, 41.1% were working in training and research hospitals, 32.9% in university hospitals, 15.1% in public hospitals, 8.2% in private hospitals, and 2.7% in city hospitals. In terms of their current position in their institution, 46.6%

Table 1. Sociodemographic characteristics of the participants

Variables	n	%
Age group (years)		
<30	9	12.32
30-39	39	53.42
40-49	20	27.39
50-59	5	6.84
Marital status		
Single	24	32.9
Married	49	67.1
Place of residence		
Home alone	20	27.4
At home with family/partner	53	72.6
Income level		
Not enough at all	6	8.2
Sometimes enough, sometimes not enough	48	65.8
Always enough	19	26.0
Total	73	100

Table 2. Reasons for choosing thoracic surgery (more than one option could be ticked)

	n	%
Compatibility with character/lifestyle/goals	47	64.4
Role models	15	20.5
Opportunity to experience before	12	16.4
Other*	9	12.3

* Surgical specialty request, patient profile, family request, exam score

Table 3. Participants' training and professional lives

Variables	n	%
The institution where the specialized training was received		
University Hospital	47	64.4
Training and Research Hospital	26	35.6
Time spent in thoracic surgery, including residency		
1-9	42	57.5
10-19	21	28.8
20-29	10	13.7
Institution currently working		
Public Hospital	11	15.1
Training and Research Hospital	30	41.1
Private Hospital	6	8.2
City Hospital	2	2.7
University Hospital	24	32.9
Current position in the institution		
Resident	23	31.5
Associate Professor	5	6.8
Assistant Professor	10	13.7
Professor	1	1.4
Specialist	34	46.6
Holding managerial positions in their organizations		
Head of department	3	4.1
Both head of department and Board membership	1	1.4
Chief Physician	4	5.5
Congress organizing committee	2	2.7
None of them	63	86.3
Total	73	100

were specialists, 31.5% were residents, 13.7% were assistant professors, 6.8% were associate professors, and 1.4% were professors. Participants' data regarding their specialization training and professional lives are summarized in Table 3. Totally 57.5% of the participants were not satisfied with their current position in their professional career (residents: 56.5%, specialists: 67.6%, employees in academic positions: 37.5%, $p=0.131$). In addition, 45.2% of the participants considered that their academic progress was difficult or prevented, as they were women (residents: 31.1%, specialists: 55.9%, employees in academic positions: 31.3%, $p=0.205$). When questioned whether they held administrative positions (i.e., head of department, deanship/directorate positions, chief physician positions) in their institutions, only four (5.5%) participants held the position of head of department and four (5.5%) held the position of chief physician. In addition, approximately half of the participants (49.3%) believed that female surgeons were less likely to influence the department where they worked. This opinion was more prevalent among those who were currently working as specialists

than among residents and employees in academic positions, indicating a statistically significant difference (residents: 30.4%, specialists: 67.6%, employees in academic positions: 37.5%, $p=0.013$). A total of 64.4% of the participants were subjected to mobbing due to being female in their professional life. This opinion was also more prevalent among those who were currently working as specialists than among residents and employees in academic positions, and the difference was statistically significant (residents: 56.5%, specialists: 79.4%, employees in academic positions: 43.8%, $p=0.031$). A total of 56.2% were taken less seriously by patients, as they were female. The perception that they were taken less seriously by patients than their male colleagues was higher among those currently working as residents and specialists than among those working in academic positions, indicating a statistically significant difference (residents: 73.9%, specialists: 61.8%, employees in academic positions: 18.8%, $p=0.002$). In addition, 75.3% were subjected to verbal or physical violence by patients or their relatives during their professional life (residents: 82.6%, specialists: 82.3%, employees in academic

Table 4. Participants' views on their professional lives and the problems they face

Variables	n	%
Exposure to mobbing due to being a woman in professional life		
Yes	47	64.4
No	26	35.6
Feeling that they are taken less seriously by patients than their male colleagues because they are women		
Yes	41	56.2
No	32	43.8
Being exposed to verbal or physical violence by the patient/patient relatives		
Yes	55	75.3
No	18	24.7
Considering to quit surgery due to discrimination		
Yes	25	34.3
No	48	65.7
Satisfaction with where she is in her professional career		
Yes	31	42.5
No	42	57.5
Thinking that academic progress is made difficult/obstructed due to being a woman		
Yes	33	45.2
No	40	54.8
Thinking that female surgeons are less likely to have influence in the department where they work		
Disagree	22	30.1
Undecided	15	20.6
Agree	36	49.3
Total	73	100

positions: 50%, $p=0.091$). Despite the relatively high percentage of unfavorable outcomes, 65.7% of the participants did not think of leaving surgery due to discrimination (Table 4).

Participants were asked to rate the impact of potential barriers to surgery for women in Türkiye on a scale of 1 (ineffective) to 5 (very effective) (Figure 1). Among the potential barriers, the highest scoring items were generally those related to gender biases (“bias that women are less physically resilient”: 4.11 points, “bias that women are psychologically less suitable to be surgeons”: 3.97 points). These were followed by “discrimination by male colleagues” with 3.79 points, “attitudes and behaviors that prevent women from choosing surgery during the specialty preference process” with 3.74 points, “unequal distribution of housework” with 3.63 points, “lack of female role models” with 3.56 points, “lack of good childcare facilities” with 3.53 points, and “discrimination by patients” with 3.37 points.

Considering the propositions according to their level of impact in terms of improving women’s careers in the surgical field (Figure 2), the highest-rated proposition was “ensuring equal conditions for academic promotion” with

4.36 points, followed by “increasing access to professional development opportunities (scholarships, mentoring programs, courses, etc.)” with 4.33 points. This was followed by “having childcare centers such as nurseries in hospitals” with 4.19 points, “more female role models in practice” with 4.16 points, “training and resources to face psychological pressure/burnout” with 4.15 points and “complying with legal regulations on working hours and post-shift leave” with 3.96 points. When the participants were asked to rate on a scale of 1 (not at all) to 5 (easily accessible) which resources they currently have access to in terms of support for their careers, the scores of other resources were low except for ‘specialty society events and scientific meetings’ (3.07 points) (‘educational scholarships’: 2.38 points, ‘regular mentor meetings’: 2.30 points, ‘women surgeons communication network’: 2.14 points).

Family life

A total of 43.8% of the participants had children, and 45.2% had a child or adult (elderly or adult in need of care) at home for whom they were primarily responsible. When asked who was primarily responsible for childcare outside school hours, 46.7% of the respondents answered “I am responsible” and

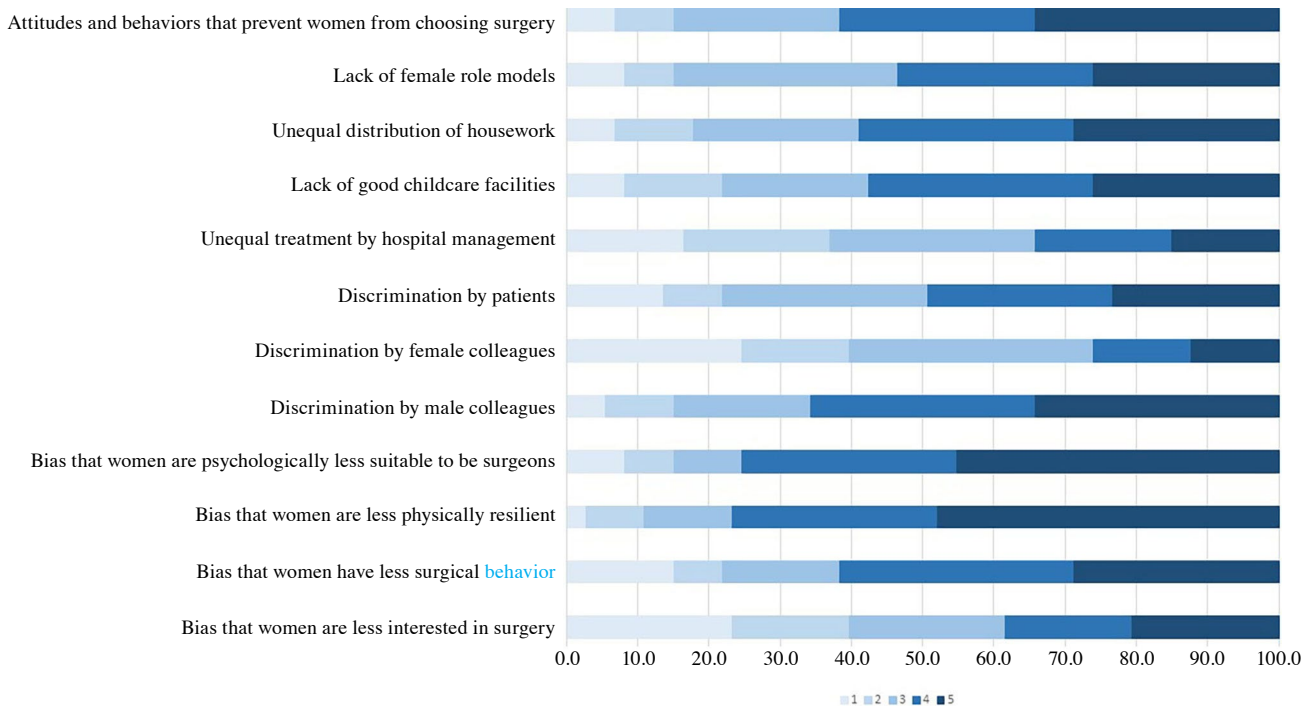


Figure 1. Impact levels of potential barriers to women in surgery in Türkiye according to the participants (1= no effect, 5= very effective).

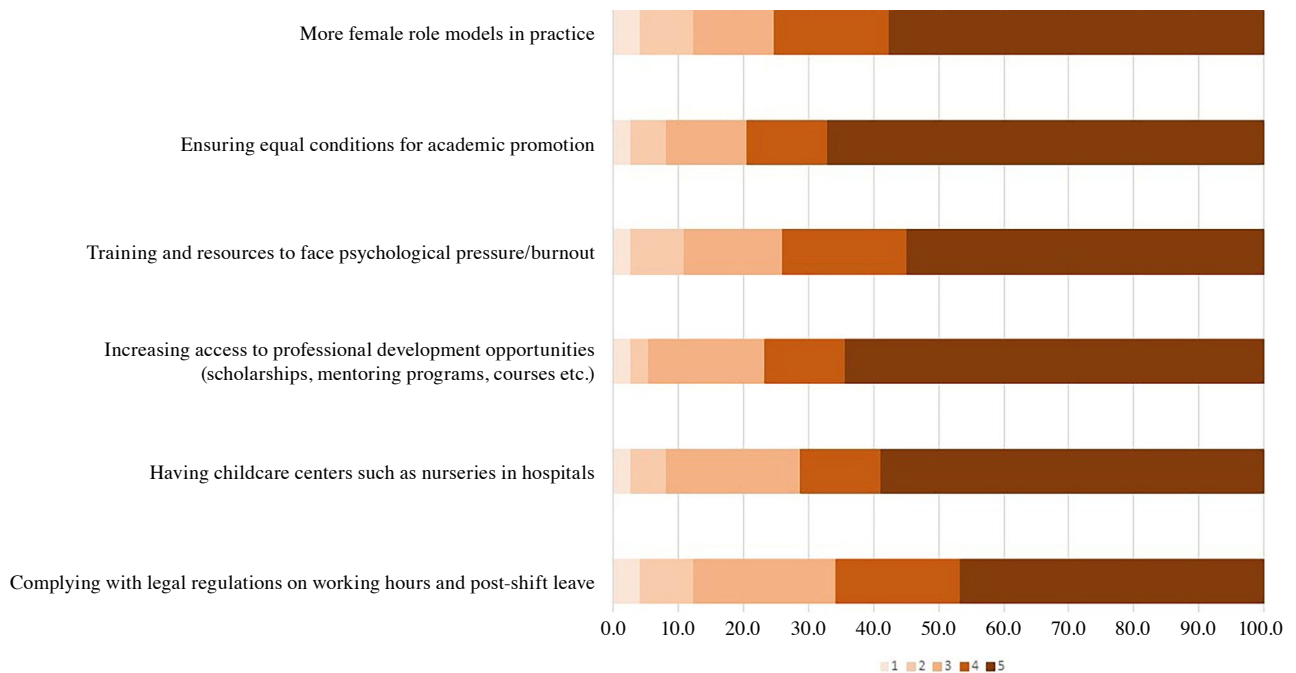


Figure 2. According to the participants, the effects of the propositions in terms of improving women’s careers in the surgical field (1= no effect, 5= very effective).

43.3% answered “I take more responsibility, although my spouse and I share the responsibility”. Only 10% of those with children answered “my spouse and I share equally”, while no one answered “my spouse” or “my spouse takes more responsibility even though my spouse and I share it”. In addition, 85% of the participants thought that the careers of female surgeons would be affected more, when they had children than male surgeons.

Furthermore, 61.1% of the participants thought that maternity leave and pregnancy would negatively affect their professional competence, and 42.5% had postponed or would postpone their pregnancy to a later date. While 41% of the participants thought that the surgeon in the managerial position at their institution did not support female surgeons who desired to balance their family and career lives, 30.1% were undecided on this issue, and 28.8% reported that they supported them. In addition, 68.5% of the participants thought that their male colleagues did not understand the difficulty of balancing work and family life for female surgeons. A total of 19.2% of the participants were subjected to mobbing due to pregnancy and maternity leave. However, 27.4% of the participants did not answer this question. When the situation of being exposed to mobbing due to pregnancy and maternity leave was

examined specifically for those with children, it was found that 40.6% of the participants with children were exposed to mobbing due to pregnancy and maternity leave in the institution they worked. The participants were also asked whether they thought it was normal for their colleagues to be reacted if they extended their maternity leave. Totally 65.8% of the participants disagreed with this statement (Table 5).

Professional associations and scientific meetings

In this section, the participants were asked about their positions and participation in professional associations, qualification boards, congresses, and scientific meetings. No one among the participants, served as the president of the professional association or on the Board of Directors of the association. Among the participants, 39.7% of thought that it was more difficult/prevented for female surgeons to participate in the boards of professional associations, 41.1% were undecided, and 19.2% disagreed. Similarly, none of the participants served as the chairperson of the qualification board. Only one participant (1.4%) served as a member of the qualification board.

Only two participants (2.7%) served on the congress organizing committee, while none served as chairperson of the congress organizing committee.

Table 5. Participants' views on family life and the problems they face

Variables	n	%
Thinking that male colleagues understand the difficulty of balancing work and family/personal life		
Disagree	50	68.5
Undecided	15	20.5
Agree	8	11
Thinking that the surgeon in the managerial position at their institution supports female surgeons who want to balance their family and career life		
Disagree	30	41.1
Undecided	22	30.1
Agree	21	28.8
Thinking that maternity leave and pregnancy negatively affects professional competence		
Yes	44	60.3
No	28	38.4
Thinking that female surgeons' careers are affected more than male surgeons when they have children		
Disagree	4	5.5
Undecided	7	9.6
Agree	62	84.9
Being subjected to mobbing in the institution due to pregnancy and maternity leave process		
No response	20	27.4
Yes	14	19.2
No	39	53.4
Thinking that it is normal to face reactions from colleagues if she extends her maternity leave		
Disagree	48	65.8
Undecided	15	20.5
Agree	10	13.7
Total	73	100

When the participants were questioned about their session leader or speaker status in congresses or scientific meetings, 53.4% of the participants were speakers. In addition, 12.3% held a session. Also, 32.8% thought that women were more hesitant to speak at scientific meetings than their male colleagues. When asked about the possible reasons for this situation, the highest rate of participants answered “working in a patriarchal society” (31.5%), followed by “the thought that their words would not be valued by their colleagues” (28.9%), and “personal shyness and, fear of public speaking” (28.8%). In addition, 38.9% of the participants agreed that informal conversations after a meeting excluded female colleagues, 34.7% were undecided, and 26.4% disagreed (Table 6). Finally, within the scope of the study the data of 12 National Thoracic Surgery Congresses held by TSTS since 2000 and whose congress booklets were published on the website of the association were analyzed. As a result of this review, the proportions of women and

men who took part in the organizing committees of the congresses, as session chairs or speakers in the sessions and as the first name or presenter in the oral presentations are summarized in Figure 3.

DISCUSSION

Although the number of women undergoing surgical training is increasing, surgical specialties, including thoracic surgery, are still male-dominated fields. Gender biases play an important role in the continuation of this situation. In our study, when participants were asked to rate the impact levels of potential barriers to women in the field of surgery in Türkiye, we observed that the propositions related to gender bias received the highest scores.

A study by The Society of Thoracic Surgeons (STS) reported that women tended to report more burnout than men (66.7% vs. 55%, $p=0.05$).^[14] In another study investigating the status of female surgeons in cardiothoracic surgery, only 27.3% of the respondents thought that cardiothoracic

Table 6. Participants' views on professional associations and scientific meetings

Variables	n	%
Thinking that their gender negatively affects their interactions with others in their professional environment		
Disagree	23	31.5
Undecided	29	39.7
Agree	21	28.8
Thinking that it was more difficult/prevented for female surgeons to participate in the boards of professional associations		
Disagree	14	19.2
Undecided	30	41.1
Agree	29	39.7
Participating as a speaker in scientific meetings		
Yes	39	53.4
No	34	46.6
Thinking that women are more hesitant than their male colleagues about speaking at scientific meetings		
Disagree	28	38.4
Undecided	21	28.8
Agree	24	32.8
Not thinking that the participants pay as much attention to the speeches of female surgeons as male surgeons in the meetings		
Disagree	21	28.8
Undecided	23	31.5
Agree	28	38.4
No response	1	1.3
Feeling that informal conversations after a meeting exclude female colleagues		
Disagree	19	26.1
Undecided	25	34.2
Agree	28	38.4
No response	1	1.3
Total	73	100

surgery was a healthy and favorable environment for women.^[11] In a survey conducted by the European Society of Thoracic Surgeons (ESTS) and the European Association of Cardio-Thoracic Surgery (EACTS) to assess the impact of gender discrimination on cardiothoracic surgical careers, 67% of the female participants were treated unfairly due to gender discrimination, whereas this rate was only 2.5% among male participants.^[15] In our study, more than half of the participants (57.5%) were dissatisfied with their place in their professional lives. In addition, 64.4% of them were subjected to mobbing, as they were women in their professional lives. Among the participants in the study, the proportion of those in academic positions was low (assistant professor: 13.7%, associate professor: 6.8%, professor: 1.4%), and 45.2% of the participants thought that their academic progress was made difficult or prevented, as they were

women. Similarly, the number of participants in leadership positions was also low (head of the department: 5.5%, chief physician: 5.5%), and almost half of the participants (49.3%) thought that female surgeons were less likely to influence the department where they worked. This situation is not unique to our country. To illustrate, only two of 56 associate professors in Italy were women, 96% of thoracic surgery professors were men, and only one unit director among 82 units was a woman.^[12] In the survey study of ESTS and EACT covering surgeons throughout Europe, 22% of the male participants were professors, while this rate was 6% for women. In terms of leadership positions, 10% of men were presidents of cardiothoracic associations compared to 3.1% of women, and 7.7% of women were presidents of organizations or institutions compared to 18% of men ($p < 0.0001$).^[15] In our study, it is also noteworthy that there was

	1 st Turkish Thoracic Surgery and Pulmonary Diseases Joint Congress (2000)	2 nd National Thoracic Surgery Congress (2003)	3 rd National Thoracic Surgery Congress (2005)	4 th National Thoracic Surgery Congress (2007)	5 th National Thoracic Surgery Congress (2009)	6 th National Thoracic Surgery Congress (2011)	7 th National Thoracic Surgery Congress (2013)	8 th National Thoracic Surgery Congress (2015)	9 th National Thoracic Surgery Congress (2017)	10 th National Thoracic Surgery Congress (2019)	11 th National Thoracic Surgery Congress (2021)	12 th National Thoracic Surgery Congress (2023)
Congress president	1 man and 1 woman	Man	Man	Man	Man	Man	Man	Man	-	Man	Man	Man
Congress secretary	2 men	Man	Man	Man	Man	Man	Man	Man	-	Man	Man	Man
Congress organising committee	-	7 men (100%)	6 men (100%)	10 men (100%)	5 men (100%)	6 men (100%)	7 men (77.7%) 2 women (22.2%)	12 men (92.3%) 1 woman (7.69%)	-	15 men (93.7%) 1 woman (6.25%)	18 men (85.7%) 3 women (14.2%)	13 men (81.2%) 3 women (18.7%)
Session chair	-	-	39 men (97.5%) 1 woman (2.5%)	25 men (86.2%) 4 women (13.7%)	26 men (89.6%) 3 women (10.3%)	18 men (81.8%) 4 women (18.1%)	22 men (81.4%) 5 women (18.5%)	-	38 men (92.6%) 3 women (7.3%)	39 men (88.6%) 5 women (11.3%)	54 men (85.7%) 9 women (14.2%)	55 men (83.3%) 11 women (16.6%)
Speaker	-	-	58 men (93.5%) 4 women (6.4%)	34 men (91.8%) 3 women (8.1%)	43 men (93.4%) 3 women (6.5%)	49 men (98%) 1 woman (2%)	41 men (85.4%) 7 women (14.5%)	-	65 men (82.2%) 14 women (17.7%)	70 men (87.5%) 10 women (12.5%)	88 men (85.4%) 15 women (14.5%)	91 men (90%) 10 women (9.9%)
1 st name in oral presentation	127 men (69.7%) 55 women (30.2%)	56 men (87.5%) 8 women (12.5%)	48 men (85.7%) 8 women (14.2%)	46 men (88.4%) 6 women (11.5%)	47 men (92.1%) 4 women (7.8%)	17 men (77.2%) 5 women (22.7%)	40 men (78.4%) 11 women (21.5%)	34 men (85%) 6 women (15%)	66 men (77.6%) 19 women (22.3%)	79 men (79%) 21 women (21%)	105 men (76.6%) 32 women (23.3%)	101 men (67.3%) 49 women (32.6%)
Presenter in oral presentation	114 men (62.6%) 68 women (37.3%)	-	-	-	41 men (80.3%) 10 women (19.6%)	17 men (77.2%) 5 women (22.7%)	38 men (74.5%) 13 women (25.4%)	-	60 men (70.5%) 25 women (29.4%)	78 men (78%) 22 women (22%)	98 men (71.5%) 39 women (28.4%)	86 men (57.3%) 64 women (42.6%)

Figure 3. National Thoracic Surgery Congresses (2000-2023).

a difference of opinion between those who were currently working as residents, specialists and those who were working as specialists regarding the possibility of female thoracic surgeons having influence in the institutions where they worked. This opinion was higher among those who were currently working as specialists than the others ($p=0.013$).

Gender bias also affects patients' attitudes and behaviors toward physicians. In one study, female physicians were frequently addressed as 'nurse' instead of 'doctor' and they were usually introduced by their first names instead of their titles.^[16] In our study, 56.2% of the participants thought that they were taken less seriously by patients, as they were women. The thought of being taken less seriously by patients than their male colleagues was higher in those who were currently working as residents and specialists than among those working in academic positions (73.9% and 61.8% vs. 18.8%). This may be considered favorable in the sense that the thought of not being taken seriously by patients decreases with increasing professional competence and experience. However, the fact that 73.9% of female residents and 61.8% of specialists at the beginning of their career feel that they are taken less seriously than their male colleagues indicates that they have not started their professional life under equal conditions and that they need to make more effort and progress to be taken seriously. Another striking indicator of patients' behavior toward physicians is that 75.3% of the participants were subjected to physical or verbal violence in their professional lives. This rate was 82.6% among residents and 82.3% among specialists. Violence is a phenomenon that may cause employees to withdraw from their profession, experience burnout, and prefer countries with safer working conditions to work and has increased over the years. The findings of our study are consistent with high rates of exposure to violence.

Our study revealed that female thoracic surgeons experience difficulties in balancing their family and professional lives. As a result of the ESTS and EACTS survey, 66% of women did not have children compared to 19% of men, while 44% of the participants postponed having children.^[15] In our study, 61.1% of the participants thought that pregnancy and maternity leave would negatively affect their professional competence and 42.5% reported that they postponed or would postpone their pregnancy to a later date. This finding indicates that pregnancy and maternity

leave are still considered problems in thoracic surgery. In our study, 85% of the participants thought that their careers would be more affected than their male colleagues when they had children. In addition, only 10% of the participants who had children took equal responsibility for childcare with their spouse. This finding shows that there is a serious inequality between men and women in terms of taking responsibility for childcare. This situation, apart from pregnancy and maternity leave, also affects the professional careers of female surgeons. To solve this problem, it is important to develop family-friendly policies that increase men's participation in early childrearing and encourage sharing childcare. If men take some of the time they spend on family care, such as maternity leave, society will benefit, and the burden on women would be reduced. These changes have already been implemented in some countries where parental leave is currently allocated to couples, not just to women.^[17] Initiatives to facilitate breastfeeding in the workplace or childcare facilities in the workplace can also help to create a more family-friendly environment.

The survey conducted by ESTS and EACT revealed that there were still a low proportion of women in leadership roles or positions of influence in the two main cardiothoracic surgical associations.^[15] Again, in a study investigating the situation in various European countries, 38.7% of thoracic surgeons in Spain were women, and no woman has been in any leadership position in the Spanish Society of Thoracic Surgery since its establishment, and only 8.5% of the members of the Swiss Society of Thoracic Surgery were women.^[12] Our study also revealed that women were underrepresented in leadership positions. In our study, there were no participant who were the president of a professional association or the chairperson of the qualification board, and no participants who were a member of the Board of Directors of the association, and only one participant was a member of the qualification board. However, several studies have reported that women and men are equally effective leaders.^[18,19] In these studies, women had difficulty in evaluating only when they adopted an autocratic, stereotypical, male-type leadership style, whereas women were more likely to lead with a collaborative or transformational style than men and that this leadership style was the most effective leadership style.^[18,20-22] Considering all these factors, female surgeons should be more involved in leadership positions, and supportive and encouraging practices should be developed in this regard.

In a study conducted by EACT and ESTS in which a total of 11 annual meetings during a five-year study period were evaluated in terms of gender distribution among session chairs and abstract presenters, 13.2% of session chairs and 15.2% of abstract presenters were women, and the proportion of female session chairs and abstract presenters tended to increase significantly from 2017 to 2022^[23] One of the favorable results of our study was that more than half of the participants (53.4%) reported that they participated in congresses as speakers. A total of 12.3% of the participants were session chairs. In addition, the results of the examination of the results booklets of 12 national thoracic surgery congresses revealed that more and more women took part in the organizing committee, session chairmanship and speaker positions over the years. In particular, the proportion of women among the first names and presenters of oral presentations has increased significantly in recent years. This situation demonstrates that participants can take an active role in association congresses. However, there is a need to increase the number of women on organizing committees. In our study, there were only two participants who took part in the organizing committee of the congress and none of the participants served as the chair of the organizing committee of the congress. Casadevall et al.^[24] reported that the presence of at least one female member on the meeting team was associated with a significantly higher rate of invited female speakers and may enable more women to attend the meeting. In addition, studies have shown that at least 25% participation is required for a minority group to be heard in a committee^[25] Therefore, it is valuable to take gender distribution into consideration while determining the organizing committees of congresses and to encourage increasing the number of women.

The first step in developing solutions to problems is to identify the problems. Our study was conducted based on this point and drew attention to the need for change by revealing the difficulties experienced by female thoracic surgeons in Türkiye in their training, professional life, career progression, and work balance with children and family life due to gender bias. Following the identification of problems, there is a need to develop strategies to reduce the impact of biases on behavior. Societies such as ESTS and EACT establish women's committees such as "women in general thoracic surgery (WGTS)", "women in cardio-thoracic surgery (WiCTS)" which aim to increase communication and solidarity among women surgeons. Similarly, in Türkiye, it is important

to create grounds where women surgeons within the association can come together. Through these committees, various practices to support female surgeons can be implemented. For instance, the development of mentorship and scholarship programs where women can mentor and sponsor women will benefit young female surgeons and increase their communication and interaction with surgeons they can see as role models. In addition, practices aimed at increasing the number of women in decision-making positions and planning committees in our work areas, professional associations and scientific activities, policies to increase men's participation in early childrearing and encourage them to share childcare, initiatives to facilitate breastfeeding in the workplace and provision of facilities, such as childcare facilities, would be important in overcoming the negative situations faced by female surgeons in their professional lives.

Nonetheless, there are some limitations to this study. First, the participants comprised 31.7% of the total number of female thoracic surgeons. Therefore, selection bias cannot be avoided. Second, the study presents the data of a survey including only female thoracic surgeons. A future survey including both male and female thoracic surgeons has the potential to provide valuable results in terms of revealing gender bias. Further well-designed studies including other surgical specialties are needed to confirm these findings.

In conclusion, our study highlights the urgent need for change by revealing the challenges faced by female thoracic surgeons in Türkiye, including obstacles in training, professional advancement, and achieving a balance between work, children, and family life, all of which are exacerbated by gender bias.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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