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Turkish Women Authors in Emergency Medicine

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Abstract

Aim: A large number of articles are published in the field of Emergency medicine in Turkey every year. This study aims to evaluate the number and quality of publications in the field of emergency medicine in Turkey and to determine the effect of female authors on publication quality.

Materials and Method: A total of 32 international journals were identified. All articles published in these journals between January 01, 2015, and December 31, 2020 were reviewed, and publications by Turkish researchers were included in the study.

Results: Most of the publications are case reports and series (35.7%), but the numbers of systematic reviews (0.4%) and meta-analyses (0.3%) are low. The median count of authors of the articles was 5 (1-32) [for women: 1 (0-16); for men: 4 (0-16); $p<0.001$]. There is at least one woman author in 66.9% of the publications included in the study. 173 (22.5%) of the publications had female corresponding authors, while 192 (25%) of the publications had female first authors; moreover, 149 (19.4%) of the studies had both female first and corresponding authors. There was also no significant difference in the gender of the first authors and corresponding authors across years ($p>0.05$).

Conclusion: The number of women authors was found to be statistically significant lower than the number of men authors. However, there was no gender difference in the distribution of first authors and corresponding authors. This showed that although the number of women was small, they were in an influential position.

Keywords: Emergency medicine, women authors, publications, researcher

Introduction

According to the 2022 data, there are 16.834 (38% women) academic staff in university hospitals and training and research hospitals in Turkey; of which, 335 are in the field of emergency medicine and 25.6% of this is women (1). United States data has shown that more than 50% of healthcare workers are women (2). Although the working rate of women in Turkey is 28%, more than half of the health workers are women (3,4). However, it has been reported that the majority of female health workers are nurses, midwives, and caregivers, and only 40% of doctors are women (4). Even though women work more in the field of health than men, the fact that they are fewer academics is attributed to different reasons (such as race, gender discrimination, unwanted sexual behaviors, motherhood, and female role in society) (5-8).

One of the important indicators and tools of academic progress is the publication of international scientific articles. In many countries, academic advancement depends on tenure and/or the number of publications and citations to those publications (9). Although the conditions for academic promotion vary from country to country, researchers are expected to publish in journals with high impact factors, and these publications are expected to be cited (10-12). Although the number of publications on emergency medicine in our country increases every year, the data

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on the number and citations of these studies are limited (13,14). One of the criteria for academic promotion in our country is to have publications in international journals such as those indexed in the Social Sciences Citation Index, Science Citation Index, Science Citation Index Expanded, or Arts and Humanities Citation Index. Additionally, papers may be published in journals listed in other indices (15).

Before this study, we had some questions in mind. To answer these questions, we designed this study.

1) Do female researchers sufficiently participate in the studies conducted in the field of emergency medicine in our country?

2) Does the presence of female researchers affect the number of citations of the publications?

For this purpose, the publications of the journals published in the field of emergency medicine between the years 2015-2020 were examined.

Materials and Methods

Study Design

The retrospective observational study that did not include human subjects, and therefore ethics committee approval was not required.

Workflow

Emergency medicine journals were searched on the LetPub-Scientific Journal Selector website (https://www.letpub.com/index.php?page=journalapp), which provides quality editorial service. Journals titled emergency medicine were taken to increase visibility. A total of 32 international journals were identified. All articles published in these journals between January 01, 2015, and December 31, 2020, were reviewed, and publications by Turkish researchers were included in the study. The genders of the authors in the articles were determined by looking at the pictures on the websites of the institutions they work at and/or on public social media accounts (ResearchGate, LinkedIn, Twitter, Instagram, etc,) (16). The website https://tez.yok.gov.tr/UlusalTezMerkezi/, where the national thesis data is available, was checked to determine whether these publications are the subject of a master's thesis or not.

Inclusion Criteria

Articles meeting the following criteria were included in the study.

- Being published in Emergency medicine journals

- To be written in English

- Full text available

- Be written on the specified dates

- Including studies based in Turkey

Included Journals

Advanced Journal of Emergency Medicine, African Journal of Emergency Medicine, Anatolian Journal of Emergency Medicine, Archives of Academic Emergency Medicine, BMC Emergency Medicine, Case Reports in Emergency Medicine, Clinical and Experimental Emergency Medicine, Clinical Practice and Cases in Emergency Medicine, Emergency Medicine International, Emergency Medicine: Open Access, Eurasian Journal of Emergency Medicine, Hong Kong Journal of Emergency Medicine, International Journal of Emergency Medicine, Iranian Journal of Emergency Medicine, Italian Journal of Emergency Medicine, Journal of Education and Teaching Emergency Medicine, Journal of Emergency and Internal Medicine, Journal of Emergency Medicine Case Reports, Journal of Emergency Medicine, Trauma and Acute Care, Journal of Pediatric Emergency and Intensive Care Medicine, Open Access Emergency Medicine, Open Journal of Emergency Medicine, Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine, Turkish Journal of Emergency Medicine, Western Journal of Emergency Medicine, World Journal of Emergency Medicine

Emergency Medicine Journal, Shock, Resuscitation, Academic Emergency Medicine, Annals of Emergency Medicine, and The Journal of Emergency Medicine were included in the study.

Measurements

For each article researched, the name of the journal, the impact factor (IF) of the journal, the number of issues for every year, and whether it has Open Access were identified.

The total number of the author, the number of men/woman authors, whether or not it is a master's thesis, the date of publishing, the number of centers (single/multicenter), type of study (meta-analysis, systematic review, randomized controlled trial, cohort study (prospective observational study), case-control study, cross-sectional study, case reports and series, ideas, editorials, opinions, animal research studies, retrospective analysis, others), subject of study (resuscitation; analgesia, anesthesia, and interventional sedation; emergency wound care and management; cardiovascular, respiratory, digestive, renal and genitourinary, obstetrics and gynecological, pediatrics, geriatrics, infectious diseases, toxicology, environmental, endocrine, hematological and oncological, neurology, eye, ear, nose, and throat, dermatological, trauma, imaging, prehospital, education, psychiatry, abuse, management, others), and the number of citations was examined for each study.

Statistical Analysis

The adherence of the data to normal distribution was examined with the Kolmogorov-Smirnov test. The Mann-Whitney U test was used to compare the features that were not normally distributed in two independent groups, and the Kruskal-Wallis and Dunn test was used to compare more than two independent groups. Relationships between numerical variables were tested with the Spearman correlation coefficient. As descriptive statistics, mean ± standard deviation and median (min-max) values for numerical variables, number and % values are given for categorical variables. SPSS Windows version 23.0 package was used for statistical analysis, and $p<0.05$ was considered statistically significant.

Results

A total of 768 articles published by researchers working in Turkey between 2015 and 2020 in these journals were investigated. 63.8% of the journals were Open Access; the average IF was 1.63±0.74; and the annual average issue was 7.14±4.07. The journal in which the articles were published the most was the Eurasian Journal of Emergency Medicine (28.4%), while the journal in which they were published the least was the Journal of Emergency Medicine. The highest number of publications appeared in 2016 (22.4%), and most of them were performed as single-center studies (79.0%). The total number of authors of the articles was 3846. The total number of male authors was approximately three times higher than that of female authors, with 2877 males (74.8%) and 969 females (25.2%), respectively. The median count of authors of the articles was 5 (1-32) (for women: 1 (0-16), for men, 4 (0-16) [$p<0.001$)]. The average number of citations received by the published articles was 4.85±9.36, and 1.77% of the articles consisted of studies obtained from master's theses. Most of the publications are case reports and series (35.7%), but the numbers of systematic reviews (0.4%) and meta-analyses (0.3%) are low (Table 1). Study subjects were mostly focused on imaging, cardiovascular,

Table 1. Descriptive data on publications

Parameter	Value	p value
Number of publications	768	-
Year n (%) 2015 2016 2017 2018 2019 2020	 155 (20.2) 172 (22.4) 117 (15.2) 104 (13.5) 123 (16.0) 97 (12.7)	0.001
Open access n (%) Yes No	 490 (63.8) 278 (36.2)	0.001
Number of citation [Mean ± SD (M) min-max]	4.85±9.36 (2) (0-140)	-
Number of centers n (%) Multicenter Single center	 161 (21.0) 607 (79.0)	0.201
Number of authors [Median (min-max)] Total (n=3846, 100%) Men (n=2877, 74.8%) Women (n=969, 25.2%)	 5 (1-32) 4 (0-16) 1 (0-16)	<0.001
Type of publication n (%) Case reports and series Retrospective study Cohort study (prospective observational) Randomized controlled trial Ideas, editorials, opinions Cross-section Case-control Systematic review Meta-analysis Animal research studies Others	 274 (35.7%) 145 (18.9%) 145 (18.8%) 80 (10.4%) 46 (6.0%) 35 (4.6%) 16 (2.1%) 3 (0.4%) 2 (0.3%) 5 (0.7%) 17 (2.2%)	0.001

(p was obtained from Mann-Whitney U or Kruskall-Wallis test within each colom, different letters superscript indicate significant differences ($p<0.05$) according to the Dunn test SD: Standard deviation, M: Median)

and trauma (12.3%; 11.1%; 9.2%, respectively) and focused least on otolaryngology, abuse, and emergency wound care and management.

There was no significant correlation between the article being a thesis and its number of citations, or between the number of study centers and the number of citations it received (p=0.613, p=0.201, respectively). It was determined that the number of citations of publications in Open Access journals was significantly lower than that in subscription journals. (p=0.001). The older the study, the higher the number of citations it received (p=0.001). case-control studies and randomized controlled trials had a higher number of citations compared to other studies (p=0.001).

A positive correlation was found between the yearly number of publications and the IF of the journals (r=0.647, p=0.001). A statistically significant very weak positive correlation was found between the IF and the total number of authors (r=0.120, p=0.001). A positive correlation was found between the IF and the number of citations it received (r=0.468, p=0.001). There were statistically significant weak relationships involving the number of yearly publications, the total number of authors, and the number of citations received. Positive and statistically significant weak correlations were found between the number of authors and the number of citations (r=0.209, p=0.001).

In only 24 (3.1%) articles, all authors were women, while in 254 (33.1%) articles, all authors were men. There is at least one woman author in 514 (66.9%) of the publications included in the study. 173 (22.5%) of the publications had female corresponding authors, while 192 (25%) of the publications had female first authors [149 (19.4%) of the studies had both female first and corresponding authors]. There was also no significant difference between the genders of the first authors and corresponding authors across years (p>0.05) (Table 2) (Figure 1).

Publications that included at least one female author were compared with others. It was observed that there was no difference in the Journal IF or the number of citations received (p>0.05) (Table 3).

Discussion

The American College of Physicians emphasizes the importance of gender equality in academia (17). In different studies, it has been determined that women are not sufficiently included as authors of original research articles in medical journals, and the proportion of female authors in some journals has decreased over time (16,18).

Hart and Perlis (16) examined the articles in journals with the highest IF between 2008 and 2018. They found a continued

Table 2. The situation of the women authors

Parameter	Women n (%)	Men n (%)	p value
Number of corresponding authors			
Total	173 (22.5%)	595 (77.5%)	
2015	35 (22.5%)	120 (77.5%)	
2016	35 (20.3%)	137 (79.7%)	
2017	25 (21.4%)	92 (78.6%)	
2018	24 (23.1%)	80 (76.9%)	0.826
2019	27 (21.9%)	96 (78.1%)	
2020	27 (27.8%)	70 (72.2%)	
Number of first authors			
Total	192 (25%)	576 (75%)	
2015	43 (27.7%)	112 (72.3%)	
2016	40 (23.3%)	132 (76.7%)	
2017	28 (23.9%)	89 (76.1%)	
2018	24 (23.1%)	80 (76.9%)	0.899
2019	30 (24.4%)	93 (75.6%)	
2020	27 (27.8%)	70 (72.2%)	

p was obtained from chi-squared test, significant differences p<0.05.

Table 3. Comparison of publications with female authors with others

	Publications without women (n=254) M [Q1 Q3]	Publications with women (n=514) M [Q1 Q3]	Total (n=768) M [Q1 Q3]	p value
Impact Factor	12.20 [2.50 12.47]	12.20 [2.50 12.47]	12.20 [2.50 12.47]	0.369
Number of citation	2 [0-5]	2 [0-6]	2 [0-6]	0.367

M: Median, p value was obtained from Mann-Whitney U test

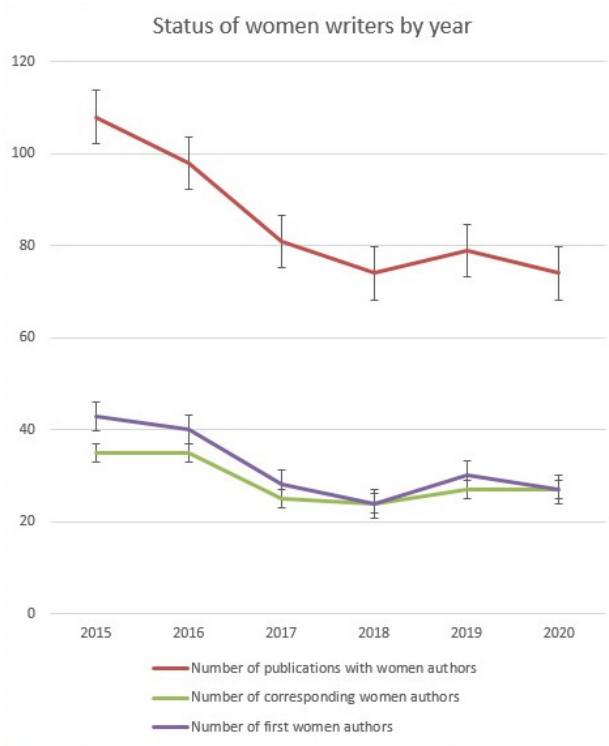

Figure 1. Status of women writers by year

increase in the representation of women in academic publications but demonstrated that disparity still exists, especially in the last author's position. Silver et al. (19) reviewed the four journals with the highest IF in pediatrics. They showed that women were underrepresented as first writers (41.7%). They showed that the first author was also underrepresented as co-author and final author, regardless of gender. Anderson et al. (20) reviewed articles on COVID-19 and identified authors of USA origin. The articles originating from the USA in the journals included in the study increased by 61% during the COVID-19 epidemic compared to the number of articles published in 2019 (20). Despite this, the proportion of women was found to be lower in COVID-19-related articles compared to articles published in 2019 (first authorship was 19% lower, last authorship was 5% lower, and the overall rate was 8% lower per article). The COVID-19 pandemic has affected almost everyone's work and family life, and this justifies the concern that women are more affected (20). Reza et al. (21) reviewed the publications included in the Class I recommendations in heart failure guidelines. It was shown that there were 20% female authors in the United States guidelines and 14% in the European guidelines. The ratio of female first/senior authors in studies on heart failure was 11%. This distribution did not change significantly over time (data from 2001 to 2016). This situation is similar to what occurs when case report authors are examined (22).

Vural et al. (17) reviewed publications in three major emergency medicine journals between 2000 and 2019. 72.5% of the publications had at least one female author. However, the rate of the first author was 25.8%; the rate of the senior author was 18.7%; and the rate of the corresponding author was (21.6%). As the number of authors in the articles increased, the number of female authors also increased.

In this study, unlike other studies, we tried to evaluate not only the journals with the highest impact value in the field of emergency medicine, but also all journals. There was at least one female author in one-third of the articles published in Turkey. In only 3.2% of the articles, the authors are all women. Although the number of male authors [median: 4 (0-16)] is higher than the number of female authors [median: 1 (0-16)] ($p<0.001$), it was observed that women did not lag behind men both as first author and as the corresponding author ($p>0.05$). The publications that included women were not different from the othersaccording to journal impact factors and citation counts.

Study Limitations

- Not including journals indexed in different databases.
- The date interval is limited to five years.
- Although it was not difficult to reach Turkish authors, special software could be used for gender determination [Genderize.io (https://genderize.io)] (3).
- Even in this study, there is only one female author.

Conclusion

The number of women authors was found to be statistically significantly lower than the number of men authors. However, there was no gender difference between the number of the first author and the corresponding author. This showed that although women were few in number, they were in an influential position.

Ethics

Ethics Committee Approval: All information collected from this study was from open accessed LetPub-Scientific Journal Selector website, ResearchGate, LinkedIn, Twitter, and Instagram accounts. All this data is publicly available. Therefore, ethics committee approval was not required.

Informed Consent: The retrospective observational study that did not include human subjects, and therefore ethics committee

approval was not required. Authors declare that human rights were respected according to the Declaration of Helsinki.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.S., Concept: M.S. M.B., Design: M.S. M.B., Data Collection or Processing: A.H. M.E.K., A.A., F.B., Analysis or Interpretation: M.B., H.G., Literature Search: A.H., M.S.K., A.A., F.B., Writing: M.B., A.A., M.S.

Conflict of Interest: The authors declare that they have no conflict of interest.

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