

ORIGINAL RESEARCH

Gender representation on editorial boards of leading oncology journals

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Available online 26 September 2022

Background: There has historically been women underrepresentation on editorial boards of peer-reviewed medical journals. High-ranked oncology journals showcase cancer-related scientific work at the forefront of the discipline. There is urgent need to investigate gender representation on editorial boards at leading oncology journals.

Materials and methods: Sixty high-ranked oncology journals based on impact factor calculated by the Journal Citation Reports (JCR) 2021 from Web of Science/Clarivate Analytics were identified. Gender-related information of editorial boards was obtained from each journal's website. The gender of each member of the editorial team was confirmed by an internet search for picture and/or gender-specific pronoun from journal or personal profile. Fisher's exact tests and analysis of variance were used to analyze categorical and continuous variables, respectively. Significance was set at $P < 0.05$.

Results: Among 4898 members on editorial boards of top oncology journals with the highest impact factor, 1177 were women. Women made up 24% (1177 of 4898) of members on editorial boards in top oncology journals, and there was significantly less women board members than men ($P < 0.0001$). The mean female composition of editorial boards of oncology journals was 27% (range from 4% to 100%). Among 71 editors-in-chief of the top oncology journals, 14 (20%) were women. There was a positive correlation between the presence of women in journal editorial leadership and the percentage of women on editorial boards ($r_s = 0.340$, $P = 0.008$). The underrepresentation of women on oncology journal editorial boards was significantly different among quartiles of journal impact factor. There was no significant correlation between women's representation on journal editorial boards (%) and journal impact factors ($r_s = 0.226$, $P = 0.086$).

Conclusions: The results demonstrated that there are gender disparities among editorial leadership at high-impact oncology journals. There are cultural and structural barriers and prejudices to gender parity and diversity on editorial boards of oncology journals.

Key words: women's representation, editorial board, oncology journal, gender bias, gender parity

INTRODUCTION

The representation of women as physicians among many medical specialties including oncology has been steadily increased during the past decades. Female doctors made up almost half of all licensed doctors in in the UK in 2020, as compared to 27% a decade ago.¹ 47.5% of European Society for Medical Oncology (ESMO) members were female according to data as of 2019.² The latest report of oncologist demographics and statistics in the United States revealed that 57.6% of oncologists were female.³ Nevertheless, the rates were much lower and disproportionate when looking

specifically at oncology leadership positions. Women constituted about one-third of faculty positions in academic oncology programs.⁴⁻⁶ The proportions of women authors, congress speakers and in leadership positions are well below 50%.² Academia and academic publishing are inevitably parts of the gendered system of social structure.⁷ Increasing evidence showed that there is gender disparity in medical research including success rates of receiving leadership positions, major grants and authorship of research articles. There is also gender imbalance in the editorship of journals across medical specialties. Women researchers have got less editorial positions than their male contemporaries which indicates that there are gender inequality and imbalance in the journal editorial boards.⁷⁻¹⁵

The editors in leadership positions and editorial board members are renowned scientists who have demonstrated competence within the academic community and can take the final decision for any publication-oriented issue.¹⁶

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Gender-balanced participation on editorial boards is closely correlated with sustainable academic advancement and productivity. It is critical to study the publication activities such as the gender distribution of editorial board members. Such studies will offer a new perspective on the assessment of research performance, publishing process and journal quality. Whether there are gender imparities in editorial boards of oncology journals, especially high-ranked journals, needs to be explored. Therefore, this study investigated the gender distribution and quantified women's representation in editorial boards of top oncology journals of the Clarivate Analytics Web of Science Journal Citation Reports (JCR) in 2021.

MATERIALS AND METHODS

This cross-sectional study investigated the gender composition of the editorial members of high-ranked oncology journals. Since this study was based on publicly available data, ethical approval and informed consent were waived by the institutional review board of Peking University Cancer Hospital & Institute.

The selection of oncology journals was based on the list in the Clarivate Analytics Web of Science JCR 2021. The 60 journals in oncology with the highest impact factor (range 508.702-6.25), ranked in JCR Q1, were recruited. Each individual journal website was searched for gender information of the editors-in-chief, second-in-command (including deputy, executive, senior and associate editors), editorial board members and advisory board members. The gender of the recruited editorial members was confirmed by an internet search for pictures and/or gender-specific pronouns from journal websites or personal profiles, as of May 2022. If gender could not be identified through publicly accessible data, the editorial offices were contacted for additional clarification. When there were two or more editors-in-chief in a journal, all of them were included in the analyses of the gender of the editor-in-chief.

Statistical analysis was carried out with the IBM SPSS Statistics, version 21.0 (IBM Corp., Armonk, NY). All variables were tested for normality. Means and standard deviations were calculated and compared with one-way analysis of variance (ANOVA). The correlation of women's representation with journal impact factor was tested by Spearman's correlation test. We further assessed the association between the gender of the editor-in-chief and the participation of women on editorial and advisory boards with Spearman's correlation test. A *P* value < 0.05 indicated statistical significance.

RESULTS

A total of 4898 members on editorial boards of 60 top oncology journals were included, of whom 1177 were women. Women comprised 24% of editorial boards of oncology journals with the highest impact factors. The mean female composition of editorial boards of oncology journals was 27% (range from 4% to 100%). Table 1 shows the descriptive statistics based on the list of impact factors. Table 2 shows the statistical analyses of women's

Table 1. Descriptive statistics of women's representation on editorial boards and gender of the editor-in-chief

Journal rank based on impact factor	No. (%) of women editorial board members	Total number of editorial board members	Gender of the editor-in-chief (M, male; F, female)
1	5 (42)	12	M
2	8 (22)	36	F
3	6 (100)	6	F
4	50 (44)	113	M
5	17 (55)	31	M
6	45 (36)	125	M
7	22 (18)	120	M
8	8 (30)	27	F
9	24 (41)	58	M
10	7 (18)	38	M
11	8 (13)	60	M
12	2 (33)	6	F
13	19 (24)	79	M
14	9 (45)	20	F
15	22 (24)	90	M
16	65 (43)	150	F
17	49 (24)	206	M
18	41 (18)	226	M
19	22 (18)	126	M
20	4 (11)	36	M
21	26 (41)	63	F
22	10 (17)	58	M
23	2 (4)	47	M
24	7 (15)	48	M
25	26 (45)	58	M
26	23 (19)	121	M
27	9 (23)	40	M
28	5 (31)	16	F
29	7 (9)	76	M
30	12 (15)	82	M
31	4 (31)	13	M
32	4 (17)	24	M
33	33 (34)	96	M
34	18 (27)	66	M
35	11 (28)	40	M
36	51 (42)	121	F
37	23 (17)	134	M
38	14 (17)	83	M
39	37 (37)	100	M
40	3 (8)	36	M
41	16 (12)	133	M
42	17 (22)	79	M
43	8 (4)	208	M
44	22 (27)	82	M
45	45 (47)	96	F
46	8 (12)	67	M
47	17 (44)	39	M
48	37 (40)	93	M
49	15 (29)	52	M
50	19 (7)	270	M
51	6 (17)	35	M
52	20 (25)	80	M
53	34 (27)	124	F
54	14 (25)	57	M
55	10 (12)	86	M
56	57 (44)	131	M
57	15 (19)	78	M
58	24 (28)	86	M
59	16 (17)	95	F
60	19 (16)	120	F

representation on editorial boards and editorial leadership per quartile of journal impact factor. There were 10 journals with >1 editors-in-chief. None of the editor-in-chief teams have both genders. The gender of the editor-in-chief was

Journal Categories	Number of Journals	Women representation on editorial boards (%) Mean ± SD (range)	Women in editorial leadership (%) Mean ± SD (range)
The first quartile level (Q1)	15	24.0 ± 11.5 (7.0-44.0)	20.0 ± 41.4 (0.0-100.0)
The second quartile level (Q2)	15	24.6 ± 12.4 (4.0-47.0)	13.3 ± 35.2 (0.0-100.0)
The third quartile level (Q3)	15	22.4 ± 12.6 (4.0-45.0)	20.0 ± 41.4 (0.0-100.0)
The fourth quartile level (Q4)	15	36.5 ± 21.2 (13.0-100.0)	33.3 ± 48.8 (0.0-100.0)

Journals are ranked by quartile levels of journal impact factors. One-way ANOVA showed a significant difference among Q1-Q4 ($P = 0.046$) in women editorial board members (%). *Post hoc* analysis revealed statistically significant differences between Q4 and Q3 ($P = 0.011$), Q4 and Q2 ($P = 0.034$), and Q4 and Q1 ($P = 0.026$). One-way ANOVA showed a non-significant difference among Q1-Q4 ($P = 0.618$) in women in editorial leadership (%). ANOVA, analysis of variance; SD, standard deviation.

identified as male when two or three of them were all men, as female if two of them were women. Among 71 editor-in-chief of the top oncology journals, 14 (20%) were women. There was significant correlation between female editor-in-chief and the participation of women on editorial boards ($r_s = 0.340$, $P = 0.008$). Women’s representation on journal editorial boards with a female editor-in-chief was

significantly higher than those with a male editor-in-chief ($38.0\% \pm 21.3\%$ versus $23.6\% \pm 12.2\%$). The representation of women on journal editorial boards was significantly different among quartiles of journal impact factor ($P = 0.048$). Journals in the fourth quartile had a significantly higher proportion of female editorial board members than the other three quartiles. There was no significant correlation between women’s representation on journal editorial boards (%) and the journal impact factors (Figure 1; $r_s = 0.226$, $P = 0.086$).

DISCUSSION

This study revealed that women comprised only 24% of editorial boards of top-ranked oncology journals, indicating substantial gender imbalance in editorial positions. To the best of our knowledge, this study included, thus far, the largest number of oncology journals and members on editorial boards from a wide range of high-impact oncology journals. Our results confirmed that editorial teams in top oncology journals did not seem to be truly reflective of the community that supported them. The proportion of female academic oncology faculty in the United States approaches 40%, and >40% of members of the ESMO are women.^{17,18}

The underrepresentation of women on editorial boards has been documented and demonstrated in journals of different medical specialties and in other scientific fields.⁸⁻¹⁵ Although the landscape of women as authors in oncology journals and as panel members is changing,¹⁹⁻²¹ the overall pattern of gender equality on editorial boards of oncology

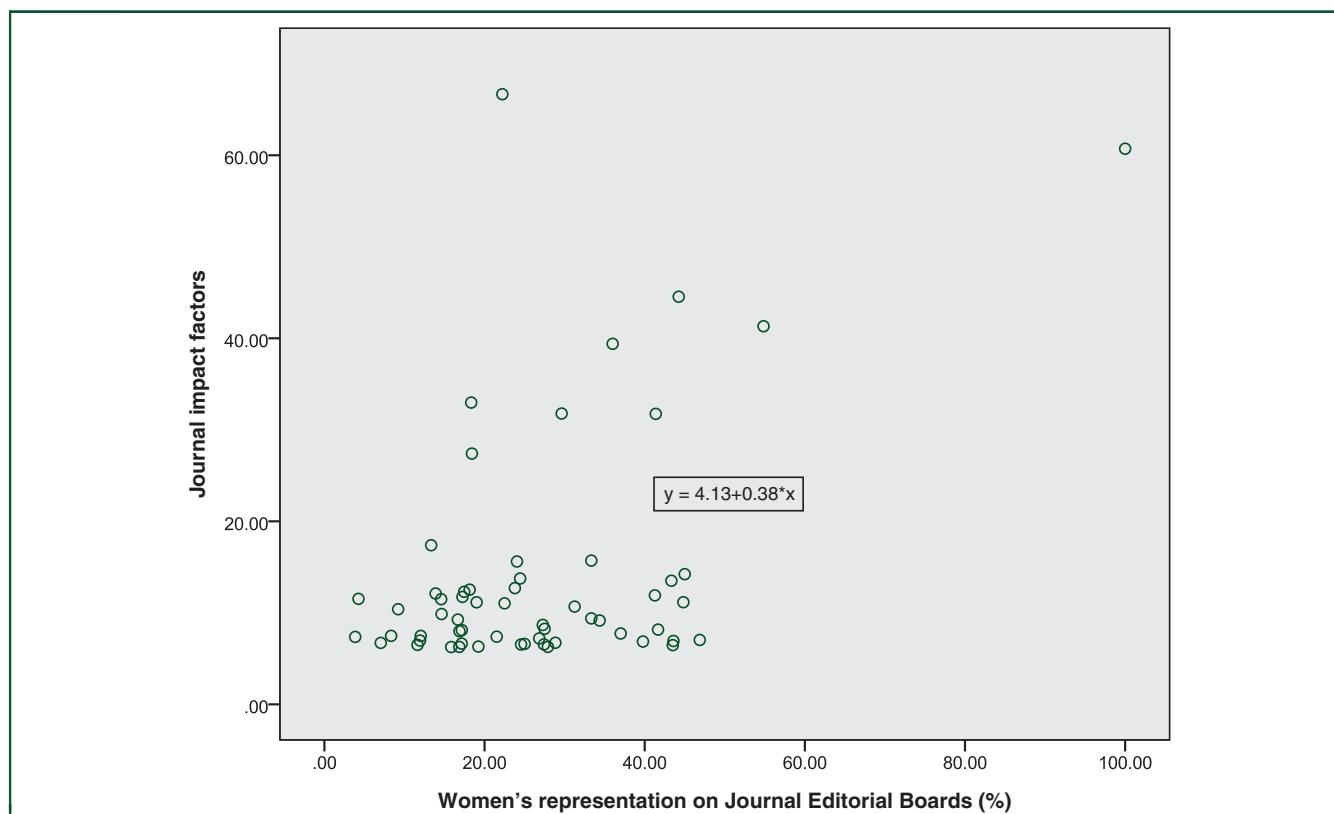


Figure 1. The association of women’s representation on editorial boards and the corresponding impact factors. The scatterplot and fit line show no significant correlation between participation of women on editorial boards and journal impact factor ($r_s = 0.226$, $P = 0.086$, excluding an outer value of 508.7).

journals is one of sluggish growth and persistent challenges. Studies found that female presence is lower than their male counterparts in authorship and editorship in journals of some subspecialties in oncology. Even in the specialized field of gynecologic oncology journals, men constituted the majority of editorial boards.^{22,23} The proportion of female editorial board members in our study is broadly comparable to the underrepresentation of women in other medical specialties and in oncology subspecialties, and the results reflect the status quo of gender imparity on editorial boards of top-impact oncology journals. The results confirmed that there are biases and prejudices against the presence of women on editorial boards and in influential positions of top oncology journals.

The underlying reasons for the under-presentation of women on editorial boards especially amid those leadership positions in oncology journals are multifactorial. Editors and editorial board members are typically scientists with demonstrated competence and established reputation in the research specialties. They usually have strong record of published research especially as the lead author. Besides, they normally have considerable experience in reviewing manuscripts. Lack of recruitment, promotion and retention of female board members is likely due to structural, cultural, organizational and societal barriers to equity and inclusion.²⁴ Strenuous efforts need to be made to eliminate such barriers and increase female presentation in holding leadership, authorship and editorship roles. The academic platforms and organizations should try together to foster a culture of inclusion, diversity and equity in the publishing community, and support and advocate equitable roles of women in editorial leadership positions. More needs to be done urgently so that the editorial boards of oncology journals do not continue to fall behind in terms of representation.

Gender equity on journal editorial boards help cultivate a more favorable academic climate and build more balanced and diversified academia.^{25,26} Gender imparity can be transformed to bias in health systems, research processes and outputs. According to the Global Gender Gap 2021 report, the coronavirus disease 2019 (COVID-19) pandemic will prolong the time to close global gender gap from 99.5 years to 135.6 years.²⁷ Actually, diversity in a field increases its efficiency. Evidence showed that when people with different life experience are brought together, they are more intelligent and communicative, and more likely to take vigorous actions. This is critical especially in scientific fields like oncology where there are more complex topics needed to be dealt with.

The gender imparity on editorial boards is partially to blame for the paucity of women on the authorship and leadership positions. Women account for 40% of academics globally and the average rates for women researchers hover around 30% in North America and Europe.²⁸ Evidence demonstrated that female cancer researchers have less opportunities to win major grants, to publish articles and hold last author positions despite being twice as motivated and productive.²⁹⁻³² Female oncologists are

underrepresented in holding managerial or leadership roles even in teams with more women than men.³³⁻³⁵ The glass ceiling is hindering women scientists from having equitable opportunities to voice their opinions, highlight their expertise and influence the direction of research. Research evidence has demonstrated that researchers' growing publication merits lead to opportunities to be included in editorial boards on oncology journals. Editorial roles may also enable women to influence journal strategies aimed at restoring gender balance in oncology publishing. Journals with larger proportion of women in leadership positions have more women on journal editorial and advisory boards.³⁶

Cultural and structural issues that manifest in individual behaviors and policies of institutions are impediments to gender parity in editorial boards of journals. Editors, publishers, societies, institutions and organizations need to be collaboratively committed to advocating for gender equality and take responsibility for supporting and empowering female scientists. The grant-funding infrastructure needs to be adjusted to reduce gender inequality. Certain investigator grants will enable projects to continue if leaders need to shoulder responsibilities such as childcare. Policies to accommodate parenthood increased female applicants and awardees for the Chinese National Distinguished Young Scientists. After changing the female age limit from 35 to 40 years, the proportion of female awardees rose from 33% to 43%.³⁷

One of the potential effective organizational approaches is to implement quota-based recruitment. This means to set the targets for the proportion of women on boards required to be recruited within the editorial board. Studies revealed that quotas can increase the overall levels of competence. Producing gender-equitable and -inclusive editorial boards can be one evaluation criterion of journals and a standard prerequisite for financial support and rank appraisal. In Central Asia, more than half of researchers are women, and women make up 80% of researchers in Myanmar, which indicates that the longstanding women's underrepresentation in academia is not immutable.²⁸ The quota on the intake of female faculty was imposed in some cases based on the evidence that academic and research institutions and health systems benefit considerably from maintaining gender equity.³⁸ Studies found that for minorities to voice their opinions and for cultural change to take place, representation needs to be at least 30%.³⁹

Structured mentorship programs and journal-initiated pipeline programs can help diversify editorial boards.^{40,41} The Advocates and Allies programs might serve as models of active practice in terms of gender equity.⁴² Superb women scientists may not pursue academic leadership due to the lack of mentors and female role models.⁴³ Explicit encouragement and well-meaning advices, together with providing more enabling environment and climate, may help eliminate women scientists' hesitation and concerns. Equity, diversity and inclusion should be the editorial boards' priority ensuring that board members have core competencies in the journal field regardless of their gender.

One positive aspect is that we have more editors-in-chief launching research awards for inspiring and recognizing outstanding women researchers and organizations which foster inclusive academic climate.

It is important to launch studies of gender diversity and have more open discussions. The Women for Oncology (W4O) initiative at the ESMO investigated the gender parity in oncology through studies focusing on gender imbalance in career development and the progression of female oncologists into leadership positions.⁴⁴ Such studies can sensitize the oncology community to the issue of gender inequalities, create opportunities for discussion and cause change gradually. Such initiatives bring oncology professionals together to communicate and exchange resources and encourage collaborations for female oncologists which can advance career and lead to new opportunities.

This study has some limitations. First, it relied on publicly available information on websites, which may not be up to date. Second, it is a cross-sectional study that does not take into account trends over time. Third, it ranked journals according to their impact factors, which is a generally accepted, yet limited, scientometric parameter to identify the leading and influential journals in each specialty. Nevertheless, it is unlikely that these limitations had substantial impact on the key study findings with respect to women's underrepresentation on editorial boards of leading oncology journals.

Conclusions

This cross-sectional study found that women are underrepresented on editorial boards of leading oncology journals. It is of momentous significance to arouse broad awareness of the gender parity and attract gender diversity in editorial boards of top oncology journals. More needs to be done urgently so that the editorial boards of oncology journals do not continue to fall behind in terms of representation. Journal editors, publishers, societies, academic institutions and organizations need to work collaboratively to ameliorate the situation, advocate gender equality and support women in holding editorial leadership positions. The adjustment of grant-funding infrastructure and policies to accommodate parenthood may help increase women's representation in grant awardee and last authorship. Quota-based recruitment, structured mentorship programs and journal-initiated pipeline programs can help diversify editorial boards. Explicit encouragement and advices, together with a more enabling environment, may help eliminate women scientists' concern and uncertainty to become board members. It is important to launch studies focusing on gender imbalance and the progression of women members into leadership positions.

FUNDING

This work was supported by the China STEM Journal Excellence Action Plan [grant number C-146].

DISCLOSURE

The authors have declared no conflicts of interest.

DATA SHARING

Data are available from the corresponding author upon reasonable request.

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