

Leadership diversity in prosthodontics: Number and percentage of women chief editors of journals publishing prosthodontic science

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Abstract

Statement of problem: The number and percentage of women chief editors of journals publishing prosthodontic science is unknown.

Purpose: The purpose of this observational study was to calculate and compare the number and percentage of women and men chief editors of journals publishing prosthodontic science.

Material and methods: A list of the dental journals, as ranked by impact factor, was obtained through the Web of Science Journal Citation Reports 2020 using the category “Dentistry, Oral Surgery, and Medicine.” Of the 91 journals listed in the Journal Citation Report, 28 published scientific findings related to prosthodontics. The chief editors of these 28 journals were identified, and their gender was recorded. The percentage of women and men chief editors was compared with the percentage of women and men members of the International Association of Dental Research (IADR) and the International College of Prosthodontists (ICP) by using the binomial test ($\alpha=.05$).

Results: Of the 28 included journals, a total of 32 chief editors were identified; of whom, 4 (12.5%) were women and 28 (87.5%) were men. There were 7886 members of the IADR who reported their gender; of whom, 3448 (43.7%) were women. There were 906 members of the ICP; of whom, 248 (27.5%) were women. Compared with the percentage of women and men members of the IADR and ICP, women chief editors were significantly underrepresented ($P<.001$ and $P=.039$, respectively).

Conclusions: The number and percentage of women chief editors of journals publishing prosthodontic science is of concern.

Clinical Implications: The position of chief editor of a journal is a key leadership position as this individual has significant influence over what, when, how, and why scientific data are published. Not only does a chief editor act as a gatekeeper but she or he also indirectly affects the career progression of those for whom scientific publishing is a key metric of success or failure. In this study, the leadership opportunity afforded to women as a chief editor of journals publishing prosthodontic science was assessed. The results indicate that improvement in the representation of women as chief editors is needed and may lead to publication of more diverse forms of prosthodontic science.

“Gender inequities are at odds with the ethics to which we as a health-care community ascribe... Gender equity on editorial boards is an easy problem to fix, and every medical journal has had more than enough time to add qualified women to their top ranks. Some have done so, others have not” wrote Julie Silver, Associate Professor at Harvard School of Medicine, in 2019.¹ Indeed, medicine has had a less-than-desirable track record regarding women editors and editorial board members for 2 decades, with examples evident of both progress and resistance toward improved diversity.^{2,3} Nevertheless, inequities remain.^{1,4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}

In dentistry, remarkably little attention has been paid to the issue of diversity in chief editors of scientific journals. This, in spite of the important role that chief editors play in scientific publishing and, by extension, in the career progress of scientists aspiring to publish their work. In 2015, Ioannidou and Rosania¹⁶ showed significant variation between dental specialties regarding the number of women serving on editorial boards and demonstrated that, overall, women were underrepresented. In their 2019 analysis of the advances made by women in leadership positions in academic dentistry, Li et al¹⁷ reviewed different metrics including the number of women chief editors of North American dental journals. They observed that of 38 editor positions, 3 were held by women and concluded from this finding and their other findings that women remain underrepresented in a variety of leadership positions in North America.

Specific to prosthodontics, Ioannidou and Rosania¹⁶ noted only 10.8% of editorial board positions and 4.4% of editorial leadership positions were held by women. Gender diversity among journal chief editors is important because women view science differently than men and diverse viewpoints impact what, when, how, and why scientific findings are published.¹⁵ Furthermore, those in leadership positions serve as role models, and the increased discussion around issues of social justice, diversity, equity, and inclusion will lead to a more diverse set of leaders in science. Therefore, the purpose of this study was to ascertain the number of women chief editors of scientific journals that publish articles relating to prosthodontics (prosthodontics, restorative dentistry, esthetic dentistry, dental materials, gerodontology, operative dentistry, orofacial pain, oral oncology, craniomandibular disorders, digital dentistry, and implant dentistry). The null hypothesis was that the percentage of these journal chief editors who are women would be similar to the percentage of prosthodontists who are women.

Material and methods

Journals listed on the Web of Science from the 2020 Journal Citation Reports system using the category “Dentistry, Oral Surgery, and Medicine” that publish manuscripts relevant to prosthodontics, including prosthodontics, restorative dentistry, esthetic dentistry, dental materials, gerodontology, operative dentistry, orofacial pain, oral oncology, craniomandibular disorders, digital dentistry, and implant dentistry, were included. Table 1 shows the 28 journals included in this study. Note that the journal Implant Dentistry, which ceased publication at the end of 2019, was included because it retained a ranking in the 2020 Journal Citation Reports system.

Table 1. Chief editors and chief editor gender (*yellow*, single chief editor woman; *gray*, single chief editor man; *blue*, 2 joint chief editors men) of journals included

| JCR2020 Rank/91 | Journal | Gender |
|-----------------|--|--------|
| 4 | Dental Materials | Gray |
| 5 | Oral Oncology | Gray |
| 8 | Clinical Oral Implants Research | Yellow |
| 9 | Clinical Implant Dent Rel Research | Blue |
| 15 | Clinical Oral Investigations | Gray |
| 17 | J Prosthodontics Research | Gray |
| 18 | European Journal of Oral Implantology | Gray |
| 21 | J Prosthetic Dentistry | Gray |
| 23 | J Adhesive Dentistry | Blue |
| 24 | Int J Oral Maxillofacial Implants | Gray |
| 25 | J Oral Rehabilitation | Gray |
| 27 | Operative Dentistry | Gray |
| 29 | J Prosthodontics | Gray |
| 32 | Int J Implant Dentistry | Blue |
| 39 | Head & Face Medicine | Gray |
| 45 | J Esthetic Restorative Dentistry | Gray |
| 48 | Int J Computerized Dentistry | Gray |
| 58 | Int J Periodontics & Restorative Dentistry | Blue |
| 59 | J Advanced Prosthodontics | Yellow |
| 61 | Int J Prosthodontics | Yellow |
| 62 | Quintessence International | Gray |
| 64 | Implant Dentistry | Gray |
| 65 | J Oral Implantology | Gray |
| 67 | Dental Materials Journal | Gray |
| 69 | Gerodontology | Yellow |
| 74 | J Oral Facial Pain & Headache | Gray |
| 78 | Cranio - J Craniomand Sleep Practice | Gray |
| 90 | Implantologie | Gray |

Using the International Standard Serial Number, each journal’s Website was reviewed, and the name of the current chief editor or chief editors identified. The editors were categorized as either a woman or a man based on their name and picture as has been described in previous studies.^{18, 19, 20} The gender distribution of chief editors for bias (underrepresentation or overrepresentation of women) was analyzed by using statistical methods. The null hypothesis was that the editors were selected independently from a pool of academic researchers and prosthodontists. As there is no definitive source of information that identifies the percentage of researchers and prosthodontists across the world that are women, the percentage of women members of the International Association of Dental Research (IADR) and the International College of Prosthodontists (ICP) was used for statistical analysis. The binomial test was used to compare the percentage of women and men chief editors with the percentage of women and men members of the IADR and the ICP ($\alpha=.05$).

Results

Of the 28 journals included, 24 had a single chief editor and 4 had 2 chief editors, yielding a total of 32 individuals serving in this leadership role. Of the 32 chief editors constituting the sample population, 4 (12.5%) were women and 17 (87.5%) were men. For the 4 journals with 2 chief editors, in each instance, both chief editors were men. Table 1 shows the chief editors

of each journal along with a color designation of whether a journal's editor(s) was a woman, a man, or both were men.

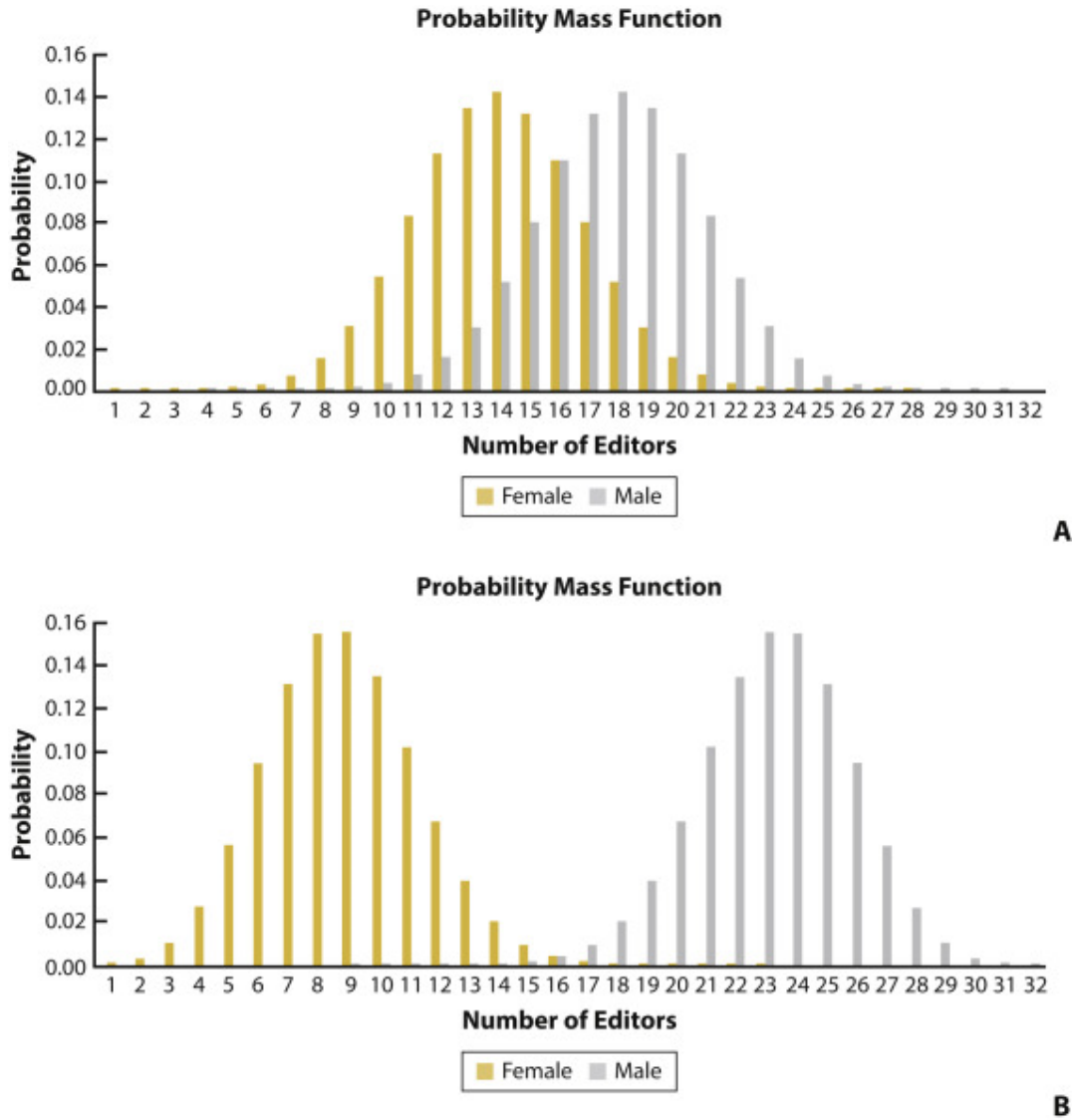


Figure 1. Probability mass function showing probability of given number of women and men editors from population of 32 editors relative to percentage of women and men members. A, International Association of Dental Research; B, International College of Prosthodontists. x-axis: Number of editors. y-axis: probability.

Statistical analysis regarding whether 12.5% of chief editors being women was an underrepresentation or overrepresentation of women relative to the number of women in the general population of prosthodontists was estimated by using the number of women who are members of the IADR and the ICP. There are 8333 members of the IADR; of whom, 7886 reported their gender. The percentage of women members of the IADR was 43.7% (3448 women; 4438 men) (personal communication; Riana Hays, Component Relations, IADR). The percentage of women chief editors was statistically significantly ($P<.001$) lower than the expected percentage using IADR gender distribution values. The percentage of ICP members who are women is 27.4% (248 women; 658 men) (personal communication; Lynn Reeves, RES

Inc Administration for the ICP). The percentage of women chief editors was statistically significantly ($P=.039$) lower than the expected percentage using ICP gender distribution values. A probability mass function showing the probability of a given number of women and men chief editors from a population of 32 editors relative to the percentage of women and men who are members of the IADR and the ICP is represented in Figure 1. A cumulative binomial distribution analysis showing probability (P value) of given number of women editors from a population of 32 editors relative to the percentage of women who are members of the IADR and the ICP is represented in Figure 2.

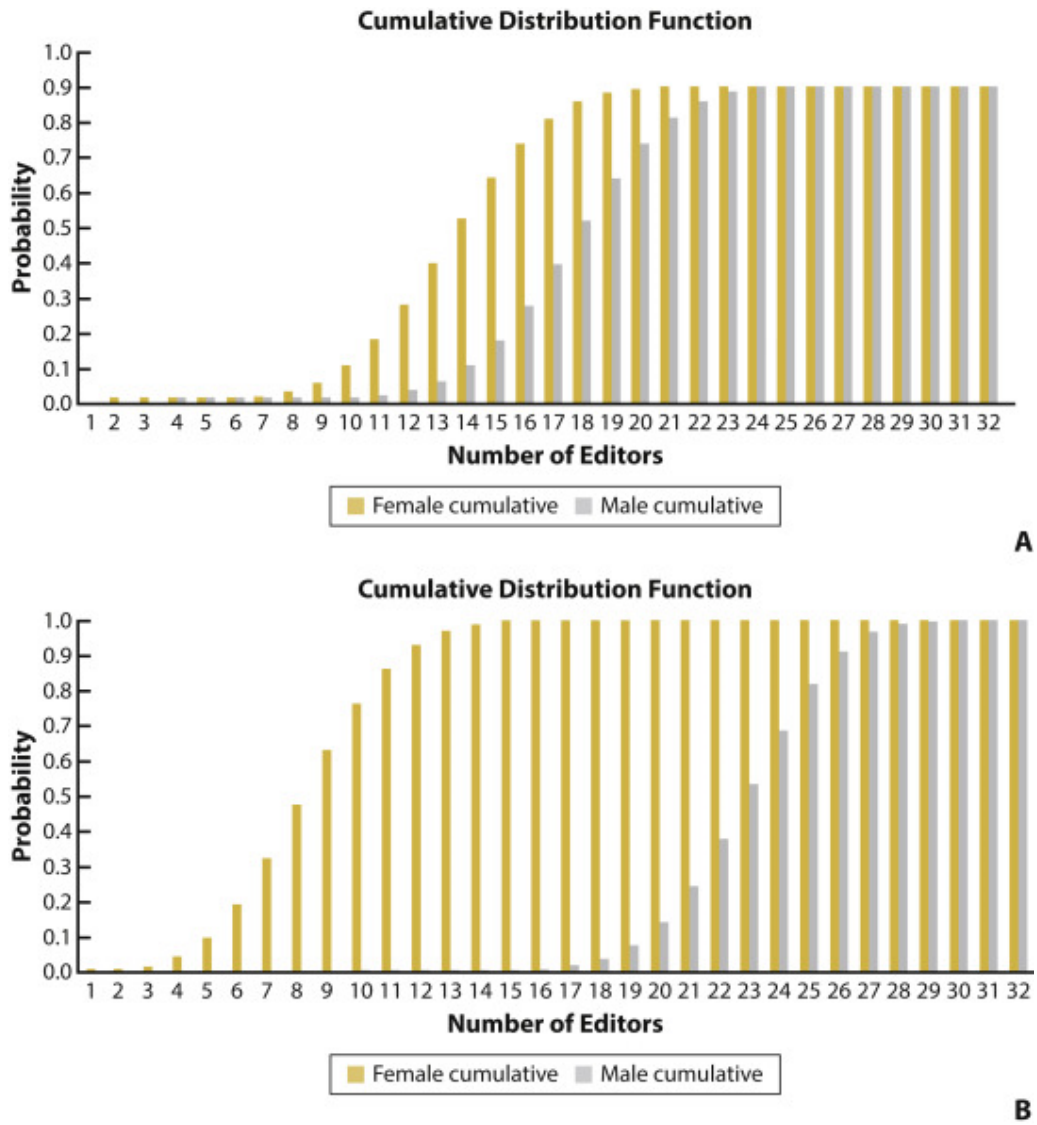


Figure 2. Cumulative binomial distribution analysis showing probability (P) of given number of women editors from population of 32 editors relative to percentage of women members. A, International Association of Dental Research; B, International College of Prosthodontists. x-axis: Number of editors. y-axis: probability.

Discussion

Only 12.5% of the chief editors of the included prosthodontic-related journals were women. This value of 12.5% is higher than the 4.4% noted by Ioannidou and Rosania,¹⁶ and the difference may be because of different inclusion criteria for journals. In the present study, a broader view was taken to include journals that routinely publish science related to prosthodontics rather than journals that only publish science related to prosthodontics. The null hypothesis tested in this study, that the percentage of women chief editors of journals that publish prosthodontic science would be similar to the percentage of women who are prosthodontists, was rejected. Clearly, beyond the statistical analysis, because of the percentage of women members of ICP is 27.4%, the fact that women chief editors lead only 12.5% of the journals included in this study is concerning. Reaching the threshold of statistical significance demonstrates that the probability of there being so few women chief editors happening by chance alone is distressingly low.

Two major influences of how a woman chief editor might be chosen are the process by which chief editors are chosen and the pool of scholars from which editors are chosen. Regarding the former, most scientific journals are owned by publishing companies which are for-profit entities, and the leadership of these companies decides who will be chief editor. In addition, a journal may be owned by a professional organization that chooses the chief editor of its journal, usually in collaboration with the journal's publisher, to ensure that the choice is acceptable to both parties. Most journals neither offer clarity in the editor selection process nor seek applications involving a transparent process for reviewing applicant credentials. The resultant opacity leaves the process of chief editor selection especially vulnerable to subjective rather than objective criteria.

A second major influence relates to the number of women scholars who, objectively at least, have the qualifications to be a chief editor. Li et al¹⁷ acknowledged that the number of qualified women has been historically low but that, in recent years, the number of qualified women has increased significantly. The implication, then, of there still being so few women chief editors undermines the "lack of suitable candidates" argument and raises the issue of bias in the selection process. Just as has been previously reported for other professional leadership positions within prosthodontics, for example, the number of women speakers at scientific meetings¹⁹ and the number of women presidents of professional organizations,¹⁸ women have been denied opportunities that should be afforded them based on objective criteria. Clearly, many factors influence who is chosen to be editor of a scientific journal.

One might ask why the gender of a chief editor matters, the answer to which has many facets and starts with the importance of the chief editor position itself. A chief editor is a powerful gatekeeper because she or he sets the direction of a journal in terms of the content and type of research that will be considered for publication. A chief editor is routinely the first person to read a new manuscript submission and make an initial decision on whether it will be rejected without further review or whether it will be sent for review. If a manuscript is to be sent for review, the chief editor then chooses who will be involved in the review process; again, a powerfully subjective decision, as chief editors know which reviewers are easier or harder to satisfy. Then, if manuscript reviewers submit diverging opinions, the chief editor makes the final decision. A chief editor, therefore, wields formidable power in the scientific publishing process.

Beyond the issue of a chief editor's power, however, comes the question of whether a chief editor's gender matters. Research from academic medicine indicates that gender does indeed matter.¹⁵ Just as for other leadership positions, those who hold those positions act as role models for those like them. The importance of having role models for an aspiring scholar cannot be underestimated, especially if the aspiring scholar belongs to a group typically underrepresented in academics.^{1,2} In addition, there is evidence that women and men see scientific priorities differently, use different language about science²¹ and engage in the peer review process differently.¹⁵ For example, women chief editors are more likely than men chief editors to invite women scientists to review, and men reviewers are more likely to accept an invitation to review from a man chief editor than from a woman chief editor; women invited to review show no such discrimination.¹⁵ The outcome is that different types of science, different areas of science, and different ways of describing science favor women chief editors compared with men editors. An important consequence of incorporating these differences is greater diversity in what constitutes good science that passes peer review inspection and, therefore, affords more paths to academic success for aspiring scholars.

Limitations of this study included that no universal definition of prosthodontist is accepted worldwide because of the diversity of educational programs, licensing regulations, and professional viewpoints of what constitutes a specialty. Consequently, no single bona fide source exists for how many prosthodontists are men and how many are women in the world. In addition, which journals were included and excluded in the study was somewhat subjective. It is acknowledged that not all the articles published in the included journals are directly related to prosthodontics. However, the focus of each of the included journals does include fields that are routinely taught in prosthodontic training programs around the world.

Conclusions

Based on the findings of this observational study, the following conclusions were drawn:

1. The percentage of chief editors of journals publishing manuscripts related to prosthodontics who are women is only 12.5%.
2. It is hoped that in the coming years, those responsible for appointing editors will seek to remedy this imbalance by providing aspiring chief editors with the necessary support to develop the skills needed to compete for a chief editor position.
3. With the ensuing increase in the number of women chief editors, more diverse types and styles of scientific inquiry will be considered for publication, and consequently, a more diverse set of scholars will have successful academic careers.

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CRedit authorship contribution statement

Karen R. Bennie: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing - review & editing. **Sreenivas Koka:** Conceptualization, Methodology, Validation, Writing - original draft, Supervision, Project administration.

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