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Representation of women on editorial boards of ophthalmology journals: protocol for a cross-sectional study

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ABSTRACT

Introduction There is a notable under-representation of women in leadership positions in ophthalmology despite the increasing number of women as ophthalmologists. Gender inequality in editorial boards of ophthalmology journals has not been investigated on a global scale. This study will aim to evaluate the representation of women as editorial board members in ophthalmology journals across different regions, journal subspecialties and impact factors.

Methods and analysis This will be a cross-sectional study describing the gender composition of editorial boards in ophthalmology journals globally. Ulrich's Periodicals Directory and SCImago Journal & Country Rank will be used to comprehensively identify journals indexed with the keyword, 'ophthalmology'. All journals with active websites and lists of editorial boards will be included. Journals will be categorised according to the World Bank's 2021 classification of countries by income and region, and classified into ophthalmology subspecialties based on publication scope. Impact factors will be obtained from Journal Citation Reports. The gender and academic degrees of each editorial board member will be determined based on journal profiles, institutional websites or name query feature on an online interface. The research impact of each editorial board member will be ascertained from the author records on Web of Science. The gender proportion will be presented for all journals combined, and then for journals grouped by regions, subspecialties and impact factors. Editorial board member characteristics including academic degrees and research productivity measures will be compared between men and women. These comparisons will be made using the χ^2 test for categorical variables and the independent samples t-test for continuous variables.

Ethics and dissemination This study did not require research ethics approval given the use of publicly available data and lack of human subjects. The results will be presented at scientific meetings and published in peer-reviewed journals.

INTRODUCTION

The editorial board of a scientific journals plays an important role as gatekeepers for the advancement of academic surgeons and in shaping what published research and knowledge become available to the public. Despite the steady increase in the number of women as ophthalmologists and women authoring

ophthalmic publications,[1 2] there appears to have been only a marginal growth in the representation of women in leadership positions.[3] Amrein *et al* identified a significant under-representation of women in editorial board membership among the top five ophthalmic journals with no representation of women in the editor-in-chief (EiC) position.[4] A decade later, a report by Camacci *et al* demonstrated that women continue to comprise a small proportion of the editorial board members in the 20 highest-ranked journals.[5] However, these studies have only characterised the select top journals within the field, majority of which were based in North America. The gender inequality may vary across different countries and continents as demonstrated in a recent study by Holman *et al* with especially low proportion of women as authors publishing in science, technology, engineering, mathematics and medicine fields in certain countries like Japan, Germany, and Switzerland.[6] As such, it is essential to evaluate the gender inequality in editorial boards of ophthalmology journals across the globe, as the geographical origin of a journal may influence participation of women in leadership positions. Furthermore, there are differences in ophthalmic surgical subspecialty representation of women and no

reports to date have characterised the gender composition of editorial boards based on different subspecialties in ophthalmology. This is important to consider as several subspecialties within ophthalmology including vitreoretinal surgery, are traditionally considered to be specialties dominated by men.[7]

Study objectives

The purpose of this study is to evaluate the representation of women in all ophthalmic journal editorial boards globally. We will describe the proportion of women in editorial boards in journals grouped by different ophthalmic subspecialties and journal impact factors. We will also compare the publication productivity and demographic characteristics between men and women.

METHODS AND ANALYSIS
Study design

This will be a cross-sectional study describing the gender composition of editorial board members in ophthalmology journals globally from inception up to 10 October 2021, as well as the productivity and demographic characteristics of board members based on gender.

Databases used

The Ulrichsweb is an online version of Ulrich's Periodical Directory, which contains detailed information on more than 300 000 periodicals of all types. The SCImago Journal & Country Rank is a public portal that contains journals rank indicators developed from the Scopus database. A comprehensive list of journals will be obtained through a sensitive search on the Ulrichsweb, and this list will be cross-checked using the list of journals generated by the SCImago Journal & Country Rank to ensure all highly ranked ophthalmology journals are included.

Journal Citation Reports is a publication of Clarivate Analytics that provides basic bibliographic information about academic journals, and will be used to search journal impact factors. Web of Science is a database that provides citation information and research impact metrics for a given journal article or an author. The research productivity measures for individual editorial board members are available on the author profile after searching the first and last names using the name search feature.

Identification of ophthalmology journals

The Ulrichsweb will be used to identify the ophthalmology journals. The search will involve using the advanced search function with the keyword, 'ophthalmology,' to identify all periodicals containing the term 'ophthalmology' in the subject classifications. Furthermore, the results will be limited to periodicals with 'active' status indicating a periodical is currently being published as of 10 October 2021, and 'journal' as the serial type. Additionally, in order to verify that a comprehensive of journals has been selected, the SCImago Journal & Country Rank will also be used to identify a list of ophthalmology journals. The lists from the two databases will be merged and any duplicate journals identified will be removed. The list will be then manually reviewed by the investigators to identify scholarly journals predominantly pertaining to ophthalmology based on their title, affiliated societies, and target audience. Journals without a valid journal website, and/or without a list of editorial board members will be excluded from the analysis. Journals with websites in non-English languages will also be excluded if an automatic English language conversion/equivalent is not provided by the website or Google (as translation of names and designations may be inaccurate or incomplete).

Journal data characteristics

For each included journal, the first publication year, years in publication, and gender composition of EiC, editors, and advisory board members will be ascertained from the journal website. For the journals identified in the SCImago Journal & Country Rank, the 2020 SCImago Journal & Country Rank indicator (a measure of journal's impact based on the number citations received in the three previous years), and whether the journal was open access from SCImago Journal & Country Rank will be obtained. The journal impact factor will be determined from Journal Citation Reports, and the journal impact factor quartile (Q1, Q2, Q3 or Q4) based on the category ranking will also be obtained from Journal Citation Reports. Impact factors for journals not listed on Journal Citation Reports will be determined from Academic Accelerator (https://academic-accelerator.com/) or the journal website. The country of publication will be abstracted from the journal website and will be categorised according to the World Bank's 2021 classification of countries by income (low vs lower middle vs upper middle vs high income) and geographical region.[8] The journal subspecialty will be determined from the journal website by identifying terminology that classifies the journal into the following subspecialty categories: general (comprehensive, ethics and medical education, all subspecialties combined), cataract and refractive surgery, cornea, glaucoma, retina and vitreoretinal surgery, ocular oncology, ocular immunology/ocular inflammation/uveitis, strabismus and paediatrics, neuro-ophthalmology, ocular histopathology, oculoplastics and basic science.

Editorial board data characteristics

EiCs from all included journals while editors and advisory board members from the journals with impact factors listed on Journal Citation Reports will be considered for the analysis of editorial board characteristics. An editor will be defined as anyone that is not EiC holding positions with decisive functions regarding manuscript acceptance. This definition will include positions such as senior editors, associate editors and section editors. Advisory board members will be included as a separate group from EiCs and editors. Administrative staffs such as managing, copy, illustration, video and technical editors will not be

included. For each editorial board member, gender (man vs woman) will be identified through profiles (biography and/or photograph within the past 10 years) on institutional affiliation websites. If no profiles are available, gender will be defined using an application programming interface (https://gender-api.com) which generates a percentage value indicating the certainty of the gender determined by the first name. A cut-off of 90% certainty will be used, and any individual whose gender cannot be determined with certainty equal to or greater than 90% will have their gender verified via an exhaustive Google search.[9] If the gender cannot be determined after the above-mentioned steps, the editorial member will be denoted to have an unknown gender. The designation of ophthalmologist versus non-ophthalmologist, as well as any academic degrees including Doctor of Medicine (MD), Doctor of Philosophy (PhD) and any non-MD or PhD degrees will be collected via the journal website profiles or institutional affiliation profiles. If this information is not readily available from the website and institutional profile, the editorial board member will be determined to be an ophthalmologist if they were either listed on the websites of the physician governing bodies (eg, American Board of Ophthalmology, Canadian Ophthalmological Society American Society of Retina Specialists) or had professional profiles indicating ophthalmology residency training or their position as ophthalmologists.[10] Board members not meeting any of the criteria above will be designated as non-ophthalmologists (or unknown if no information can be identified). Information on academic degrees will be obtained from the editorial board member's most recent two publications.

The Web of Science will be accessed to determine each member's country of origin, total number of publications, number of publications in the recent 5 years, number of citations by other documents and h-index (defined as the number of publications (h) that have received at least h citations). Lastly, the m-quotient, which is a metric that facilitates comparisons of research productivity among authors with varying lengths of academic careers, will be calculated by dividing the h-index by the number of years since the first published paper. If the data on research impact is not available on Web of Science, the Scopus database will be used to collect the above-mentioned variables for each editorial member included in the study.

Study outcomes

The overall gender proportion of EiCs, editors and advisory board members will be presented separately. Additionally, the gender proportions based on specific journal characteristics including, journal impact factor, impact factor quartiles, geographical region category and journal subspecialty category will be characterised and compared.

The study will also compare the composition of ophthalmologists versus non-ophthalmologists, degrees (medical, PhD and non-medical or non-PhD degrees), country of origin, as well as productivity measures (total number of publications, number of publications in the

Table 1 Overview of Journal and editorial board parameters	
Journal data	**Editorial board data**
Journal Title	Name
First publication year	Position
Total years in publication	Gender
Country of origin	Source used to determine gender
World Bank country income	Ophthalmology training
World Bank country region	Doctor of Medicine
Journal subspecialty	Doctor of Philosophy
Journal network	Other academic degrees
Impact factor	Editorial member country of origin
Impact factor source	Total publications
Impact factor quartile	Publications within 5 years
SCImago indicator	Total citations
Total no of editors-in-chief	Year of first publication
No of women as editors-in-chief	H-index
No of men as editors-in-chief	M-quotient
Total no of editors	
No of women as editors	
No of men as editors	
No of women as advisory board members	
No of men as advisory board members	

recent 5 years, number of citations, h-index and m-quotient) between men and women.

Data collection

A standardised data collection sheet (table 1) will be used for the study. All study variables will be collected by four separate investigators. As a part of a quality check, three investigators will independently dually extract data for a random selection of five journals (representing approximately 10% of the data set), in order to assess interrater reliability of the data collection. The kappa statistic and percent agreement will be reviewed and reported.

Missing data

If any of the variable of interest is unavailable or unclear from the above-mentioned resources, investigators will directly contact the journal based on the contact email information provided for the editorial office and/or EiC. Attempts to contact will be made over a 2-week period. If no response is obtained, the data will be coded as missing for all analyses.

Statistical analysis

The inter-rater reliability will be assessed using kappa statistic, and a cut-off of 0.8 will be used to determine if the investigators are in good agreement with regard to the data collection for a random selection of 5 journals. If the kappa value is less than 0.8, the investigators will

re-establish standard grading criteria and repeat quality check until kappa value of 0.8 is achieved. Data will be reported descriptively for the proportion of women in EiC, editor and advisory board positions in all ophthalmology journals, as well as in each journal category by region and subspecialty. For continuous variables such as journal impact factor, publishing years, number of publications, publications in the last 5 years, number of citations, h-index and m-quotient, normality will be tested using histograms of data spread, Q-Q plots and the Kolmogorov-Smirnov tests. Normally distributed variables will be presented as mean and SD and compared using the independent samples t-test. Non-parametrically distributed variables will be reported using median with IQR and compared using the Mann-Whitney U test. For categorial variables such as journal subspecialty, categories of country of origin and degree type, proportions will be reported, and the χ^2 test will be used to compare frequencies between men and women in the editorial boards. Linear regression analysis will be conducted with journal impact factor as the independent variable and proportion of women as the dependent variable. A p value of 0.05 will be considered for statistical significance. Data will be analysed using SPSS V.27.

Patient and public involvement

The development and design of the protocol involved consultation with academic ophthalmologists and members of the scientific community that consume literature in the field of ophthalmology. The opinions and documented experiences that illustrate the challenges of women as ophthalmologists during their training and career shaped the research question. Furthermore, the outcome measures were developed to provide explanations for why such gender disparity exists in ophthalmology leadership positions. The results from this study will be disseminated to local and national ophthalmology communities including professional societies and journals.

DISCUSSION

Women are under-represented in medical leadership positions, especially in surgical specialties such as ophthalmology. This will serve as the first study to identify all ophthalmology journals including the non-English journals, and to investigate the underrepresentation of women in editorial roles within the field of ophthalmology globally. It is anticipated that the gender inequality of ophthalmic editorial board members may vary across different regions as the culture and political structure of a country may influence participation of women in leadership positions. Furthermore, several subspecialties within ophthalmology including vitreoretinal surgery, are traditionally considered to be specialties dominated by men, and similar trend may be observed among the editorial board members of journals with greater emphasis on surgery. This study will also characterise impact factors,

and the investigators hypothesise that there will be a lower representation of women in editorial boards of higher-impact journals, and this gender disparity may be even more apparent in the EiC position based on a previous study evaluating gender composition of the 20 highest-ranked ophthalmology journals.[5]

It is important to acknowledge the potential limitations of this study. Although we will be the largest and most comprehensive study to date on this topic, any international journals without English translation will be excluded, and thus foreign journals may be under-represented in the study. Journal impact factor is a scientometric index calculated by Clarivate of the journals indexed on the Web of Science database. Some low impact and international journals may not be properly indexed on the Web of Science, and thus only a subset of the journals may have their impact factors available on Journal Citation Reports released by Clarivate. Furthermore, the investigators of this study will assign gender to each editorial board member using the binary classification (men vs women) based on data available publicly. It is possible that the assigned gender based on the photographs, first names and gender pronouns is different from the actual gender that the individual identifies with.

It is expected that ophthalmology is not the only specialty that experiences significant gender disparity in leadership positions. The methodology outlined in the current protocol may be applicable to future studies investigating gender disparity in the editorial boards belonging to the journals of other specialties, which may allow comparisons of the findings across multiple fields within medicine.

ETHICS AND DISSEMINATION

Research ethics approval will not be necessary given the use of publicly available data and lack of human subjects. The study will be conducted in accordance with the Declaration of Helsinki. The results of this study will be disseminated through scientific conference presentations and research publications. Overall, the findings from this study will identify any gender disparities and contribute to the knowledge on why such gaps exist as the first step to informing and addressing issues in diversity and inclusion.

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