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Gender aspects in medical publication – the *Wiener klinische Wochenschrift*

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Gender-Aspekte bei medizinisch-wissenschaftlichen Publikationen am Beispiel der *Wiener klinischen Wochenschrift*

Zusammenfassung. *Fragestellung und Ziel:* Medizin ist ein akademischer Fachbereich, in dem nach wie vor ein Ungleichgewicht zwischen Männern und Frauen herrscht. Weltweit sind mehr als die Hälfte aller Medizinstudenten weiblich, jedoch erreicht nur ein kleiner Prozentsatz später eine Führungsposition. Das Ziel der vorliegenden Arbeit war es, zu analysieren, wie diese Situation in einer allgemein-medizinisch-wissenschaftlichen Fachzeitschrift reflektiert wird.

Methodik: Alle Manuskripte, die in dem Zeitraum zwischen Jänner 2001 und September 2009 bei der *Wiener klinischen Wochenschrift* zur Publikation eingereicht waren, wurden in die Untersuchung einbezogen. Folgende Gesichtspunkte wurden analysiert: Erstautorenschaft von Frauen in Bezug auf eingereichte sowie angenommene Manuskripte, eingeladene Manuskripte, Art der Publikation, medizinisches Fachgebiet der Manuskripte, Prozentsatz an eingeladenen Gutachtern und Qualität der Gutachten.

Ergebnisse: Im Beobachtungszeitraum wurden 2507 Manuskripte bei der *Wiener klinischen Wochenschrift* zur Publikation eingereicht, davon hatten 26% weibliche Erstautoren. Dieser Prozentsatz stieg kontinuierlich von 16% in 2001 bis auf 32% in 2007 an und blieb in der Folge konstant. Der Anteil an Arbeiten, die von Frauen zur Publikation eingereicht waren, war abhängig vom medizinischen Sonderfach – so betrug er 48% bei pädiatrischen Manuskripten, aber nur 12% bei kardiologischen Arbeiten. Der Anteil an zur Publikation angenommenen Arbeiten war bei männlichen und weiblichen Erstautoren gleich. Es gab jedoch einen größeren Anteil von sofort abgelehnten Manuskripten mit einer weiblichen Erstautorin als mit einem männlichen Erstautor (21% versus 16%). Manuskripte mit einer weiblichen Erstautorin nannten häufiger einen anderen korrespondierenden Autor als Manuskripte mit einem

männlichen Erstautor. Mehr als 40% aller eingereichten Originalarbeiten, 24% der Übersichten, aber nur 10% der Editorials wiesen eine Frau als Autorin auf. Während der letzten 5 Jahre waren nur 11% der Gutachter Frauen, die Qualität der Gutachten war aber generell höher. Unter den 21 Mitgliedern des Editorial Boards ist nur eine einzige Frau.

Zusammenfassung: Zwischen 2001 und 2007 stieg der Anteil an Manuskripten, die von Frauen eingereicht wurden, konstant an und beträgt derzeit ca. 30%, in einzelnen Fachbereichen wie Kinderheilkunde bis zu 50%. Nichtsdestotrotz liegt nach wie vor eine massive Ungleichstellung zwischen männlichen und weiblichen Autoren vor: Übersichtsarbeiten sowie eingeladene Editorials sind selten von Frauen verfasst, ein sehr niedriger Anteil an Manuskripten wird von Frauen begutachtet, wobei von Frauen erstellte Gutachten meist besser sind. Nur ein Mitglied des Editorial Board ist eine Frau.

Dies widerspiegelt die generelle Situation in der akademischen Medizin. Medizinisch-wissenschaftliche Zeitschriften müssen aktiv dazu beitragen, diese Ungleichheiten zu beseitigen.

Summary. *Objective:* Medicine is a discipline where there are still pronounced gender imbalances. Whereas worldwide about 50% of beginners in medical schools are female, only few of them reach leading positions. Our aim was to analyze how this situation is reflected in a peer-reviewed general medical-scientific journal.

Methods: We screened all papers submitted to the *Wiener klinische Wochenschrift – The Middle European Journal of Medicine* between January 2001 and September 2009, analyzing the percentage of female first authors of submitted papers and accepted papers, the contribution of female authors depending on the type of article and medical specialty, and the percentage of invited female peer reviewers as well as the quality of their reviews.

Major results: During the period studied, a total of 2507 manuscripts were submitted to *Wiener klinische*

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Wochenschrift. 26% of these papers had female first authors, and this proportion increased continuously from 16% in 2001 to 32% in 2007, whereafter it remained constant. The proportion of papers submitted by female first authors was dependent on the medical subspecialty (e.g. 48% female first authors of pediatric papers, 12% female first authors of cardiology papers). There was no difference in the acceptance rate of papers by male and female first authors; however, a somewhat higher rate of papers with female first authors was subject to rapid rejection (21% vs. 16%). Papers with female first authors more often named a different corresponding author than papers with male first authors, and in most of these cases the corresponding author was a man. More than 40% of all submitted original papers, 24% of the review articles, but only 10% of the editorials had female first authors. During the years studied only 5–11% of reviewers were women, despite that the quality of their reviews was generally better than those by men. Among the 21 members of the editorial board only one is a woman.

Conclusion: Between 2001 and 2007 the percentage of manuscripts submitted to *Wiener klinische Wochenschrift* by female authors constantly increased and is now around 30%, reaching almost 50% in some specialties such as pediatrics. Nevertheless, there remains a massive gender imbalance in *Wiener klinische Wochenschrift*: review papers or invited editorials are only rarely authored by female researchers, a very low percentage of peer reviewers is female – although the quality of their reviews is generally better – and only one member of the editorial board is female. Even though this is mostly a reflection of the general situation in academic medicine, medical journals can and must take action and contribute to the elimination of these gender inequalities.

Key words: Medical publication, gender, gender bias, author, reviewer, editor.

Introduction

Medicine is a field where distinct gender inequalities still exist. Despite the fact that in most medical schools worldwide about 50% of the medical students are women, only few of them are promoted to leadership positions and even fewer will become full professors or department chairs [1]. This situation has somewhat improved but has not fundamentally changed during the past decade.

These inequalities are mirrored in the field of medical publication. There is indication that the proportion of papers authored by female researchers submitted to biomedical journals has increased during recent years, but that integration of female experts into the publication process and editorial boards of journals remains low [2–4].

Certainly, most aspects of a gender imbalance in scientific publication reflect the general situation in academic medicine. Nevertheless, there are several areas where medical journals can contribute to the elimination of such gender inequalities.

Since available information of gender aspects in medical scientific publication is scarce and mostly limited to isolated aspects, we analyzed the reality of gender-related aspects in a European peer-reviewed general medical-scientific journal.

Methods

For the purpose of this study we searched all articles submitted between January 2001 and September 2009 in the database of the editorial office of the *Wiener klinische Wochenschrift – The Middle European Journal of Medicine* with respect to gender aspects regarding authorship of submitted manuscripts, medical specialty, acceptance rates, and authorship of solicited articles such as review articles and editorials.

We also assessed the percentage and performance of female vs. male reviewers. Peer reviewers for *Wiener klinische Wochenschrift* are asked to submit a recommendation for the reviewed manuscript (“accept as is”, “minor revisions”, “major revisions” or “reject”) and to give detailed explanation to the authors, especially when asking for minor or major revision. The quality of the submitted peer reviews is rated by the editorial office on a scale from 1 (very good) to 5 (poor). The recommendations by the experts and the rating of review quality were analyzed with respect to differences between male and female reviewers.

Lastly, we considered the composition of the editorial board of the journal.

Results

Women as first authors

Overall, among a total of 2507 papers submitted to *Wiener klinische Wochenschrift* during the observation period 26% had a woman as first author. This percentage increased from 16% in 2002 to 32% in 2007 (Fig. 1). There were large differences in the percentage of female first authors depending on the medical specialty (Table 1): thus, nearly half the papers in pediatrics were authored by female researchers but only 12% of the cardiology investigations.

Of the papers submitted by female authors, 21% were not considered suitable for formal review and thus were subject to “rapid rejection”; among papers submit-

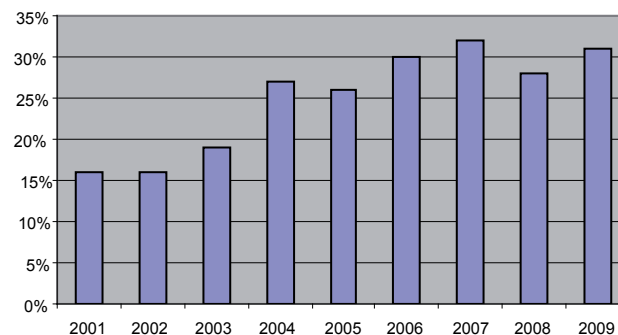


Fig. 1. Percentage of papers submitted to *Wiener klinische Wochenschrift* with female first authors from 2001 to September 2009

Table 1. Gender distribution of papers submitted to *Wiener klinische Wochenschrift* according to medical specialty

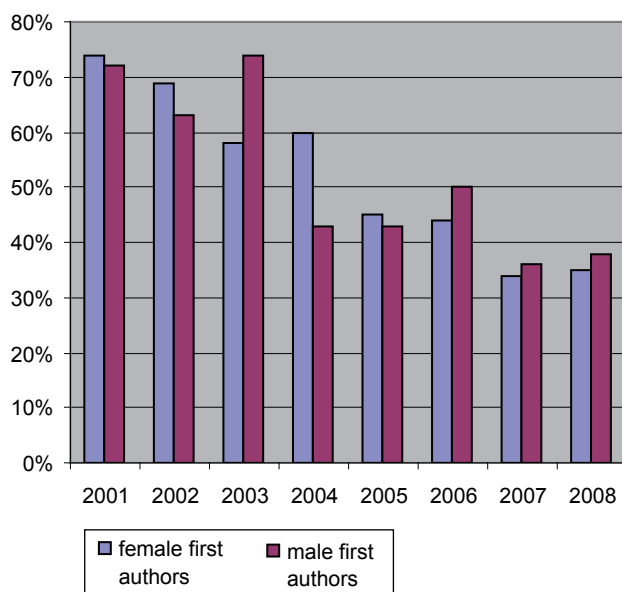
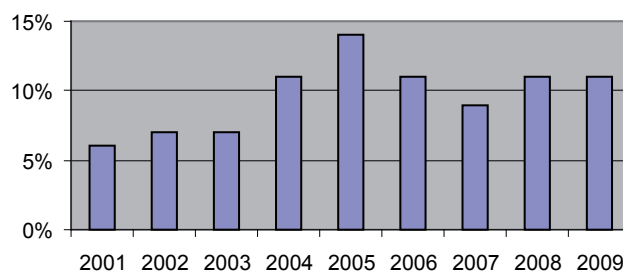
Medical subspecialty	Papers with female first authors (%)
Cardiology	12
Surgery	20
Gynecology	29
Microbiology	38
Psychiatry and psychology	40
Pediatrics	49

ted by male first authors a somewhat lower fraction (16%) was immediately rejected.

However, there was no difference between male and female first authors in the percentage of papers accepted for publication (Fig. 2): the overall acceptance rate was 56% of papers by male first authors vs. 52% by female first authors. Among manuscripts entering the formal review process, 62% of female first authors were accepted vs. 56% from male authors.

In analysis of corresponding authors in papers submitted by a female first author, 34% had a different corresponding author and in only 21% of these cases was the corresponding author a woman. In contrast, only 17% of submissions by male first authors named a different corresponding author and in only 10% of these cases was the corresponding author female. This situation did not change notably over the years analyzed.

In contrast to original papers, where the contribution of female first authors has continuously increased during recent years, female authorship of review articles and, even more pronounced, of editorials (which

**Fig. 2.** Gender distribution of percentage of papers accepted for publication in *Wiener klinische Wochenschrift***Fig. 3.** Percentage of female first authors in relation to type of article submitted to *Wiener klinische Wochenschrift***Fig. 4.** Percentage of female reviewers during the period 2001–2009

are mostly invited) has remained very low at 25% and 10%, respectively (Fig. 3).

Women as reviewers

The proportion of female reviewers was low overall, showing large fluctuations over the years analyzed: 6% in 2001 and 14% in 2005 (Fig. 4).

Female reviewers less often used the recommendation term “accept as is” (1% for female reviewers vs. 6% for male reviewers) and more often recommended “major revisions” (45% vs. 36%). The rejection rate, on the other hand, was similar (26% vs. 27%) (Fig. 5a).

Analysis by the editorial office of the internal rating of the peer reviews showed a distinctly better rating for female reviewers (Fig. 5b).

Women on the editorial board

The largest gender inequality is seen within the personnel structure of the journal itself. There has never been a female editor of *Wiener klinische Wochenschrift*, and of the 21 members of the editorial board only one is a woman.

Discussion

In this investigation we have shown that the proportion of papers by female first authors submitted to the general medical-scientific journal *Wiener klinische Wochen-*

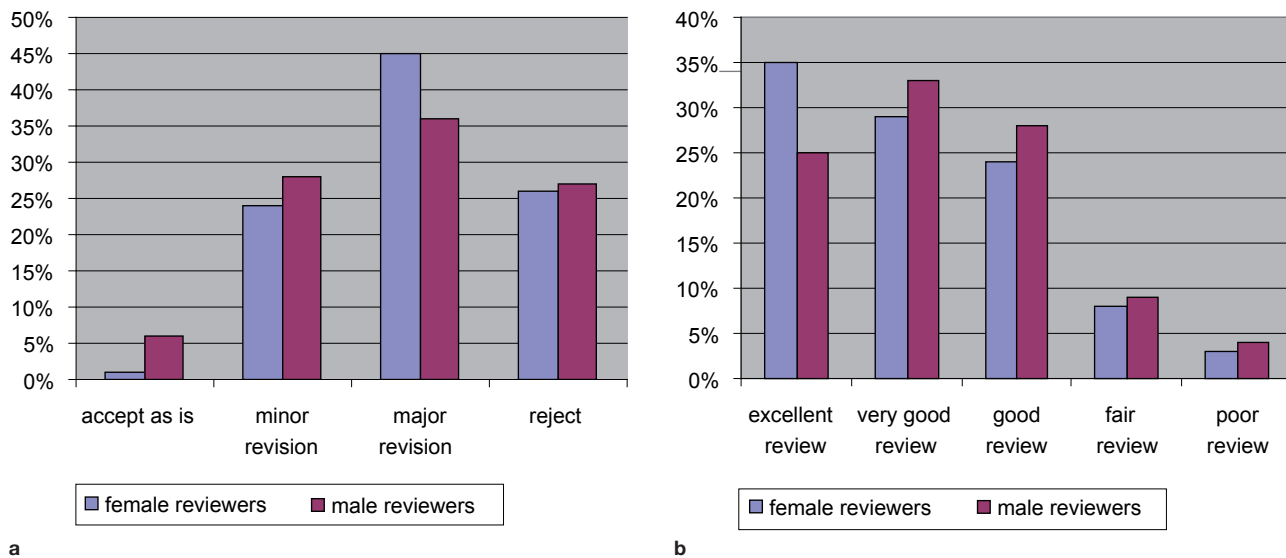


Fig. 5. Peer reviews by female vs. male experts: (a) Recommendation of the reviewers; (b) Rating of the review quality (by the editorial office)

schrift has considerably increased during the past decade. Our figures are in accordance with other investigations and reflect the situation in academic medicine in general [2, 5].

Looking at the overall rejection rates of papers submitted by male and female first authors we could not detect any differences – the same percentage of submitted manuscripts had sufficient scientific quality to reach publication status. However, we noticed that more manuscripts submitted by female first authors were “rapidly rejected” as not having sufficient quality to enter the review process.

Frequently these manuscripts were rejected not so much because of their scientific content but because of their poor presentation. It has often been postulated that women scientists tend to “sell themselves short”, have a certain lack of confidence compared with their male colleagues, are “less careerist”, “less self-promoting”, and therefore less determined and experienced in presenting their own scientific work.

In the same context, it was interesting to note that the percentage of papers where the first author was not named as corresponding author (i.e. work group leader) was twice as high in papers with female first authors than in papers with male first authors. In these cases the corresponding author was a woman in only 21% of the manuscripts by female first authors, and, even worse, in 10% of manuscripts by male first authors. This clearly reflects the fact that work group leaders are men in most cases, and that women are less often in leading positions or heading research groups.

The scientific contribution of women in academic medicine depends strongly on the respective field of medicine. We found a large variation in the percentage of female first authors depending on the medical specialty (e.g. 49% in pediatrics but only 12% in cardiology).

A further interesting aspect is that this analysis of original contributions to *Wiener klinische Wochenschrift*

showed a significantly higher ratio of female first authors in interdisciplinary papers than in monodisciplinary ones [6]. This might indicate that women are more interested in such types of investigation, but also that they are better team workers and more willing to cooperate with other researchers.

In contrast to the high submission rate of original articles by female first authors, the proportion of women authoring review articles, editorials and perspectives was low, and this situation did not change during the decade analyzed. These types of article are mostly solicited by the journal editors, and again the low proportion of women authors obviously reflects the lack of female research group leaders in academic medicine [7].

We also analyzed gender aspects of the review process. The proportion of female reviewers was constantly low during the years investigated. This might indicate that there is a limited pool of women who have achieved sufficient international recognition and expertise. On the other hand we found that our female reviewers usually put more time and effort into their reviews: in comparison with their male colleagues they considerably more often recommended “major revisions”, which implies having to submit detailed comments to the authors. In accordance, female reviewers scored much better on the internal rating of the editorial office.

This could again be attributed to the fact that women in general tend to be less “careerist” and therefore prepared to spend more time on the review of a manuscript – a task that may be important and interesting but does not really help in advancing their career.

We could not detect any difference in the percentage of papers rejected by male and female reviewers, rejection being determined by the insufficient scientific quality of the manuscript.

The number of women (only one) on the editorial board of *Wiener klinische Wochenschrift* is embarrassingly low. This aspect of gender inequality is especially

crucial, because the missing representation of women among editors also signifies that women remain outside the scientific community and have still less opportunity to influence the scope and direction of the specific field of a journal. Editors are highest ranking with regard to influencing the scientific community: they select the manuscripts and shape the content and policy of a journal [8]. If women are not represented in decision-making forums such as editorial boards, they are also in no position to shape the rights and the health needs of women. The majority of health workers are women yet they are still inadequately represented in decision-making processes [9].

To summarize, the general submission rate to *Wiener klinische Wochenschrift* of manuscripts by female and male authors has reached almost equal proportions in some disciplines. This might indicate that the high rate of female students entering medical schools is finally impacting academic medicine and medical science [10, 11]. However, other relevant indicators for gender inequality have remained [12, 13]. Where scientists with higher academic degrees are involved (solicited articles, peer reviewers, editorial boards), female contribution is still much too low – a reflection of the fact that in medicine, as in all other academic disciplines, the higher the academic level, the lower the percentage of female scientists becomes [14].

This analysis must be seen as a means of defining potential areas for improvement and as a call for action. A medical journal can reduce the gender bias [15] in medical publishing by inviting more women to author review articles, comments and editorials, by choosing more women as peer reviewers and also by appointing more women to the editorial board.

This article is not the place to discuss the causes of gender inequalities in medicine in general. The discouraging gender situation in medical publication clearly reflects more general inequalities, even in modern societies in highly developed industrialized countries. Nevertheless, scientific journals can and must contribute to the elimination of these still existing gender imbalances.

Conflict of Interest

The authors declare that there is no conflict of interest.

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