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**Authors:** Barbara Zdzierak, Agata Krawczyk-Ożóg, Artur Dziewierz

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## **Closing the gender gap in cardiology research: Encouraging news for women**

Barbara Zdzierak<sup>1</sup>, Agata Krawczyk-Ożóg<sup>1,2</sup>, Artur Dziewierz<sup>1,3,\*</sup>

<sup>1</sup>Clinical Department of Cardiology and Cardiovascular Interventions, University Hospital, Kraków, Poland

<sup>2</sup>Department of Anatomy, HEART — Heart Embryology and Anatomy Research Team, Jagiellonian University Medical College, Kraków, Poland

<sup>3</sup>2<sup>nd</sup> Department of Cardiology, Institute of Cardiology, Jagiellonian University Medical College, Kraków, Poland

### **Correspondence to:**

Artur Dziewierz, MD, PhD,

2<sup>nd</sup> Department of Cardiology,

Jagiellonian University Medical College,

Jakubowskiego 2, 30–688 Kraków, Poland,

phone: +48 12 400 22 50,

e-mail: artur.dziewierz@uj.edu.pl

Women remain underrepresented and face significant professional challenges in the field of cardiology. Despite the progressive increase in the percentage of women graduating from medical studies, they have less chance of being promoted to higher positions in academic medicine and are less often recognized as experts and leaders. Consequently, they are less likely to be authors of published articles, guidelines, and clinical trials [1–3].

Recently, Konieczńska et al. [1] raised a very important issue in their study, analyzing gender differences in the authorship of articles in Polish cardiology journals. They were the first to show trends between 2013 and 2023 in the gender of authors who have published articles in the *Polish Heart Journal*, the official monthly of the Polish Cardiac Society [1]. Similar to other papers devoted to gender differences, Konieczńska et al. [1] confirmed that female representation in published cardiology research constitutes a minority. Women remain underrepresented as first, senior, and corresponding authors in the overall number of publications. Despite the low population of women among researchers and authors, a gradual increase in the number of all female authors in recent years has been observed [1], which is in

line with other studies [2, 3]. The authors mentioned the lack of analysis of data from other Polish cardiology journals as a limitation of their study. To address this, we have assessed gender representation among authors who published in another Polish cardiology journal, *Advances in Interventional Cardiology*, from 2015 to 2023 [2]. Similarly, our analysis revealed an increasing trend towards publishing papers led by female authors. However, these still account for only approximately one-fourth of all published papers. Although the representation of women authors in specific roles, such as first, senior, or corresponding authors, remains lower, they continue to contribute to a variety of publications. At least one female author was identified in 68.3% of articles published.

Another important issue not addressed by Koniecznyńska et al. [1] was the impact of gender on the citation rate. Importantly, no such difference for papers authored by male and female first authors was observed in our study [2]. The only independent factors influencing citation rate were the number of authors and date of publication. Similarly, no impact of gender of the corresponding author on rejection rate was observed. This may suggest a similarly high scientific value of the published papers, regardless of gender, in Polish cardiology journals.

Unsurprisingly, non-interventional topics dominate among publications by women authors [1–3]. Women are less interested in interventional procedures, and female interventional cardiologists are underrepresented in contemporary practice, constituting around 4% of all independent percutaneous coronary intervention (PCI) operators in Poland [4]. In contrast, Koniecznyńska et al. [1] have suggested a relatively high percentage of first female authors (17.4%) in articles dedicated to interventional cardiology, a male-dominated field. In Blumer et al. [3] analysis, the percentage of female first authors in studies on invasive cardiology was much lower, reaching only 2.4%. Similarly, in our study, the percentage of first female authors was lower for papers from the coronary and peripheral intervention field than for papers covering general cardiology topics. However, we kindly disagree with relating the number of published papers in the field of interventional cardiology to the number of PCI operators in Poland. In fact, the majority of operators work in non-academic centers and are unlikely to be involved in research. On the other hand, papers covering interventional topics are published by non-certified operators, non-interventional cardiologists, residents, and even research students. Thus, it should not be interpreted as “overrepresentation” among first authors [1]. Also, it can be seen as an example of the Pareto principle, where the majority of articles are published by a few individual female PCI operators and authors. These are well-recognized leaders in the field.

It is important to highlight that diverse gender-balanced teams have been more effective in problem-solving than teams composed exclusively of men or women [5]. Also, women in leadership positions are likely to positively impact on other women in their departments and motivate them to become more involved in research. Thus, we wholeheartedly agree that “further efforts are needed to support scientific activity among female cardiologists in Poland and other countries” [1].

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