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Original Research Article

Study on analysis of gender trends among the first authors of publications on Kawasaki disease

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ABSTRACT

Background: Kawasaki disease is an inflammatory disorder predominantly affecting children less than 5 years of age. If left untreated, it has the potential to cause life-threatening cardiac complications. There have been numerous articles published on it concerning various aspects of the disease over the last 20 years. Thus, the study aims to compare the number of male and female first authors for published Kawasaki disease articles and study whether there is any association between gender and country.
Methods: This is a cross-sectional observational study wherein published articles on Kawasaki disease over the last 20 years were assessed and the names of their first authors determined. Subsequently, NamSor was used to establish the gender of the first author. ARIMA (Auto Regressive integrated moving average) was used for statistical analysis.
Results: Data evaluation demonstrated that 51% were male first authors, 36% were female first authors, and 12% did not have a clearly determined gender. Males as first authors have been unwaveringly higher in number than females annually. When gender trends are compared globally, there is a statistically significant association between gender and country, with Greece and Finland having the highest female-to-male ratios.
Conclusions: Although recent years have seen an increase in the number of female first authors, gender disparity still continues to prevail in medical research. This gap has to be eliminated in order to gain dynamic insight from all genders, which can help form a better understanding and further the cause of innovation in not just Kawasaki disease but any other subject of discussion.

Keywords: Kawasaki disease, Gender trends, Gender equality, NamSor

INTRODUCTION

Kawasaki disease is an inflammatory disease of childhood, mainly affecting children under the age of 5. In 1967, a Japanese paediatrician named Tomisaku Kawasaki brought this ailment to the attention of the medical world.[1] Kawasaki disease is a self-limiting inflammatory condition affecting medium-sized blood vessels in the body that results in symptoms ranging from conjunctivitis and skin rashes to the involvement of coronary arteries, leading to deadly cardiac disease in rare cases when left untreated.[2]

Although the scientific community strives to understand Kawasaki disease better in order to enhance patient outcomes, it is equally important to assess the representation of gender equality among the primary authors. By examining the classification of male and

female lead authors in the study of Kawasaki disease, we are gendered in scientific publishing and gain a better understanding of the ailment.

This paper aims to connect Kawasaki disorder and the gender trends of first-author research publications. This interlinking serves a twofold purpose. Firstly, including gender diversity in research enhances the understanding of an ailment from a wider angle, potentially leading to a more comprehensive diagnostic and management approach.[3] Secondly, analysing gender trends among first authors helps shed light on any disparities in gender equity, which can propel us towards creating a homogeneous scientific field of research.[4] Hence, analysing this trend is a vital element to gain an all-rounded perspective and create a strong framework to establish a concrete foundation for breakthrough findings. Thus, inclusion in academic settings is incomplete without gender equality.[5]

Aim and objectives

Aim and objectives of the study were to assess disparities in academic publications related to Kawasaki disease based on gender of first author and country, and to determine the gender disparities in academic publications related to Kawasaki disease and to explore the potential connection between the gender of first authors and their respective countries using the Fisher's exact test, determining the existence of any significant association between these variables.

It also aims to determine journals with substantial gender imbalances in favour of female authors, based on a minimum of 10 publications.

METHODS

This is a cross-sectional observational study conducted in the month of July 2023. This study involved screening, collecting, and analyzing the first authors of articles related to Kawasaki disease, published between January 1st, 2003 and December 31st, 2022.

Articles were collected from the PubMed database, using the search term “Kawasaki disease”. The full names of the first authors and their country of origin, determined by their institutional affiliations were collected by the authors. Articles with no mention of the full name of the first author were also excluded from the analysis.

Genders of the authors were then determined using the NamSor application interface (API), which provides a probability range from 0 to 1 of an individual’s gender, based on their full name and country of origin.[6] Genders determined by NamSor with a probability of 0.6 and below were reassessed by the authors by verifying with the authors’ publicly accessible institutional profile. The genders which could not be determined were excluded from the analysis.

The data collected was then exported to Microsoft Excel, and further statistical analysis, the ARIMA model was utilized, and Fisher’s exact test was employed to determine statistical significance between variables. To ensure the accuracy and completeness of the data, articles with unavailable abstracts were excluded from the analysis.

RESULTS

A total of 4634 published articles associated with Kawasaki disease were screened, and a total of 4,124 articles were included in the analysis, with 500 due to absence of the full name of the first author.

Of all the evaluated entries, 51% have male first authors, 36% have female first authors, and 12% do not have a clearly determined gender.

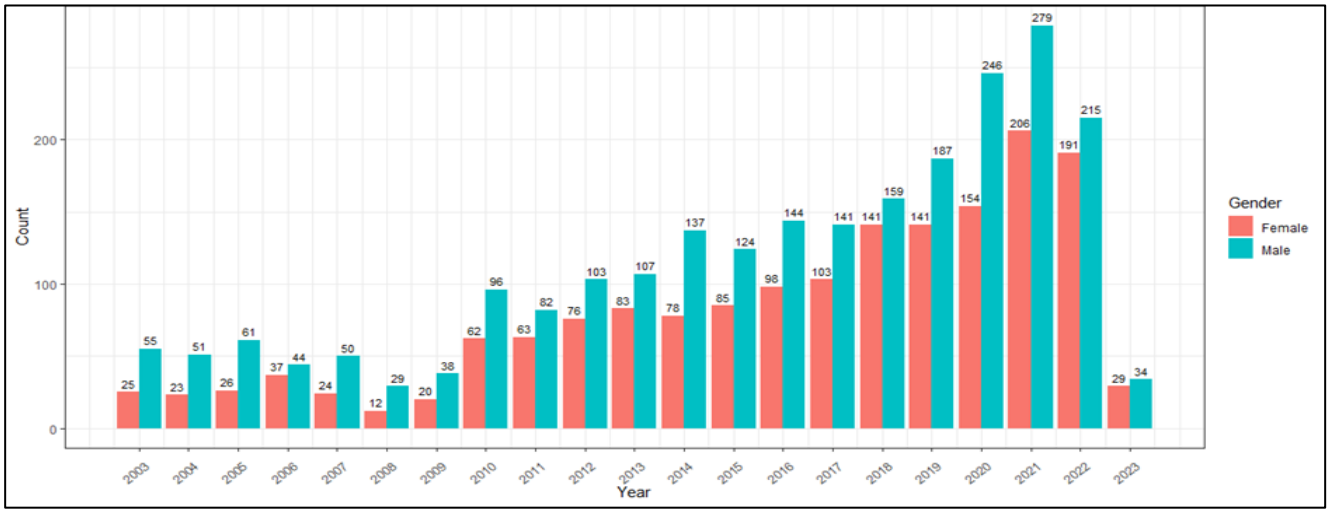

Figure 1: Total number of male and female first authors each year.

Figure 1 depicts a double bar graph comparing the total number of male and female first authors for published Kawasaki disease articles over the last 20 years, establishing that male first authors have been consistently higher in number yearly than female first authors. Figures 2 A and B demonstrate the observed and predicted publication trends for male and female first authors, with a forecast done for the next 5 years until 2027. Future 5-year trends predict the number of male first authors to be stagnant (Figure 2A), whereas there is a remarkable incline for the number of the female first authors (Figure 2B).

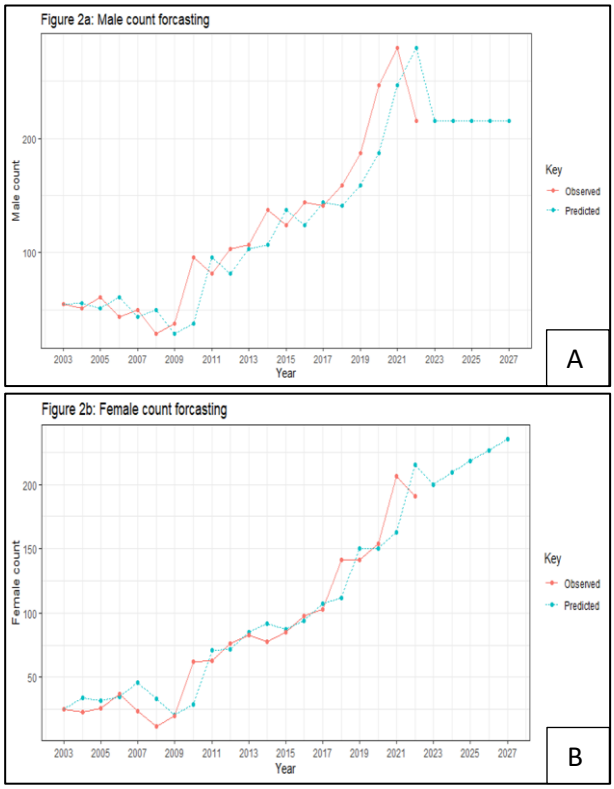

Figure 2 (A and B): Observed publication trends among male count and female count first authors from 2003 to 2022 and prediction of trends for the next 5 years.

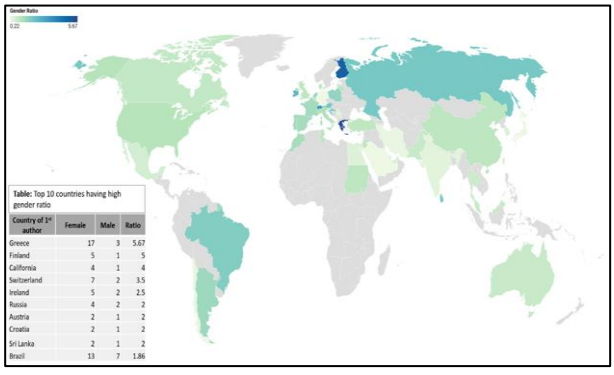

Figure 3: Gender trends in publications (2003-2023 based on country).

Table 1: Top journals having favourable gender ratio (At least 10 publications).

Journal book	Female	Male	Ratio
Front Cardiovasc Med	9	9	1
Exp Ther Med	7	7	1
J Epidemiol	7	7	1
J Trop Pediatr	6	6	1
Echocardiography	5	5	1
Korean J Pediatr	24	23	1.04
Pediatrics	16	15	1.07
Front Pediatr	64	59	1.08
Pediatr Rheumatol Online J	26	24	1.08
Children (Basel)	14	13	1.08

*Favourable gender ratio is the comparatively equal gender count i.e. gender ratio around 1.

Table 2: Top countries having high gender ratio (At least 10 publications).

Country of 1st author	Female	Male	Ratio
Greece	17	3	5.67
Brazil	13	7	1.86
Netherlands	22	13	1.69
Poland	13	8	1.62
Portugal	14	10	1.4
France	36	26	1.38
Spain	34	25	1.36
Italy	63	53	1.19
United States of America	297	271	1.1
China	374	371	1.01

Table 3: Top journals having high gender ratio (At least 10 publications).

Journal book	Female	Male	Ratio
Clin Exp Med	10	4	2.5
Glob Pediatr Health	7	3	2.33
Int J Environ Res Public Health	7	3	2.33
Vaccine	7	3	2.33
Ital J Pediatr	11	6	1.83
Arthritis Rheumatol	6	4	1.5
J Pediatric Infect Dis Soc	6	4	1.5
Ann Rheum Dis	7	5	1.4
Jama Pediatr	8	6	1.33
Plos One	31	24	1.29

Table 1 lists the top journals with a favorable gender ratio, meaning almost equal male and female first authors. Countries with a high female-to-male ratio, i.e., a ratio greater than 1, are listed in Table 2 in descending fashion. A statistically significant association was found present between gender and country. Table 3 includes the top journals with a high gender ratio, indicating a greater number of female first authors compared to males.

Figure 3 highlights the country-wise gender trends of first authors for published Kawasaki disease articles, with Greece having the highest female to male ratio of 5.67, closely followed by Finland with a ratio of 5.

DISCUSSION

This research study aimed to investigate the gender equality of first authors in publications related to Kawasaki disease over a period of 20 years. The study analyzed 4,214 articles extracted from PubMed, covering the time span from January 1, 2003, to December 31, 2022. Out of the evaluated entries, 51% had male first authors, 36% had female first authors, and 12% did not have any clearly determined gender. Notably, male first authors consistently outnumbered female first authors throughout the years. However, the study also found a remarkable increase in the number of female first authors in recent years, suggesting a positive trend towards greater gender equality. Country-wise gender trends of first authors for published Kawasaki disease articles showed Greece with the highest female-to-male ratio of 5.67.

The findings indicate that gender disparity persists among first authors in publications related to Kawasaki disease. Numerous other studies focusing on gender distribution reveal significant disparities. A study by Filardo et al aimed at investigating shifts in the representation of women among primary authors of original research published in high-impact general medicine journals indicates that female authorship accounted for only 34%.[7] Similarly, when examining the first authorship of original research in pediatric journals over a 15-year period, it is evident that female representation started at 39.8% in the initial year and notably improved to 57.7% by the final year.[8]

The notable increase in female first authors in recent years could signify positive steps towards addressing the gender imbalance.[8,9] The predominance of male first authors in core disciplines could lead to female researchers being pushed towards more peripheral roles across various fields.[10] This highlights the need for further efforts to promote gender equality in academic publishing. However, it is essential to continue supporting and encouraging female researchers to achieve gender parity in the field.

Gender inequalities are noticeable even during graduate education. Research indicates that women often have limited access to research opportunities, social support, equipment, and mentoring compared to men.[11] While gender disparities and challenges are prevalent for women in most research settings, there is a body of research suggesting that in interdisciplinary research domains, they might experience certain advantages.[10-12]

Women often assume the role of intermediaries for the flow of knowledge between various parties, such as basic researchers and clinical researchers. Through the creation of networks that encompass a wide range of collaborators from both parties, they are positioned to propel advancements in both foundational knowledge and practical application.[13] As a result, they become integral participants in initiatives focused on translating research into real-world solutions. The underrepresentation of female researchers may limit diverse perspectives and ideas in scientific publications, potentially affecting the overall quality of research and innovation in the field.[14] Addressing this issue can lead to more inclusive and comprehensive research, which, in turn, may result in improved healthcare strategies and outcomes related to Kawasaki disease. The creation of research networks by women has the potential to address numerous gender imbalances. These networks can establish unique patterns that challenge established norms and generate fresh possibilities for gaining higher social recognition among colleagues.[15,16]

While this study provides valuable insights into gender equality among first authors in Kawasaki disease publications, there are certain limitations to consider. Firstly, the study only focused on first authors and did not analyze other authorship positions, which may also contribute to gender disparities. Secondly, the gender identification method using the NamSor site might not be entirely accurate, leading to potential misclassifications. Additionally, the exclusion of articles with unavailable abstracts could introduce selection bias, affecting the generalizability of the findings. To address the gender disparity observed in the study, academic institutions and journals should actively promote gender diversity in research by encouraging and supporting female researchers to take on first authorship roles. Moreover, implementing blind peer review processes could mitigate potential biases during the review as well as publication stages.

Limitations

Out of all the selected publications, 500 articles did not mention the first name of the author, and thus were excluded from this study, which could have added to the gender disparity. Since only published articles are included, there is no data regarding submitted articles that were not published, which might have affected the gender trends. The study only focused on first authors and did not analyze other authorship positions, which may contribute to gender disparities. The gender identification using the NamSor site might not be entirely accurate, leading to potential misclassifications.

CONCLUSION

Trends show that although there is an increase in the total number of female authors, gender disparity continues to prevail among first authors in publications related to Kawasaki disease. The predominance of male first authors highlight the need for further efforts to promote gender equality in the academic sector. Further studies are

required to find reasons for female underrepresentation in research. This disparity in female researchers may limit diverse perspectives and ideas in scientific publications, potentially affecting the overall quality of research and innovation in the field. Addressing this issue can lead to more inclusive and comprehensive research, which, in turn, may result in improved healthcare strategies and outcomes related to Kawasaki disease.

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