

Title:

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Gender differences in the authorship of Global Major Gastroenterology Society Guidelines

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Author contributions: Shiqi Li, Bei Luo and Jieyu Peng contributed equally to this study. Study conception and design: Xiaowei Tang. Acquisition of data: Shiqi Li, Bei Luo and Jieyu Peng. Critical revision: Yan Peng and Muhan Lü. Interpretation of data: Bei Luo. Drafting of manuscript: Shiqi Li, Bei Luo and Jieyu Peng. Revision of manuscript: Xiaowei Tang. All authors approved the final version for publication.

Keywords: Gender differences. Guidelines. Female authors.

Dear Editor,

Diversity, equality and inclusion are of great significance to promote academic health (1). However, the gender gap is difficult to bridge in the Gastroenterology field. It has been reported that the percentage of female authors of guidelines and technical reviews of the American Association for the Study of Liver Disease (AASLD), American College of Gastroenterology (ACG) and American Gastroenterological Association (AGA) was only 21 %, and the proportion of female authors of the AGA guidelines declined from 22 % in 2011-2014 to 14 % in 2015-2019 (2). Presently, the career development of female gastroenterologists is threatened by gender

differences.

Guidelines published between 2003 and 2022 were collected from global major Gastroenterology societies with a high impact in the clinical practice. For each guideline, the genders of the first and senior authors were determined by searching their names on the internet or using the Genderize tool (3).

Among 210 guidelines, a total of 461 authors were included in our study, including 247 first authors and 214 senior authors. The proportion of female first and senior authors was 11.3 % and 9.8 %, respectively. For the first authors, the AGA had the highest percentage (25 %) of female authors, while among female senior authors, the highest proportion was in the Canadian Association of Gastroenterology (CAG) (28.6 %). For the year of publication, the proportion of female authors in most societies has significantly increased over the past 20 years ($p < 0.001$) except for the World Gastroenterology Organization (WGO) ($p = 0.829$, $p = 0.175$). Meanwhile, the growth trend of female first authors in the British Society of Gastroenterology (BSG) was also not obvious ($p = 0.755$). The AGA showed the greatest changes in proportion, which increased from 7.7 % in 2013-2017 to 30.8 % in 2018-2022. Overall, the proportion of female first authors increased from 4 % in 2003 to 15.2 % in 2022 ($p = 0.003$) and the proportion of female senior authors increased from 0 to 15.7 % ($p < 0.001$) (Table 1).

Although the proportion of female authors has improved over time, the progress is still slow. Compared to previous studies, we found an increase in the number of females as the first and senior authors in the AGA guidelines, while the gender gap had not narrowed in WGO and the Japanese Society of Gastroenterology (JSGE). This may indicate that we still need to increase gender equality awareness globally to promote academic research in gastroenterology. Moreover, the reasons behind the gender differences are complex and difficult to identify, including an implicit bias and family and parenting factors that affect female academic advancement (2,4). Overall, our research partly reflects the low number of female authors in Gastroenterology guidelines. This gender gap is likely to persist for a long time, and more efforts are needed to bridge it.

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Table 1. Proportion of female authors of global major Gastroenterology society guidelines, by year, no. (%)

<i>Variable</i>	<i>2003-2007</i>	<i>2008-2012</i>	<i>2013-2017</i>	<i>2018-2022</i>	<i>p-value</i>
ACG					
First authors	0/5 (0)	0/7 (0)	5/24 (20.8)	4/21 (19)	< 0.001
Senior authors	0/5 (0)	0/6 (0)	4/22 (18.2)	5/21 (23.8)	< 0.001
AGA					
First authors	NA	0/1 (0)	0/13 (0)	9/22 (40.9)	< 0.001
Senior authors	NA	0/1 (0)	2/13 (15.4)	3/17 (17.6)	< 0.001
BSG					
First authors	1/15 (6.7)	1/11 (9.1)	2/12 (16.7)	1/30 (3.3)	0.755
Senior authors	0/15 (0)	0/9 (0)	0/10 (0)	4/26 (15.4)	< 0.001
JSGE					
First authors	NA	0/2 (0)	0/11 (0)	1/11 (9.1)	< 0.001
Senior authors	NA	0/3 (0)	0/11 (0)	0/10 (0)	
CAG					
First authors	NA	0/3 (0)	0/1 (0)	1/9 (11.1)	< 0.001
Senior authors	NA	0/3 (0)	0/1 (0)	2/7 (28.6)	< 0.001
WGO					
First authors	0/5 (0)	1/12 (8.3)	2/20 (10)	0/12 (0)	0.829
Senior authors	0/3 (0)	1/11 (9.1)	0/12 (0)	0/8 (0)	0.175
Overall					
First authors	1/25 (4)	2/36 (5.6)	9/81 (11.1)	16/105 (15.2)	0.003
Senior authors	0/23 (0)	1/33 (3)	6/69 (8.7)	14/89 (15.7)	< 0.001

NA: not available; ACG: American College of Gastroenterology; AGA: American Gastroenterological Association; BSG: British Society of Gastroenterology; JSGE: Japanese Society of Gastroenterology; CAG: Canadian Association of Gastroenterology; WGO: World Gastroenterology Organization.