Gender and authorship in pharmacoepidemiology

Studying the authorship patterns of CNODES' research

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BACKGROUND

- A gender gap in productivity, as measured by publication volume, exists across STEMM disciplines. Wang et al. 2017
- Government and funding agencies are promoting gender balance and other equity issues; CIHR aims to minimize gender and other biases in the funding, design, and execution of its granting programs. Witteman et al. 2019
- CNODES, funded by CIHR, studies the benefits and risks of post-market drugs using de-identified population-based administrative healthcare data. Suissa et al. 2012

Because we found no data on gender and authorship within CNODES or the pharmacoepidemiology subdiscipline, we explored gender authorship patterns of CNODES articles and their citing literature

METHODS

- CNODES articles published between 2012 and 2017 were identified using Scopus, a citation database that includes tracking tools and researcher / institutional profiles, and all citing articles were extracted.
- Scopus author IDs for each author were used to extract their full name from the Scopus application programming interface (API).
- A web service (www.genderapi.com) was used to estimate the gender of both the CNODES authors and the citing authors. The service provides an estimated gender and a probability of being correct; all probabilities <80% were converted to "indeterminate".
- Outcomes:
  - 1° - proportion of female authorship in CNODES publications, compared to that in citing literature
  - 2° - association between gender and authorship position

CIHR definition of gender: *"…the socially constructed roles, behaviours, expressions, and identities of girls, women, boys, men, and gender diverse people"*

Female authorship rate in a Canadian pharmacoepidemiology research network slightly higher than its citing literature, but still well short of parity.

DISCUSSION

- Women represented 36% of CNODES authorship – compared to 32% *Pharmacoepidemiology* editorial board; 13% Canadian U15 presidents, 47% VPs research, 32% deans; 30% members of CAHS.
- Women as senior authors largest gap to close in STEMM disciplines.
- Barriers to women's academic productivity identified in the literature related to individual- (e.g. self confidence/self promotion), institutional- (e.g. high teaching/clinical loads, limited mentorship) and societal-level factors (e.g. parental/caregiver leave policies).

Considerations

- Report team research outputs by gender
- Share authorship equitably
- Address implicit bias in hiring/promotion, peer review processes
- Ensure professionalism in workplace
- Benchmark STEMM scholarly outputs by researcher characteristics (e.g. gender) to encourage reflection, catalyze change, and monitor its impact.

Peterson Gabster el al 2020; Wright et al. 2014

Strengths	Limitations
- Quick, informative approach to estimate female authorship using an API.	- Did not apply feminist theory; quantitative approach did not ascertain reasons for gender gap.
- Process could be reproduced using other platforms (Web of Science, Google Scholar, etc.).	- Used binary estimate of gender and publicly available register; more difficult for non-Latin alphabet names.
- Potential for real-time monitoring.	- Overall pharmacoepidemiology researcher gender breakdown unknown.

CONCLUSIONS

- The female authorship rate in the CNODES articles was slightly higher than its citing literature.
- Gender API tool readily implemented and informative; work needed to automate gender analysis to provide ongoing feedback.
- Research needed to determine barriers and facilitators to women's roles in teams and authorship.

RESULTS

- 28 CNODES articles, written by 108 authors: 46 female, 54 males, 8 indeterminate.

Table 1. Total authorships

CNODES articles had a slightly higher percentage of female authors than the citing literature (36% vs 29%, 7% difference, 95% CI [1%, 13%], p-value = 0.024).

	CNODES	Citing
female	99 (36%)	779 (29%)
male	168 (61%)	1802 (68%)
indeterminate	7 (3%)	83 (3%)

Figure 1. Proportion of female authors

CNODES articles averaged 33% females per article, compared to 27% in citing literature.

Citing literature had shorter author lists (5.7 vs. 9.5 average authors), resulting in more variability.

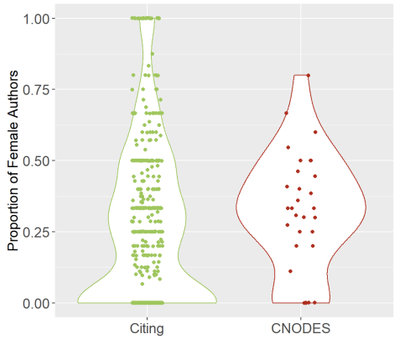

Figure 2. Female authorship and position

There is a lack of pattern in order of authorship by gender.

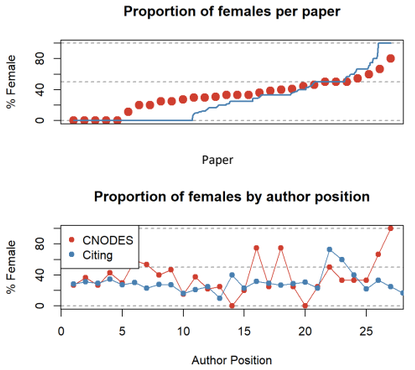

Table 2. Female positions in author lists

Investigating how often females fill some of the more important roles in the authorship list.

	CNODES (n=28)	Citing (n=474)
0 female authors	5 (18%)	175 (37%)
all female authors	0 (0%)	19 (4%)
female first author	8 (29%)	131 (28%)
female second author	11 (39%)	129 (27%)
female last author	13 (46%)	99 (21%)

CNODES
CANADIAN NETWORK FOR OBSERVATIONAL DRUG EFFECT STUDIES

Our full reference list can be found at this link.

AFFILIATIONS
1. Dalhousie University, Halifax, NS
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3. University of Manitoba, Winnipeg, MB

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