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Changes in Gender Representation in Pharmacy Research Literature

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ABSTRACT

Purpose/Background: Many health disciplines, such as pharmacy, have been historically male dominated. However, female gender representation continues to increase in health care and especially in pharmacy with women representing 57.5% of pharmacists in 2017.

Shifts in workforce gender representation have not always translated to research and publication. Limited data exist regarding women's authorship in pharmacy research literature. The purpose of our analysis was to determine whether the percentage of women as first authors of research articles in the pharmacy literature has increased over the past decade.

Materials & Methods: We conducted a retrospective bibliometric analysis. Citations from key pharmacy practice journals from 2007 through 2017 were exported using Web of Science (WoS). We considered citations to be research if they were designated by WoS as "articles," which is defined as reports of research on original works. Our outcome of interest was the proportion of research articles having feminine names as first authors. The U.S. Social Security Administration and genderize.io were used to determine femininity of names. Citations were excluded from analysis if gender could not be determined. The

Cochrane-Armitage trend test was used to determine differences in proportions of women as first authors over time with a p-value <0.05 considered statistically significant. We analyzed citations from journals individually and combined.

Results: Our analysis included 9,354 citations from eight pharmacy practice journals. All journals evaluated, except *Annals of Pharmacotherapy and Drugs*, showed a significant increase in women as first authors from 2007 through 2017 (Table). The greatest change in the proportion of women as first authors was seen in the *Journal of the American Pharmacist Association* (+20.5%). In our combined analysis of all journals, the proportion of women as first authors significantly increased from 45.1% in 2007 to 55.4% in 2017 (Figure). Across the entire time period of interest, women were first author in slightly more than half (51.5%) of all citations

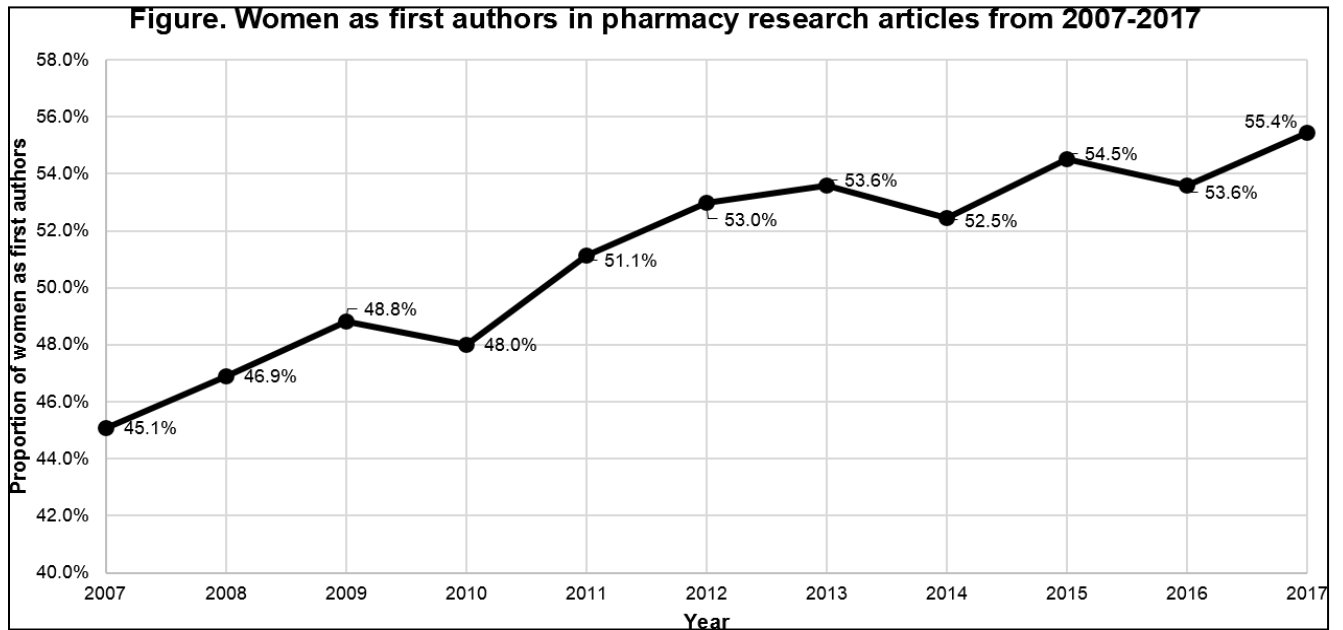
Discussion/Conclusion: Women as first authors of research articles in pharmacy literature
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has significantly increased over the past decade. While our findings appear to show gender alignment between first authorship in pharmacy research literature and workforce representation, disparities in gender and other characteristics must be continually examined so that inequalities can be identified and addressed.



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Table. Women as first authors in pharmacy research articles by journal

Journal	# of women first authors / total # of first authors (%)		
	2007	2017	2007-2017
American Journal of Health-System Pharmacy	67 / 144 (46.5)	90 / 145 (62.1)	799 / 1509 (52.9)*
Annals of Pharmacotherapy	114 / 206 (55.3)	32 / 70 (45.7)	913 / 1605 (56.9)
Clinical Therapeutics	45 / 133 (33.8)	52 / 115 (45.2)	533 / 1387 (38.4)*
Drugs	23 / 52 (44.2)	33 / 70 (47.1)	378 / 722 (52.4)
European Journal of Clinical Pharmacology	35 / 93 (37.6)	61 / 112 (54.5)	612 / 1205 (50.8)*
Journal of the American Pharmacists Association	14 / 31 (45.2)	65 / 99 (65.7)	410 / 680 (60.3)*
Journal of Pharmacy and Pharmacology	49 / 106 (46.2)	71 / 124 (57.3)	624 / 1282 (48.7)*
Pharmacotherapy	43 / 100 (43.0)	55 / 93 (59.1)	508 / 964 (52.7)*
All journals	390 / 865 (45.1)	459 / 828 (55.4)	4777 / 9354 (51.1)*

*Statistically significant change from 2007 through 2017, 2008-2016 data represented but not shown

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