

INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Gender Disparities in Promotion in Academic Medicine: A Systematic Review and Meta-Analysis

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Review question / Objective: What are the unadjusted differences between men and woman in promotion to associate professor and/or full professor, promotion to other leadership positions, number of publications, first or senior authorship, h-indices and grants in academic medicine? What are the differences in promotion to associate and/or full professor after adjustment for career duration, number of publications, leadership positions and grant funding?

Condition being studied: The disparity in numbers of women compared to men holding advanced titles and leadership positions in academic medicine despite twenty years of equal numbers of female and male medical students.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 December 2022 and was last updated on 21 December 2022 (registration number INPLASY2022120087).

INTRODUCTION

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leadership positions, number of publications, first or senior authorship, h-indices and grants in academic medicine? What are the differences in promotion to associate and/or full professor after adjustment for career duration, number of

publications, leadership positions and grant funding?

Rationale: Ascertaining the severity of the gender gap in academic medicine leadership and the factors contributing to it is critical to narrowing any disparity, and thereby improving the representation of half the population for the sake of trainees and patients.

Condition being studied: The disparity in numbers of women compared to men holding advanced titles and leadership positions in academic medicine despite twenty years of equal numbers of female and male medical students.

METHODS

Search strategy: Academic Search Premier, Business Source Complete, Cochrane Library, ERIC, Google Scholar, Ovid Embase, Ovid MEDLINE, PubMed Scopus, and Web of Science Core Collection from inception through August 18, 2022. https://www.crd.york.ac.uk/PROSPEROFILES/283537_STRATEGY_20211005.pdf.

Participant or population: Medical doctors and MD/PhD holders with academic appointments throughout the world.

Intervention: Female gender.

Comparator: Male gender.

Study designs to be included: Original studies examining differences between men and women in academic rank, number of publications, first or senior authorship, h-indices, grants and other leadership positions in academic medicine after residency and fellowship training. Unadjusted and adjusted analyses will be included. Reviews not reporting original data will be excluded. Guidelines will be excluded.

Eligibility criteria: Studies reporting data on men and women with MD or MD/PhD degrees working in all fields of academic medicine and surgery will be included. All countries and languages will be included.

Trainees (students, residents and fellows) and sole PhD holders will be excluded. Professionals in pharmacology, dentistry, veterinary medicine and nursing will be excluded. Leaders not affiliated with an academic medical center will be excluded. Studies related to gender differences in perspectives or outcomes other than those listed above will be excluded.

Information sources: The following electronic databases will be used: Academic Search Premier, Business Source Complete, Cochrane Library, ERIC, Google Scholar, Ovid Embase, Ovid MEDLINE, PubMed Scopus, and Web of Science Core Collection.

Main outcome(s): Gender differences in associate and full professorship after adjustment for career duration, number of publications, h-index and grant funding.

Additional outcome(s): Unadjusted differences in associate professorship, full professorship, other leadership positions, number of publications, first or senior authorship, h-indices and grants by gender. Other leadership positions will be defined as deans, division chiefs, department chairs and members of editorial boards of high-profile journals as defined by the studies reporting them.

Data management: Using Covidence, two reviewers will independently screen all titles and abstracts for possible inclusion. If one or both reviewers determine a study might be eligible, both reviewers will perform a full text review of that study. Differences of opinion on inclusion after full text review will be resolved by consensus. For all included studies, two reviewers will independently extract data into the standardized, pilot-tested Excel spreadsheet. Differences in results will be resolved by consensus. Data to be extracted for each study include author, year, study period, location, study methodology, definition of academic rank, definition of leadership position, definition of career duration, grants rewarded, unadjusted outcome frequencies by gender, and, when applicable, outcome

frequencies by gender adjusted for each the following confounders: career duration, number of publications, leadership positions and grant funding.

Quality assessment / Risk of bias analysis: Two authors will independently assess the risk of bias using the ROBINS-E tool. Differences will be resolved by consensus.

Strategy of data synthesis: We will compare outcomes between men and women using random effects meta-analysis using restricted maximum likelihood method using Stata. We will do separate meta-analyses for unadjusted and adjusted outcomes. The primary outcomes will be the adjusted analyses. Heterogeneity will be explored using sensitivity analysis and subgroup analysis and if there are more than 10 studies, using meta-regression. For example, for the outcome of academic promotion, we will compare the proportions of men compared to women that are full professors. The primary outcome will be adjusted analyses, including adjusted odds ratio, adjusted risk ratio, and adjusted hazard ratios. These measures will be individually meta-analyzed since they cannot be combined into a single analysis. We will also do random effects meta-analysis for the unadjusted (crude) proportions of men and women who are full professors.

Subgroup analysis: Potential subgroups will include year/decade of publication, area of medicine, study location. As with main outcome data synthesis, we will look at study level subgroups including which country the study is from, decade of publication, study method groupings such as whether the data was from Doximity, and study risk of bias. Meta-regression will be done using these same subgroups.

Sensitivity analysis: We will perform leave-on-out sensitivity analysis to see if pooled effect or heterogeneity change substantially when studies are sequentially removed from the analysis.

Language restriction: No.

Country(ies) involved: United States.

Keywords: Gender equity, academic medical centers, systematic review, faculty.

Contributions of each author:

Author 1 - Elizabeth Marhoffer - Protocol design, search strategy, study screening, data extraction, risk of bias assessment, manuscript drafting.

Author 2 - Samer Ein-Alshaeba - Study screening, data extraction.

Author 3 - Alyssa Grimshaw - Search strategy, search.

Author 4 - Jurgen Holleck - Data extraction.

Author 5 - Benjamin Rudikoff - Data analysis.

Author 6 - Lori Bastian - Study screening.

Author 7 - Craig Gunderson - Protocol design, search strategy, risk of bias assessment, meta-analysis, manuscript drafting.