Title: Association of physician sex and gender with patient outcomes in acute care: A systematic review and meta-analysis.

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ABSTRACT

Background

There are significant differences in the processes of medical care of female and male physicians. Though these have been extensively studied in the fields of primary and surgical care, there is a lack of understanding regarding the impacts of physician sex/gender on patients' outcomes in an acute care setting.

Methods

Only prospective or retrospective original quantitative studies were included were included if they investigate the impact of physician sex/gender on patient outcomes in an acute care setting. Searches were conducted in the electronic database Medline (via OVID) from inception to February 25, 2020. Studies were screened and data was extracted in duplicate two independent reviewers.

Results

Conclusions

INTRODUCTION

Every year, approximately 43 million patients around the world experience morbidity or mortality as a result of adverse events that occur in hospitals.[1] Among the many factors that play a role in these events, research increasingly suggests that processes of care often differ according physician sex and gender.[2] [3] [4] These differences are, in turn, associated with inequitable outcomes among patients.[5] [6]

Sex refers to a biological variable which differentiates between male and female anatomical and physiological characteristics. Gender, a socially constructed concept, encompasses behavioral, cultural, or psychological features which are dynamic and context dependent. [7] [8] At the clinical level, sex and gender play an important role in processes of care. For example, observable differences exist in the communication and decision-making styles between female and male physicians.[2] Female physicians are also more likely than their male colleagues to adhere to evidence based clinical practice, spend more time consulting patients, and adopt patient centered communication styles in cardiac or primary care. [9] [10] [11] As a result, patients may be more likely to receive preventative care and reoccurring diagnostic measures when treated by a female physician.[3] As well, it was found that the 30 day mortality and readmission rates in patients with the 8 most common medical conditions (acute renal failure, arrhythmia, COPD, gastrointestinal bleeding, heart failure, pneumonia, sepsis, and urinary tract infections) were lowest among female physicians.[5] At the same time, Amacher *et al* (2017) found that a team of male medical students had less of a delay in the commencement of chest compressions as a consequence of their leadership style. The observed resuscitation performance was greater than that of a team of female students.[10]

Although physician sex and gender have critical implications for patient outcomes, the influence of these attributes has yet to be systematically summarized in acute care. Understanding how processes of care and patient outcomes may differ among female and male physicians at a system level can provide key insights to inform future education and training interventions. This systematic review aimed to identify and assess the association of physician sex and gender across acute care services.

MATERIALS AND METHODS

This systematic review will be conducted and reported in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA). The protocol will be published on the University of Ottawa's research repository.

Eligibility Criteria

Studies will be included if they examine the impact of physician sex or gender on patient outcomes in an acute care setting, including the following: critical care, emergency, prehospital care, short term stabilization, surgery, trauma and/or urgent care. Studies which investigate patient outcomes outside of acute care or that examine only patient sex differences will be excluded. Potential patient outcomes include: mortality, physiological/clinical life impact (cognitive; emotional; physical; role; social functioning), adverse events, resource use (economic; further intervention required; hospital; societal/career burden). Only published prospective or retrospective original quantitative studies will be eligible for inclusion in this review. There may be additional measures of patient outcomes when the studies are under review and will be subsequently added. Editorials, letters, conference abstracts, and qualitative studies will be excluded.

Search strategy and information sources

The search strategy will be developed in collaboration with an information specialist. The strategy will then be reviewed by an additional information specialist using PRESS guidelines.[12] Searches will be conducted in the electronic databases: Medline, Medline in Process (via OVID), PsycINFO, Embase, CINAHL from inception to February 5,2020**.** Language restrictions will not be applied; however, data will only be extracted from those selected studies published in English or French. The final list of included articles will be reviewed by sex and gender and patient safety experts to confirm the accuracy and relevance of the studies. The search will be regularly updated until a prespecified date via database alerts and regularly performed repeat search updates.

Study selection

An electronic screening form will be used to identify relevant references. At the first level of screening, titles and abstracts will be screened as per eligibility criteria in duplicate by two independent reviewers. Full texts of relevant studies will be reviewed in the second level of screening. At each level of screening, any disagreements will be resolved through consensus or consultation with a third independent review, if required.

Data items and abstraction

Data will be extracted in duplicate by two independent reviewers using an electronic form. The form will include such items as publications details (e.g. first author, year, country of data collection), clinical context (e.g. acute care; critical care, emergency, prehospital care, short term stabilization, surgery, trauma and/or urgent care), population demographics (e.g. physician sex, physician specialty), study details(e.g. research objective, methodology), outcomes assessed (e.g. mortality; physiological/clinical; life impact; resource use following treatment by a physician of either sex), and study results(reported impact of physician sex on patient outcomes).

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