

## Prevalence of Work-Related Musculoskeletal Disorders Among Medical Personnel: A Systematic Review and Meta-analysis

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### ADMINISTRATIVE INFORMATION

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**Review Stage at time of this submission** - Preliminary searches.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202410113

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 January 2024 and was last updated on 27 January 2024.

### INTRODUCTION

**Review question / Objective** Workers of many occupations bear a health burden associated with disabling musculoskeletal pain and injuries of a work-related etiology, collectively called work-related musculoskeletal disorders (WRMD). Medical workers are a unique group of professionals who perform skilled clinical operation for long hours. They are required to maintain constant postures and perform repetitive movements with exertion which in turn subjects them to physical stresses. Medical workers have a high prevalence of WRMD, and the prevalence of medical workers varies in different departments. Although research has been conducted on WRMD, little attention has been paid to the growing body of literature describing the WRMD forcing these physicians to undergo surgery, reduce productivity, and at times lose their careers. Reliable estimates of the burden of WRMD among these physicians are important for informing the urgency and scope of preventive efforts needed, particularly given the

impending workforce shortage. We conducted a systematic review and meta-analysis of published studies among at-risk medical workers, with several goals. These include (a) determine the overall prevalence of WRMD outcomes for allied health professionals; (b) determine whether prevalence of WRMD vary by body region and occupational classification; and (c) identify the burden of WRMD among allied health professionals. Based on the review, priorities will be identified to fill the gaps and lead to a better understanding of pain and suffering that allied health professionals experience worldwide, specifically identifying body regions, outcomes and burden of WRMD that need to have more research initiated.

**Condition being studied** Musculoskeletal (MSK) issues, which include pain, discomfort, stiffness, fatigue, and numbness, may plague allied health professionals throughout their career. Work-related MSK discomfort (WRMD) amongst allied health professionals can be the result of repetitive upper

extremity movements, static body posture, and force exertion from adverse positions. Studies examining the prevalence of WRMD found rates ranging from 40% in dentists and up to 97% in vascular surgeons. Yet, the rate and impact of WRMD are obscured by the fact that these injuries are frequently underreported. A study of surgeons noted that only 19% of 103 injured surgeons reported their injuries to their institution despite 35% of injured surgeons operating less because of their injury. Of those with WRMD, approximately 12% ultimately required a leave of absence, practice restriction, or early retirement. To our knowledge, no systematic review has described the prevalence of WRMD among allied health professionals. Thus, our primary goal is to evaluate the reported burden of WRMD in surveyed allied health professionals and how that burden affects their career. Secondary goals include determining the prevalence of WRMD among allied health professionals.

## METHODS

**Participant or population** Population: Full article study investigating the prevalence of pain or WRMD injury in one of the targeted body regions for allied health professionals without limiting demographic factors, which included the following classifications: allergist, andrologist, anesthesiologist, audiologist, cardiologist, dentist, dermatologist, emergency doctor, endocrinologist, ENT specialists, epidemiologist, gastroenterologist, general practitioner, geriatrician, gynaecologist, haematologist, health worker, hematologist, hepatologist, immunologist, medical specialist, nephrologist, neurosurgery, nurse, obstetrician, oncologist, pathologist, pediatrician, physician, physicians, podiatrist, psychiatrist, pulmonologist, radiologist, rheumatologist, specialties, surgeons, urologist. And future studies should have sufficient numbers of participants to detect statistically significant differences. Sample size determination for these trials should be based on Type 1 error (alpha value), adequate power (probability of correctly rejecting null hypothesis), and expected effect size acquired from previous literature. For example, to assess the prevalence of WMSD related to intervention effects would require a sample size of 369, at 5% width of a 95% confidence interval, assuming the expected prevalence was an average of 60%, based on values seen in the literature. To detect a 0.5 unit change in mean pain score with a standard deviation of 1.5, would need a total sample size of 284, with 142 for each arm of the study.

**Intervention** As this is a systematic review of the prevalence of musculoskeletal diseases, it is not applicable.

**Comparator** As this is a systematic review of the prevalence of musculoskeletal diseases, it is not applicable.

**Study designs to be included** We included cross-sectional study. We only included studies that have access to the full text and complete data. Studies published as letters, commentaries, short reports will be excluded.

**Eligibility criteria** Studies were required to report prevalence and location of symptoms for inclusion. 15.Papers published in any language can be included in the research. Abstracts were reviewed independently by two reviewers with the assistance of a third reviewer to resolve conflicts.

**Information sources** Using the Covidence search tool, the authors performed a comprehensive search of PubMed, Embase, CENTRAL, CINAHL, and Web of Science on January 26, 2024 with no filters for language or date.

**Main outcome(s)** One review author (YRG) extracted the following data (authors, year, country, setting/context, sample size, participants-characteristics/total number, results/findings divided by musculoskeletal body regions, outcome assessed, appraisal, methods of analysis) from included studies and a second author (LX) checked the extracted data. Disagreements were resolved by discussion between the two review authors; if no agreement could be reached, a third author (XFE) decided the data to be included.

**Quality assessment / Risk of bias analysis** Two reviewers independently assessed the quality of all the included studies. The quality assessment tool was based on the risk of bias criteria developed by the Joanna Briggs Institute.

**Strategy of data synthesis** Random effects meta-analyses were used to estimate overall summary proportions of surveyed allied health professionals not limited to a specific subspecialty who reported WRMD. Analyses used a logit transformation and the DerSimonian-Laird method to estimate between-study variance, with the Jackson method to estimate confidence intervals. The I<sup>2</sup> statistic with Cochrane's Q test was used to evaluate the proportion of variance in observed effects that reflects heterogeneity between studies rather than sampling error.

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**Subgroup analysis** Subgroup analysis included diagnosis subgroup, pain site subgroup, and disease burden subgroup.

**Sensitivity analysis** Sensitivity analysis will be performed by omitting the risk estimate of each study in turn to examine the robustness and stability of the pooled results.

**Country(ies) involved** Country: China ; affiliations: Sichuan university; west china hospital of sichuan university.

**Keywords** work-related musculoskeletal disorders, medical personnel , meta-analysis, systematic review, career impact.

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