Prevalence and predictors of work-related musculoskeletal disorders among healthcare professionals in Sub-Saharan African region: systematic review and meta-analysis protocol

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Study protocol

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Abstract

Background: The Global Burden of Diseases 2017 found that musculoskeletal disorders (MSDs) are the second most prevalent cause of years lost to injury, although years of life lost are decreasing in low-income countries, especially in Sub-Saharan Africa. The objective will be to describe the regional prevalence of WMSD for different anatomical body areas and their risk factors in different health professions in the sub-Saharan African region.

Method: We will search databases such as Scopus, PubMed, Science Direct, AJOL, and Google Scholar for publications published between January 2002 and December 2022. The primary outcome will be the prevalence of work-related musculoskeletal disorders among health professionals, and risk factors related to WRMSDs will be the secondary outcome. Three reviewers will screen all abstract data, full-text articles, and all citations independently. The Newcastle-Ottawa scale (NOS) will be used to assess the quality of eligible publications. Subgroup analysis will be conducted to explore the potential heterogeneity (e.g., age, sample size, gender, and occupational activities). Publication bias and heterogeneity will be assessed and reported using the appropriate tools.

Discussion: This systematic review and meta-analysis will provide a synthesis of the literature on work-related musculoskeletal disorders and their predictors among health professionals in the Sub-Saharan Africa region. The consensus of data from this review will provide a regional view to help occupational health-related policymakers, healthcare professionals, and program managers in developing countries gain a better understanding of the prevalence, causes, and trends to build better evidence-based occupational musculoskeletal health and disorders prevention programs among various health professionals.

Systematic review registration: PROSPERO, CRD42023455517

Introduction

Musculoskeletal Disorder (MSD) is a disorder and injury that affects a component of the body's musculoskeletal system, which includes blood vessels, tendons, ligaments, joints, cartilage, bones, nerves, and spinal discs, as defined by the National Institute for Occupational Safety and Health (NIOSH) in the United States [1]. Similarly, work-related musculoskeletal diseases (WMSDs) are significant health concerns widely prevalent in many professions and have profoundly and detrimentally affected society as a whole, businesses, governments, and professionals [2]. This may in turn, hinders individuals' productivity and predispose them to the risk of permanent disability.

Empirically, it was documented by the Global Burden of Diseases 2017 that musculoskeletal disorders (MSDs) are the second most prevalent cause of years lost to injury, although years of life lost are decreasing in low income countries especially in Sub-Saharan Africa [3,4,5]. Furthermore, WRMSDs constitute one of the major causes of morbidity in many working populations, including health workers [6]. Besides the detrimental effects posed by WRMSDs on the health outcome of these professionals, it

also creates a huge burden on the health systems with consequent poor performance at the workplace, decreased productivity, loss of employments, as well as economic burden [6] [7].

While the health care professionals are meant to provide care for several patients suffering from WRMSDs, they are no exception to the risk of this disease condition as they harbor greater exposure to occupational risk factors [8, 9]. However, the actual exposure rate among health care professionals is difficult to determine, but it appears that most health care workers do suffer WRMSDs at rates that are comparable to or slightly higher than other working population. [10–12]. Specifically, high prevalence rates of musculoskeletal disorders have been recorded among various professionals in the health care settings including; dentists [1, 13, 14, 16], physiotherapists [17, 18, 19, 20], medical laboratory technicians [21] and nurses [22, 23, 24, 25, 26]. It is estimated that almost one-third of all cases of sick leave among health care workers are associated with work-related musculoskeletal disorders WMSDs [27]. Understanding the mechanisms that lead to the appearance of WMSDs and the dynamics in the prevention and control of the health condition requires information adequacy related to the knowledge of the most exposed body areas during daily occupational activities. A large number of studies among different health professionals have reported that the lower back was a highly exposed area in physiotherapists [28], nurses [29], and surgeons [30]. Additionally, neck and shoulder have also been reported to be widely exposed areas in healthcare professionals [14, 17, 21, 24].

Moreover, a previously published systematic review has reported the prevalence of WRMSDs in some Africa countries by including studies predominantly from South Africa and West Africa. The prevalence of WRMSDs varies from 13 to 92% in South Africa and Ghana respectively [31]. Considering that factors such as racial, economic, and social homogeneity are not features widely experienced in Africa, the may underlie the discrepancy between the reported prevalence. Hence, it is therefore logical to argue that genetic diversity, differences in social structure, economics, and other specific factors may influence the WRMSDs prevalence among health professionals in sub-Saharan Africa.

Despite the emerging concern of WRMSDs in healthcare workers and their probable consequences particularly, on the healthcare system and the society at large, these disorders have been less studied among healthcare workers to a very large extent. In light of this, this current review is pertinent as it will make it possible to better understand and draw conclusions about the appropriate measures to be implemented to reduce the burden and impact of MSDs among health professionals. However, due to the importance of the MSD issue for health professionals, it is imperative to summarize the prevalence of MSD by body area, including all health professions for which information is available regionally.

The consensus of data from this review will provide a regional view to help occupational health-related policymakers, healthcare professionals and program managers in developing countries, to gain a better understanding of the prevalence, causes, and trends to build a better evidence-based occupational musculoskeletal health and disorders prevention programs among various health professionals. The objective will be to describe the regional prevalence of WMSD for different anatomical body areas and their risk factors in different health professions in sub-Saharan African region.

Specific review questions are as follows

1. What is the regional prevalence of WRMSDs of different anatomical body areas among health professionals and subgroups in sub-Saharan African region from internationally published articles?
2. What are the occupational-risk factors associated with the prevalence of WRMSDs among health professionals and subgroups in sub-Saharan Africa from internationally published articles?

Methods

Journal article search strategy

This present review protocol has been registered within the PROSPERO data base (registration number CRD42023455517) and will be carried out in tandem with Preferred Reporting System for Systematic Review and Meta-analysis (PRISMA) standards [32] as shown in the flow chat Fig. 1. All primary studies that would have investigated the regional prevalence of WRMSDs and their occupational risk factors among health professionals in Sub-Sahara African region will be identified by thorough searches in the following data bases; Scopus, PubMed, Science Direct, AJOL, and Google scholar published between January, 2002 to December 2022.The search will be done by ABA, IBA and OAO between the period of June to August, 2023 using specific terms related to WRMSDs among health professionals in Sub-Sahara African region.

Selection of articles for meta-analysis

A thorough review of the tittle, abstract and full paper will be done by three reviewers (ABA, IBA and OAO). Any forms of disagreement will be settled between three reviewers during the weekly evaluation meetings by a consensus. The consistency of selection process and quality assessment across the three reviewers will be ensured by calculating the level of inter-rater agreement (Kappa statistics) [33]. A full-text analysis of actually most qualifying studies including identification of duplicated records will be conducted by ABA, IBA and OAO. Data extraction will be applicable to only article with full-text.

Study selection and eligibility criteria

The systematic review and meta-analysis will include primary studies with full text articles from the mentioned data bases. The study selection will be focused exclusively on English language peer-reviewed works that quantified the MSDs prevalence by anatomical body region in healthcare professionals. Reviews, systematic reviews, commentaries, case studies and case series will not be included in this our study. Articles will be included in this study if they are original research that studied the prevalence of work-related musculoskeletal disorders among healthcare professionals and included all the nine anatomical body regions for musculoskeletal disorders (i.e. neck, shoulder, upper back, lower back, elbow/arm, wrist/thumb, hips/buttocks, knee and ankle). The following studies were excluded from this current study if they: were not published in English, were not published in in Sub-Sahara Africa region, were not about healthcare professionals, mixed healthcare workers without the possibility of

distinguishing between them, provided with insufficient details on WRMSDs, provided insufficient data about sampling and focused on only a limited number of body areas.

Data Extraction and quality assessment/ Methodological quality assessment and risk of bias

The following data will be extracted by authors from the screened articles eligible for inclusion in the meta-analysis; First author, year of publication, age, country, region, healthcare professional, general body prevalence of WRMSDs, anatomical body region prevalence, sample size, gender, occupational risk factors.

The Newcastle-Ottawa scale (NOS) will be used to assess the quality of eligible publications with total score of 9, and those publications with scores of 6, 7, 8, and 9 will be considered satisfactory quality and 5 and bellow will be considered not satisfactory quality. The overall methodological quality will be done by three reviewers; ABA, IBA and OAO to assess the quality of the articles independently. Data from the articles will be entered into excel spread sheet on daily basis by the three reviewers ABA, IBA and OAO. Duplicates articles will be removed from the records after comparing records of the reviewers during weekly meetings. The three reviewers; ABA, IBA and OAO will ensure that each primary study will be evaluated throughout each phase of review (Screening, eligibility and inclusion in meta-analysis).

Statistical analysis

A Kurskal-Wallis test will be used to compare the prevalence of each of the anatomical body region on the Sub-Sahara region (significance level set at 5%). A meta –regression will be performed to analyze the trend in MSD prevalence as a function of average age of the participants, gender and occupational risk factors.

The proportions (pooled prevalence) of work-related musculoskeletal disorders and the pooled odds ratios (OR) of the associated factors with a confidence interval of 95% will be calculated using random-effects and quality effects model. The presence of heterogeneity of the studies will be assessed using Cochran's Q test (significance level < 10%) and I^2 statistic (significance level > 50%). In case of heterogeneity, the random effects model with inverse-variance approach will be employed. Funnel plots will be used to assess small study effects or publication bias [34] by inspection of asymmetry and in addition Egger's regression test ($p < 0.05$) and Begg's equation will be computed to ascertain publication bias.

Various subgroup will be identified based on the study characteristics and population characteristics. The Sub-group analysis will be performed to determine the source of heterogeneity attributed to gender, sample size, age of respondents, region of pain, study setting, and occupational factors. Sensitivity analysis will be performed after excluding each study one by one, and the pooled estimate will be calculated for the remaining studies. Analysis will be performed by using the statistical software MedCalc version 19.13

Dissemination of findings

The findings from the data synthesis will be published in relevant peer-reviewed journals and conferences targeting work-related musculoskeletal disorders interventions. Additionally, the findings will be presented during the monthly academic seminars at the faculty of health sciences, Habib Medical School, Islamic University in Uganda (IUIU).

Discussion

Despite the emerging concern of WRMSDs in healthcare workers and their probable consequences particularly, on the healthcare system and the society at large, these disorders have been less studied among healthcare workers to a very large extent. This review aimed at providing overviews of the prevalence of WRMSDs among the healthcare professionals in sub-Saharan African region. This current review will make it possible to better understand and draw conclusions about the appropriate measures to be implemented to reduce the burden and impact of MSDs among health professionals. The consensus of data from this review will provide a regional view to help occupational health-related policymakers, healthcare professionals and program managers in developing countries, to gain a better understanding of the prevalence, causes, and trends to build a better evidence-based occupational musculoskeletal health and disorders prevention programs among various health professionals.

Furthermore, this study will be the first systematic review and meta-analysis that will present pooled prevalence of WRMSDs among healthcare professionals in the sub-Saharan African region.

The rationale for conducting this review was as results of recent systematic review on healthcare professionals not including meta anlaysis in their review [35] and meta-analysis on global prevalence only on physiotherapist [36]. The first review on health professional focuses on global study, only few Africa studies were included in the studies. Therefore, the regional pooled prevalence of sub-Saharan African region has not yet been captured in any review on musculoskeletal disorders among health professionals. We will envisage some potential challenges at review level decisions as to studies reporting only on study that reports one aspect of body region to be included or not.

Declarations

Author details

ABA is working as a senior lecturer of public health and global health researcher, faculty of health science, Habib Medical School Islamic university in Uganda. He has been working on musculoskeletal disorders in African settings. IBA is a public health specialist and global health researcher with numerous years of experience in infectious and non-infectious diseases in sub-Saharan Africa. He is currently a Doctoral student of Public Health at the University of Ottawa, Ottawa, Ontario, Canada. OAO is an environmental health specialist with experience in occupational health related issues, he works as lecturer at Mount Kenya University.

Author contributions

ABA participated in conception of the research idea, literature search, research question, screening of journal articles for meta-analysis, quality score and manuscript writing. IBA contributed to literature search, screening of journal articles, quality score analysis and review of the manuscript. OAO supervised the work during the analysis, proof read the manuscript and gave technical guidance. All authors will read and approve this protocol before sending it will be sent for publication.

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Availability of data and materials

Not applicable

Ethical approval and consent to participate

“Not Applicable (NA)”

Consent for publication

“Not Applicable (NA)”

Competing interests

The authors declare no competing interests.

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Figures

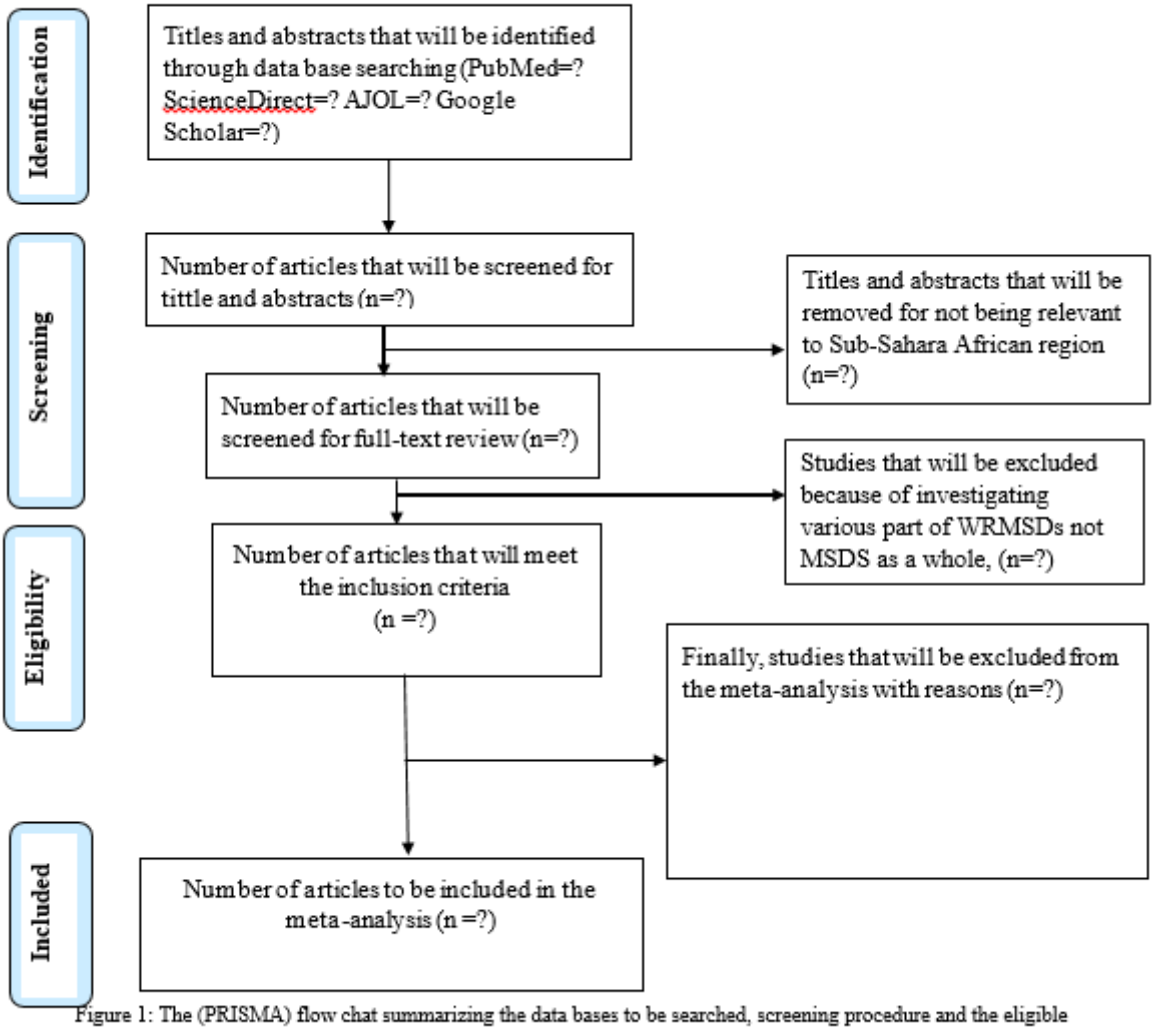

Figure 1: The (PRISMA) flow chat summarizing the data bases to be searched, screening procedure and the eligible studies for inclusion in data synthesis

Figure 1

See image above for figure legend.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile1.png
- Additionalfile2PRISMAPchecklistforMSDs.doc
- Additionalfile3.docx