Review

Global Prevalence and Patterns of Work-related Musculoskeletal Disorders among Butchers: A Scoping Review

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ABSTRACT

Background: Musculoskeletal disorders remain a prominent occupational health concern in the butchering profession. Therefore, this study aimed to map evidence on the prevalence and pattern of Work-related Musculoskeletal Disorders (WRMSDs) among butchers worldwide as this would help in the formulation of needed occupational health policy or workplace interventions.

Methods: A scoping review was conducted following the Arksey and O'Malley framework, enhanced by Levac, and reported per PRISMA-ScR guidelines. Eight databases (PubMed, Google Scholar, CINAHL, Medline, AJoL, Scopus, Web of science, and EMBASE) were searched (between 2016 – 2022) for peer-reviewed observational studies reporting musculoskeletal symptoms or injuries in actively employed butchers. Six studies met inclusion criteria. Data were narratively synthesized to map prevalence trends, risk factors, and preventive practices.

Results: Work-related Musculoskeletal Disorders 12-month prevalence ranged from 10.3% to 88.2%, and the most commonly affected body region are the lower back, shoulders, wrists, and neck. Risk factors included repetitive knife use, heavy lifting, poor posture, prolonged standing, inadequate equipment, and lack of protective gear. Only one study used clinical diagnostic tools; others relied on self-reports. Preventive strategies were poorly documented, with low awareness and unsafe practices noted.

Conclusion: Butchers experience disproportionately high Work-related Musculoskeletal Disorders rates, especially in the spine and upper extremities, driven by task demands and poor ergonomics. Evidence on prevention remains sparse, underscoring the need for targeted occupational health programs, ergonomic interventions, and further longitudinal or interventional research.

Keywords: musculoskeletal pain, prevalence, risk factors, Butchers, Scoping review.

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INTRODUCTION

Musculoskeletal disorders (MSDs) are among the most common occupational health problems globally and represent a major cause of morbidity, lost productivity and reduced quality of life.[1] Musculoskeletal disorders (MSDs) refer to injuries or dysfunctions affecting muscles, nerves, tendons, joints, cartilage, or spinal discs, often resulting from occupational exposures such as repetitive motion, forceful exertion, awkward postures, or vibration.[2,3] In a recently released Global burden of Disease (GBD) data, 1.71 billion people worldwide are affected by MSDs such as low back pain, neck pain revealing that MSDs are the leading contributor to disability worldwide.[4] Amongst these MSDs, low back pain remains the most significant contributor to the overall burden of disease, with an estimated 570 million prevalent cases worldwide, accounting for responsible for 7.4% of total global Years Lived with Disability (YLDs).[4]

The burden of MSDs is particularly high in physically demanding occupations such as butchery, where workers encounter significant biomechanical and ergonomic stressors daily.[5-7] Butchering typically involves forceful cutting meat, repetitive manual tasks, heavy lifting, and prolonged standing, factors known to exacerbate the risk of developing musculoskeletal complaints.[8] In addition, butchers often work in cold environments and under time constraints, with limited access to ergonomic equipment or automation, leading to heightened strain on the back, shoulders, upper limbs, and wrists.[9,10] In many low- and middle-income countries (LMICs), including regions in Sub-Saharan Africa and South Asia, the occupational settings for butchers remains largely informal and unregulated, as reflected in the lack of occupational health surveillance, insufficient training on safe work practices, and limited access to health care, which together contributes to the prevalence of preventable MSDs and other chronic health issues.[11,12]

Despite the occupational hazards faced by butchers, there is limited comprehensive evidence synthesizing the prevalence and nature of MSDs among these individuals. Even though there are studies that have been conducted among poultry meat processing workers, this could not suffice for butchers as there are clear differences between them with respect to animals processed, the processing methods, the scale of operation and the final products produced. This invariably affects their prevalence, patterns and risk factor of WRMSDs among them.[8,13] Most available studies focus on general labour or specific industries such as construction, healthcare, or manufacturing, often excluding butchers or aggregating them within broader occupational groups. This lack of targeted research hinders the development of occupation-specific interventions and policies aimed at reducing MSDs among butchers.

A scoping review offers a suitable methodological approach for mapping the current body of evidence, identifying knowledge gaps, and guiding future research and workplace interventions. Through this review, a clearer understanding of the prevalence, patterns, and associated risk factors of MSDs among butchers can be established, supporting informed occupational health decision-making in this workforce.

METHODS

Study design: We conducted this scoping review following the framework of Arksey and O'Malley [14] and the PRISMA-ScR reporting guidelines. Methodological frameworks by Levac and colleagues and Arksey and O'Malley were used to guide this scoping review.[14,15] The framework included the following stages:

1. Identifying research questions
2. Identifying relevant studies
3. Selecting studies
4. Charting the data, collating, and summarizing
5. Reporting the results

In addition, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist was applied.[16] This provided a clear summary of the article selection process, showing the steps from identifying records in databases to screening, assessing eligibility, and finally including studies in the review.

Identifying the research question: The overarching research question was as follows: What is the available global evidence regarding the prevalence and patterns of musculoskeletal disorders among Butchers?

Eligibility of the research: The PCC (Population, Concept, Context) framework was used to structure the eligibility criteria.

Population: Actively employed butchers of all genders, aged 18 years and above.

Concept: Musculoskeletal disorders (MSDs), including work-related musculoskeletal symptoms, injuries, or diagnosed conditions.

Context: Occupational and workplace settings specific to butchers across diverse global regions.

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Search strategy: The following electronic databases were searched: PubMed, Google Scholar, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, AJoL, Scopus, Web of Science, and EMBASE. Search terms included combinations of "musculoskeletal disorders" OR "MSDs" OR "WRMSDs"; AND "butcher" OR "meat processing workers" OR "abattoir workers"; AND "occupational health" OR "ergonomics" and related keywords. The reference lists of all included studies were searched for additional eligible studies. The study selection was presented using the PRISMA-ScR flow diagram.

Study selection: Two reviewers, I.G. and I.O., independently screened titles and abstracts. They piloted the full-text screening, and both reviewers also screened eligible full texts for inclusion criteria. In case of any disagreement during title and abstract and full-text screening, both reviewers discussed to reach a consensus. When consensus could not be reached in the titles and abstracts screening or full-text screening stages, a third reviewer A.N was consulted for the final decision.

Eligibility criteria

Inclusion criteria: Studies were eligible for inclusion if they:

i. Focused on butchers currently working in abattoirs, butcher shops, or meat processing environments.
ii. Included participants aged 18 years and older with a minimum of 6 months of work experience.
iii. Reported the prevalence, types, or risk factors associated with musculoskeletal disorders.
iv. Employed observational research designs, particularly cross-sectional, cohort, or case-control studies.
v. Were peer-reviewed with full-texts available.
vi. Were published in English.

Exclusion criteria: Studies were excluded if they:

i. Did not involve butchers or focused on other occupational groups.
ii. Did not assess musculoskeletal disorders or related conditions.
iii. Did not report original data (e.g., editorials, letters, commentaries).
iv. Were non-English language publications and no translation resources were available.

Charting the data/Data Management: All articles retrieved from the databases were exported into RAYYAN (https://rayyan.ai.org) and screened for titles and abstracts. Sorting and removal of duplicates were also emphasized. Thereafter, full-text screening was conducted based on the inclusion and exclusion criteria. Organization and documentation of extracted data were done mainly using Microsoft Excel sheets.

Collating and summarizing: The characteristics of the included studies and any important questions related to the aim of this scoping review were summarized in a tabular format. Extracted data from included studies was presented in a table with narrative summaries. Relevant information that addresses the study questions was gathered and summarized. This technique of organizing was adopted to assist in the categorization of materials depending on search results. Two authors (I.G. and A.O.) analysed the summary data to discover trends or common topics/categories.

Ethical consideration: This study used publicly available data from published studies and therefore did not require institutional ethical approval.

RESULTS

A total of 127 records were identified through database searching and exported to Rayyan (Fig. 1). After the removal of duplicates, 54 records remained for title and abstract screening. Of these, 11 full-text articles were assessed for eligibility. Five articles were excluded, three due to unavailability of full-text and two because of unsuitable publication type. The remaining six met the inclusion and exclusion criteria and were included in this review. This selection process is summarized in the PRISMA-ScR flow diagram below

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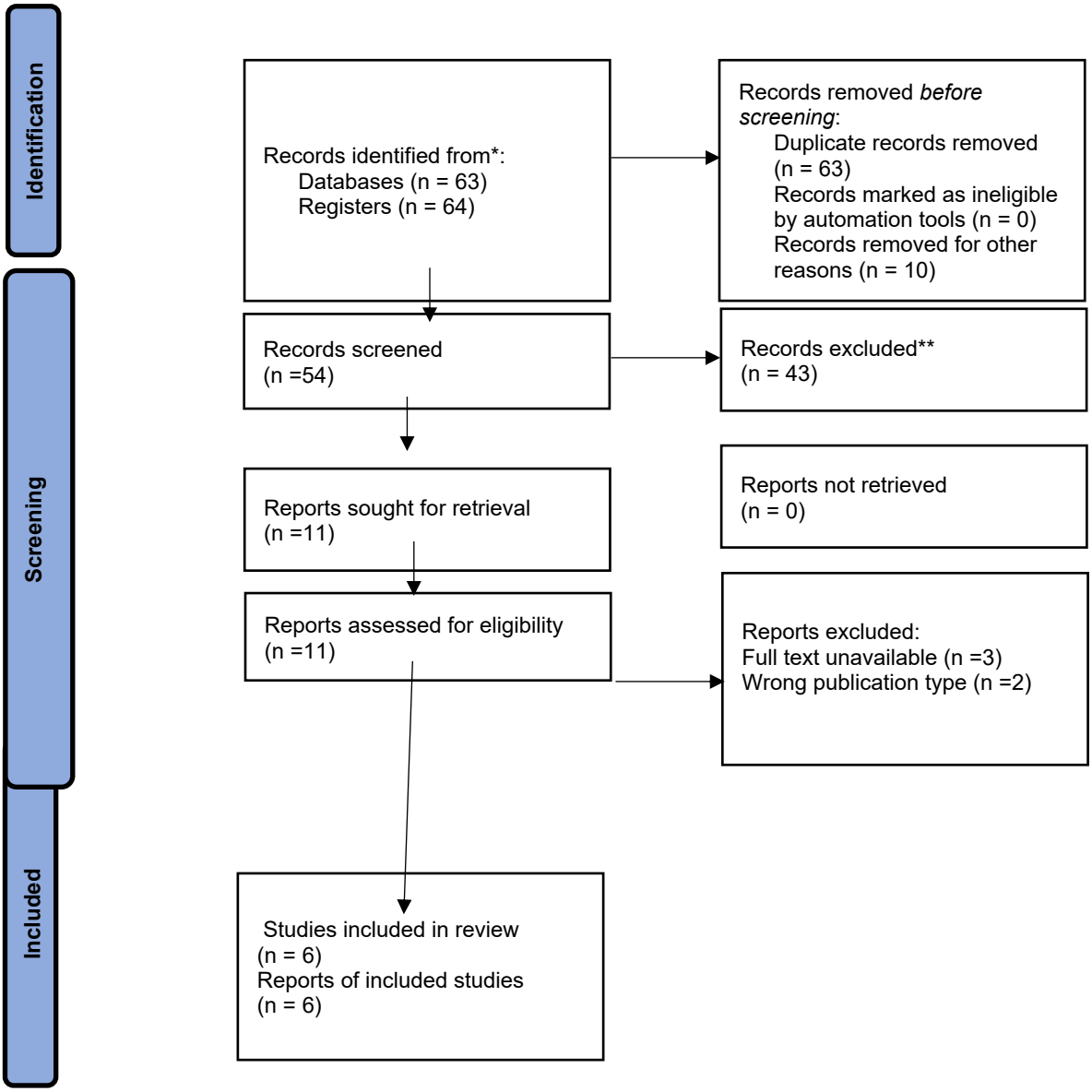

Figure 4.1: PRISMA-ScR flow diagram.

Study Characteristics: The six studies included in this scoping review were all cross-sectional in design and conducted across four countries: Nigeria, Pakistan, Turkey, and Bangladesh. Sample sizes ranged from 69 to 400 participants, with all studies focusing on actively employed male butchers working in abattoirs, butcher shops, or meat markets. Participant ages varied, though most were between 20 and 40 years old with several years of work experience. The primary data collection tools used were the Standardized Nordic Musculoskeletal Questionnaire, Boston Carpal Tunnel Syndrome (CTS) Questionnaire, and custom structured interviews or checklists. The studies primarily assessed the prevalence, distribution, and severity of musculoskeletal disorders (MSDs), with particular focus on the lower back, shoulders, wrists, and neck. Findings showed consistently high MSD prevalence, ranging from 10.3% to 88.2%, highlighting significant occupational strain. Some studies also explored injury patterns, such as hand and finger injuries from sharp tools, and poor working conditions including lack of personal protective equipment. Overall, the studies provide a comprehensive regional insight into the burden and risk factors associated with MSDs among butchers.

Table 1: Characteristics of included articles

Authors	Year	Country (City)	Study Design	Sample Size	Data Collection Instrument	Prevalence of MSD	Diagnostic criteria for MSD	MSD Types
Kaka B et al.	2016	Nigeria (Kano)	Cross-sectional	102	Structured questionnaire (Nordic)	12-month: 88.2%; Point: 74.5%; Lower back: 66.7%	Standardized Nordic Musculoskeletal Questionnaire	Lower back, wrist/hand, hip/thigh, knee, ankle/foot
Öz F et al.	2021	Turkey (Hatay)	Cross-sectional	69	Face-to-face 32-item questionnaire	Hand/finger: 60.9%; Back pain: frequent (no %)	Self-reported injuries	Hand/finger injuries, back pain
Saleem Z et al.	2020	Pakistan (Lahore)	Cross-sectional	150	Standardized Nordic Musculoskeletal Questionnaire	Shoulder: 44.0%, Lower back: 42.0%, others 10–30%	Standardized Nordic questionnaire (self-report)	Neck, shoulder, elbow, wrist/hand, back, hip, knee, ankle
Johnson OE, Etokidem AJ	2019	Nigeria (Uyo)	Cross-sectional	157	Semi-structured questionnaire	Neck pain: 36.9%, Back pain: linked to cow handling	Self-reported pain and injuries	Neck pain, back pain
Shamsi T et al.	2022	Bangladesh (Dhaka)	Cross-sectional	124	Nordic Questionnaire + Job Content Questionnaire	Wrist: 60%, Back: 61%, Shoulder: 62%, Neck: 51%	Self-reported symptoms (Nordic)	Wrist, back, shoulder, neck pain
Hayder A et al.	2022	Pakistan	Cross-sectional	400	CTS questionnaire, VAS, Boston CTS Questionnaire	CTS: 10.3%	Tinel's, Phalen's tests, nerve conduction studies	Carpal Tunnel Syndrome (CTS)

Table 2: Key findings (summary)

Authors	Year	Country	Prevalence Rates	Key Findings	Limitations Noted by Authors
Kaka B et al.	2016	Nigeria (Kano)	12-month: 88.2%; Point: 74.5%; Lower back: 66.7%	Very high prevalence of MSDs; lower back most common (66.7%)	Limited to Hausa-speaking butchers
Öz F et al.	2021	Turkey (Hatay)	Hand/finger injuries: 60.9%; Back pain: frequent	High rate of hand/finger injuries (61%); back pain also common	Small sample; self-reported data
Saleem Z et al.	2020	Pakistan (Lahore)	Shoulder: 44.0%, Lower back: 42.0%	High frequency of WRMSDs; poor posture habits noted	None explicitly reported
Johnson OE, Etokidem AJ	2019	Nigeria (Uyo)	Neck pain: 36.9%; Back pain: linked to cow handling	Common hazards/injuries; poor slaughterhouse conditions	No explicit limitations section
Shamsi T et al.	2022	Bangladesh (Dhaka)	Wrist: 60%, Back: 61%, Shoulder: 62%, Neck: 51%	Upper-body MSDs common; moderate job satisfaction	Single-city sample; cross-sectional
Hayder A et al.	2022	Pakistan	CTS: 10.3%	Moderate CTS burden; middle-aged butchers most affected	Convenience sampling; no control group

Narrative Synthesis of Included Studies

The six studies included in this review provide comprehensive insights into the prevalence, patterns, and occupational determinants of work-related musculoskeletal disorders (WRMSDs) among butchers in various regions including Nigeria, Pakistan, Bangladesh, and Turkey. The findings have been synthesized thematically to reflect commonalities and differences across geographic and occupational contexts.

Prevalence of Musculoskeletal Disorders

Across all studies, WRMSDs were found to be highly prevalent among butchers, often affecting multiple body regions. The study by Kaka et al.[7] in Kano, Nigeria, reported a remarkably high 12-month prevalence rate of 88.2%, with a point prevalence of 74.5%. Similarly, Saleem et al.[17] reported that more than 40% of butchers in Lahore, Pakistan, experienced shoulder and lower back pain over the past year. Shamsi et al.[18], in a study conducted in Dhaka, Bangladesh, noted that 60% of butchers reported wrist problems, while 62% and 61% reported shoulder and back pain respectively. This suggests that MSDs are not only common but also widely distributed across different anatomical sites, reinforcing the physical burden of butchering work.

Commonly Affected Body Regions

A consistent pattern emerged across all studies regarding the most affected body regions. The lower back was frequently identified as the primary site of discomfort. For instance, Kaka et al.[7] found that 66.7% of butchers reported low back pain. In the study by Saleem et al.[17], 42.0% of respondents identified lower back pain as a primary complaint, followed closely by shoulder pain (44.0%). The shoulder, neck, and upper limbs, particularly the wrist and hand, were also frequently cited. Shamsi et al.[18] observed that over half of the participants had sought medical attention for pain in the wrist, shoulder, and neck. These findings are reinforced by Öz et al.[19] in Turkey, where 60.9% of butchers reported hand and finger injuries, and back pain was also common.

The carpal tunnel syndrome (CTS) study conducted by Hayder et al.[20] offers further insight into upper limb conditions, showing a 10.3% prevalence of CTS among butchers in Pakistan. The study also highlighted that individuals with 3–5 years of work experience, particularly those aged 26–30, were most affected by CTS symptoms, including tingling and functional limitations in the wrist and hand.

Occupational Risk Factors

Occupational exposure emerged as a major contributing factor to WRMSDs. All studies reported repetitive cutting motions, prolonged standing, poor ergonomic conditions, and heavy lifting as primary contributors. Kaka et al.[7] emphasized that butchers working with large carcasses under poor ergonomic setups were particularly susceptible to low back disorders. Similarly, Saleem et al.[17] linked shoulder and wrist pain to repetitive use of knives and long working hours. Öz et al.[19] detailed that 97.1% of injuries among Turkish butchers were caused by sharp tools, often due to lack of proper protective equipment such as gloves. The study also found that many butchers did not use any safety measures while working. In the Uyo study by Johnson and Etokidem[6], additional hazards like slippery floors and contact with live animals were identified as contributing to workplace injuries, including neck pain (36.9%).

Healthcare Utilization and Coping

Despite the high burden of symptoms, few butchers actively sought treatment. Kaka et al. [7] noted that only

23.3% of butchers who reported symptoms had ever visited a health facility. This suggests underreporting or normalization of chronic pain among butchers. By contrast, Shamsi et al. [18] observed relatively higher rates of health-seeking, though they also highlighted limited access to primary healthcare and low levels of job satisfaction due to the physical toll of the work.

Regional Variations

There were some regional differences in reported prevalence and injury types, possibly due to variations in slaughtering techniques, infrastructure, and safety enforcement. The highest prevalence of WRMSDs was found in Nigeria[7], which may reflect the more labour-intensive nature of butchering in that region. In contrast, the CTS-focused study in Pakistan[20] reported a lower, though still significant, prevalence of a specific upper limb disorder, possibly due to differences in job roles, workload, or the narrower focus of that study.

Outcome Measures

Across the six included studies, several consistent outcome measures were observed, forming the basis for understanding the burden of work-related musculoskeletal disorders (WRMSDs) among butchers. The most reported outcome was the 12-month prevalence of WRMSDs, which ranged as high as 88.2% in the Nigerian study by Kaka et al.[7], indicating that nearly nine out of ten butchers experienced at least one musculoskeletal complaint over the course of a year. While not all studies reported a unified prevalence figure, many broke down data by anatomical region, offering a region-specific distribution of symptoms. The most affected body regions were the lower back, shoulders, wrists/hands, and neck, with some variation across countries. For instance, lower back pain was reported in 66.7% of butchers in Kano[7], while shoulder and wrist issues were dominant in Dhaka and Lahore, with over 60% seeking treatment for upper-body pain.[17,18]

Injury-specific outcomes such as knife cuts and carpal tunnel syndrome were also reported. Öz et al. [19] found that 60.9% of Turkish butchers had sustained hand/finger injuries, primarily due to unsafe handling of sharp tools, while Hayder et al.[20] clinically diagnosed carpal tunnel syndrome (CTS) in 10.3% of Pakistani butchers using nerve conduction studies and physical tests (Tinel's and Phalen's). These outcomes extend beyond self-reported symptoms and highlight objective physical dysfunctions in this population. Another critical outcome was the frequency of healthcare utilization. Despite the high prevalence of symptoms, low rates of medical care-seeking behaviour were observed across the studies. For example, Kaka et al. [7] noted that only 23.3% of butchers sought hospital care for their symptoms, while most others either endured the pain or used self-remedies. In contrast, Shamsi et al.[18] found slightly higher utilization in Bangladesh, where over 50% visited doctors for wrist, back, and shoulder pain. This disparity reflects variability in healthcare access, awareness, and health-seeking behaviour across regions. Finally, some studies assessed the impact of WRMSDs on daily function. Kaka et al. [7] reported that 26.7% of affected butchers experienced activity limitations, affecting their ability to perform routine work-related or personal tasks. However, standardized disability scores (e.g., DASH or Oswestry) were not used in any of the included studies, highlighting a methodological limitation.

DISCUSSION

This scoping review synthesized evidence on WRMSD prevalence, patterns, risk factors, impacts, and potential interventions among butchers, a group exposed to intensive manual tasks and ergonomically challenging postures. Six observational studies from diverse geographic settings consistently indicate a high burden of WRMSDs, especially lower back, shoulder, wrist/hand, and neck complaints. In addition, this study highlights CTS prevalence reflecting neuropathic risk in repetitive tasks associated with the use of the wrist.[6,7,17,18,19,20]

The high prevalence rate of WRMSDs among butchers in this study highlights it as a significant occupational health concern. Kaka et al. [7] reported an 88.2% 12-month prevalence in Kano, Nigeria which were among the highest documented rates with age as a significant risk factor. Shamsi et al. [18] found similarly elevated rates (>60%) in Dhaka, Bangladesh, while Hayder et al. [20] noted a 10.3% prevalence for clinically confirmed carpal tunnel syndrome. These findings align with broader occupational health data, which demonstrate that manual labourers including butchers, routinely face WRMSDs prevalence rates exceeding 70–90% for general symptoms and 10–20% for specific conditions like carpal tunnel syndrome.[20,21] This consistency underscores the pervasive burden of WRMSDs among butchers globally attributable to a combination of factors such as poor ergonomic workplace design, lack or inadequate workplace regulation, and largely informal,

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low-technology nature of the work environment particularly in developing nations.

Studies uniformly showed that butchers experienced the highest prevalence of lower back pain, followed by shoulder, neck, and upper limb discomfort. Kaka et al. [7] reported that 66.7% of respondents experienced low back pain, and Saleem et al.[17] similarly observed 42% prevalence in Lahore. The CTS-focused study by Hayder et al.[20] further highlighted upper limb impacts, emphasising hand–wrist strain. These patterns are supported by ergonomic assessments in manual meat-cutting occupations, which frequently report high REBA/RULA scores for the spine, shoulders, and arms, indicating increased risk for musculoskeletal injury.[22] This distribution solidifies the link between repetitive, forceful tasks and specific anatomical strain.

The evidence identified repetitive cutting, sustained awkward postures, heavy lifting of carcasses, and inadequate ergonomic design as primary risk factors. Öz et al.[19] reported that 97% of hand injuries were due to knife use without adequate protective equipment, and Johnson and Etokidem[6] noted the impact of slippery surfaces and animal handling. These findings are reinforced by ergonomic studies demonstrating that repetitive upper limb motion, awkward trunk flexion, and insufficient rest are significant predictors of WRMSDs in meat-processing tasks.[22,23] The correlation between biomechanical load and MSDs is well-established in occupational health literature.

WRMSDs among butchers were shown to negatively affect health-seeking behaviour, daily function, and work capacity. For instance, only 23.3% of affected workers in Kano sought medical care,[7] while Shamsi et al.[18] observed widespread continuation of work despite persistent pain. Hayder et al.[20] reported that CTS symptoms, such as tingling and reduced grip, directly impaired manual ability. These experiences align with international findings in other manual occupations, where musculoskeletal pain has been linked to functional limitations, reduced productivity, and impaired quality of life.[24,25,26] The impact on hand function from CTS is particularly debilitating for occupations reliant on precision and strength.

While most studies identified risk factors, few described specific interventions. Nonetheless, the findings point toward urgent needs for occupational health and safety reforms. Kaka et al.[7] and Öz et al.[19] emphasized the lack of protective equipment, suggesting that gloves, supportive footwear, and cut-resistant tools could prevent many injuries. Ergonomic modifications such as adjustable work surfaces, anti-fatigue mats, and optimized tool design were also indicated by the burden of upper limb and spinal complaints. Saleem et al. [16] and Shamsi et al.[18] highlighted poor posture and long hours as contributing factors, advocating for structured rest periods and ergonomic training. Hayder et al.[20] suggested early detection strategies and routine screening, particularly for hand and wrist conditions. Collectively, the findings support the implementation of multi-level interventions including worker education, policy enforcement, and ergonomic reengineering to reduce the burden of WRMSDs in the butchering profession.

Strengths of the study

To our knowledge, this is the first scoping review to map the prevalence, pattern and risk factors associated with WRMSDs among butchers globally. This scoping review methodology has allowed us to use a systematic approach to identify relevant studies, charting, and analysis of outcomes. In addition, our studies were selected according to population, concept and context framework as it was relevant to address our research question. Also, our study findings were reported following the PRISMA flow diagram for the purpose of transparency and completeness.

Limitations of the study

Despite the consistency in reported prevalence rates and symptom patterns, several clinical and methodological limitations were evident across the six included studies. These limitations may affect the interpretation, generalizability, and clinical application of findings regarding work-related musculoskeletal disorders (WRMSDs) among butchers. This review made use of six studies, which typically might be too small and serve as a limitation for generalizability of the study. A major limitation across most studies was the over-reliance on self-reported data. Except for the study by Hayder et al.[20], which employed clinical diagnostic methods including Tinel's and Phalen's tests as well as nerve conduction studies for carpal tunnel syndrome (CTS), the remaining studies[6,7,17,18,19] relied exclusively on interviews or questionnaires. While tools such as the Standardized Nordic Musculoskeletal Questionnaire (SNMQ) are validated and widely used, the absence of clinical confirmation in most studies may result in recall bias or misclassification of symptoms. Another critical

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limitation was the cross-sectional design used in all six studies. This design limits the ability to establish causal relationships between occupational risk factors (e.g., repetitive tasks, poor posture) and the onset of MSDs. For example, while Kaka et al.[7] and Shamsi et al.[18] associated musculoskeletal symptoms with specific job demands, they were unable to determine whether these factors directly caused the reported conditions.

In addition, variability in diagnostic criteria and outcome measures was evident. Some studies applied standardized tools like the SNMQ,[7,17] while others used custom or non-standard questionnaires,[6,19] reducing the comparability and reliability of findings across studies. Furthermore, most studies lacked detailed reporting on symptom severity, duration, and the functional impact of WRMSDs, which are clinically relevant for understanding the true burden of disease. Demographic and contextual limitations were also observed. All participants across the studies were male, and all studies were conducted in low- to middle-income countries including Nigeria, Pakistan, Turkey, and Bangladesh. This creates a gender and geographic bias, limiting the generalizability of findings to female workers or those in higher-income settings with different occupational health regulations. Another concern was the limited exploration of healthcare access and treatment pathways. Although high symptom burden was reported across studies, few addressed whether affected individuals received medical evaluation or intervention. For instance, Kaka et al.[7] reported that only 23.3% of butchers with symptoms sought medical care. Similarly, Öz et al.[19] highlighted that most butchers in their sample did not use protective equipment, pointing to inadequate workplace safety practices.

Implication for research

First, future research should combine self-reported assessments with clinical diagnostic methods. The comprehensive approach used by Hayder et al.[20] offers a strong example of how clinical confirmation can enhance diagnostic accuracy and reliability. Studies should consider incorporating physical examinations, functional assessments, or imaging when appropriate. Second, researchers should adopt longitudinal study designs to assess symptom progression, determine causality, and evaluate the long-term effects of occupational exposures. This would provide deeper insight into how musculoskeletal conditions develop and respond to interventions over time. Third, there is a need to standardize diagnostic tools and outcome measures across studies. Consistent use of validated instruments such as the SNMQ, Boston Carpal Tunnel Syndrome Questionnaire (BCTSQ), and Visual Analog Scales (VAS) would improve the comparability of findings and support future evidence synthesis. Fourth, future studies should explore and evaluate preventive and ergonomic interventions. None of the included studies assessed the effectiveness of workplace modifications or safety programs. Intervention-based research such as trials on ergonomic training, use of mechanical aids, or personal protective equipment is essential for evidence-based practice in occupational health.

Implication for practice

Policy-level action is needed to address structural gaps. Authorities should integrate musculoskeletal screening into occupational health assessments for butchers and meat industry workers. Enhancing access to primary care, physiotherapy, and safety education could significantly reduce the burden of MSDs in this high-risk occupational group, as illustrated by the unmet needs reported in Johnson & Etokidem [6] and Shamsi et al.[18]

CONCLUSION

Butchers exhibit a high prevalence of WRMSDs across multiple body regions, driven by repetitive, forceful, and awkward manual tasks inherent in meat processing. These disorders impair function, productivity, and well-being, yet formal healthcare utilization and preventive measures remain limited. Addressing this occupational health issue requires multi-pronged strategies: ergonomic interventions, worker training, occupational health surveillance programmes, and policy support.

Abbreviations

WRMSDs: Work-related Musculoskeletal Disorders
MSDs: Musculoskeletal disorders
WHO: World Health Organization
GBD: Global Burden of Disease
LMICs: Low-and Middle-Income Countries
PRISMA-ScR: Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews
CTS: Carpal Tunnel Syndrome
SNMQ: Standardized Nordic Musculoskeletal Questionnaire
BCTSQ: Boston Carpal Tunnel Syndrome Questionnaire

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VAS: Visual Analog Scales

Declarations

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