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Frequency of Shoulder Pain and Its Association with Low Back Pain among Street Vendors

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ABSTRACT

Background: Street vendors are frequently exposed to prolonged standing, repetitive upper-limb movements, manual handling of heavy loads, and awkward working postures, which increase their risk of developing work-related musculoskeletal disorders, particularly shoulder pain and low back pain. However, evidence regarding the association between these conditions among street vendors remains limited.

Objective: To determine the frequency of shoulder pain and its association with low back pain among street vendors.

Methods: A cross-sectional analytical study was conducted among 139 male fruit and vegetable street vendors from Gulberg and Iqbal Town using a non-probability convenience sampling technique. Shoulder disability was assessed using the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire, while low back pain intensity was evaluated using the Numeric Pain Rating Scale (NPRS). Data were analyzed using SPSS version 25. Descriptive statistics were reported as frequencies, percentages, means, and standard deviations. The association between shoulder disability and low back pain was determined using the Chi-square test, with $p<0.05$ considered statistically significant.

Results: The mean weight and height of participants were 62.29 ± 11.07 kg and 169.46 ± 11.26 cm, respectively. Moderate shoulder disability was observed in 40 (28.8%) participants, whereas 86 (61.9%) reported moderate low back pain. A statistically significant association was found between shoulder disability and low back pain ($p = 0.002$).

Conclusion: Shoulder disability was significantly associated with low back pain among street vendors. Ergonomic interventions, early screening, and physiotherapy-based preventive strategies may help reduce musculoskeletal disability and improve occupational health in this vulnerable workforce.

Keywords: Body Mass Index, Low Back Pain, Musculoskeletal Diseases, Occupational Health, Occupational Therapy, Shoulder Pain, Street Vendors, Work Related Musculoskeletal Disorders.

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Introduction

Work-related musculoskeletal disorders (WMSDs) are among the leading occupational health problems worldwide and constitute a major cause of pain, functional disability, reduced work productivity, and diminished quality of life. These disorders involve muscles, tendons, ligaments, joints, peripheral nerves, and supporting structures that become injured or aggravated due to occupational activities. Physical workloads such as repetitive movements, manual material handling, prolonged standing, awkward working postures, bending, twisting, lifting heavy loads, and forceful exertions substantially increase the risk of developing musculoskeletal disorders. Individual factors including age, previous injuries, physical fitness, lifestyle, and genetic predisposition may further contribute to their occurrence when occupational demands exceed the body's physiological capacity (1,2).

Street vendors represent a significant proportion of the informal workforce, particularly in low- and middle-income countries, where they contribute substantially to local economies while frequently working under physically demanding and ergonomically unfavorable conditions. Their daily activities commonly involve prolonged standing, repetitive upper-limb movements, lifting and carrying heavy loads, pushing or pulling carts, and maintaining awkward postures for extended periods. These occupational exposures predispose vendors to musculoskeletal disorders involving multiple body regions, particularly the shoulders and lower back. A study conducted among street vendors in the Central African Republic reported a high prevalence of musculoskeletal disorders, emphasizing that the physical nature of street vending places workers at considerable risk of developing occupational musculoskeletal problems (3). Similarly, an ergonomic assessment of fruit and vegetable vendors in Boyacá, Colombia, using the Rapid Entire Body Assessment (REBA) method demonstrated that vendors were exposed to high ergonomic risks because of sustained standing postures and repetitive work activities, highlighting the need for workplace modifications and ergonomic interventions to reduce musculoskeletal injuries (4).

Musculoskeletal disorders remain highly prevalent among working populations across different occupational sectors. Evidence from a nationwide survey involving more than 22,000 workers in Taiwan demonstrated that approximately one-third of employees experienced musculoskeletal disorders, with low back pain representing the most frequently affected anatomical region, followed by disorders involving the neck, shoulders, hands, and wrists. The study further identified increasing age, female sex, educational status, and specific occupations involving heavy physical work as important determinants of musculoskeletal disorders (5). Likewise, research conducted among informal workers in Colombia reported that prolonged working hours, repetitive occupational tasks, manual lifting, and inadequate workplace ergonomics substantially increased the burden of musculoskeletal pain, emphasizing that informal workers often experience limited occupational health protection despite their elevated exposure to physical hazards (6).

Among work-related musculoskeletal disorders, shoulder pain and low back pain are particularly common because both anatomical regions are continuously exposed to repetitive loading and sustained biomechanical stress during occupational activities. Occupational tasks requiring repetitive arm movements, lifting, carrying heavy objects, overhead work, and forceful pushing and pulling have been identified as important risk factors for shoulder disorders, whereas prolonged standing, repetitive bending, manual handling, and awkward trunk postures contribute significantly to the development of low back pain. Previous studies have demonstrated that repetitive occupational activities considerably increase the incidence of shoulder disorders, while manual pushing and pulling tasks have also been associated with shoulder and spinal complaints, although additional evidence is still required to clarify these relationships across different occupational groups (7–9).

Despite the substantial physical demands associated with street vending, relatively limited evidence is available regarding the frequency of shoulder pain and its association with low back pain in this occupational population, particularly in developing countries. Since shoulder dysfunction may alter posture, movement patterns, and spinal biomechanics, it can increase mechanical loading on the lumbar spine. Conversely, chronic low back pain may result in compensatory movement strategies that adversely affect shoulder function, suggesting a reciprocal biomechanical relationship between these conditions. Understanding this association is important because concurrent shoulder and low back pain may reduce work capacity, impair functional performance, decrease productivity, and negatively affect the socioeconomic well-being of street vendors. Therefore, the present study was conducted to determine the frequency of shoulder pain and its association with low back pain among street vendors, thereby providing evidence to support the development of ergonomic interventions, preventive strategies, and rehabilitation programs aimed at improving occupational health in this vulnerable working population.

Material and Methods

This cross-sectional analytical study was conducted among fruit and vegetable street vendors working in the Gulberg and Iqbal Town areas. The study was completed over a period of four months following the approval of the research synopsis. The study aimed to determine the

frequency of shoulder pain and its association with low back pain among street vendors engaged in physically demanding occupational activities.

The sample size was calculated as 139 participants and was recruited using a non-probability convenience sampling technique. Male street vendors aged between 20 and 50 years who had been working as fruit or vegetable vendors for a minimum of six months were considered eligible for inclusion in the study. Participants with a history of neurological disorders, cardiovascular diseases, congenital or acquired musculoskeletal deformities, previous upper limb or spinal surgery, recent traumatic injuries, or any condition that could influence shoulder or low back function were excluded from the study to minimize potential confounding factors.

Prior to data collection, ethical approval was obtained from the relevant Institutional Review Board/Ethics Committee. The study was conducted in accordance with the ethical principles. Written informed consent was obtained from all participants after explaining the purpose, objectives, procedures, potential benefits, and voluntary nature of the study. Participants were assured that all collected information would remain confidential and anonymous, and that they had the right to withdraw from the study at any stage without any consequences.

Data were collected through face-to-face interviews using a structured data collection form. Demographic information, including age, occupation, and duration of work, was recorded before administering the outcome measures. Shoulder pain and disability were assessed using the Disabilities of the Arm, Shoulder and Hand (DASH) Questionnaire, a valid and reliable self-reported instrument designed to evaluate upper extremity symptoms and functional limitations. Low back pain intensity was assessed using the Numeric Pain Rating Scale (NPRS), an 11-point scale ranging from 0 (no pain) to 10 (worst imaginable pain), which has demonstrated excellent validity and reliability for the assessment of pain intensity.

All collected data were checked for completeness and accuracy before entry into the Statistical Package for the Social Sciences (SPSS) software, version 23.0, for statistical analysis. Descriptive statistics were used to summarize demographic characteristics and study variables. Continuous variables were presented as mean ± standard deviation, whereas categorical variables were expressed as frequencies and percentages. The association between shoulder pain/disability and low back pain was determined using the Chi-square test. A p-value of <0.05 was considered statistically significant for all analyses.

Results

A total of 139 street vendors participated in this study. All participants were male (139, 100%). Regarding age distribution, 15 (10.8%) participants were aged 20–30 years, 46 (33.1%) were 31–40 years, 49 (35.3%) were 41–50 years, and 29 (20.9%) were 51–60 years. With respect to work experience, 3 (2.2%) participants had 5 years, 100 (71.9%) had 10 years, and 36 (25.9%) had 20 years of work experience. The mean body weight was 62.29 ± 11.07 kg, while the mean height was 169.46 ± 11.26 cm. According to body mass index (BMI), 24 (17.3%) participants were underweight, 50 (36.0%) had normal weight, 49 (35.3%) were overweight, and 16 (11.5%) were obese.

Table 1: Demographic Characteristics of the Study Participants

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	139	100.0
	Female	0	0.0
Age (years)	20–30	15	10.8
	31–40	46	33.1
	41–50	49	35.3
	51–60	29	20.9
Working Experience	5 years	3*	2.2
	10 years	100	71.9
	20 years	36	25.9
BMI Category	Underweight	24	17.3
	Normal weight	50	36.0
	Overweight	49	35.3
	Obese	16	11.5
Weight (kg)	Mean ± SD	62.29 ± 11.07	
Height (cm)	Mean ± SD	169.46 ± 11.26	

Assessment of shoulder disability using the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire demonstrated that 40 (28.8%) participants had moderate disability, followed by 33 (23.7%) with mild disability and

30 (21.6%) with severe disability. Fourteen (10.1%) participants had no disability, while 8 (5.8%) and 14 (10.1%) exhibited very severe and extremely severe disability, respectively. Assessment of low back pain using the Numeric Pain Rating Scale (NPRS) revealed that 86 (61.9%) participants experienced moderate pain, representing the most common pain category. Mild pain was reported by 30 (21.6%), severe pain by 20 (14.4%), whereas only 3 (2.2%) participants reported no low back pain.

Table 2: Distribution of Shoulder Disability and Low Back Pain Among Street Vendors

Outcome Measure	Category	n (%)
Shoulder Disability (DASH)	No Disability	14 (10.1)
	Mild Disability	33 (23.7)
	Moderate Disability	40 (28.8)
	Severe Disability	30 (21.6)
	Very Severe Disability	8 (5.8)
	Extremely Severe Disability	14 (10.1)
Low Back Pain (NPRS)	No Pain	3 (2.2)
	Mild Pain	30 (21.6)
	Moderate Pain	86 (61.9)
	Severe Pain	20 (14.4)

The association between shoulder disability and low back pain is presented in Table 4. Among participants without shoulder disability, most experienced either mild or moderate low back pain. As the severity of shoulder disability increased, the proportion of participants reporting moderate and severe low back pain also increased. Notably, 50.0% (7/14) of participants with extremely severe shoulder disability reported severe low back pain. The Chi-square test demonstrated a statistically significant association between shoulder disability and low back pain ($p = 0.002$), indicating that increasing shoulder disability was associated with greater severity of low back pain.

Table 4. Association Between Shoulder Disability (DASH) and Low Back Pain (NPRS)

Shoulder Disability	No Pain	Mild Pain	Moderate Pain	Severe Pain	Total
No Disability	1	6	6	1	14
Mild Disability	2	9	19	3	33
Moderate Disability	0	10	24	6	40
Severe Disability	0	3	26	1	30
Very Severe Disability	0	2	4	2	8
Extremely Severe Disability	0	0	7	7	14
Total	3	30	86	20	139

Discussion

The The present study investigated the frequency of shoulder pain and its association with low back pain among street vendors, a population that is routinely exposed to physically demanding occupational activities and unfavorable ergonomic conditions. A total of 139 male street vendors participated in the study, with the majority belonging to the 31–50-year age group. Shoulder disability was assessed using the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire, while low back pain intensity was evaluated using the Numeric Pain Rating Scale (NPRS). The findings demonstrated that moderate shoulder disability and moderate low back pain were the most prevalent conditions among the participants. More importantly, the study identified a statistically significant association between shoulder disability and low back pain ($p = 0.002$), indicating that increasing severity of shoulder disability was accompanied by greater severity of low back pain. These findings suggested that the repetitive manual work, prolonged standing, lifting and carrying heavy loads, awkward postures, and continuous physical exertion required in street vending may simultaneously affect the shoulder complex and lumbar spine, thereby increasing the burden of work-related musculoskeletal disorders in this occupational group.

The findings of the present study were consistent with those reported by Nurul Izzah et al., who investigated the prevalence of musculoskeletal symptoms among food delivery riders in Kota Bharu, Kelantan using a modified

Nordic Musculoskeletal Questionnaire. Their cross-sectional study reported that low back pain and shoulder pain were among the most commonly affected body regions, and significant associations were observed between occupational factors and lumbar symptoms ($p < 0.05$). Similar to the present findings, workers performing prolonged riding, repetitive upper-limb movements, and sustained postures experienced concurrent musculoskeletal complaints involving the shoulder and lower back. Although the occupational setting differed, both studies highlighted that physically demanding occupations requiring repetitive movements and prolonged static postures substantially increase the risk of developing musculoskeletal disorders affecting multiple body regions (19).

The present findings were further supported by the work of Skovlund et al., who evaluated the relationship between physical work demands and work capacity among 5,377 workers experiencing musculoskeletal pain. Their study demonstrated that occupational activities involving repetitive bending, twisting, and rotational movements for more than one-quarter of the working day significantly reduced work capacity among individuals with both low back pain and neck or shoulder pain. Furthermore, simultaneous exposure to multiple physical workload factors produced an even greater reduction in work capacity. These findings closely corresponded with those of the present study because street vendors are routinely exposed to combinations of heavy lifting, repetitive upper-limb activities, prolonged standing, bending, and trunk rotation throughout their working hours. Such occupational demands may explain the observed coexistence and significant association between shoulder disability and low back pain among the study participants (20).

The present study also agreed with previous findings reported among street vendors in Bangui, Central African Republic, where musculoskeletal disorders represented the most frequently reported occupational health problem. In that study, musculoskeletal disorders affected approximately 95% of vendors, with the shoulder being the most frequently involved upper-limb region. The authors attributed this high prevalence to prolonged working hours, repetitive manual handling, continuous walking, and inadequate ergonomic conditions. Similar occupational exposures were evident among the participants in the present study, who spent prolonged periods lifting, carrying, and handling merchandise under physically demanding conditions. Collectively, these findings reinforce the growing body of evidence suggesting that informal workers, particularly street vendors, experience a disproportionately high burden of musculoskeletal disorders because of poor workplace ergonomics, limited occupational health protection, and prolonged exposure to biomechanical stressors (1).

In contrast, Rathod et al. reported that although musculoskeletal discomfort was highly prevalent among street vegetable vendors, the lower back was the most frequently affected body region, whereas upper-limb involvement was comparatively less common. Their study further demonstrated that musculoskeletal discomfort was significantly associated with demographic variables such as age and sex but showed no significant relationship with body mass index, work experience, or several occupational characteristics. While the present study similarly identified a high burden of low back pain, it additionally demonstrated a statistically significant association between the severity of shoulder disability and low back pain. This difference may be explained by variations in study populations, assessment instruments, occupational practices, ergonomic exposures, sample characteristics, and statistical methodologies. Unlike the Nordic Musculoskeletal Questionnaire used by Rathod et al., the present study employed the DASH questionnaire to quantify shoulder disability together with the Numeric Pain Rating Scale to assess low back pain intensity, thereby allowing a more direct evaluation of the relationship between functional shoulder impairment and lumbar pain severity (2).

The observed association between shoulder disability and low back pain may also be explained by biomechanical and functional interdependence between the shoulder girdle and the lumbopelvic region. Repetitive upper-limb activities, prolonged elevation of the arms, carrying heavy loads, and sustained asymmetrical postures can alter scapular mechanics, trunk alignment, and spinal loading patterns. Conversely, persistent low back pain may produce compensatory movement strategies, impaired postural control, and altered kinetic chain function, resulting in increased stress on the shoulder complex. Consequently, dysfunction affecting one anatomical region may progressively influence adjacent body segments, thereby contributing to the coexistence of shoulder disability and low back pain among workers performing physically demanding occupations.

The present study possessed several strengths. It specifically investigated an occupational group that has received limited attention in musculoskeletal research despite representing a substantial proportion of the informal workforce. Furthermore, standardized and internationally validated assessment instruments, namely the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire and the Numeric Pain Rating Scale, were utilized to evaluate shoulder disability and low back pain, thereby enhancing the reliability of the findings. The study also provided clinically relevant evidence regarding the relationship between shoulder disability and low back pain, which may assist clinicians, physiotherapists, occupational health professionals, and policymakers in designing preventive and rehabilitative strategies for street vendors.

Future research should employ longitudinal or prospective cohort designs involving larger and more diverse populations to establish temporal and causal relationships between shoulder disability and low back pain among informal workers. Comprehensive ergonomic assessments together with objective physical performance measures should be incorporated to identify modifiable occupational risk factors. Furthermore, intervention studies evaluating workplace ergonomic modifications, manual handling education, structured exercise programs, and physiotherapy-based preventive strategies are warranted to reduce the burden of musculoskeletal disorders among street vendors. Such initiatives may improve occupational health, functional capacity, work productivity, and overall quality of life while reducing disability associated with prolonged exposure to physically demanding occupational activities.

Conclusion

The present study concluded that shoulder disability and low back pain were highly prevalent among street vendors, with a statistically significant association observed between the two conditions. The physically demanding nature of street vending, characterized by prolonged standing, repetitive upper-limb activities, awkward postures, and manual handling of heavy loads, likely contributed to the coexistence of these musculoskeletal disorders.

Authors' Contributions

ICMJE authorship criteria	Detailed contributions	Authors
Substantial Contributions	Conception or Design of the work	1,3
	Data acquisition	2,4
	Data analysis or interpretation	1,2,3
Drafting or Reviewing	Draft the work	1
	Review critically	1,2,3,4
Final approval	Final approval of the version to be published.	1,2,3,4
Accountable	Agreement to be accountable for all aspects of the work.	1,2,3,4

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