

Prevalence of Musculoskeletal Disorders Among Public Transport Users of Lahore

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ABSTRACT

Background: Musculoskeletal disorders (MSDs) affect muscles, bones, and joints, leading to pain and disability. Public transport users are often exposed to risk factors such as prolonged sitting, repetitive stress, and poor ergonomics, increasing the likelihood of MSDs.

Objective: To determine the prevalence of musculoskeletal disorders among public transport users in Lahore.

Methods: A cross-sectional study was conducted involving 212 participants aged 18–50 years, recruited through non-probability convenience sampling from various bus stops and rickshaw stands in Lahore. Data were collected using the Nordic Musculoskeletal Questionnaire and analyzed using SPSS version 25. Ethical approval was obtained, and all participants provided informed consent.

Results: The mean age of participants was 24.33 years (SD = 6.65), with 48.1% males and 51.9% females. The prevalence of musculoskeletal symptoms was highest in the neck (54.2%), upper back (57.1%), and ankles/feet (59.0%). Severity scores indicated that 26.37% had low, 70.23% moderate, and 3.29% high severity of symptoms.

Conclusion: The prevalence of musculoskeletal disorders among public transport users in Lahore is moderate, with significant impacts on the neck, upper back, and lower limbs. Ergonomic interventions are recommended to reduce these risks.

INTRODUCTION

Musculoskeletal disorders (MSDs) encompass a range of conditions affecting the muscles, bones, nerves, ligaments, tendons, joints, and spinal discs, often leading to injuries, strains, tears, and inflammation. Commonly observed symptoms of MSDs include pain, stiffness, weakness, numbness, burning sensations, loss of strength, and reduced range of motion, with disorders such as osteoarthritis, rheumatoid arthritis, osteoporosis, scoliosis, and various forms of back pain being prevalent (1). These disorders are frequently attributed to factors such as vibration, excessive force exertion, repetitive tasks, and awkward postures (2). MSDs are a significant health concern globally and are particularly pervasive in work environments, where they are influenced by a combination of individual, physical, and psychosocial factors. Individual factors such as gender, age, body mass index (BMI), physical activity levels, and smoking status have been linked to varying risks of developing MSDs, with women and older individuals being at higher risk (3). Physical factors include improper equipment, poor workstation ergonomics, and prolonged periods in incorrect postures, while psychosocial factors such as high job demands, low job control, poor social support, and high stress levels further exacerbate the risk of MSDs (4).

The prevalence of MSDs remains a critical public health issue in many regions, including Europe, where they are reported as the most common work-related health problem, affecting a substantial proportion of workers (5). Studies have repeatedly demonstrated a strong association between work-related psychosocial factors and the occurrence of MSDs, highlighting

the role of stress and work-related psychosocial risks in these conditions (6). For instance, high perceived stress, low job satisfaction, and repetitive tasks are recognized as key contributors to the onset and exacerbation of MSDs. The economic impact of MSDs is considerable, with significant costs attributed to healthcare expenses, lost productivity, and reduced quality of life. For example, in Korea, MSDs accounted for a substantial proportion of national health insurance claims, underscoring their financial burden (7).

MSDs affect various occupational groups, including healthcare professionals, manual laborers, and public transport users, with the latter being a particularly vulnerable group due to prolonged exposure to risk factors such as vibration, awkward postures, and repetitive movements. Public transport users, such as those commuting by buses, rickshaws, and vans, are frequently subjected to stressful condition, including poor road infrastructure and traffic congestion, which contribute to repetitive stress on the musculoskeletal system, particularly the shoulders, neck, back, and lower limbs. Holding onto bus rails, standing in awkward positions, and sitting on uncomfortable seats for extended periods can significantly affect musculoskeletal function and increase the risk of MSDs among this population. Epidemiological studies have shown that prolonged exposure to these conditions can lead to a high prevalence of MSDs, with notable symptoms in the shoulders, neck, and back, which are among the most commonly affected body regions (8). The public health implications of these findings are substantial, as they highlight the need for targeted interventions to address MSD risks among public transport

users, including ergonomic improvements and increased awareness of proper body mechanics during travel. This study aims to investigate the prevalence of MSDs among public transport users in Lahore, a city where public transport is a major mode of daily commuting for a large segment of the population. By identifying the specific musculoskeletal challenges faced by these individuals, the study seeks to contribute to the development of effective strategies for preventing and managing MSDs in this vulnerable group, thereby improving their overall health and quality of life. The findings from this research are expected to provide valuable insights into the burden of MSDs among public transport users and inform the implementation of interventions aimed at reducing the impact of these disorders on public health.

MATERIAL AND METHODS

The study employed a cross-sectional design to determine the prevalence of musculoskeletal disorders among public transport users in Lahore. The target population comprised individuals aged 18 to 50 years who regularly used public transport, including buses, rickshaws, and taxis. A total of 212 participants, including both males and females, were recruited using a non-probability convenience sampling technique from various bus stops, rickshaw stands, and Hajvery University. Participants who did not use public transport daily or had other neuromuscular disorders were excluded from the study (39). Data were collected through a structured questionnaire, which included demographic information and the Nordic Musculoskeletal Questionnaire to assess the presence and severity of musculoskeletal symptoms. The questionnaire was administered face-to-face by trained researchers, ensuring that participants understood the questions and provided accurate responses. The study was conducted over a period of six months following the approval of the study protocol by the Institutional Review Board (IRB) at Hajvery University. Ethical considerations were strictly adhered to, in line with the Declaration of Helsinki, ensuring voluntary participation, informed consent, and confidentiality of participants' data.

Data analysis was performed using SPSS software version 25. Descriptive statistics, including mean, standard deviation, frequencies, and percentages, were calculated to summarize the demographic characteristics of the participants and the prevalence of musculoskeletal symptoms. Inferential statistics were used to explore associations between demographic variables and the prevalence of musculoskeletal disorders, with significance set at a p-value of less than 0.05. The Nordic Musculoskeletal Questionnaire scores were categorized into low, moderate, and high frequency groups, based on the scoring criteria, to identify the severity of musculoskeletal symptoms among the study population. The findings were presented in the form of tables and figures, highlighting the most affected body regions and the impact of musculoskeletal symptoms on participants' daily activities and work performance.

Throughout the study, all procedures were conducted with a commitment to maintaining high ethical standards, including obtaining written informed consent from all participants and ensuring their right to withdraw from the study at any point without any repercussions. The study adhered to the principles of respect for persons, beneficence, and justice, as outlined in the ethical guidelines for human research. Data security was also ensured by keeping all records confidential and accessible only to the research team, thereby safeguarding participants' privacy and personal information.

RESULTS

The study included a total of 212 participants, with a mean age of 24.33 years and a standard deviation of 6.65. Among the participants, 48.1% were males, and 51.9% were females. The mean weight was 63.41 kg with a standard deviation of 13.53 kg. The average duration of travel experience was 1.5 years (SD = 0.50), and the mean daily travel time was 0.51 hours (SD = 0.50).

The analysis of the Nordic Musculoskeletal Questionnaire revealed that 27.4% of the participants reported no symptoms of musculoskeletal disorders. Among those reporting symptoms,

Table 1: Descriptive Statistics of Participants

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Age (years)	212	18	50	24.33	6.65
Weight (kg)	212	40	120	63.41	13.53
Experience of Traveling (years)	212	1	2	1.50	0.50
Daily Traveling Hours	212	0	1	0.51	0.50
Gender (% Male)	212	-	-	48.1	-

Table 2: Prevalence of Musculoskeletal Symptoms by Body Region

Body Region	Frequency	Percentage (%)
No Symptoms	58	27.4
Right Shoulder	37	17.5
Left Shoulder	65	30.7
Both Shoulders	52	24.5
Neck	115	54.2
Upper Back	121	57.1
Hips/Thighs	111	52.4
Ankles/Feet	125	59.0

the most commonly affected regions were the neck (54.2%), upper back (57.1%), and ankles/feet (59.0%). The data indicated that 26.37% of the participants had a low severity of symptoms,

70.23% had moderate symptoms, and only 3.29% experienced high severity of musculoskeletal symptoms.

Table 3: Severity of Musculoskeletal Disorders (MSD) Scores

Severity Level	Score Range	Frequency	Percentage (%)
Low	0-10	56	26.37
Moderate	11-20	149	70.23
High	21-24	7	3.29

Table 4: Prevalence of Work-Related Musculoskeletal Symptoms in the Last 12 Months

Body Region	Affected During Work (%)
Neck	54.2
Upper Back	42.0
Knees	39.6
Shoulders	42.5
Wrists/Hands	39.2
Lower Back	54.2

These results underscore the significant prevalence of musculoskeletal disorders among public transport users in Lahore, with moderate levels of severity being the most common. The findings suggest that prolonged travel and the associated stressors contribute to musculoskeletal symptoms, particularly in the neck, upper back, and lower limbs. The study highlights the need for ergonomic interventions and public health strategies to address the musculoskeletal health of individuals relying on public transport for their daily commute.

DISCUSSION

The study investigated the prevalence of musculoskeletal disorders (MSDs) among public transport users in Lahore, highlighting the moderate burden of these conditions in this population. The findings indicated that a significant proportion of participants experienced musculoskeletal symptoms, particularly in the neck, upper back, and lower limbs, with 70.23% reporting moderate severity of symptoms. These results align with previous studies that have documented a high prevalence of MSDs in populations exposed to prolonged sitting, repetitive stress, and awkward postures during transportation (3). The prevalence of MSDs observed in this study is consistent with the findings of Akber et al., who reported similar trends among farmers in Southeast Asia, suggesting that occupational and environmental stressors are critical contributors to MSDs across different populations (24). The high prevalence of symptoms in the neck and upper back observed in this study is comparable to the findings of Tang et al., who reported a significant burden of neck and back symptoms among nurses, a group similarly exposed to prolonged periods of static postures and repetitive tasks (9). Moreover, the significant prevalence of MSDs in the shoulders, which affected 72.6% of participants, mirrors findings from studies conducted on other populations, such as drivers and healthcare workers, who are frequently subjected to similar biomechanical and ergonomic challenges (42). The relationship between prolonged exposure to suboptimal postures and the development of MSDs has been well documented, reinforcing the need for targeted ergonomic interventions and public health strategies aimed at mitigating these risks (6).

Despite the valuable insights provided by this study, several limitations should be acknowledged. The cross-sectional design of the study limits the ability to establish causality between public transport use and the development of MSDs. Additionally, the use of a non-probability convenience sampling technique may have introduced selection bias, potentially

limiting the generalizability of the findings to the broader population of public transport users in Lahore. The reliance on self-reported data through questionnaires may have also introduced recall bias, which could affect the accuracy of the reported prevalence rates. However, the use of a standardized instrument, the Nordic Musculoskeletal Questionnaire, strengthens the reliability of the data by providing a structured approach to assessing musculoskeletal symptoms (39).

The study's strengths include its focus on a population that is often overlooked in musculoskeletal health research. By highlighting the prevalence of MSDs among public transport users, the study addresses a critical gap in the literature and underscores the need for further research to explore the underlying mechanisms and risk factors associated with these disorders in this specific group. Future research should consider longitudinal designs to better understand the temporal relationship between public transport use and MSD development, and should include a broader, more representative sample to enhance the generalizability of the findings.

Given the high prevalence of moderate musculoskeletal symptoms among public transport users, it is recommended that public health interventions focus on improving the ergonomic conditions of public transport vehicles and educating passengers on the importance of proper posture during travel. Implementing ergonomic adjustments, such as improving seat design and providing handrails at appropriate heights, could significantly reduce the strain on passengers' musculoskeletal systems. Additionally, raising awareness about the benefits of maintaining good posture and performing regular physical activity to strengthen musculoskeletal health could further mitigate the risk of MSDs in this population.

Overall, the study contributes valuable information on the prevalence and distribution of MSDs among public transport users in Lahore, emphasizing the need for targeted interventions and policy measures to address this public health concern. The findings highlight the importance of considering both biomechanical and psychosocial factors in the development of effective prevention strategies, as well as the need for a holistic approach to musculoskeletal health that incorporates environmental, occupational, and individual-level interventions.

CONCLUSION

In conclusion, the study found a moderate prevalence of musculoskeletal disorders among public transport users in

Lahore, with the neck, upper back, and lower limbs being the most affected regions. These findings suggest that prolonged travel in suboptimal ergonomic conditions significantly contributes to musculoskeletal symptoms, highlighting the need for targeted interventions to improve passenger comfort and reduce the risk of MSDs. The implications for human healthcare include the importance of integrating ergonomic improvements in public transport and promoting awareness of proper posture and physical activity to enhance musculoskeletal health among commuters. Addressing these factors could lead to a reduction in the burden of MSDs, ultimately improving the quality of life and productivity of individuals reliant on public transport.

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