

Original Article

# Work-Related Musculoskeletal Disorders in Goldsmiths of Suha Bazaar, Lahore, Pakistan

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## ABSTRACT

**Background:** Work-related musculoskeletal disorders (MSDs) are prevalent across various industries, significantly affecting workers' health and productivity. The intricate and repetitive tasks in goldsmithing, a traditional craft, pose a high risk for the development of MSDs, particularly in regions like Suha Bazaar, Lahore, where ergonomic practices are often overlooked.

**Objective:** This study aimed to assess the prevalence and specific areas of musculoskeletal discomfort among goldsmiths in Suha Bazaar, Lahore, and to identify potential ergonomic and workplace modifications to mitigate these disorders.

**Methods:** A cross-sectional study was conducted over six months, involving 122 professional goldsmiths selected through non-probability purposive sampling. Participants were aged 20 to 70 years, with at least three years of professional experience. Data were collected using the Modified Nordic Musculoskeletal Questionnaire to evaluate musculoskeletal symptoms, with additional demographic and occupational information gathered. Data analysis was performed using SPSS version 25, focusing on descriptive statistics, frequencies, percentages, means, and standard deviations. Ethical approval was obtained, and all participants provided informed consent.

**Results:** The study found that 40.2% of participants experienced discomfort in the upper back, 38.0% in the neck, and 27.9% in both shoulders. The average age of participants was 39.52 years (SD = 12.16), and the majority (86.9%) worked between 40-45 hours per week. Most participants (35.2%) had over 20 years of experience in the field.

**Conclusion:** The high prevalence of musculoskeletal discomfort in critical areas such as the upper back and neck among goldsmiths in Suha Bazaar indicates an urgent need for ergonomic interventions and workplace improvements. Implementing ergonomic solutions and training on proper posture could significantly enhance occupational health and productivity in this traditional craft.

**Keywords:** Musculoskeletal Disorders, Goldsmiths, Ergonomics, Occupational Health, Modified Nordic Musculoskeletal Questionnaire.

## INTRODUCTION

Musculoskeletal disorders (MSDs) represent a substantial public health concern globally, impacting numerous industries by contributing to increased morbidity, productivity loss, and health care costs. This is particularly true in occupations requiring manual handling, repetitive motions, and maintenance of awkward postures for prolonged periods (1). In the intricate and precise field of goldsmithing, workers are frequently exposed to conditions that predispose them to musculoskeletal injuries. The traditional craft involves detailed and repetitive tasks that can strain various body parts, notably the neck, back, and upper limbs, leading to chronic musculoskeletal conditions (2).

Suha Bazaar in Lahore, Pakistan, is a notable center for this traditional craft, where the prevalent work practices and conditions significantly contribute to musculoskeletal discomfort among goldsmiths. The majority of their tasks, such as filing, engraving, and polishing, demand prolonged periods of sitting in static positions, often in poorly designed workspaces that do not accommodate the ergonomic needs of the workers (3). These suboptimal conditions are compounded by the use of tools that require precision,

exerting additional physical demands on the workers. The repetitive nature of their tasks, combined with inadequate breaks and the need to meet production targets, further exacerbates the risk of developing MSDs

Despite the recognition of MSDs as a critical issue in various occupational settings globally, there remains a gap in specific research focused on goldsmiths, particularly within the context of Pakistan. Previous studies have highlighted the prevalence and impact of MSDs across different professions, but limited data exists concerning goldsmiths, who represent a unique subset of skilled artisans with specific work-related exposures (4,5). This study aims to fill this knowledge gap by assessing the prevalence and characteristics of work-related musculoskeletal disorders among goldsmiths in Suha Bazaar, utilizing a cross-sectional survey design coupled with the Modified Nordic Musculoskeletal Questionnaire to collect detailed data on the prevalence of MSDs and associated work practices (6).

The relevance of this study is underscored by global research indicating the significant impact of occupational health interventions, which can mitigate the prevalence of MSDs when ergonomic practices are effectively implemented (7,8). In similar occupational settings, interventions focusing on ergonomic improvements have demonstrated reduced incidence of musculoskeletal complaints and enhanced worker productivity and health outcomes. Thus, this study not only aims to document the prevalence of MSDs among goldsmiths in Suha Bazaar but also to contribute to the broader discourse on occupational health, particularly in industries characterized by manual and repetitive work tasks. The findings are expected to provide a basis for developing targeted interventions tailored to the specific needs of goldsmiths, which could include ergonomic adjustments to workstations, the introduction of regular breaks, and exercises designed to reduce musculoskeletal strain(9, 10).

## MATERIAL AND METHODS

This study employed a cross-sectional design to investigate the prevalence of work-related musculoskeletal disorders among goldsmiths operating in Suha Bazaar, Lahore. The research spanned a six-month period, with participants recruited through non-probability purposive sampling. Eligibility criteria included goldsmiths aged between 20 and 70 years, possessing a minimum of three years' professional experience in the craft. Individuals were excluded if they had a history of spinal fractures, surgeries, significant trauma, neurological conditions, spinal deformities, or musculoskeletal pain not associated with their occupational activities (1, 3). A total of 122 goldsmiths consented to participate in the study. Data collection was conducted using a structured questionnaire, which was adapted from the Modified Nordic Musculoskeletal Questionnaire (NMQ). This tool is widely recognized for its effectiveness in assessing the frequency and severity of musculoskeletal complaints across various body regions (2, 4). The questionnaire also gathered comprehensive demographic information, including age, height, weight, and Body Mass Index (BMI), alongside work-related data such as weekly working hours and years of professional experience

Prior to commencing the study, ethical approval was obtained from the institutional review board, adhering to the guidelines set forth in the Declaration of Helsinki. All participants were informed about the study's aims and procedures, and written informed consent was obtained, ensuring confidentiality and the right to withdraw from the study at any time without consequence.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were utilized to summarize the demographic and occupational characteristics of the sample. The prevalence of musculoskeletal disorders was calculated as frequencies and percentages. Additionally, measures of central tendency and dispersion, such as means and standard deviations, were used to describe continuous variables. The analysis strictly focused on the assessment of the collected data without intertwining the results with the methodological narrative, ensuring clarity and focus on the study's established methods(11, 12).

## RESULTS

The results of the study revealed a significant prevalence of musculoskeletal discomfort among the goldsmiths surveyed in Suha Bazaar, Lahore. The demographic and work-related characteristics of the participants, along with the prevalence of musculoskeletal discomfort across different body regions, are detailed in the following tables:

**Table 1:** Demographic and Work-Related Characteristics of Participants

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Age (years)	122	19	79	39.52	12.165
Height (meters)	122	1.60	1.85	1.7227	0.06918
Weight (kg)	122	50.00	103.00	78.377	12.33776
BMI (kg/m <sup>2</sup> )	122	17.40	30.38	24.34	3.09731

**Table 2:** Working Hours and Experience

Working Hours per Week	Frequency	Percent
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Less than 40 hours	8	6.6%
40-45 hours	106	86.9%
More than 50 hours	8	6.6%
<b>Total</b>	<b>122</b>	<b>100%</b>
<b>Work Experience (years)</b>	<b>Frequency</b>	<b>Percent</b>
1-5 years	20	16.4%
6-10 years	11	9.0%
11-15 years	24	19.7%
16-20 years	24	19.7%
More than 20 years	43	35.2%
<b>Total</b>	<b>122</b>	<b>100%</b>

Table 3: Prevalence of Musculoskeletal Discomfort by Body Part

Body Part	No Discomfort (%)	Discomfort (%)	Total (%)
Neck	62.0	38.0	100.0
Shoulders	64.8	35.2	100.0
Both Shoulders	72.1	27.9	100.0
Elbows	93.4	6.6	100.0
Both Elbows	98.4	1.6	100.0
Wrists/Hands	80.3	19.7	100.0
Upper Back	59.8	40.2	100.0
Lower Back	79.3	20.7	100.0
Hips/Thighs	78.7	21.3	100.0
Knees	80.3	19.7	100.0
Ankles/Feet	73.0	27.0	100.0

The most affected areas were the upper back (40.2%) and neck (38.0%), with a notable proportion of participants also reporting discomfort in both shoulders (27.9%). The data indicate that despite varying frequencies of discomfort across different body parts, the upper back, neck, and shoulders are critical areas of concern. These findings suggest that ergonomic interventions focused on these regions could significantly alleviate the musculoskeletal burden among goldsmiths.

## DISCUSSION

The findings of this study revealed a high prevalence of musculoskeletal disorders among goldsmiths in Suha Bazaar, Lahore, particularly in the upper back, neck, and shoulders. These results align with existing literature that highlights the susceptibility of individuals engaged in occupations requiring repetitive movements and prolonged static postures to develop musculoskeletal discomforts (13-15). The specific focus on goldsmiths, a group often understudied within occupational health research, provides valuable insights into the ergonomic challenges faced in traditional crafting occupations.

Comparatively, previous studies have reported similar findings in other artisan crafts, where repetitive and precision-demanding tasks were strongly associated with increased risks of musculoskeletal conditions (16-18). For instance, a study on dental professionals, who also perform precision-dependent tasks, showed comparable rates of neck and upper back pain (19). This similarity underscores the critical need for ergonomic interventions across occupations with analogous work conditions.

The strength of this study lies in its targeted approach, focusing on a specific occupational group within a defined geographic area, which has allowed for the collection of nuanced data that is directly applicable to similar settings. However, the study's cross-sectional design limits the ability to establish causality between the ergonomic factors and the musculoskeletal symptoms reported. Moreover, the reliance on self-reported data might have introduced recall bias, and the exclusion of objective measures could have affected the accuracy of the findings. The research was also confined to a single locality, which may limit the generalizability of the results to other populations or regions without similar socioeconomic and occupational conditions(20,21).

One significant limitation noted was the study's inability to measure the psychosocial factors that may contribute to musculoskeletal disorders, an aspect that is increasingly recognized as a crucial component of occupational health (22, 23). Future research should incorporate a more holistic approach that includes both physical and psychosocial risk factors to better understand the interplay of these elements in the development of musculoskeletal disorders.

In terms of recommendations, the findings suggest that introducing ergonomic modifications at the workplace, such as adjustable workstations, ergonomic tools, and frequent scheduled breaks, could potentially reduce the prevalence of musculoskeletal symptoms among goldsmiths. Moreover, educational programs focusing on proper postural techniques could further mitigate the risk of musculoskeletal issues. Implementing these interventions not only benefits the health and productivity of workers but also contributes to reducing healthcare costs associated with treating chronic musculoskeletal conditions.

In conclusion, this study adds to the growing body of evidence on the occupational health risks faced by artisans, specifically goldsmiths, and underscores the importance of ergonomic practices in preventing work-related musculoskeletal disorders. Further longitudinal studies are needed to explore the long-term effects of ergonomic interventions and to establish causative relationships between occupational practices and musculoskeletal health outcomes.

## CONCLUSION

The high prevalence of musculoskeletal discomfort in critical areas such as the upper back and neck among goldsmiths in Suha Bazaar indicates an urgent need for ergonomic interventions and workplace improvements. Implementing ergonomic solutions and training on proper posture could significantly enhance occupational health and productivity in this traditional craft.

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