



Work related musculoskeletal disorder in teachers of superior university Lahore

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CONFLICT OF INTEREST

None declared.



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ABSTRACT

Background: Work-related musculoskeletal disorders are common occupational health problems among teachers and may interfere with daily activities and work performance. Evidence from university teaching populations in Pakistan remains limited.

Objective: To determine the distribution of work-related musculoskeletal symptoms among teachers of Superior University Lahore.

Methods: A descriptive cross-sectional study was conducted over three months among teachers at Superior University Lahore. A sample of 98 teachers was selected from a population of 195 by simple random sampling. Musculoskeletal symptoms were assessed with the Nordic Musculoskeletal Questionnaire. Data were analyzed descriptively using frequencies, percentages, and mean with standard deviation.

Results: The mean age of participants was 32.60 ± 8.77 years. During the previous 12 months, shoulder symptoms were most frequent (36/98, 36.7%), followed by neck (26/98, 26.5%), upper back (20/98, 20.4%), and lower back symptoms (19/98, 19.4%). Shoulder symptoms most often prevented normal activities (19/98, 19.4%) and prompted physician consultation (15/98, 15.3%). During the previous 7 days, shoulder (30/98, 30.6%), neck (26/98, 26.5%), knee (21/98, 21.4%), and lower back symptoms (19/98, 19.4%) were most frequent.

Conclusion: Musculoskeletal symptoms were present across multiple body regions among university teachers, with the shoulder and neck showing the highest 12-month and recent symptom frequencies. Workplace ergonomic assessment and preventive strategies focusing on upper-quarter and spinal loading are warranted.

Keywords

Cross-Sectional Studies; Faculty; Musculoskeletal Diseases; Occupational Diseases; Prevalence; Surveys and Questionnaires

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Liaquat I et al. Short Title

Musculoskeletal Disorders in University Teachers





INTRODUCTION

Musculoskeletal disorders are an important occupational health concern in teaching because teaching combines prolonged standing and sitting, repetitive upper-limb activity, board work, computer use, and sustained postures. A 2024 systematic review and meta-analysis of 44 studies involving 15,972 teachers estimated an overall musculoskeletal disorder prevalence of 68%, with the neck, lower back, and shoulder among the most frequently affected regions (1). Recent university-level data also demonstrate a substantial burden: a 2025 survey of university teachers in Taiwan reported symptoms in 88.8% of respondents, with shoulders, neck, upper back, and lower back among the leading sites (2). Comparable findings have been reported across different educational settings. Among school teachers in Cairo, 66.8% reported a work-related musculoskeletal disorder during the previous year, with neck, shoulder, lower-back, and knee complaints predominating (3). Studies in the United Arab Emirates (4), Ethiopian universities (5), the University of Douala in Cameroon (6), and Mekelle University in Ethiopia (7) similarly demonstrate that musculoskeletal symptoms are common among teaching staff. Work stress, prolonged sitting or standing, computer use, awkward posture, workload, and inadequate ergonomics have been associated with symptoms in several teacher populations (8-14).

The magnitude and distribution of symptoms vary markedly between settings. Brazilian and Nigerian studies have reported differing patterns and prevalence estimates, reflecting variations in work organization, population characteristics, measurement approaches, and exposure profiles (15,16). In Lahore, a large cross-sectional study of school teachers reported musculoskeletal pain in 70.8% of participants, indicating that this is also a relevant local occupational health issue (17). Earlier work in China identified neck/shoulder and low-back symptoms as frequent among teachers and linked them with prolonged standing, sitting, static posture, and inadequate back support (18). A systematic review likewise emphasized the multifactorial nature of musculoskeletal disorders in the teaching profession (19). Despite this evidence, data describing body-region-specific symptoms among university teachers in Lahore are limited. The objective of this study was therefore to determine work-related musculoskeletal disorders among teachers of Superior University Lahore, with emphasis on 12-month symptoms, recent symptoms, activity limitation, and physician consultation.

MATERIALS AND METHODS

Study design and reporting

This was a descriptive cross-sectional study. The manuscript was structured with reference to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations for cross-sectional research (22).

Setting and duration

The study was conducted among teachers of Superior University Lahore over a three-month period after approval of the research synopsis.

Population, sample size, and sampling

The sampling frame comprised 195 teachers. The planned sample size was calculated using a finite-population proportion formula with a 95% confidence level, 5% margin of error, and an assumed response distribution of 85%. Substitution of these values produced an estimated sample of 97.98, rounded to 98 participants. Simple random sampling was used to select participants.

Eligibility criteria

Teachers working at Superior University Lahore with at least three years of professional teaching experience were eligible. Teachers with chronic musculoskeletal disease, a history of accidental injury relevant to the musculoskeletal system, or a pertinent past medical history were excluded.

Outcome measurement and data collection

Musculoskeletal symptoms were assessed using the standardized Nordic Musculoskeletal Questionnaire, which evaluates symptoms by body region and is widely used in occupational epidemiology (20). The questionnaire records symptoms in the neck, shoulders, upper back, elbows, wrists/hands, lower back, hips/thighs, knees, and ankles/feet, including 12-month symptoms, whether symptoms prevented normal activities, whether medical care was sought, and symptoms during the previous 7 days. Nordic-style symptom questionnaires have demonstrated high sensitivity for surveillance applications, although questionnaire findings represent self-reported symptoms rather than a clinical diagnosis (21).

Statistical analysis

Data were entered and analyzed in SPSS using descriptive statistics. Age was summarized using mean and standard deviation. Categorical outcomes were summarized as frequencies and percentages. For this manuscript, 95% confidence intervals around body-region-specific proportions were calculated from the reported counts using the Wilson method. No hypothesis-testing results were reported because the available dataset was descriptive and did not contain participant-level exposure data suitable for valid association testing.





Ethical considerations

Participation was voluntary. Written informed consent was obtained from participants, who were informed of their right to withdraw. Study information and records were handled confidentially and used for research purposes.

RESULTS

Participant characteristics

Ninety-eight teachers were included in the analysis. The mean age was 32.60 ± 8.77 years.

Musculoskeletal symptoms during the previous 12 months

Shoulder symptoms were most frequently reported during the previous 12 months (36/98, 36.7%), followed by neck (26/98, 26.5%), upper back (20/98, 20.4%), and lower back symptoms (19/98, 19.4%). Wrist/hand symptoms were least frequent (5/98, 5.1%).

Table 1. Body-region-specific musculoskeletal symptoms during the previous 12 months

Body region	Yes, n	No, n	Prevalence, %	95% CI, %
Neck	26	72	26.5	18.8-36.0
Shoulder	36	62	36.7	27.9-46.6
Upper back	20	78	20.4	13.6-29.4
Elbow	13	85	13.3	7.9-21.4
Wrist/hand	5	93	5.1	2.2-11.4
Lower back	19	79	19.4	12.8-28.3
Hip/thighs	7	91	7.1	3.5-14.0
Knees	16	82	16.3	10.3-24.9
Ankle/feet	16	82	16.3	10.3-24.9

Note: Percentages use N=98. Confidence intervals were calculated from reported counts using the Wilson method.

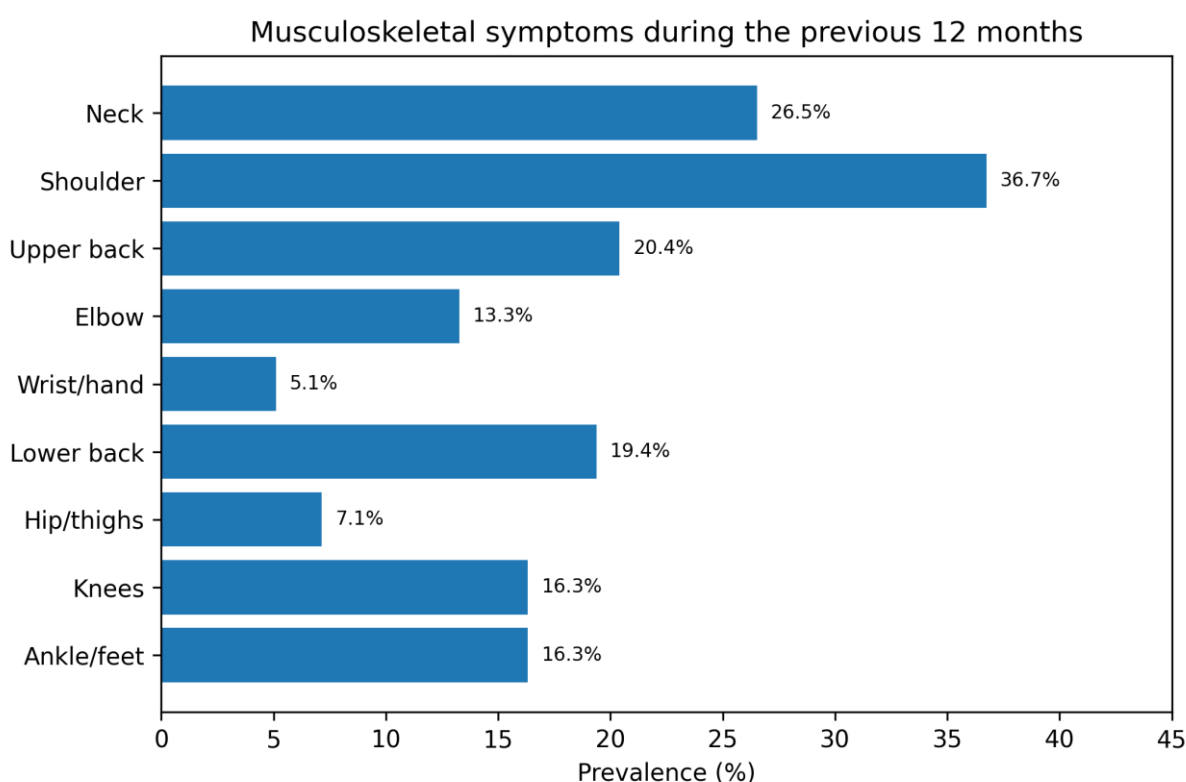


Figure 1. Prevalence of musculoskeletal symptoms by body region during the previous 12 months (N=98).





Activity limitation during the previous 12 months

Symptoms most frequently prevented normal activities when they involved the shoulder (19/98, 19.4%). Activity limitation related to neck symptoms occurred in 11.2% of participants, while upper-back and knee symptoms each limited activities in 10.2%.

Table 2. Musculoskeletal symptoms that prevented normal activities during the previous 12 months

Body region	Yes, n	No, n	Prevalence, %	95% CI, %
Neck	11	87	11.2	6.4-19.0
Shoulder	19	79	19.4	12.8-28.3
Upper back	10	88	10.2	5.6-17.8
Elbow	5	93	5.1	2.2-11.4
Wrist/hand	5	93	5.1	2.2-11.4
Lower back	9	89	9.2	4.9-16.5
Hip/thighs	4	94	4.1	1.6-10.0
Knees	10	88	10.2	5.6-17.8
Ankle/feet	8	90	8.2	4.2-15.3

Note: Percentages use N=98. Confidence intervals were calculated from reported counts using the Wilson method.

Physician consultation during the previous 12 months

Physician consultation was most frequently reported for shoulder symptoms (15/98, 15.3%), followed by neck and knee symptoms (9/98, 9.2% each).

Table 3. Physician consultation for musculoskeletal symptoms during the previous 12 months

Body region	Yes, n	No, n	Prevalence, %	95% CI, %
Neck	9	89	9.2	4.9-16.5
Shoulder	15	83	15.3	9.5-23.7
Upper back	6	92	6.1	2.8-12.7
Elbow	4	94	4.1	1.6-10.0
Wrist/hand	5	93	5.1	2.2-11.4
Lower back	5	93	5.1	2.2-11.4
Hip/thighs	3	95	3.1	1.0-8.6
Knees	9	89	9.2	4.9-16.5
Ankle/feet	6	92	6.1	2.8-12.7

Note: Percentages use N=98. Confidence intervals were calculated from reported counts using the Wilson method.

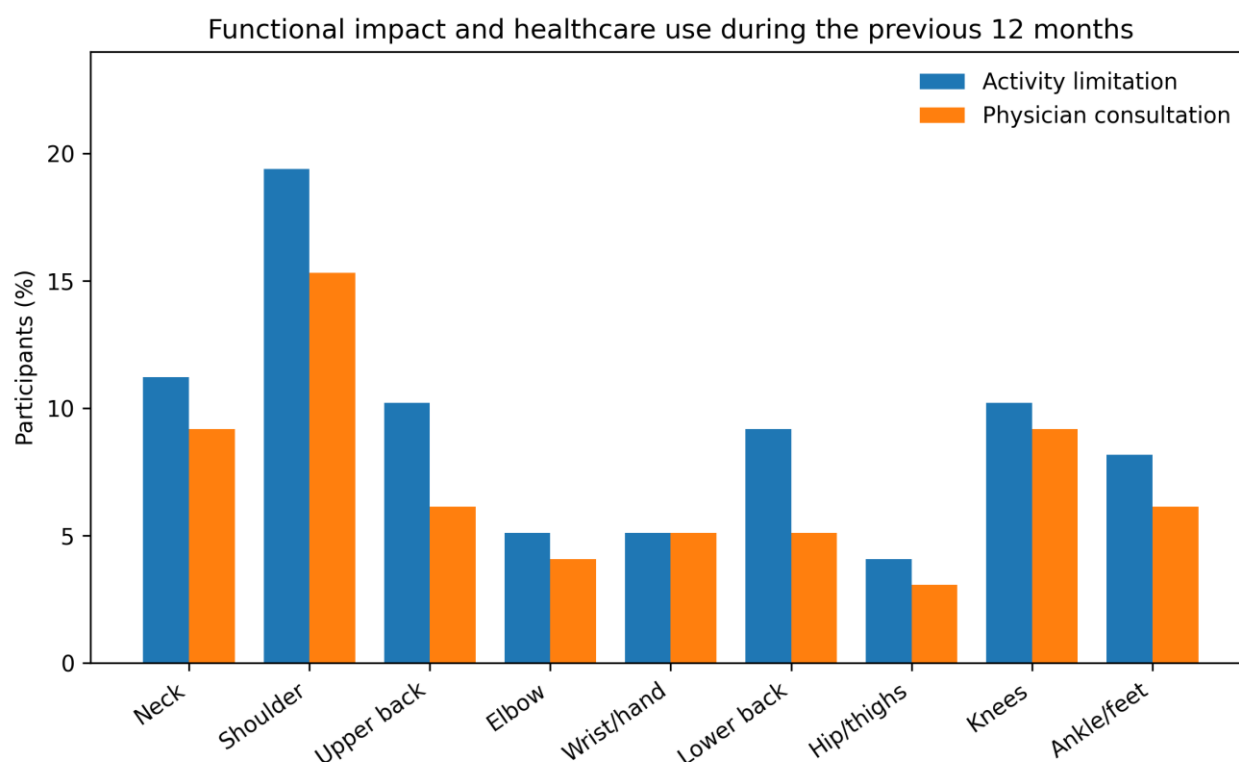


Figure 2. Activity limitation and physician consultation for musculoskeletal symptoms during the previous 12 months (N=98).

Musculoskeletal symptoms during the previous 7 days

During the previous 7 days, shoulder symptoms were again most frequent (30/98, 30.6%), followed by neck (26/98, 26.5%), knee (21/98, 21.4%), and lower back symptoms (19/98, 19.4%). Elbow symptoms were least frequent (8/98, 8.2%).

Table 4. Body-region-specific musculoskeletal symptoms during the previous 7 days

Body region	Yes, n	No, n	Prevalence, %	95% CI, %
Neck	26	72	26.5	18.8-36.0
Shoulder	30	68	30.6	22.4-40.3
Upper back	9	89	9.2	4.9-16.5
Elbow	8	90	8.2	4.2-15.3
Wrist/hand	13	85	13.3	7.9-21.4
Lower back	19	79	19.4	12.8-28.3
Hip/thighs	16	82	16.3	10.3-24.9
Knees	21	77	21.4	14.5-30.5
Ankle/feet	13	85	13.3	7.9-21.4

Note: Percentages use N=98. Confidence intervals were calculated from reported counts using the Wilson method.

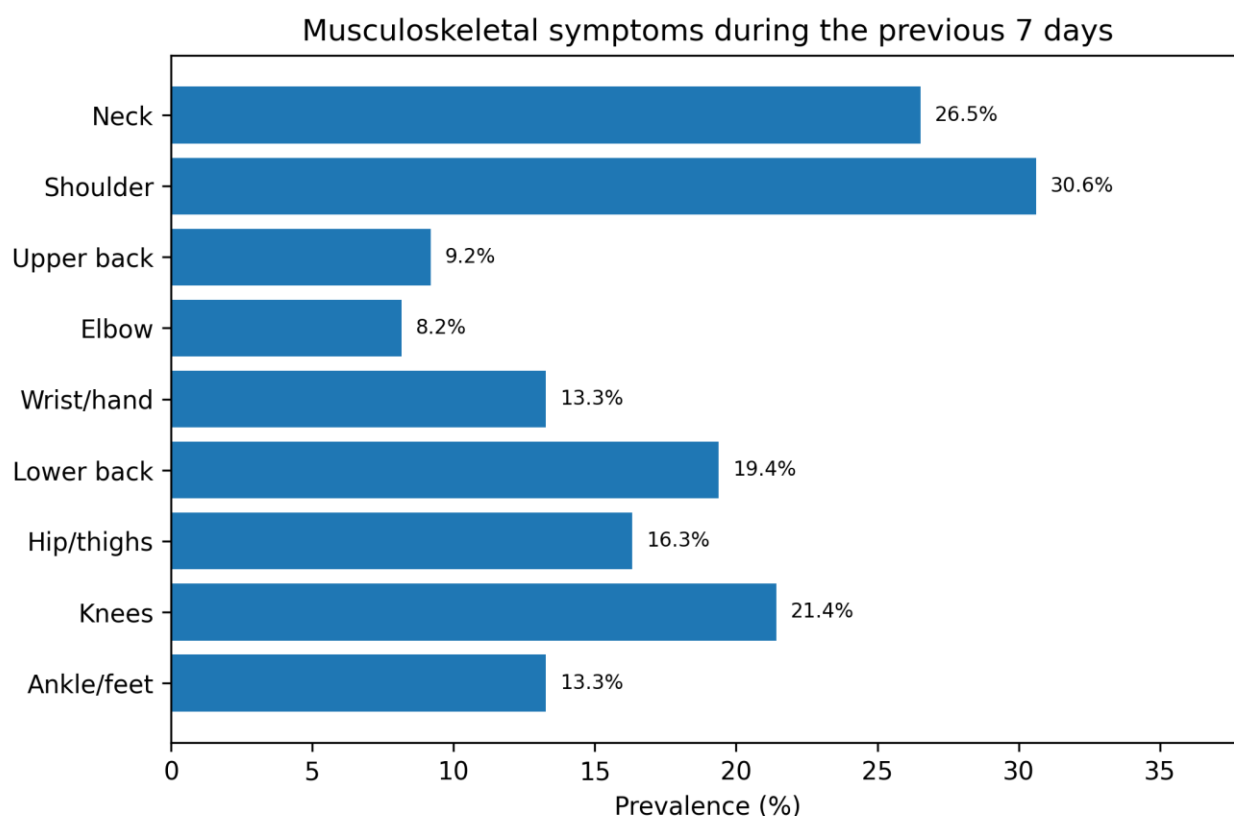


Figure 3. Prevalence of musculoskeletal symptoms by body region during the previous 7 days (N=98).

DISCUSSION

This study found musculoskeletal symptoms across multiple body regions among teachers at Superior University Lahore. The shoulder was the most frequently affected region over both the previous 12 months (36.7%) and previous 7 days (30.6%), followed by the neck (26.5% in both periods). Shoulder symptoms also produced the greatest reported interference with normal activities (19.4%) and the highest frequency of physician consultation (15.3%). These findings identify the shoulder-neck region as the dominant symptomatic area in this university teaching sample. The distribution is broadly consistent with contemporary teacher literature, although the absolute frequencies in this study were lower than many published estimates. The 2024 meta-analysis by Tahernejad and colleagues reported pooled prevalences of 47% for neck symptoms, 47% for lower-back symptoms, and 44% for shoulder symptoms (1). The Taiwan university study found shoulders, neck, upper back, and lower back to be the leading sites, with an overall prevalence of 88.8% (2). In Cairo school teachers, neck pain affected 56.1%, while shoulder and lower-back pain each affected 53.2% (3). Such between-study variation is expected because studies differ in population composition, work demands, symptom definitions, sampling, recall periods, and cultural or organizational context.

The prominence of shoulder and neck symptoms is clinically plausible in teaching occupations. Recent teacher studies associate musculoskeletal symptoms with prolonged sitting, computer work, static posture, board-related tasks, and other ergonomic exposures (4,5,8,14). Earlier Chinese data similarly linked neck/shoulder symptoms with prolonged standing and sitting, static posture, and inadequate back support (18). However, the present study did not quantify ergonomic or psychosocial exposures at the individual level; therefore, the observed symptom pattern should not be interpreted as evidence that any specific exposure caused the symptoms. The 12-month lower-back symptom frequency in this study was 19.4%, lower than figures reported in several university and school teacher populations. Mekelle University reported a 12-month prevalence of 65.2% for musculoskeletal pain overall, with neck and low-back pain most common (7), while academic staff in Ethiopian universities reported a high overall burden of work-related musculoskeletal symptoms (5). The University of Douala also identified the neck, shoulders, and lower back as commonly affected regions (6). Differences in teaching tasks, duration of exposure, age distribution, physical activity, workstation design, and case definitions may contribute to these contrasts.

The functional findings add practical relevance. Nearly one-fifth of participants reported shoulder symptoms that prevented normal activities, and 15.3% had seen a physician for shoulder symptoms. Other research has shown that teacher musculoskeletal disorders can adversely affect quality of life and work functioning (3,13). The present results therefore support preventive approaches that move beyond symptom counting toward ergonomic assessment, early self-management, and timely clinical evaluation for persistent or disabling complaints. An important strength of this study is the use of the Nordic Musculoskeletal Questionnaire, a standardized occupational symptom instrument with an established history of use and acceptable surveillance validity (20,21). The study also





focused specifically on university teachers in Lahore, a group for which locally published data are limited. The finite population was defined and the planned sample size was consistent with the stated confidence, error, and response-distribution assumptions.

The study has limitations. Its cross-sectional design cannot establish temporal or causal relationships. Findings were based on self-reported symptoms and were not confirmed by physical examination. The study was conducted at a single university with a modest sample, limiting generalizability. The available dataset was primarily descriptive and did not permit robust assessment of associations with sex, workload, posture, computer exposure, psychosocial stress, or other risk factors. Non-response during data collection may also have introduced selection bias. Future studies should use larger multi-university samples, standardized exposure measures, and multivariable analyses to identify modifiable occupational determinants and evaluate targeted ergonomic interventions.

CONCLUSION

Work-related musculoskeletal symptoms affected multiple body regions among teachers of Superior University Lahore. The shoulder and neck were the most frequently symptomatic regions over both 12-month and 7-day recall periods, and shoulder symptoms produced the greatest activity limitation and physician consultation. University occupational-health strategies should prioritize ergonomic assessment, education on posture and task variation, and early management of persistent shoulder, neck, and spinal symptoms. Larger analytical studies are needed to identify modifiable risk factors in university teaching environments.

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