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Prevalence of Musculoskeletal Disorders and Association with Depression Among Supportive Staff at Private Sector Universities of Peshawar

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KEYWORDS

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DECLARATIONS

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ABSTRACT

Background: Musculoskeletal pain and depression often coexist; depression is typified by a persistent sense of sadness, a lack of interest, and the possibility of functional impairment. Due to physical strain and demanding work environments, supportive staff who are crucial to the effectiveness of organizations, frequently experience severe pressures like anxiety, depression, and mental health disorders. **Objective:** To determine the prevalence of musculoskeletal disorders and their association with depression among supportive staff at private sector universities of Peshawar. **Methodology:** In this cross-sectional study, data were collected at a single point in time from participants in private sector universities of Peshawar. Male participants aged 18-60 years with at least one year of experience were included, while those with a history of major trauma or psychiatric drug use were excluded. Data were collected using the standardized Nordic Musculoskeletal Questionnaire, which assessed the prevalence and effects of musculoskeletal disorders, and the Patient Health Questionnaire, which measured the severity of depression. Ethical approval was obtained from the Departmental Research Committee of Allied Health Sciences, City University of Science and Information Technology, Peshawar, and informed consent was taken from all participants, guaranteeing confidentiality, voluntary participation, and adherence to ethical principles of beneficence, non-maleficence, and autonomy. Descriptive statistics (frequencies, percentages) and cross-tabulation to explore association, and inferential statistics, including chi-square tests, and logistic regression to assess relationships between musculoskeletal disorders and depression among supportive staff. **Results:** All participants provided their informed consent, ensuring ethical approval and guaranteeing confidentiality and compliance with ethical standards. According to the results, 19.9% had high musculoskeletal symptoms and 42.2% had moderate symptoms. The prevalence of depression was also noteworthy, with 10.4% reporting moderate depression and 39.8% reporting mild depression. **Conclusion:** Depression and musculoskeletal symptom severity were found to be statistically significantly correlated ($p < 0.00$). Higher musculoskeletal scores were a predictor of greater depression severity, according to regression analysis.

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INTRODUCTION

A collection of problems known as musculoskeletal disorders (MSDs) can impact the spinal disc, cartilage, ligaments, tendons, muscles, bones, and joints. Disorders of the musculoskeletal system are increasingly recognized to result in physical pain and an effect on mental health. These disorders include problems associated with acute injury, chronic disorders, repeated strain, and degenerative changes. Acute musculoskeletal pain is temporary. However, the source, intensity, and therapy taken all affect how long it lasts.¹ The symptoms and disorders of musculoskeletal disorders can be very diverse, ranging from localized or widespread pain, stiffness, swelling, tenderness, or functional limitations to a specific anatomical site or spread throughout the body, with the neck, shoulders, back, hips, knees, and hands being frequently affected areas.

Musculoskeletal (MSK) problems continue to be the primary cause of absenteeism from work worldwide, including MSK problems related to the workplace, where correlations have been found between psychological risks at work or poor workplace ergonomics.^{2,3} About 150 pathological disorders are caused by changes in the functioning of this intricate system's constituent parts, which are connected to the system's overall health.⁴ These disorders are regarded as serious disorders that impact millions of workers and cost businesses and public health systems billions of dollars. Work-related discomfort, which can impact several body areas, is another typical feature of these diseases.⁵ Musculoskeletal disorders, particularly shoulder, lower back, and neck discomfort, were the primary reasons for occupational consultations in actual practice. Additionally, pain issues might negatively impact one's abilities and efficiency at work. This could result in mental health issues, including persistent depression.⁶

Since MSDs impact professionals in various fields, including industrial, medical, and educational ones, they are regarded as one of the primary occupational health issues in developing nations. Research on MSDs has shown that the most commonly affected areas are the lower back and upper limbs.⁷ Nonetheless, research has shown that it is more common in the foot, thighs, hips, lower legs, and lower limbs.⁸ One of the main early signs of any MSD, regardless of the body area, is discomfort.⁹ The World Health Organization states

that MSK disorders are mostly responsible for limitations and disabilities in day-to-day living. Workers in a range of occupations suffer from debilitating musculoskeletal pain and injuries that have a work-related cause, commonly known as work-related MSDs.¹⁰ The topic of safety and health has taken center stage in order to provide a secure workplace that does not put employees at risk. Because of these risks, workers have uncomfortable working circumstances.^{11,12}

Around the world, MSK pain is quite common, causing physical unfitness for hundreds of millions of people while also placing a significant economic burden on society. Approximately 1.71 billion people globally experience musculoskeletal disorders.¹³ Low back pain is the main cause of impairment in 160 nations, while musculoskeletal disorders represent the leading cause of worldwide disabilities. Depression and musculoskeletal disorders can combine more frequently than either condition occurs in isolation.¹⁴

Depression and anxiety are among the most common mental health disorders in Australia, with estimated 12-month prevalence rates of approximately 4% and 14%, respectively. Evidence from international studies highlights considerable variation in the prevalence of depressive symptoms among nursing professionals: 35-41% of nurses in the United States, 11-80% in Iran, 35% in China, 17% among Australian midwives, 51% in Brazil, 10% in Canada, and about 33% among nurse supervisors in France.¹⁵ Similarly, anxiety is widely reported across the profession, with prevalence rates ranging from 20% among Australian midwives, 32-43% among Chinese nurses, 40-46% in Iran, 44-66% in Brazil, and 22-24% among American nurses, the latter group also showing symptoms consistent with PTSD. Documented stress levels among nurses are also high, with prevalence estimates ranging between 40% and 90%, most commonly within the moderate-to-high range.¹⁶

Two of the most prevalent disorders that pose a global public health concern are depression and MSK pain. Depression is regarded as a major. The most common reason for requesting support personnel is MSK pain, which is a source of the disability and financial burden on health care systems worldwide. According to WHO estimations, 4.4% of the world's population suffers from depression. Several appropriate methods,

such as searching medical records for formal clinical diagnoses, are used to derive such estimates of depression in epidemiological research.¹⁷

There is existing research on the relationship between MSK disorders and their association with depression, but no studies focus on supportive staff. So it is decided to identify the prevalence of musculoskeletal disorders and their association with depression among supportive staff at private sector universities.¹⁸ So, due to no study on supportive staff, less regional focus and insufficiency of integration of variables, it is decided to address this gap through a focused study which can provide valuable insights that are in detail to this population.¹⁹

The significance of this study focuses on a neglected group, the supportive staff of private universities in Peshawar. By determining the prevalence of MSDs and their association with depression, the research provides useful information and fills a gap in existing literature. Understanding how physical problems like MSDs are linked to mental health problems such as depression emphasizes the need for holistic workplace health strategies. Ultimately, addressing these issues can enhance the physical and mental health, well-being, and productivity of the supportive staff, benefiting both the employees and the universities.²⁰ Its conclusions are based on direct ergonomic procedures and workplace rules to lower the occurrence of musculoskeletal disorders and improve the general health of supported employees.¹²

METHODOLOGY

The study was designed as a cross-sectional study, collecting data at a single point in time from participants in private sector universities of Peshawar. Male participants aged 18-60 years with at least one year of experience were included, while those with a history of major trauma or psychiatric drug use were excluded (Kodom-Wiredu, 2019). A total of 211 participants were recruited through non-probability convenience sampling, with the sample size determined using the Raosoft tool at a 95% confidence level and 5% margin of error. Data were collected using the standardized Nordic Musculoskeletal Questionnaire, which assessed the prevalence and effects of MSDs, and the Patient Health Questionnaire (PHQ-9), which screened for and

measured the severity of depression, ensuring comprehensive evaluation of both physical and mental health issues.

Ethical approval was obtained from the Departmental Research Committee of Allied Health Sciences, City University of Science and Information Technology, Peshawar, and informed consent was taken from all participants, guaranteeing confidentiality, voluntary participation, and adherence to ethical principles of beneficence, non-maleficence, and autonomy. Data were analysed using IBM SPSS Statistics version 24, applying descriptive statistics (means, frequencies, percentages) to determine prevalence, cross-tabulation to explore associations, and inferential statistics, including chi-square tests, normality testing, and logistic regression to assess relationships between MSDs and depression among supportive staff.

RESULTS

Figure 1 shows how people are grouped by age. It is divided into four age ranges: 18-28, 29-39, 40-50, and 51-61. The largest group is people aged 18-28, which makes up 37% of the total having MSK disorders. The next largest group is 29-39 years old, making up 30%. This means that most of the people in the chart are under 40 years old. People aged 40-50 make up 21% of the total, and the smallest group is those aged 51-61, which is only 12%. Overall, the chart shows that the majority of individuals are younger adults, with fewer people in the older age groups. Table 1 presents the distribution of individuals across three categories of MSK symptoms: low, moderate, and high. It shows frequency and percent. Specifically, 80 individuals experienced low MSK symptoms, accounting for 37.9% of the total.

Figure 1: Frequency of participants' age

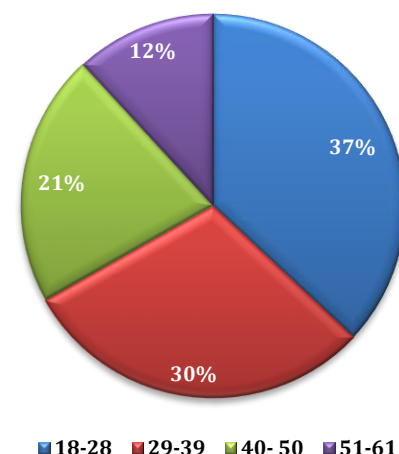


Table 1: Musculoskeletal symptoms and depression level of participants

Variables		Frequency	Percentage
MSK Symptoms	Low	80	37.9
	Moderate	89	42.2
	High	42	19.9
Depression level	Minimal	101	47.9
	Mild	84	39.8
	Moderate	22	10.4
	Moderately severe	3	1.4
	Severe	1	0.5

A larger group of 89 individuals had moderate MSK symptoms, representing 42.2%. The smallest group was those with high MSK symptoms, totalling 42 individuals, or 19.9%. In Table 1, minimal, mild, moderate, moderately severe, and severe depression are the five categories of depression into which individuals are divided using the table. Specifically, 101 individuals scored in the Minimal depression range, making up 47.9% of the total. Mild depression was observed in 84 individuals (39.8%), while Moderate depression affected 22 individuals (10.4%). A smaller number, 3 individuals, had moderately severe depression (1.4%), and only 1 individual (0.5%) fell into the severe depression category.

Table 2 shows the association between the intensity of depression and musculoskeletal complaints. Individuals are categorized by their degree of depression (minimum, mild, moderate, moderately severe, and severe depression) in the columns, and by their MSK symptoms (low, moderate, and high) in the rows. Each cell displays the count of individuals who have a particular combination of MSK symptom severity and depression severity. About 54 individuals with Low MSK symptoms also reported Minimal depression, whereas 1 individual with High MSK symptoms also reported severe depression. This table allows for an examination of how these two measures of health status co-occur within the observed population.

The chi-square shows the relationship between Nordic scoring and total PHQ-9 scores. It includes the results of three different chi-square tests: Pearson chi-square, likelihood ratio, and linear-by-

linear association. Each of the three tests had a reported p-value of 0.00, which is less than the conventional significance level of 0.05. This implies a statistically significant relationship between MSK symptoms and the severity of depression. Table 3 presents the results of the analysis of the variance for the regression model. It breaks down the total variability in the dependent variable into components explained by the regression model and residual variability.

The independent variable is musculoskeletal disorders, and the dependent variable is depression. The column shows the sum of squared deviations for regression (10.27), residual (110.50), and total (120.77). The df column indicates 1 degree of freedom for the regression, 209 for the residual, and 210 for the total. The total of squares divided by the degrees of freedom yields the mean square, which is 10.27 for regression and 0.52 for residual. The regression model's overall significance is tested using the F-statistic, which comes out at 19.42. The regression model as a whole is statistically significant and accounts for a sizable amount of the variation in the dependent variable, as indicated by the F-statistic p-value of 0.00, which is less than 0.05.

DISCUSSION

This descriptive cross-sectional study, conducted in private universities of Peshawar, primarily aimed to determine the prevalence of MSDs and their association with depression, highlighting the bidirectional impact of physical and psychological health. MSDs, which affect bones, joints, muscles, tendons, ligaments, and cartilage, are well recognized for causing physical pain and influencing mental health, particularly depression. The study involved 211 participants, most of whom were young adults under 40 years, with findings showing that 42.2% reported moderate MSD symptoms, 37.9% low symptoms, and 19.9% high symptoms, indicating that musculoskeletal complaints are prevalent but mostly mild to moderate.

Depression was also present, with 39.8% of participants reporting mild depression and 47.9% minimal depression, while more severe depression levels were less common. Statistical analysis revealed significant associations: younger individuals (18-28 years) experienced fewer MSD symptoms compared to older participants ($p=0.00$), and higher MSD symptom severity

Table 2: Association between musculoskeletal symptoms and depression Level

Nordic Scoring * PHQ-9	Minimal depression	Mild depression	Moderate depression	Moderately severe depression	Severe depression		p-value
Low MSK symptoms	54	19	7	0	0	Pearson Chi-Square	0.00
Moderate MSK symptoms	37	40	10	2	0	Likelihood Ratio	0.00
High MSK symptoms	10	25	5	1	1	Linear-by-Linear Association	0.00

Table 3: Regression model

	Sum of Squares	DF	Mean Square	F	Sig.
Regression	10.27	1	10.27	19.42	0.00b
Residual	110.50	209	0.52		
Total	120.77	210			

strongly correlated with higher depression levels ($p=0.00$). Regression analysis further confirmed that the severity of MSDs significantly predicted depression severity, emphasizing the interconnectedness of physical discomfort and mental health. These findings align with international evidence: agricultural workers in the U.S. showed a high prevalence of musculoskeletal symptoms linked to ergonomic strain, stress, and fatigue (Du et al., 2022); gas station workers in China reported 73.23% WMSD prevalence, with fatigue and work position as major predictors (Fan et al., 2024); firefighters demonstrated significant links between occupational stress, PTSD, and WRMSDs (Khoshakhlagh et al., 2024); and Jordanian dentists reported a 51% prevalence of musculoskeletal pain, primarily in the neck, shoulders, and lower back, significantly associated with age, obesity, and work-related stress (Labib et al., 2025).

Collectively, these findings underscore the global burden of MSDs across diverse occupational groups and highlight their close association with mental health conditions such as stress, fatigue, and depression. The current study contributes to this growing body of evidence, stressing the importance of integrated interventions that simultaneously address physical and psychological aspects of health to mitigate the burden of MSDs and improve overall well-being.

CONCLUSION

This study examined the prevalence of MSDs among the supportive staff at the private institutions in Peshawar and their relationship to depression. The findings indicated a high prevalence of moderate musculoskeletal complaints and a significant presence of depression, particularly mild and moderate forms. It was found that there was a statistically significant correlation between the severity of MSK symptoms and the degree of depression. This indicates that people who have experienced more physical discomfort are also more likely to report symptoms of depression. These findings focus on the significance of promoting the physical and mental well-being of supportive staff in universities. Enhancing workplace ergonomics, stress reduction programs, and mental health support strategies may significantly affect the productivity and quality of life of this often overlooked workforce segment.

DECLARATIONS

Consent to participate: Written consent had been obtained from patients. All methods were performed following the relevant guidelines and regulations.

Availability of Data and Materials: Data will be made available upon request. The corresponding

author will submit all dataset files.

Competing interests: None

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