

ASSESSMENT OF DEPRESSION, ANXIETY AND QUALITY OF LIFE IN PATIENTS WITH CHRONIC MUSCULOSKELETAL DISORDERS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Chronic musculoskeletal disorders are an important cause of persistent pain, functional limitation, disability, and impaired quality of life. Psychological symptoms, particularly depression and anxiety, frequently coexist with chronic musculoskeletal pain and may further aggravate disability and adversely affect treatment outcomes.

Objective: To assess the prevalence and severity of depression and anxiety, evaluate quality of life (QoL), and determine factors associated with psychological morbidity among patients with chronic musculoskeletal disorders.

Materials and Methods: This hospital-based cross-sectional study included 180 adult patients with musculoskeletal symptoms persisting for ≥ 3 months. Sociodemographic and clinical characteristics, duration of illness, pain severity using the Numeric Rating Scale (NRS), and relevant comorbidities were recorded. Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), anxiety using the Generalized Anxiety Disorder-7 (GAD-7), and quality of life using the World Health Organization Quality of Life-BREF (WHOQOL-BREF). Associations were evaluated using appropriate univariate tests and multivariable logistic regression. A p-value < 0.05 was considered statistically significant.

Results: The mean age of participants was 49.2 ± 13.6 years, and 103 (57.2%) were female. Low-back disorders (32.8%) and osteoarthritis (27.8%) were the most frequent musculoskeletal conditions. Depressive symptoms (PHQ-9 ≥ 5) were present in 55.0% and clinically relevant moderate-to-severe depressive symptoms (PHQ-9 ≥ 10) in 28.9%. Anxiety symptoms (GAD-7 ≥ 5) occurred in 47.2%, while 21.1% had moderate-to-severe anxiety (GAD-7 ≥ 10). Patients with moderate-to-severe depressive symptoms had significantly lower WHOQOL-BREF scores across all four domains (all $p < 0.01$). Severe

pain, illness duration >5 years, sleep disturbance, and functional limitation were independently associated with depression and/or anxiety.

Conclusion: Depression and anxiety are common among patients with chronic musculoskeletal disorders and are associated with substantially impaired quality of life. Incorporating routine psychological screening into musculoskeletal care may facilitate early identification of patients requiring integrated physical and mental-health interventions.

Keywords: Anxiety; chronic musculoskeletal pain; depression; GAD-7; PHQ-9; quality of life; WHOQOL-BREF.

INTRODUCTION

Musculoskeletal disorders comprise a broad spectrum of conditions involving the bones, joints, muscles, tendons, ligaments, and spine. Chronic low-back pain, osteoarthritis, cervical pain, inflammatory arthropathies, and other persistent musculoskeletal conditions contribute substantially to pain, functional limitation, work absenteeism, disability, and healthcare utilization. [1,2] Their burden increases with advancing age, obesity, occupational exposure, sedentary lifestyle, and the presence of chronic noncommunicable diseases.

Chronic musculoskeletal pain is not exclusively a physical phenomenon. Persistent nociceptive input, limitation of mobility, sleep disturbance, reduced participation in social and occupational activities, and concerns regarding long-term disability can adversely influence psychological health. [3,4] Conversely, depression and anxiety may amplify pain perception, decrease pain tolerance, interfere with rehabilitation, reduce adherence to treatment, and contribute to chronicity. These reciprocal relationships have led to increasing recognition of chronic musculoskeletal disorders within a biopsychosocial framework rather than solely as structural or mechanical abnormalities. [3,5]

Depression is particularly relevant among patients with chronic pain. Depressive symptoms may manifest as low mood, anhedonia, fatigue, impaired concentration, disturbed sleep, and reduced motivation, several of which overlap with symptoms of chronic painful disorders. Anxiety may additionally contribute to fear of movement, pain catastrophizing, avoidance behaviour, and reduced physical activity. Failure to recognize these psychological components may therefore result in incomplete assessment and suboptimal clinical management.

Quality of life represents another important patient-centred outcome in chronic musculoskeletal disease. The WHOQOL-BREF evaluates physical health, psychological health, social relationships, and environmental well-being, thereby providing a broader assessment of disease impact than pain intensity alone.[6,7] Individuals experiencing both persistent pain and psychological distress may demonstrate particularly poor quality of life across multiple domains.

Despite the substantial burden of chronic musculoskeletal disorders, psychological screening is not routinely incorporated into musculoskeletal outpatient practice in many resource-limited healthcare settings. Identifying the magnitude of depression and anxiety and their relationship with quality of life may support a more integrated model of care.

Therefore, the present study was undertaken to assess depression, anxiety, and quality of life among patients with chronic musculoskeletal disorders and to identify clinical factors associated with psychological morbidity.

Objectives

The primary objectives were to determine the prevalence and severity of depressive and anxiety symptoms among patients with chronic musculoskeletal disorders and to assess their quality of life. Secondary objectives were to examine the relationship between depression, anxiety, pain severity, disease duration, and WHOQOL-BREF scores and to identify independent predictors of clinically relevant depression and anxiety.

MATERIALS AND METHODS

Study design and setting

This hospital-based cross-sectional observational study was conducted in the Department of Orthopaedics/Physical Medicine and Rehabilitation at a tertiary-care teaching hospital in India over a period of 12 months.

Study population

Adult patients attending the outpatient department with a clinically diagnosed musculoskeletal disorder and persistent musculoskeletal pain or related symptoms for at least three months were consecutively screened for eligibility.

Inclusion criteria

Patients aged ≥ 18 years, diagnosed with a chronic musculoskeletal disorder, having symptoms for ≥ 3 months, and willing to provide written informed consent were included.

Exclusion criteria

Patients with acute musculoskeletal trauma, malignancy-related pain, severe neurological disease, cognitive impairment interfering with questionnaire administration, severe systemic illness requiring immediate hospitalization, or inability to communicate adequately for completion of study instruments were excluded.

Sample size

The sample size was calculated using $n = Z^2pq/d^2$. Assuming a prevalence of psychological morbidity of 50%, a 95% confidence level ($Z=1.96$), and an absolute precision of 7.5%, the calculated sample size was approximately 171. After allowing approximately 5% for incomplete responses, the final sample size was rounded to 180 participants.

Data collection

After obtaining informed consent, demographic information including age, sex, residence, educational status, occupation, marital status, and socioeconomic characteristics was recorded. Clinical information included primary musculoskeletal diagnosis, duration of symptoms, comorbid illnesses, treatment history, sleep disturbance, and limitations in routine daily activities. Pain intensity during the preceding week was assessed using an 11-point Numeric Rating Scale (NRS), ranging from 0 to 10. Pain was categorized as mild (1–3), moderate (4–6), or severe (7–10).

Assessment of depression

Depressive symptoms were evaluated using the Patient Health Questionnaire-9 (PHQ-9).[8] Scores were interpreted as 0–4 minimal/no depression, 5–9 mild, 10–14 moderate, 15–19 moderately severe, and 20–27 severe. A PHQ-9 score ≥ 10 was considered clinically relevant moderate-to-severe depressive symptoms.

Assessment of anxiety

Anxiety was assessed using the Generalized Anxiety Disorder-7 (GAD-7) scale.[9] Scores of 0–4, 5–9, 10–14, and 15–21 represent minimal, mild, moderate, and severe anxiety symptoms, respectively. A score ≥ 10 was considered clinically relevant moderate-to-severe anxiety.

Quality-of-life assessment

Quality of life was assessed using the WHOQOL-BREF, a 26-item instrument developed by the World Health Organization. [6,7] It evaluates four domains: physical health, psychological health, social relationships, and environment. Domain scores were transformed to a 0–100 scale, with higher scores indicating better perceived quality of life.

Ethical considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants before enrolment. Confidentiality and anonymity of participant information were maintained throughout the study.

Statistical analysis

Data were analysed using appropriate statistical software. Continuous variables were expressed as mean $\pm$ SD or median with interquartile range, while categorical variables were presented as frequencies and percentages. Independent-samples t-test or Mann–Whitney U test and Chi-square/Fisher's exact test were used as appropriate. Pearson's or Spearman's correlations were used to examine relationships among PHQ-9, GAD-7, pain severity, and WHOQOL-BREF scores. Multivariable logistic regression identified independent predictors, with adjusted odds ratios (AORs) and 95% confidence intervals (CIs). All tests were two-sided and $p < 0.05$ was considered statistically significant.

RESULTS

A total of 180 patients with chronic musculoskeletal disorders were included. Their mean age was 49.2 ± 13.6 years, with the largest proportion belonging to the 41–60-year age group. Females constituted 57.2% of the study population. The median duration of musculoskeletal symptoms was 4.2 years.

Table 1. Sociodemographic and clinical characteristics of participants (n=180)

Characteristic	Frequency (%)
Age 18–40 years	43 (23.9)
Age 41–60 years	89 (49.4)
Age >60 years	48 (26.7)
Male	77 (42.8)
Female	103 (57.2)
Urban residence	104 (57.8)
Rural residence	76 (42.2)
Chronic low-back disorder	59 (32.8)
Osteoarthritis	50 (27.8)
Chronic cervical/neck disorder	27 (15.0)
Inflammatory arthritis	19 (10.6)
Other disorders	25 (13.9)
Symptoms 3 months–2 years	60 (33.3)
Symptoms >2–5 years	65 (36.1)

Symptoms >5 years	55 (30.6)
Mild pain	27 (15.0)
Moderate pain	101 (56.1)
Severe pain	52 (28.9)
Sleep disturbance	86 (47.8)
Significant functional limitation	74 (41.1)
≥1 medical comorbidity	92 (51.1)

Table 2. Severity of depression and anxiety among study participants

Psychological status	Frequency (%)
PHQ-9: Minimal (0–4)	81 (45.0)
PHQ-9: Mild (5–9)	47 (26.1)
PHQ-9: Moderate (10–14)	31 (17.2)
PHQ-9: Moderately severe (15–19)	15 (8.3)
PHQ-9: Severe (20–27)	6 (3.3)
GAD-7: Minimal (0–4)	95 (52.8)
GAD-7: Mild (5–9)	47 (26.1)
GAD-7: Moderate (10–14)	27 (15.0)
GAD-7: Severe (15–21)	11 (6.1)

Overall, 99 (55.0%) participants had at least mild depressive symptoms (PHQ-9 ≥5), while 52 (28.9%) had moderate-to-severe depressive symptoms (PHQ-9 ≥10). Anxiety symptoms (GAD-7 ≥5) were identified in 85 (47.2%), with 38 (21.1%) having moderate-to-severe anxiety (GAD-7 ≥10).

Table 3. WHOQOL-BREF domain scores

Domain	Mean ± SD
Physical health	57.2 ± 14.3
Psychological health	60.6 ± 14.6
Social relationships	63.4 ± 14.4
Environment	63.1 ± 12.1

Table 4. Quality of life according to moderate-to-severe depressive symptoms

WHOQOL-BREF domain	PHQ-9 <10 (n=128)	PHQ-9 ≥10 (n=52)	p-value
Physical health	61.9 ± 12.8	45.8 ± 11.7	<0.001
Psychological health	66.1 ± 11.9	47.2 ± 12.5	<0.001
Social relationships	66.7 ± 13.5	55.4 ± 14.1	<0.001
Environment	65.3 ± 11.4	57.6 ± 11.9	<0.001

Table 5. Association of selected clinical factors with moderate-to-severe depression and anxiety

Factor	Depression n (%)	p-value	Anxiety n (%)	p-value
Mild/moderate pain (n=128)	24 (18.8)	<0.001	18 (14.1)	<0.001
Severe pain (n=52)	28 (53.8)		20 (38.5)	
Illness ≤5 years (n=125)	27 (21.6)	0.001	20 (16.0)	0.018
Illness >5 years (n=55)	25 (45.5)		18 (32.7)	
No sleep disturbance (n=94)	14 (14.9)	<0.001	10 (10.6)	<0.001
Sleep disturbance (n=86)	38 (44.2)		28 (32.6)	
Absent/mild functional	18 (17.0)	<0.001	14 (13.2)	0.002

limitation (n=106)				
Significant functional limitation (n=74)	34 (45.9)		24 (32.4)	

Correlation analysis

PHQ-9 score showed a positive correlation with pain severity ($r=0.46$, $p<0.001$) and GAD-7 score ($r=0.68$, $p<0.001$). Increasing depressive symptom severity correlated negatively with physical ($r=-0.58$, $p<0.001$) and psychological QoL scores ($r=-0.63$, $p<0.001$). GAD-7 scores similarly showed inverse correlations with physical ($r=-0.42$, $p<0.001$) and psychological QoL ($r=-0.56$, $p<0.001$).

Table 6. Multivariable logistic regression for predictors of moderate-to-severe depressive symptoms

Predictor	Adjusted OR	95% CI	p-value
Severe pain (NRS ≥ 7)	2.86	1.36–6.01	0.006
Illness duration >5 years	1.92	1.01–3.67	0.047
Sleep disturbance	2.74	1.32–5.68	0.007
Significant functional limitation	2.31	1.12–4.77	0.024
Medical comorbidity	1.42	0.72–2.80	0.310

DISCUSSION

The present study demonstrates a substantial burden of psychological morbidity among individuals with chronic musculoskeletal disorders. More than half of the participants had at least mild depressive symptoms, approximately three in ten had moderate-to-severe depressive symptoms, and nearly half reported some degree of anxiety. Importantly, increasing psychological symptom severity was accompanied by significant deterioration across all domains of quality of life.

Chronic musculoskeletal disorders and psychological distress have complex bidirectional relationships. Persistent pain may interfere with sleep, mobility, occupational performance, social participation, and independence. Over time, these limitations can contribute to helplessness, reduced self-efficacy, social withdrawal, and depressive symptoms. Conversely, depression and anxiety can alter pain processing, enhance attention to painful stimuli, promote catastrophizing, and reduce participation in physical rehabilitation. [3-5]

The finding that depressive symptoms were common is clinically important. Depression in chronic pain is associated with greater perceived pain intensity, disability, healthcare utilization, and poorer treatment response. Psychological assessment should therefore form part of routine evaluation of patients with persistent musculoskeletal symptoms.

Anxiety was also frequent. Patients with persistent pain may develop concerns regarding worsening structural damage, future disability, employment, financial dependence, or fear that physical activity will aggravate their condition. Such fear may encourage avoidance of movement, further deconditioning, and functional limitation.

A major observation was the strong relationship between psychological symptoms and quality of life. Participants with moderate-to-severe depressive symptoms demonstrated substantially lower physical, psychological, social, and environmental WHOQOL-BREF scores. The physical-health domain showed

the lowest overall QoL score, but reductions in psychological and social domains demonstrate that the burden extends beyond physical impairment.

Pain severity emerged as an important independent predictor of depression. Participants with severe pain had almost three times the adjusted odds of moderate-to-severe depressive symptoms. Longer disease duration was also associated with depression, potentially reflecting cumulative exposure to pain, disability, repeated healthcare utilization, and uncertainty regarding recovery.

Sleep disturbance was another independent correlate of depression. Pain can impair sleep initiation and maintenance, while inadequate sleep may increase pain sensitivity, fatigue, irritability, and emotional distress. Functional limitation also remained independently associated with depression, emphasizing the psychological consequences of reduced independence and participation.

The positive correlation between PHQ-9 and GAD-7 scores suggests considerable overlap between depressive and anxiety symptoms. Both measures showed negative correlations with WHOQOL-BREF scores, particularly the psychological and physical domains. These observations reinforce the need for a biopsychosocial approach. Brief screening instruments such as PHQ-9 and GAD-7 can be administered in outpatient settings, with appropriate clinical assessment and referral for patients with elevated scores.[8,9]

Strengths

The study simultaneously assessed depression, anxiety, pain severity, functional limitation, and multiple domains of quality of life using standardized instruments. Multivariable analysis further allowed identification of factors independently associated with depressive symptoms.

Limitations

The cross-sectional design does not permit determination of temporal or causal relationships. The single-centre setting may limit generalizability. PHQ-9 and GAD-7 are screening instruments and do not replace structured psychiatric diagnostic interviews. The study included heterogeneous musculoskeletal disorders, and unmeasured factors such as socioeconomic stress, medication use, pain catastrophizing, social support, and previous psychiatric history may influence outcomes. Longitudinal studies are required to determine changes in psychological health following improvement in pain and function.

CONCLUSION

Depression and anxiety are common among patients with chronic musculoskeletal disorders and are closely associated with pain severity, chronicity, sleep disturbance, functional limitation, and poorer quality of life. Patients with clinically relevant depressive symptoms demonstrated substantial impairment across physical, psychological, social, and environmental QoL domains. These findings support the integration of brief psychological screening into routine musculoskeletal assessment. A multidisciplinary approach addressing pain, physical functioning, sleep, psychological well-being, and social participation may provide more comprehensive patient-centred care.

Clinical implications

Routine use of brief tools such as PHQ-9 and GAD-7 may help identify psychological morbidity that could otherwise remain unrecognized. Patients with significant symptoms should undergo appropriate

clinical assessment and referral when indicated. Quality-of-life assessment may additionally help clinicians evaluate overall disease burden and treatment outcomes.

Funding

No external funding was received for this study.

Conflict of Interest

The authors declare no conflict of interest.

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