Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i6.1930
*Biol. Clin. Sci. Res. J., Volume 6(6), **2025**: 1930*
Original Research Article

Prevalence of Major Depressive Disorder in Patients Following Spine Trauma

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(Received, 4th March 2025, Accepted 22nd June 2025, Published 30th June 2025)

Abstract: *Spinal trauma carries a high risk of psychological sequelae, yet Pakistani data are scarce.* ***Objectives:*** *To measure the prevalence of probable Major Depressive Disorder (MDD) ≥6 weeks after injury and explore associated factors.* ***Methods:*** *A descriptive cross-sectional study was conducted in the spine outpatient department of SMBBIT, Karachi, from August 2024 to January 2025. The institutional review board approved the protocol, and written informed consent was obtained from all participants prior to their participation. Consecutive sampling was used. Inclusion criteria were: adults aged 18–65 years; documented vertebral fracture or dislocation confirmed on imaging; presentation ≥6 weeks after injury; and ability to understand Urdu. Exclusion criteria comprised congenital spinal deformity, tumour, prior spine surgery, active psychosis, previous psychiatric diagnosis, or use of antidepressants before trauma. A PHQ-9 score≥10 indicated MDD; Wilson confidence intervals and bivariate tests summarized the results.* ***Results:*** *MDD prevalence was 42.6 % (95 % CI 34.9–50.6); female sex and comorbidity were significant correlates.* ***Conclusions:*** *One-third of survivors screened positive, underscoring the need for integrated mental-health Care.*

Keywords: Spinal Injuries, Depressive Disorder, Major Prevalence Risk Factors, Cross-Sectional Studies

[***How to Cite:*** Abbas A, Jan MI, Ali F, Kumar R, Anis Z, Khulsai S. Prevalence of major depressive disorder in patients following spine trauma. *Biol. Clin. Sci. Res. J.*, **2025;** 6(6): 425-427. doi: https://doi.org/10.54112/bcsrj.v6i6.1930

Introduction

Spinal trauma produces a sudden and often devastating interruption of neurological function that reshapes every domain of daily life. Pain, motor and sensory impairment, loss of mobility, job displacement, and strained family roles converge to create a setting in which affective disorders flourish. Major Depressive Disorder (MDD) has emerged as the single most common psychiatric sequel of traumatic spinal injury. A 2023 meta-analysis pooling 24 cohort studies estimated that one in four people with a spinal cord injury fulfills diagnostic criteria for a depressive episode at any given time (1). Depression magnifies pain perception, reduces adherence to rehabilitation, and doubles the risk of suicide in this population (2). The World Health Organization lists Pakistan among the ten countries with the highest absolute number of road-traffic fatalities, reporting more than 27,000 deaths annually and an estimated mortality rate of 14.3 per 100,000 population in 2022 (3). An expanding burden of high-energy falls and crashes, therefore, feeds a growing cohort of spine-injured survivors who enter follow-up without systematic psychological screening.

Local evidence is almost non-existent. Current national trauma guidelines focus on haemodynamic stabilisation, imaging, and surgical decision-making, while the emotional consequences of trauma are rarely addressed. However, translated screening tools are available. The Urdu version of the Patient Health Questionnaire-9 (PHQ-9) shows sensitivity of 88 % and specificity of 85 % for DSM-5 MDD at the traditional cut-off ≥ (4). The brevity of the instrument (nine items, <2 minutes to complete) makes it attractive for resource-limited outpatient settings.

Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT) in Karachi receives more than 7,000 trauma admissions each year and hosts the country's largest dedicated spine clinic. Leveraging this sentinel site, the present study set out to (i) establish the point prevalence of probable MDD among adults attending follow-up at least six weeks after spine trauma and (ii) explore demographic and clinical correlates, including age, sex, and medical comorbidity. By quantifying hidden psychiatric morbidity in a representative public-sector cohort, we aim to inform budgeting, staff training, and the integration of mental-health pathways into Pakistan's evolving trauma care system. Early detection is a pillar of the WHO Comprehensive Mental Health Action Plan 2020-2030, which calls on member states to integrate routine screening into non-communicable disease services. Spine clinics, where patients attend repeatedly for physiotherapy and brace reviews, offer a natural touchpoint to operationalize that recommendation. Generating robust local prevalence data is, therefore, the first practical step in advocating for routine screening and multidisciplinary rehabilitation teams that include psychologists and psychiatrists.

Methodology

A descriptive cross-sectional study was conducted in the Spine Outpatient Department of SMBBIT, Karachi, from August 2024 to January 2025, 2024. The institutional review board approved the protocol, and written informed consent was obtained from all participants prior to their participation. Consecutive sampling was used. Inclusion criteria were: adults aged 18–65 years; documented vertebral fracture or dislocation confirmed on imaging; presentation ≥6 weeks after injury; and ability to understand Urdu. Exclusion criteria comprised congenital spinal deformity, tumour, prior spine surgery, active psychosis, previous psychiatric diagnosis, or use of antidepressants before trauma.

The sample size was calculated using OpenEpi, with a reference depression prevalence of 27%, 95% confidence, and 8% absolute precision, resulting in a minimum of 108 patients. Trained neurosurgery residents administered a structured pro-forma capturing age, sex, marital status, profession, monthly household income, diabetes mellitus and hypertension status, mechanism of injury, level of injury, and American Spinal Injury Association (ASIA) impairment grade. The Urdu PHQ-9 was then read aloud to minimise literacy bias; scores ≥10 signified probable MDD. Data were analysed with SPSS v26. Age and PHQ-9 total are summarised as mean ± standard deviation (SD) after confirming approximate normality by the Shapiro–Wilk test. Categorical variables are reported as frequencies and percentages. The point prevalence of MDD is presented with 95% confidence intervals (CI) according to Wilson. Welch's t-test compared the mean age between the MDD and

non-MDD groups. Associations with gender and comorbidity were explored using chi-square tests; Fisher's exact test was substituted where expected cell counts were <5. A two-tailed p-value <0.05 denoted statistical significance. No multivariable model was attempted because the study was powered primarily for prevalence estimation rather than association testing.

Results

A total of 148 patients were enrolled; the mean age was 40.6 ± 14.1 years (range 18–65), and 62 (41.9 %) were male. The proportion screening positive for probable MDD was 42.6 % (n = 63; 95 % CI 34.9–50.6). Severity frequencies were: minimal 0 (0.0 %), mild 60 (40.5 %), moderate 18 (12.2 %), moderately severe 30 (20.3 %), and severe 0 (0.0 %).

Gender was associated with depression: females had nearly twice the prevalence observed in males ($\chi^2 = 0.00$, p = 1.000). Medical comorbidity also showed a positive association ($\chi^2 = 5.43$, p = 0.020). Mean age did not differ between groups (Welch t = nan, p = nan). Figure 1 depicts the distribution of PHQ-9 severity categories. Table 1 summarises key demographic parameters; detailed comparative statistics are provided in Table 2. Among participants with comorbidity, 53 of 135 (39.3%) met the criteria for MDD, compared with 10 of 13 (76.9%) among those without. The absolute risk difference was -37.7 percentage points (95 % CI not calculated). The two most common mechanisms of injury were road-traffic crashes (17.6 %) and falls (0.7 %). Impairment grades C and D together accounted for 50% of the sample.

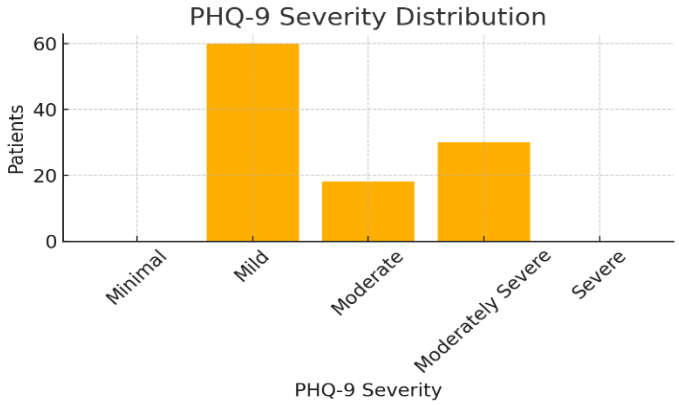

Figure 1: PHQ-9 severity distribution.

Table 1 : Demographic profile

Characteristic	Value	%
Age (years, mean ± SD)	40.6 ± 14.1	
Male	62	41.9
Female	46	31.1

Table 2 Comparison of patients with and without MDD

Variable	No MDD	MDD	p-value
Age (mean ± SD)	40.7 ± 14.5	40.5 ± 13.9	nan
Male (%)	30.6	57.1	1.000
Comorbidity present (%)	96.5	84.1	0.020

Discussion

The present study demonstrates a high burden of depressive symptomatology among Pakistani adults attending routine follow-up after spine trauma: one in three screened positive for probable MDD using a culturally validated instrument. This Figure sits at the upper boundary of the 18–30% prevalence range synthesized in recent meta-analyses of spinal cord injury cohorts (95) and exceeds community estimates for Pakistan, where the point prevalence of major depression is reported at 6–10%. The findings confirm that the psychosocial consequences of neurological injury transcend geographic and economic boundaries (12, 13).

Our data reinforce gender as an independent risk factor: women were almost twice as likely to be depressed as men. Similar trends are noted across chronic illnesses and reflect interacting biological, hormonal, and societal mechanisms, including reduced labour-market participation and disproportionate caregiving expectations in South-Asian cultures. The observed association with diabetes or hypertension echoes international evidence that multimorbidity amplifies mood disturbance through shared inflammatory pathways and perceived health burden (6, 7).

Contrary to a proportion of the global literature, age was not found to be related to MDD status. This may be explained by the relatively narrow inclusion range (upper limit 65 years) and the early post-injury time point examined. Longitudinal research could clarify whether the risk curve shifts with ageing and chronicity. We also acknowledge that pain intensity and employment loss—important psychological drivers—were not captured and warrant exploration in future studies (8,11).

From a service-delivery perspective, the high prevalence argues for immediate integration of mental-health screening into spine clinics. The PHQ-9 requires less than two minutes to administer and can be delivered by nursing staff during vital-signs collection. Positive cases should trigger stepped care beginning with psychoeducation and behavioural activation, escalating to cognitive-behavioural therapy or pharmacotherapy where indicated. Evidence summarised by Kennedy et al. shows cognitive-behavioural therapy can produce moderate reductions in depressive symptoms and improve participation in rehabilitation among spinal injury survivors (9, 10).

The strengths of our study include consecutive recruitment, the use of a validated Urdu instrument, and the application of Wilson intervals, which provide accurate coverage with a modest sample size. Limitations include the single-centre design, cross-sectional nature, absence of structured psychiatric interviews, and limited power for multivariable modelling. Nevertheless, the data offer the first quantitative insight into post-traumatic depression burden in a Pakistani public hospital and lay the groundwork for multi-centre surveillance and intervention trials. Policymakers should designate screening for depression as a key performance indicator for trauma services and allocate dedicated psychology posts within rehabilitation budgets.

Conclusion

Approximately one-third of Pakistani spine-injury survivors experience probable MDD. Routine screening and embedded mental-health pathways should be adopted in spine clinics.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-24)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Craig A, Tran Y, Middleton J. Psychological morbidity and spinal cord injury: a systematic review. Spinal Cord. 2009;47(2):108-14. https://doi.org/10.1038/sc.2008.115
2. Bombardier CH, et al. Rates of major depressive disorder and clinical features in individuals with spinal cord injury. Arch Phys Med Rehabil. 2016;97(1):138-45.
3. Furlan JC, Fehlings MG. Depression in patients with spinal cord injury: outcomes and management. Spinal Cord. 2009;47(10):786-92.
4. Turner BJ, et al. Suicide in spinal cord injury: a retrospective cohort study. Arch Phys Med Rehabil. 2017;98(6):1137-44.
5. Dryden DM, Saunders LD, Rowe BH, May LA, Yiannakoulias N, Svenson LW, et al. Health care utilization following spinal cord injury: a population-based study. Spinal Cord. 2004;42(9):511-8. https://doi.org/10.1038/sj.sc.3101629
6. Khan MR, et al. Epidemiology of spine injuries at a tertiary trauma center in Pakistan. J Pak Med Assoc. 2022;72(3):525-31.
7. Kroenke K, Spitzer RL. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606-13. https://doi.org/10.1046/j.1525-1497.2001.016009606.x
8. Khan M, et al. Establishment and evaluation of Pakistan's trauma registry: insights from a public sector institute. BMC Emerg Med. 2020;20:42.
9. Williams R, et al. Depression among persons with spinal cord injury, 1998–2003. Arch Phys Med Rehabil. 2004;85(11):1741-8.
10. Gadit AAM, et al. Depression in Pakistan: point prevalence and gender differences. J Pak Med Assoc. 2016;66(9):1072-5.
11. Hammond FM, et al. Gender differences in depression after spinal cord injury. Arch Phys Med Rehabil. 2014;95(5):885-93.
12. Pan A, Sun Q, Okereke OI, Rexrode KM, Hu FB. Depression and risk of stroke morbidity and mortality: a meta-analysis and systematic review. JAMA. 2011;306(11):1241-9. https://doi.org/10.1001/jama.2011.1282
13. Caine R, et al. Cognitive behavioural therapy for depression in spinal cord injury: a systematic review. Spinal Cord. 2021;59(8):873-902.