

ORIGINAL ARTICLE

Symptoms of Depression Over Time in Adults With Pediatric-Onset Spinal Cord Injury



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Abstract

Objective: To investigate the prevalence of depressive symptoms in adults with pediatric-onset spinal cord injury (SCI) and explore potential risk factors that may be associated with elevated symptoms.

Design: Longitudinal, cohort survey over a period of 2 to 9 years. Follow-up occurred approximately every year, a total of 868 interviews were conducted, and most participants contributed to at least 3 waves of data (72%; range, 2–8; mean, 4.34±2.16).

Setting: Community.

Participants: Adults (N=214; 133 men; mean age at first interview, 29.52±5.21y; range, 24–42y) who sustained an SCI prior to age 19 (mean age at injury, 13.93±4.37y; range, 0–18y). Participants tended to have complete injuries (71%) and tetraplegia (58%).

Interventions: Not applicable.

Main Outcome Measures: Participants completed measures assessing psychosocial functioning, physical independence, participation, and depression at each time point. Multilevel growth modeling analyses were used to explore depression symptoms across time.

Results: Depression symptoms at initial status were typically minimal (3.07±.24; 95% confidence interval, 2.6–3.54) but fluctuated significantly over time ($P<.01$). Several factors emerged as significant predictors of depressive symptoms in the final model, including less community participation ($P<.01$), incomplete injury ($P=.02$), hazardous drinking ($P=.02$), bladder incontinence ($P=.01$), and pain ($P=.03$). Within individuals, as bowel accidents ($P<.01$) and pain increased ($P<.01$), depression scores increased; however, marriage resulted in decreases in depression scores for individuals ($P=.02$).

Conclusions: These findings suggest that most patients with pediatric-onset SCI are psychologically resilient, but strategies to minimize secondary health complications and foster community participation and engagement should be considered.

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Individuals with a spinal cord injury (SCI) can differ significantly from one another in their levels of physical and functional independence and in their adjustment and emotional well-being. Predicting the psychological and emotional sequelae that will occur after SCI can be difficult. In order to develop a greater understanding of mental health outcomes for adults with pediatric-onset SCI, it is essential to explore how depression symptoms might change over time and the factors associated with such changes.

Depression in the adult population with SCI has been well studied. Research has offered varying estimates of symptom prevalence. Cross-sectional studies examining depressive symptomatology in the acute phase of injury estimate that symptoms occur in approximately 23% to 37% of individuals when using

self-report measures¹⁻⁴ and 20% to 37% when depression is operationalized as meeting criteria for major depressive disorder (MDD).^{1,5-7}

The rate of depression symptoms for adults with SCI has also been examined longitudinally with some conflicting findings. Depression rates assessed at least 1 year postinjury ranged from 11% to 48%.^{1,2,8-10} Several studies have documented a pattern of heightened depression symptoms leading up to and immediately after hospital discharge followed by a significant decrease in symptoms by 2 to 3 years postinjury,^{2,11-13} with a few studies suggesting symptom remittance as soon as 3 months post-discharge.^{7,12} This evidence suggests that the acute phase of injury, which requires adapting to drastic changes in physical functioning and independence, may be a period of increased vulnerability to depressive symptomatology; however, in the long term, most individuals with SCI will be psychologically healthy. There are also numerous studies, however, documenting stable rates of depression over injury duration¹⁴ and a heightened risk of depression among individuals with SCI relative to the general population.^{1,10,15} Several risk factors have been linked to the development of depression, including demographic and injury characteristics,^{8,10,16} increased pain and declining health,^{5,9,13,17} presence of pressure ulcers,^{11,18} unsafe alcohol use or abuse,^{17,19} unhealthy life style behaviors,^{10,17} and the existence of pre-morbid psychological disorders.²⁰

Pediatric-onset SCI represents a small proportion of those injured each year; estimates suggest <6% of injuries occur before the age of 17.^{21,22} Consequently, most studies have focused on depression symptoms for adult-onset SCI. Of the pediatric-onset studies available, as many as 27% of adults with pediatric-onset SCI are estimated to have mild to severe depression symptoms, but only 3% meet criteria for a diagnosis of MDD,²³ a much lower estimate than those found in adult injury studies. The cross-sectional design of the study, however, failed to account for changes in depression scores over time or examine predictors of long-term depression scores.

Potential differences in adjustment because of the developmental phase of injury onset, along with the paucity of research in the area, highlight the importance of ongoing research examining mental health outcomes of individuals with pediatric-onset SCI. Additionally, existing literature has noted a continued need for greater measurement precision in differentiating diagnosable depression from distress²⁴ and the necessity of studying these symptoms longitudinally.^{2,24} Consequently, the aim of the current study is to investigate the prevalence and change in depression symptoms over time in a sample of adults with pediatric-onset SCI. The secondary aim was to identify potential risk factors and secondary health conditions associated with elevated symptoms. We hypothesized that increased secondary health conditions, low community involvement, and low functional independence would be associated with greater depression in adults who sustained pediatric SCI. We also hypothesized that depression symptoms would fluctuate across time and fluctuations would be significantly related

to changes in participant variables and social characteristics that change with age.

Methods

Participants

Participants were from a large ongoing longitudinal study of individuals who received SCI care at Shriners Hospitals for Children. This is an extension of a previously published article²³ that examined depressive symptoms using cross-sectional analysis. Participants were at least 24 years of age, sustained an SCI at age ≤18 years, did not have a significant brain injury, and spoke English. Participants were from a wide geographic area within the United States and Canada. This study was approved by the institutional review board, and informed consent was obtained prior to participation. Of the 457 participants enrolled in the longitudinal study, 355 (78%) completed >2 follow-up interviews; of these, 214 (60%) were assessed for depression at multiple time points. All participants were interviewed between 2000 and 2013 with injuries occurring between 1970 and 2006; participants were assessed on an annual or biannual basis for up to 9 years (mean, 4.34y; range, 2–9y).

Measures

Demographic and injury-related factors and information on secondary health conditions were collected using a study-specific questionnaire. Neurological level²⁵ was obtained from medical records.

Community participation and independence

The Craig Handicap Assessment and Reporting Technique (CHART)²⁶ was used to assess community participation, independence, and activity level. Responses were used to calculate an overall score and separate subscales, including physical independence, cognitive independence, mobility, occupation, social integration, and economic self-sufficiency; higher scores indicated greater participation in the community.

Depression

The Patient Health Questionnaire-9 (PHQ-9)²⁷ was used to assess depression symptoms. The PHQ-9 is composed of 9 statements that align with the diagnostic criteria for MDD.²⁸ Participants respond to each question on a scale of 0 (not at all) to 3 (nearly every day), indicating how much they are bothered by each item over the last 2 weeks. PHQ-9 scores can be used continuously as an indicator of probable MDD or categorically (no to minimal depressive symptoms [scores 0–4], mild symptoms [scores 5–9], moderate symptoms [scores 10–14], or severe symptoms [scores 20–27]).

Health and functional status

The FIM instrument²⁹ was used to assess functional status and disability in the areas of self-care, sphincter control, transfers, locomotion, communication, and social cognition. Items were scored on a Likert scale ranging from 1 (total assistance) to 7 (complete independence).

Perception of health-related quality of life was assessed with the SF-12v2 Health Survey.³⁰ Responses to the SF-12v2 generate a mental and a physical component score; higher scores indicate greater perceived health.

List of abbreviations:

AUDIT-C	Alcohol Use Disorders Identification Test
CHART	Craig Handicap Assessment and Reporting Technique
MDD	major depressive disorder
MLM	multilevel modeling
PHQ-9	Patient Health Questionnaire-9
SCI	spinal cord injury

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