



The effect of early psychological symptom severity on long-term functional recovery: A secondary analysis of data from a cohort study of minor injury patients



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ABSTRACT

Background: The mental health consequences of injuries can interfere with recovery to pre-injury levels of function and long term wellbeing.

Objectives: The purpose of this study was to explore the relationship between psychological symptoms after minor injury and long-term functional recovery and disability.

Design: This exploratory study uses secondary data derived from a longitudinal cohort study of psychological outcomes after minor injury.

Setting: Participants were recruited from the Emergency Department of an urban hospital in the United States.

Participants: A cohort of 275 patients was randomly selected from 1100 consecutive emergency department admissions for minor injury. Potential participants were identified as having sustained minor injury by the combination of three standard criteria including: presentation to the emergency department for medical care within 24 h of a physical injury, evidence of anatomical injury defined as minor by an injury severity score between 2 and 8 and normal physiology as defined by a triage-Revised Trauma Score of 12. Patients with central nervous system injuries, injury requiring medical care in the past 2 years and/or resulting from domestic violence, and those diagnosed with major depression or psychotic disorders were excluded.

Methods: Psychological symptom severity was assessed within 2 weeks of injury, and outcome measures for functional limitations and disability were collected at 3, 6 and 12 months. A quasi-least squares approach was used to examine the relationship between psychological symptom scores at intake and work performance and requirement for bed rest in the year after injury.

Results: Adjusting for demographic and injury covariates, depression symptoms at the time of injury predicted ($p \leq 0.05$) both poorer work performance and increased number of days in bed due to health in the year after injury. Anxiety symptoms predicted ($p \leq 0.05$) bed days at 3, 6, and 12 months and work performance at 3 months.

Conclusions: Depression and anxiety soon after minor injury may help predict important markers of long-term recovery. With further research, simple assessment tools for psychological symptoms may be useful to screen for patients who are at higher risk for poor long-term recoveries and who may benefit from targeted interventions.

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What is already known about the topic?

- The severity of traumatic injury and residual physical impairments explain only a small proportion of the presence of and variation in long-term post-injury disability.

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- Mental health diagnoses such as posttraumatic stress disorder and major depression that are concomitant to minor and major injury predict poorer long-term functional recovery and quality of life in injured patients.

What this paper adds

- This secondary analysis of longitudinal data from a cohort of minor injured patients demonstrates that severity of psychological symptoms for depression and anxiety at the time of injury predicts two important markers of long-term recovery: self-assessed work performance and the number of health-related days of bed rest in the post-injury year.
- Nurses and other clinicians caring for injured patients in the emergency or primary care setting, who lack the time and expertise to administer mental health diagnostic exams, can use short standardized psychological symptomatology assessments to screen for patients at highest risk for suboptimal recovery.

1. Introduction

Nurses across multiple healthcare settings including emergency departments, acute care units, and rehabilitation facilities are at the forefront of the care for injured people. Injuries cause over 10% of worldwide mortality and account for more deaths each year than malaria, tuberculosis and HIV/AIDS combined (World Health Organization (WHO), 2010). Mortality is only one dimension of the public health impact of injury. Millions of people survive injuries and require costly hospitalization, emergency care, and other forms of treatment for disability and limitations in daily function (World Health Organization (WHO), 2010). The medical costs incurred during acute hospitalization and rehabilitation are only a small fraction of the total cost of injury to society. The physical and psychological limitations that impede an injured person's daily economic and social wellbeing and hinder recovery to pre-injury levels of function are injuries' less visible and potentially most significant costs (Michaels et al., 2000; Corso et al., 2006; Leigh, 2011).

Most research focuses on severe injuries because they are associated with the highest risk for mortality and long-term disability. Minor injuries, however, are far more common, accounting for the vast majority of injuries treated at healthcare institutions each year (Polinder et al., 2012). If the burden of injury were illustrated as a pyramid, the peak of the pyramid would represent fatalities, the center of the pyramid as hospitalizations, and the wide base of the pyramid as emergency department visits for minor injuries (from both intentional and unintentional causes) where evaluation, treatment, and discharge occur within a relatively short period of time (Sahai et al., 2005; Wadman et al., 2003). Minor injuries contribute to 37.3% of disability adjusted life years, exceeding the contribution of serious injuries (33.3%) and fatalities (29.6%) (Polinder et al., 2012). The high volume of minor injury combined with the associated medical costs, loss of work and income, and psychological effects raises minor injury to a public health problem of considerable consequence.

The severity of physical injury has limited influence on long-term disability following non-central nervous system injury (Holbrook et al., 1999; Richmond et al., 2003). Residual impairments after injury (e.g., limited range of motion, pain, weakness), together with age and gender account for only a small percentage (12%) of the variance in work-related disability (MacKenzie et al., 1993). Given that injury severity and residual physical impairments insufficiently explain the presence of and variation in post-injury disability, it is essential to examine other factors.

For patients with severe injuries (without central nervous system involvement or burns >20% of body surface area), post-

traumatic stress symptoms and psychological distress have been shown to impact health-related quality of life in the year after hospital discharge. (Aitken et al., 2012) In a cohort of patients with mixed levels of injury severity (without serious head injuries or self-inflicted injuries), factors that predicted successful return to pre-injury work status a year after injury were low injury severity, absence of head injury, low levels of depressive symptom severity and an optimistic life orientation (Toien et al., 2012). The severity of psychological symptoms in the weeks immediately after a minor injury has not been examined in relation to long-term recovery.

The purpose of this study is to describe the relationship between psychological symptom severity soon after minor injury and variations in outcomes in the post-injury year. If this relationship is better understood, nurses and other health care providers would be able to focus on those patients who may be at higher risk for excess challenges in recovery. When recovery is incomplete, individuals become functionally impaired and unable to carry out the activities that fulfill their multiple life roles (Verbrugge and Jette, 1994). Functional limitations can progress to disability, which is broadly defined as persistent difficulty in the activities that are typically performed by adults in society. Therefore, in this study, we examine two components of recovery: functional limitations (number of days spent in bed due to health) and disability (ability to return to work) and how each is predicted by the severity of acute psychological symptoms measured shortly after injury.

Our team has already demonstrated that patients meeting diagnostic criteria (using DSM IV-TR) for depression and post-traumatic stress disorder do not return to pre-injury levels of function in the year after injury (Richmond et al., 2009). Yet emergency department clinicians lack the time and expertise to perform comprehensive diagnostic evaluation for depression and other psychiatric illnesses and to our knowledge the utility of psychological symptom severity to screen for patients at high risk for poorer recoveries has not been explored in the minor injured population. Thus, in this secondary analysis we seek to assess whether acute psychological symptom severity that can be measured using brief validated instruments can predict poorer outcomes in patients with minor injuries in the post-injury year. Specifically, we hypothesize that individuals with higher symptom severity for depression and anxiety shortly after injury will have poorer work performance and will spend more days in bed for health reasons in the year post-injury than individuals with lower symptom severity.

2. Materials and methods

2.1. Study design

We performed a secondary analysis of an existing data set to examine the relationship between psychological symptom severity soon after injury and long-term recovery. The data set was derived from a longitudinal cohort study that examined the effect of post-injury major depression diagnosis on return to pre-injury levels of function. Psychological symptom severity measures were collected at intake, 3, 6 and 12 months. Outcome measures that included work performance and days spent in bed for health reasons were collected at 3, 6, and 12 months. The parent study and this secondary analysis were both approved by the Institutional Review Board of the University of Pennsylvania.

2.2. Target population and sampling

2.2.1. Parent study

A cohort was randomly drawn from all patients (n=1110) presenting to an urban emergency department in the United States

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