ACRM
AMERICAN CONGRESS OF REHABILITATION MEDICINE

Archives of Physical Medicine and Rehabilitation

journal homepage: www.archives-pmr.org

Archives of Physical Medicine and Rehabilitation 2015;96:410-7

ORIGINAL ARTICLE

# Effect of Mental Health on Long-Term Disability After a Road Traffic Crash: Results From the UQ SuPPORT Study

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**Abstract**

**Objective:** To investigate the relation between mental health and disability after a road traffic crash (RTC) up to 24 months for claimants with predominantly minor injuries in an Australian sample.

**Design:** Longitudinal cohort study with survey and telephone interview data collected at approximately 6, 12, and 24 months post-RTC.

**Setting:** Not applicable.

**Participants:** Claimants (N = 382) within a common-law, fault-based compulsory third-party motor accident insurance scheme in Queensland, Australia, consented to participate when invited and were approached at each wave. Retention was high (65%) at 2-year follow-up. Disability scores from at least 1 wave were known for 363 participants, with the mean age of participants being 48.4 years and 62% being women.

**Interventions:** Not applicable.

**Main Outcome Measure:** Self-reported disability (via the World Health Organization Disability Assessment Schedule 2).

**Results:** Participants reported higher disability (mean, 10.9±9.3) compared with the Australian norms (mean, 3.1±5.3). A multilevel regression analysis found that predictors of disability included present diagnosis of posttraumatic stress disorder (PTSD), anxiety, or depression, mental health history, perceived threat to life, and pain. PTSD moderated the relation between age and disability such that older age predicted higher disability in the PTSD group only, whereas anxiety moderated the relation between expectation to return to work and disability such that those with low expectations and anxiety reported significantly higher disability.

**Conclusions:** Claimants with predominantly minor physical injuries report high disability, particularly when comorbid psychiatric disorders are present, pain is high, and expectations regarding return to work are low. Developing tools for detecting those at risk of poor recovery after an RTC is necessary for informing policy and practice in injury management and postinjury rehabilitation.

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Road traffic crashes (RTCs) are a common occurrence worldwide with long-lasting consequences. While approximately 1.24 million people die annually from RTCs, another 20 million to 50 million people suffer nonfatal injuries.[1] The estimated societal cost of RTCs in Australia was approximately $17.85 billion in 2006, of which more than half ($9.61 billion) was attributable to nonfatal RTCs.[2] The World Health Organization[3] has estimated that road traffic injuries will rise to be the third leading cause of disability-adjusted life-years lost by 2020.

Most of the research with RTC survivors has predominantly focused on serious or life-threatening injuries, possibly because survivors with minor injuries, who are largely not hospitalized, are presumed to recover quickly.[4] High disability and functional impairment has been reported for cohorts with serious injuries after an RTC.[5,6] RTC research conducted with minor injury samples suggests that these groups have ongoing physical and psychological problems[7,8]; however, little is known about their

Presented in part to the Injury Schemes Seminar, November 10–12, 2013, Gold Coast, Queensland, Australia.

Supported by the Motor Accident Insurance Commission; however, the views presented in this article do not necessarily reflect those of the funder.

Disclosures: none.

0003-9993/14/$36 - see front matter © 2015 by the American Congress of Rehabilitation Medicine
http://dx.doi.org/10.1016/j.apmr.2014.10.007

long-term disability, with 1 study reporting functional impairment in approximately 20% of the participants with mild-to-moderate injuries 1 year post-RTC.[6]

The construct of disability encompasses a bio-psycho-social paradigm[9] and as such relates to the subjective day-to-day experience of the person postinjury. The World Health Organization Disability Assessment Schedule 2 (WHO-DAS-II)[10] was designed to assess this construct of disability, and it aligns with the conceptual framework of the International Classification of Functioning, Disability and Health, which provides a universal classification of disability and health.[11] The WHO-DAS-II has been applied to general injury populations,[12,13] with a range of demographic/injury-related predictors for disability reported, including injury severity, sex, and preinjury disability,[14] as well as physical, cognitive, and social functioning.[13] Within RTC samples, particularly for those with predominately minor injuries, more information is required about predictors of disability.

The influence of mental health may also be relevant to long-term disability. However, psychiatric comorbidity is a fairly recent concept, which has mainly been addressed within the area of general injury research.[15] In RTCs, only posttraumatic stress disorder (PTSD) prevalence has been investigated extensively (range, 6%–45%),[16] but incidence/prevalence rates for other psychological disorders are not yet available. Rather, data from self-reported symptom questionnaires indicate prevalence estimates of 10% for depressive symptoms,[17] 36% for anxiety symptoms,[8] and 20% for travel phobia[17] in RTC samples.

There are other psychosocial factors that potentially influence recovery. Injury research suggests that prior alcohol use inhibits rehabilitation,[18] that low return to work expectations increase the recovery period,[19] and that lower social support is associated with both the development of PTSD[20,21] and reduced physical health.[22,23] Therefore, it may also be prudent to examine the association between these predictors and disability levels after an RTC in a predominately minor injury sample.

Overall, the objective of this study was to investigate the relation between mental health and disability after an RTC for claimants with predominantly minor injuries in an Australian sample. The objectives of this study were to (1) assess the degree of disability reported up to 2 years post-RTC in a cohort of claimants with predominantly minor injuries; (2) assess mental health status and further physical, psychological, and social factors that potentially affect the claimant's reported disability; and (3) evaluate the effects of physical, psychological, and social factors (eg, expectations regarding return to work) on self-reported disability levels.

***List of abbreviations:***

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| **AIS** | **Abbreviated Injury Scale** |
| **CI** | **confidence interval** |
| **GAD** | **generalized anxiety disorder** |
| **ISS** | **injury severity score** |
| **MDE** | **major depressive episode** |
| **PTSD** | **posttraumatic stress disorder** |
| **RTC** | **road traffic crash** |
| **UQ SuPPORT** | **The University of Queensland Study of Physical and Psychological Outcomes for claimants with predominantly minor injuries following a Road Traffic crash** |
| **WHO-DAS-II** | **World Health Organization Disability Assessment Schedule 2** |

# Methods

## Participants and procedure

This analysis forms part of The University of Queensland Study of Physical and Psychological Outcomes for claimants with predominantly minor injuries following a Road Traffic crash (UQ SuPPORT). The UQ SuPPORT study is a longitudinal cohort study with survey and telephone interview data collected on motor accident insurance claimants at approximately 6, 12, and 24 months post-RTC. The protocol for the UQ SuPPORT has been fully described elsewhere.[24] However, in brief, participants were claimants within a common-law "fault-based" compulsory third-party scheme in Queensland regulated by the Motor Accident Insurance Commission and were recruited from Motor Accident Insurance Commission records across an 18-month period (from April 2009 to September 2010). Participants were eligible for the study if they met the following inclusion criteria: (1) driver/passenger of a car/motorbike, cyclist, or pedestrian involved in an RTC; (2) sustained predominately minor physical injury with a maximum severity of $\leq$3 on the Abbreviated Injury Scale (AIS); (3) aged 18 years and older; (4) sufficient English-speaking ability; (5) RTC occurred during the 3 months before claim notification; and (6) resident of Australia. The exclusion criteria were as follows: (1) cognitive impairment (assessed by trained interviewers on the basis of a person's ability to answer questions during the initial interview) and (2) a severe physical condition preventing the participant from completing the interview or survey (eg, stroke and paralysis). The UQ SuPPORT study was approved by the Medical Research Ethics Committee at The University of Queensland, Brisbane, Australia.

## Measures

Participants were assessed for a broad range of physical and psychosocial constructs at approximately 6 (wave 1), 12 (wave 2), and 24 (wave 3) months post-RTC, using both computer-assisted telephone interview and paper survey methods. The measures listed below were used at all 3 waves, with the exception of demographic characteristics (wave 1 only) and questions relating to mental health history (wave 1 and wave 2 only). Detailed information regarding all measures and the procedure for collecting data are available in the study protocol.[24]

### Interview measures

Disability was assessed using the self-report 12-item WHO-DAS-II,[10] which was designed to assess participants' perceived limitations and restrictions in the past 30 days regarding communication, self-care, mobility, relationships, work, and community roles. Items are rated on a 5-point scale, scored from 0 (no difficulty) to 4 (extreme difficulty), and summed to create a score ranging from 0 to 48.[25]

Mental health was assessed using the Composite International Diagnostic Interview module for PTSD[26] and the Composite International Diagnostic Interview-Short Form[27] for major depressive episode (MDE) and generalized anxiety disorder (GAD), based on the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, criteria.[28] These diagnoses were classified as 0 (no diagnosis) or 1 (diagnosis). Perceived threat to life was also assessed by asking participants "How much did you believe you were going to die during the accident?" Responses were initially rated on a 5-point scale ("not at all" to "very strongly") and subsequently categorized as 1 (not at all), 2 (slightly,