



The effect of mental health on long-term health-related quality of life following a road traffic crash: Results from the UQ SuPPORT study



Justin Kenardy ^{a,*}, Michelle Heron-Delaney ^{a,b}, Jacelle Warren ^a, Erin Brown ^a

^a Centre of National Research on Disability and Rehabilitation Medicine (CONROD), School of Medicine, The University of Queensland, Brisbane, Queensland, Australia

^b School of Psychology, Australian Catholic University, Brisbane, Queensland, Australia

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ABSTRACT

Background: Most research on the consequences of road traffic crashes (RTCs) has focused on serious injury cohorts, yet RTC survivors with minor injury are also affected. This study investigates the relationship between mental health and health-related quality of life (QoL) following an RTC for those with predominately minor injuries.

Methods: A longitudinal cohort design with an opt-in consenting procedure was used. A letter of invitation was sent to 3146 claimants within the Compulsory Third Party (CTP) motor vehicle insurance scheme in Queensland, Australia, with a total of 382 (12%) responding to the invitation and consenting to participate in the study. Retention was high (65%) at 24 months. Survey and telephone interview data were collected at approximately 6, 12 and 24 months post-RTC. Health-related QoL (SF-36 v2) data from at least one wave was known for 343 participants. The sample was predominantly female (62%), with an average age of 48.6 years.

Results: Participants consistently reported physical and mental health-related QoL below Australian norms. A multilevel regression analysis found overall physical health-related QoL improved with higher expectations of returning to work, but was lower with age, increasing pain, expectations of persistent pain, heightened perceived threat to life, and the presence of Posttraumatic Stress Disorder (PTSD) or Major Depressive Episode (MDE). Overall, mental health-related QoL did not improve with time, was higher with increased social support and expectations of returning to work, but was lower with increasing pain and the presence of PTSD, MDE or Generalised Anxiety Disorder (GAD). Contrary to expectations, lower injury severity was related to poorer mental health-related QoL.

Conclusions: Individuals with predominately minor RTC-related injuries have poor physical and mental health-related QoL, particularly when pain levels are high and comorbid psychiatric disorders are present. Of particular concern is that the low levels of reported health-related QoL do not appear to improve by 2 years post-RTC. The potential risk factors found in this study may be useful indicators for early identification and enhanced rehabilitation of those at risk of poor recovery.

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Introduction

The World Health Organization [1] has estimated that up to 50 million people worldwide suffer a non-fatal injury from a road traffic crash (RTC) each year, leading to long-term impairment in many individuals. In Australia, the majority of RTC victims survive with minor injuries which do not require hospitalization [2]. Nonfatal RTC injuries have physical, emotional and economic

repercussions for individuals, families, and society [3]. Further, the consequences may be long-lasting, with some research suggesting victims have not recovered to pre-crash health by 18 months post-RTC [4]. In addition, lost quality of life (QoL) has been described as a major part of RTC burden, therefore research exploring factors that impact QoL following an RTC may help define areas for intervention [1].

QoL research on RTC survivors has mostly focused on those with serious injuries [4,5], however, RTC survivors with minor injuries also appear to suffer serious consequences. QoL is often measured using the Short Form 36 (SF-36) [6], which provides mental, as well as physical, health-related QoL component scores. To date, research on minor RTC injury and QoL is scarce. A small ($n = 95$)

* Corresponding author at: The University of Queensland, CONROD, Level 1 Edith Cavell Building, Herston, Queensland 4029, Australia. Tel.: +61 7 3346 4859.
E-mail address: j.kenardy@uq.edu.au (J. Kenardy).

study using a minor RTC injury cohort recruited through a hospital emergency department found baseline physical component scores (PCS) to be 1–1.5 standard deviations (SD) below Australian norms, and mental component scores (MCS) to be 1.5–2 SD below Australian norms [7]. Follow-up at 6 months showed some improvement (PCS: 0–0.5 SD below norm, MCS: 0.5–1 SD below norm), but no further improvement was found when the sample was re-examined at 12 months post-RTC. Additionally, those who claimed compensation reported worse PCS and MCS scores than those not claiming compensation. This research suggests physical and mental health-related QoL is affected long term, even when the RTC injury is classified as ‘minor’.

More widely, research comparing hospitalised (i.e., more severely injured) and non-hospitalised (i.e., less severely injured) drivers injured in an RTC found scores on the SF-36 mental and general health subscales were worse at 5–18 months after the RTC, when compared with the initial assessment, in both groups [4]. This finding suggests injury severity may not predict later QoL, as has been found elsewhere [8]. Other research with serious injury cohorts has also found QoL reductions over time. In a small sample ($n = 62$) with serious RTC injury, significantly reduced QoL was found across the eight SF-36 domains at 4 months post-RTC (0.3–1.8 SD below Australian norms), with some improvement found at 8 months post-RTC (0.1–0.5 SD below norms) [5]. Further, general trauma research with admitted patients has reported reduced QoL up to two years post-RTC [9]. These authors noted that significant improvements were found up to one year post-injury, however, only physical functioning and physical limitations continued to improve through the second year post-injury.

Mental health is a second area important in the study of injured RTC populations. Rates of Posttraumatic Stress Disorder (PTSD; 6–45%) in RTCs have been extensively reported [10], however rates for other psychological disorders are not as readily available. Research using self-reported symptom questionnaires from RTC samples estimate the incidence of depressive symptoms to be 10 percent [11], anxiety symptoms to be 36 percent [12], and travel phobia to be 20 percent [11]. The comorbidity between psychiatric illness and QoL has been extensively researched. A recent systematic review found PTSD to very strongly impair QoL in a variety of populations [13], and specific to RTCs, researchers have found the presence of PTSD to predict poorer QoL at one year post-RTC [14]. In general injury cohorts, diagnosed depression was closely associated with reduced QoL [15,16], as was high scores on the Hospital Anxiety and Depression Scale (HADS) [17]. There is a clear relationship between the presence of mental illness and reported QoL, however, while others have used scores on screening questionnaires as a measure of mental illness [7], there has been no research to date which examines the relationship between QoL and mental health diagnosis in a RTC sample with predominately minor injuries. Therefore, it remains unclear how QoL in a RTC cohort with predominately minor injuries is affected by diagnosed mental illness.

Other potential factors that influence post-RTC QoL include expectations regarding recovery, self-reported pain levels, and social support. Work by Cole and colleagues [18] found injured workers with high recovery expectations reported lower pain levels and higher QoL, compared to workers with low recovery expectations. Other research has found greater social support predicts higher QoL post-injury [16], and an indirect negative relationship between PTSD and social support in an RTC sample [19]. The relationship between pain and QoL has also been extensively studied in many populations. Pain affects both physical and emotional QoL domains, with the effect of pain dependent on the intensity and duration of the pain, as well as the individual's characteristics [20]. These factors may all influence QoL in our RTC sample.

Overall, the objective of this study was to explore the relationship between mental health and health-related QoL following an RTC for claimants with predominately minor injuries in an Australian sample. The aims of the study are to (1) assess the level of health-related QoL reported during the 2 years post-RTC in the cohort of motor vehicle insurance claimants with predominately minor injuries; and (2) evaluate the effects of physical, psychological and social factors (e.g., expectations regarding return to work) on self-reported levels of health-related QoL.

Materials and methods

Participants and procedure

This analysis forms part of The University of Queensland Study of Physical and Psychological Outcomes for claimants with predominately minor injuries following a Road Traffic crash (UQ SuPPORT). UQ SuPPORT is a longitudinal cohort study of claimants within a common law ‘fault-based’ Compulsory Third Party (CTP) motor vehicle insurance scheme in Queensland regulated by the Motor Accident Insurance Commission (MAIC). Survey and telephone interview data were collected at approximately 6, 12 and 24 months post-RTC. The UQ SuPPORT study protocol has been fully detailed elsewhere [21]. Briefly, potential participants were identified from records held by MAIC across an 18 month period (April 2009–September 2010). Eligibility criteria were: (1) Driver/passenger of a car/motorcycle, cyclist, or pedestrian involved in an RTC, (2) sustained predominately minor physical injury with a maximum severity of ≤ 3 on the Abbreviated Injury Scale (AIS), (3) aged 18 years or older, (4) sufficient English speaking ability, (5) RTC occurred during the three months prior to claim notification, and (6) resident of Australia. Exclusion criteria were: (1) cognitive impairment (subjectively assessed by trained interviewers based on the participants' capacity to answer questions during the initial interview), and (2) a severe physical condition preventing the participant from completing the interview or survey (e.g., stroke, paralysis). Eligible participants were sent a letter by MAIC inviting them to participate in the study, and were able to opt-in by returning the accompanying consent form in a reply-paid envelope. This method of recruiting eligible claimants was governed by legislative requirements. Given the ‘common law’ nature of the CTP scheme in Queensland, where a high percentage of claimants obtain legal representation, it was anticipated that number of claimants opting-in to the study may be reduced, therefore, 3146 eligible claimants were initially approached for consent. The UQ SuPPORT study received ethical approval (Approval No.: 2009000035) from the Medical Research Ethics Committee at The University of Queensland, Brisbane, Australia.

Measures

Participants were assessed via Computer Assisted Telephone Interview (CATI) and paper questionnaire methods on a range of physical and psychosocial constructs at 6 (Wave 1), 12 (Wave 2) and 24 months (Wave 3) post-RTC. Each measure (listed below) was used at each wave, with the exception of demographics (Wave 1 only) and questions relating to the participant's mental health history (Wave 1 and Wave 2 only). Further information regarding each measure and the data collection procedure is available in the study protocol [21].

Interview measures

Mental health was assessed using the Composite International Diagnostic Interview module for PTSD (CIDI-PTSD) [22] and the

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