



## Psychological distress after physical injury: A one-year follow-up study of conscious hospitalised patients

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### ABSTRACT

**Background:** Acute physical injury may lead to psychological distress. The relationship between peritraumatic responses, injury severity, the personality trait of optimism/pessimism and psychological distress is not fully understood. In addition, the development of post-traumatic stress symptoms may differ in subgroups.

**Methods:** One hundred and eighty-one patients (18–65 years) completed questionnaires 1 (baseline), 3 and 12 months after first admission for acute physical injury. All patients were conscious on arrival. Scores on the Casualty Chain Inventory (CCI) for peritraumatic responses, the Impact of Event Scale (IES), the Hospital Anxiety and Depression Scale (HADS), the Life Orientation Test-Revised (LOT-R), trauma-related variables (ISS, Abbreviated Injury Scale [AIS], Glasgow Coma Scale [GCS]), and background variables were assessed.

**Results:** Mean IES scores were 21.5 (95% CI: 19.0–24.0) at baseline and 15.8 (13.5–18.1) at 12 months ( $p < 0.001$ ). One subgroup (delayed onset, 12.2%) had an increase of at least 10 points in the IES score and another subgroup (chronic, 13.3%) had high and persistent post-traumatic stress symptoms during the follow-up period. At baseline, 45.3% had an IES score  $\geq 20$ , indicating possible clinical case levels, compared with 33.1% at 12 months. Accordingly, 14% had anxiety symptoms and 10.8% had depression symptoms at a case level (HADS  $\geq 8$ ) at one-year follow-up. Mutually independent predictors of post-traumatic stress symptoms at 12 months were dissociation (OR 1.3, 95% CI: 1.1–1.6) and perception (OR 1.1, 95% CI: 1.0–1.3) measured by the CCI. Being in work before injury (OR 0.1, 95% CI: 0.02–0.4) and higher educational level (OR 0.3, 95% CI: 0.1–0.7) were associated with fewer IES symptoms. Dissociation and having a pessimistic trait predicted anxiety and depression at 12 months. Previous psychiatric problems predicted anxiety symptoms, and high educational level predicted less depression symptoms.

**Conclusion:** One-third of conscious physical injured patients had post-traumatic stress symptoms at a possible clinical case level one year after the traumatic event, and one-third of these had delayed onset. Symptoms of peritraumatic dissociation and perception were mutually independent predictors of psychological distress.

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### Introduction

Victims of physical injury leading to hospitalisation have experienced a potentially life-threatening event that may trigger intense fear or feelings of helplessness. Conscious patients are likely to remember the event. They may have been exposed to strong impressions and substantial threat during the physical injury, both at *the scene of injury*, and *in hospital* (the casualty chain). Both the level and the duration of perceived threat may explain psychological distress after trauma.

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Recovery from acute physical injury may be influenced by three clusters of post-traumatic stress symptoms (PTSS); intrusion (e.g. flash-backs), avoidance (e.g. avoiding thoughts and reminders of the event) and hyperarousal (e.g. irritability, startle reflexes) as well as symptoms of depression and anxiety (psychological distress).<sup>1</sup> The prevalence rate of PTSD at 12 months varies from 2% to 36% (a diagnosis of PTSD requires symptoms from each cluster, must be accompanied with distress and impairment, and at least persist for 1 month).<sup>1,57</sup> A substantial number of trauma patients do not fulfil the diagnostic criteria for PTSD, but they may still have clinically relevant psychological symptoms (PTSS). Accordingly, the focus of the present study is on PTSS and not PTSD. An Impact of Event Scale (IES) sum score of >20 has been suggested as a clinical case level,<sup>2–5</sup> and a cut-off score  $\geq 35$  has been suggested to correspond to a diagnosis of post-traumatic stress disorder (PTSD).<sup>3</sup> At a group level, PTSS decrease across time, but there may be subgroups with a different pattern. Bonanno<sup>6</sup> have identified four trajectories of adjustment; (1) resilience, characterised by transient and low levels of symptoms soon after the event and remaining low in the follow-up period; (2) recovery, a gradual return to normal after elevated symptoms; (3) chronic, a sharp elevation and persistent high level of symptoms; and (4) delayed onset, characterised by moderate to elevated symptoms soon after the event and gradual worsening over time. Similar patterns have been shown in studies of Norwegian physically injured trauma patients.<sup>7–9</sup> The trajectory patterns are only partly understood.

Psychiatric co-morbidity among trauma patients seems to be the standard rather than the exception.<sup>1,56</sup> Depression is probably the most common diagnosis that is co-morbid with PTSD, with a rate from 6.6 to 53%,<sup>1,10</sup> although a small number of studies have identified anxiety disorder. The studies on co-morbidity are criticised for methodical problems.<sup>1</sup> After physical injury, depression and generalised anxiety disorder (both 9%) were the most common new psychiatric disorders at one-year follow-up, while PTSD was less common (6%).<sup>11</sup>

Women are usually found to be at higher risk than men for developing PTSS, but there are divergent findings.<sup>12–14,57</sup> Psychiatric problems prior to the accident, low educational level and being out of work<sup>12,13,15–20</sup> are background and vulnerability characteristics found to predict PTSS. The personality trait optimism/pessimism, in relation to general expectations for outcomes in life, was a predictor of depression in ICU patients,<sup>7,8</sup> reactions to traumatic life events,<sup>21</sup> and anxiety and depression in newly diagnosed cancer patients.<sup>22</sup> Injury-related characteristics (e.g., type of accident, injury severity) and somatic consequences (e.g., elevated heart rate) of the accident also give divergent findings.<sup>14,16,17,23–28</sup> Peritraumatic dissociation has been assessed as one of the substantial predictors of PTSD,<sup>16,29</sup> but may, in fact, be a confounding variable.<sup>30,31</sup> It is important to control for this variable when studying other independent predictors. In a recent review, Bryant emphasised that dissociation cannot be fully considered as a predictor for PTSD because there is a lack of information about the mechanism underpinning dissociation.<sup>32</sup>

Two meta-analyses on predictors of PTSD include recommendations for further research: Brewin et al.<sup>14</sup> emphasised that more research on peritraumatic responses in association with pre-trauma risk factors was required. Ozer et al.<sup>29</sup> concluded that peritraumatic psychological processes might be the strongest predictors of PTSD. In a recent review, Bovin and Marx<sup>33</sup> emphasised the need to consider immediate responses when defining a traumatic stressor. These recommendations support a focus on peritraumatic responses in addition to dissociation, fear, helplessness and/or horror. The combined impact of peritraumatic psychological and sensory impressions (perception) in victims of civilian accidents is only partly understood; the Casualty Chain Inventory (CCI)<sup>34</sup> was therefore entered as an independent variable

in the present study. The inventory measures peritraumatic responses with two factors: perception and dissociation. Obtaining subjective reports of peritraumatic responses required the participation of conscious patients in this study.

The aims of the study were:

- (1) (a) to investigate psychological distress in a mixed sample of conscious hospitalised patients during the first year after physical injury;(b) to study subgroups with different symptoms development; and
- (2) to study possible background variables including personality trait and previous psychiatric problems, peritraumatic and injury-related predictors of psychological distress one year post-trauma.

## Materials and methods

### Patients

This prospective cohort study was performed at Oslo University Hospital, Ullevål, Norway, which is a trauma referral centre for 2.5 million people.<sup>35</sup> Between April 2005 and December 2007, adult patients aged 18–65 years, who had experienced acute physical injury but were conscious on admission, were consecutively enrolled. The patients had injuries caused mainly by motor vehicle accidents (car, motorcycle, bicycle, and pedestrian), fall (leisure-time and work accidents) and violence (shooting and knife). Only a few patients had injuries caused by fire. On admission, a multidisciplinary trauma team<sup>36</sup> examined the patients. The trauma team consisted of at least 10 professionals; a surgical trauma team leader, other surgery specialists, an anaesthesiologist, anaesthetic, operating room and emergency room nurses, and laboratory and radiology personnel. The level of consciousness on arrival was assessed using the Glasgow Coma Scale.<sup>37</sup>

LS and KT checked the lists of admitted and discharged patients weekly. One or two weeks after discharge, eligible patients were sent a letter that included written information about the study and a consent form. A questionnaire and a stamped envelope were enclosed. A nurse telephoned them approximately 1 week later and answered any questions regarding the study. A consent form, a questionnaire and a stamped addressed envelope were enclosed. If there was no postal reply, a reminder was sent 1 month later.

Self-report data were collected at three measurement points. The first assessment measured psychological responses, background data and peritraumatic responses (CCI) 1 month, on average, after the injury. Even though all patients were conscious on arrival, some were seriously injured. The first contact was made after the patients had been discharged from the hospital and the initial psychological reactions were more stable. The second assessment was 3–4 months after the first self-report, and the last assessment was 12 months after the injury. Clinical variables (injury-related variables) were measured in the emergency room shortly after arrival. The Trauma Registry at the hospital provided these data.

The study includes only patients who responded at all three measurement points ( $n = 181$ ), but some data from the dropout patients are presented to detect any possible bias.

Because this study was part of a randomised controlled trial with a nurse-led, early psychological intervention, patients living more than 60 km from the hospital were excluded (data will be reported in a subsequent paper). Patients were also excluded if they were unable to speak or read Norwegian, had an unknown address, self-inflicted injuries, serious psychiatric and/or substance abuse problems (psychosis and/or in need of acute psychiatric treatment), or had sustained injuries while involved in criminal activity.

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