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## Stability of coping and the role of self-efficacy in the first year following mild traumatic brain injury



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## ABSTRACT

**Background and aims:** Coping, the psychological adaptation to stressors and serious life events, has been found to have a great influence on the development and persistence of posttraumatic complaints. Coping has received much attention for having been found to be modifiable in treatment following mild traumatic brain injury (mTBI) and for its potential to identify the Patients who are at risk of suffering from long-term complaints. Currently, coping styles are assumed to be stable over time. Although interventions to facilitate adaptive coping are given at different time intervals after the injury, little is known about spontaneous changes in preferred strategies over time following mTBI. This study aimed to investigate the stability of different coping styles over a one-year period following mTBI (at two weeks', six and twelve months' post-injury) and to investigate the relation between coping styles and feelings of self-efficacy.

**Methods:** We included 425 mTBI patients (Glasgow Coma Scale [GCS] score 13–15) admitted to three Level-1 trauma centers in the Netherlands as part of a prospective follow-up study. All participants filled out The Utrecht Coping List (UCL) to determine their position on seven coping subscales.

**Results:** Most coping styles showed a decrease over time, except for positive reframing, which showed a decrease and then increased. Interestingly, the passive coping style was found to stabilize over time within the year after injury. High feelings of self-efficacy were related to a high active coping style ( $r = 0.36$ ), and low feelings of self-efficacy with passive coping ( $r = -0.32$ ).

**Conclusions:** These results hold important possibilities for the use of the passive coping strategy as an inclusion criterion for intervention studies and an entry point for treatment itself. Considering the intertwinement of coping with self-efficacy, improving feelings of self-efficacy could form an effective part of an intervention to improve outcome.

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More than 80% of all traumatic brain injuries (TBI) can be considered as mild, making mild traumatic brain injury (mTBI) one of the most common neurological disorders in the world (Baratz et al., 2010). Although most mTBI patients show a full recovery within a few weeks, a minority (15–25%) of patients reports persistent somatic, cognitive, and emotional posttraumatic complaints that interfere with resumption of work and other activities (Ponsford et al., 2012). Many studies have aimed to investigate which factors determine individual differences in recovery trajectories, and much attention has been paid to the concept of coping,

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which describes the various ways individuals can psychologically adapt to serious life events such as mTBI (Maestas et al., 2014). Inadequate coping styles have been found to be of great influence on the development and persistence of complaints (Miller and Mittenberg, 1998; Snell et al., 2013), and have therefore often been used as a target of cognitive behavioral interventions (Folkman and Moskowitz, 2004; Miller and Mittenberg, 1998; Snell et al., 2013). Currently, coping style is often measured at one time point early after injury as an indication of pre-injury coping, and is related to outcomes for up to several years after the injury, assuming that one's coping style is stable over long periods of time (Geyer et al., 2015). Although interventions and treatments aimed at improving coping style are offered to patients at varying times after the injury (Al Sayegh et al., 2010), little is known about spontaneous changes in preferred strategies over the time of

recovery following mTBI.

Coping is a very broad concept and has a long history with many different theoretical orientations that can be approached from different perspectives (Eisenbarth, 2012). However, there is consensus in coping being an organizing construct that can be used to describe all the efforts a person makes to prevent or diminish stressful experiences (Carver and Connor-Smith, 2010; Eisenbarth, 2012). The most commonly used definition of coping is that of Lazarus and Folkman (1984), who defined coping as the cognitive and behavioral efforts to manage the internal and external demands of situations that are appraised as stressful. Coping strategies are thought to be orthogonal constructs, in which individuals are prone to use one coping strategy over another (Eisenbarth, 2012; Nielsen and Knardahl, 2014). A commonly used distinction in coping strategies is the classification of strategies into two subtypes: active, problem-focused coping and emotion-focused coping that attempts to diminish discomfort by altering appraisal of the stressor. Another commonly used distinction is between engagement and disengagement coping (Nielsen and Knardahl, 2014). Engagement coping, otherwise known as approach coping, is aimed at dealing with the stressor or related emotions and includes both problem-focused and emotion-focused coping strategies (e.g., seeking social support, cognitive restructuring). Disengagement coping entails a more avoidant response style, and is often emotion-focused (avoidance, denial, wishful thinking) (Carver and Connor-Smith, 2010). Passive coping styles are based on denial or avoidance of problems and focusing on negative feelings rather than actively solving the problem. Although the effectiveness of a certain coping style strongly depends on the situation, a passive coping style is generally associated with a negative outcome following mTBI (Curran et al., 2000; Gould et al., 2011; Gregorio et al., 2014; Linley and Joseph, 2004). Coping style is partly dependent on an individual's beliefs of self-efficacy, which can be defined as trust in one's capability to deal with adverse situations such as a trauma (Bonanno et al., 2010). In patients with chronic disease, a high level of general self-efficacy was related to the use of more adaptive coping strategies (i.e., strategies that actually decrease the perceived stress) and lower levels of anxiety and depression in contrast with patients with low general self-efficacy (Luszczynska et al., 2005).

Studies in different patient populations show that, although coping style is thought to be a relatively stable trait, the choice of a particular coping strategy can be highly dependent on the situation and the specific phase in the recovery process. For example, two recent studies on coping in patients with osteoarthritis (Regier and Parmelee, 2015) and breast cancer (Geyer et al., 2015) reported change in all coping styles over two- and ten-year periods, respectively. Changes in coping style also appeared in studies on TBI of mixed severity, in which a decrease in active, problem-focused strategies in combination with an increase in emotion-focused coping strategies are most often reported (Dawson et al., 2006; Kendall et al., 2001; Tomberg et al., 2007). There is still a need to investigate the mTBI population separately, considering that cognitive disorders caused by severe TBI might cause changes in coping strategies that cannot be compared to mTBI patients (Moore and Stambrook, 1995). Studies on long-term changes in coping following mTBI are sparse. We are aware of one study that investigated changes in coping style following mTBI and reported no changes over time (Snell et al., 2013); yet, it only measured at two time points to a maximum of six months after injury. Considering the importance of coping style for outcome after mTBI and the implications for treatment interventions, looking more elaborately into the stability and/or spontaneous changes in coping styles following mTBI is very important, which might aid in a more precise identification of patients at risk of an unfavorable outcome and

promote a tailored treatment.

The main goal of this study was to investigate the stability of coping styles over a one-year period following mTBI and investigate the relation of coping styles with feelings of self-efficacy. Based on several studies in TBI and other patient populations that all showed changes over time in coping styles, we expected that this would also be the case in our mTBI population. The prediction of exact patterns over time was difficult due to the lack of literature on mTBI specifically. That said, when looking at the patterns found in most studies on coping in TBI, we expected passive coping styles to increase and active coping styles to decrease over time. Furthermore, we expected that patients with an active problem-focused coping style to have higher levels of self-efficacy and that those with a passive coping style would have lower levels of self-efficacy. Given the chronic nature of posttraumatic complaints, the development of a more adaptive coping style could be a crucial determinant of improving recovery following mTBI. Insight regarding changes over time of coping styles following mTBI might be essential for develop a tailored and effective intervention.

## 1. Method

### 1.1. Design and setting

This study is part of a larger ongoing prospective cohort study on outcome in mTBI (the UPFRONT-study). The study was approved by the Ethics committee of the University Medical Center Groningen, and began in January 2013. Patients were included in three level I trauma centers; University Medical Center Groningen (UMCG), St. Elisabeth Hospital Tilburg (EZH) and the Medisch Spectrum Twente (MST) in the Netherlands. Patients included in this study received questionnaires two weeks, six months and twelve months after injury. Demographic variables and injury characteristics were obtained from the hospital records. The Injury Severity Score (ISS) was determined based on these records (Baker et al., 1974).

### 1.2. Participants

The sample consisted of patients 16 years and older with mTBIs who were admitted to the emergency departments of the UMCG, MST and EZH between January 2013 and December 2015. The mTBI was defined according to the recommended guidelines of the EFNS task force (European Federation of Neurological Societies): a blunt impact to the head with sudden acceleration, deceleration or rotation resulting in: a Glasgow Coma Scale (GCS (Teasdale and Jennett, 1974): score of 13–15 on presentation at the emergency department, posttraumatic amnesia of less than 24 h and/or loss of consciousness lasting less than 30 min (Vos et al., 2012). Exclusion criteria were: chronic alcohol and/or drug abuse and major psychiatric and neurological disorders. Patients with no permanent home address or insufficient comprehension of the Dutch language were also excluded due to anticipated follow-up difficulties. Educational level was determined by use of the Dutch Verhage scale (Verhage, 1964), ranging from 1 (no primary school) to 7 (university).

## 2. Measures

### 2.1. Coping style

Coping was measured at two-weeks, six- and twelve-months post-injury, by means of The Utrecht Coping List (UCL (Schreurs et al., 1984): The UCL is a questionnaire that assesses coping styles with 47 items that ask for the way a person acts to minimize

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