Posttraumatic Cognitions, Physical Pain, and Injury Severity as Predictors of Trauma Symptoms in Motor Vehicle Accident Survivors

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Traumatic stress resulting from motor vehicle accidents (MVAs) can be maintained by injury-related factors as well as posttraumatic cognitions (Koch et al., 2005). This study examines a number of risk factors for trauma symptoms, including posttraumatic cognitions, ongoing chronic pain, and severity of physical injury in a sample of $N = 136$ university students and community members who experienced a MVA. Results indicated that posttraumatic cognitions and physical pain ratings predicted PTSD symptoms while physical injury severity was not a significant predictor. The findings imply that unhelpful posttraumatic cognitions and reducing subjective pain levels play an important role in treatment interventions while physical injury severity may not be as critical for emotional functioning following a traumatic MVA.

Introduction

- The residual psychological effects of motor vehicle accidents (MVAs) can be detrimental.

- According to recent meta-analyses, 15.5% of MVA survivors experience acute stress disorder (Dai et al., 2018), while approximately 22.5% develop posttraumatic stress disorder (Lin, Gong, Xia, & Dai, 2018).

- Several accident-related physical health factors, such as objective injury severity and perceived pain level, can maintain trauma following a motor vehicle incident (Zatzick et al., 2007).

- The current study investigates PTSD symptoms in MVA survivors while exploring its relationship with posttraumatic cognitions, injury severity (as measured by days of post-MVA hospitalization), and subjective pain level.

- It was hypothesized that subjective physical pain, posttraumatic cognitions, and initial physical injury severity are related to and predictive of higher levels of PTSD symptoms.

Methods

Sample
- The sample consisted of $N = 136$ community and university student MVA survivors in Nanaimo, BC. Student participants made up 44% of the sample. Participant ages ranged from 18 to 69, with a mean age of 35.81 ($SD = 15.21$). The majority (68%) were female.

Procedure
- Data was collected in the Fear & Anxiety Lab of Vancouver Island University, via an interview and the completion of a number of self-report questionnaires. Participants were compensated with coffee cards.

Measures
Posttraumatic Diagnostic Scale (PDS; Foa, 1995). A 49-item self-report measure designed to provide a PTSD diagnosis according to DSM-IV diagnostic criteria, as well as symptom severity. In this study, the PDS demonstrates excellent internal consistency ($\alpha = .76$).

Posttraumatic Cognitions Inventory (PTCI; Foa et al., 1999). A 33-item measure assessing negative cognitions about oneself, the world, and self-blame. The internal consistency of the PTCI is excellent ($\alpha = .94$).

Motor Vehicle Accident Interview (MVA-I; O'Neill, 2007). A 23- item question interview designed to identify the demographic, situational, and injury-related details of a MVA.

Brief Pain Inventory (BPI; Cleeland & Ryan, 1994). A self-report questionnaire comprised of 9 items, designed to assess pain severity and its interference with emotions and functioning. Internal consistency was measured at $\alpha = .94$.

Results

- Bivariate correlations demonstrated moderate positive relationships between PTSD symptoms, posttraumatic cognitions ($r = .61$, $p < .001$), and pain ($r = .42$, $p < .001$). Contrary to predictions, the association between physical injury severity and trauma symptoms was not significant (see Table 1).

- Multiple regression analysis indicated that posttraumatic cognitions and pain significantly predicted PTSD symptomatology ($F_{(3, 70)} = 20.23$, $p < .001$), accounting for 44.1% of the total variance ($R^2 \text{ } Adj. = .441$) in trauma symptoms.

- The strongest predictor of trauma symptoms were posttraumatic cognitions, followed by pain level, while injury severity was not a significant predictor (see Table 2).

Table 1
Correlation Coefficients for the PDS, PTCI, BPI, and Injury Severity Scores.

Correlations		PDS	PTCI	BPI	Injury
Correlation	PDS	-	.61**	.42**	.13
	PTCI	.61**	-	.18*	.10
	BPI	.42**	.18*	-	.10
	Injury	.13	.10	.10	-

Table 2
Multiple Regression of Posttraumatic Cognitions, Pain, and Injury Severity on PTSD symptoms.

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	SE B	β	t	Sig.
Step 1						
	PTCI	.16	.03	.54	6.02	.001
	BPI	.06	.02	.30	3.37	.001
	Injury	.03	.04	.06	.70	.488

Discussion & Implications

- The results point towards the importance of both physical and cognitive variables in perpetuating traumatic stress after a motor vehicle accident.

- In the current study, psychological pain was a more significant predictor of post-MVA trauma when compared to physical pain, while injury-related variables did not predict PTSD symptoms.

- These conclusions are incompatible with previous studies that have established a link between severity of physical injury and the risk of developing PTSD following a MVA (Chossegros et al., 2011).

- Future research is necessary to expand the present knowledge on the relationship between perceived physical pain, posttraumatic cognitions, and particularly injury severity.

Clinical Implications
- These findings suggests that treatment directed towards posttraumatic cognitions as well as reducing perceived pain levels could play an important role in increasing emotional functioning following a traumatic MVA. This may include interventions such as cognitive restructuring and pain blocking.

- Initial physical injury severity may not be as critical a factor for clinicians when formulating treatment interventions for MVA survivors.

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