



PTSD symptom severity and psychiatric comorbidity in recent motor vehicle accident victims: A latent class analysis

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ARTICLE INFO

Article history:

Received 24 February 2014

Received in revised form 26 June 2014

Accepted 27 June 2014

Available online 11 July 2014

Keywords:

PTSD/posttraumatic stress disorder

Depression

Alcoholism/alcohol use disorder

Substance use disorder

Trauma

Intervention

ABSTRACT

We conducted a latent class analysis (LCA) on 249 recent motor vehicle accident (MVA) victims to examine subgroups that differed in posttraumatic stress disorder (PTSD) symptom severity, current major depressive disorder and alcohol/other drug use disorders (MDD/AoDs), gender, and interpersonal trauma history 6-weeks post-MVA. A 4-class model best fit the data with a resilient class displaying asymptomatic PTSD symptom levels/low levels of comorbid disorders; a mild psychopathology class displaying mild PTSD symptom severity and current MDD; a moderate psychopathology class displaying severe PTSD symptom severity and current MDD/AoDs; and a severe psychopathology class displaying extreme PTSD symptom severity and current MDD. Classes also differed with respect to gender composition and history of interpersonal trauma experience. These findings may aid in the development of targeted interventions for recent MVA victims through the identification of subgroups distinguished by different patterns of psychiatric problems experienced 6-weeks post-MVA.

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1. Introduction

Over 2 million Americans are treated in emergency departments yearly due to motor vehicle accident (MVA)-related injuries (CDC, 2011); these victims are at increased risk for negative mental health outcomes including posttraumatic stress disorder (PTSD), major depressive disorder (MDD), and alcohol/other drug use disorders (AoDs) (O'Donnell, Creamer, Pattison, & Atkin, 2004). In particular, PTSD is one of the most common psychiatric disorders following injury (Heron-Delaney, Kenardy, Charlton, & Matsuoka, 2013). Further, PTSD is associated with significant cost to both the individual experiencing it and to society at large: MVA victims with PTSD experience more physical and psychological functional impairment (Bryant et al., 2010) and utilize greater medical and psychiatric

health care dollars than victims without PTSD (O'Donnell, Creamer, Elliott, & Atkin, 2005).

MDD and AoDs often co-occur with PTSD: MDD and AoDs affect 35.2% and 46.4% of people with PTSD, respectively (Pietrzak, Goldstein, Southwick, & Grant, 2011). This comorbidity is significant, as people with PTSD/MDD report more severe PTSD symptom severity and lower levels of psychosocial functioning (Shalev et al., 1998) than people with either PTSD or MDD alone. Additionally, people with PTSD/AoDs experience a greater number of PTSD symptoms (Saladin, Brady, Dansky, & Kilpatrick, 1995) and consume greater addiction treatment services, yet experience less benefit from them (Brown, Stout, & Mueller, 1999).

Since psychiatric comorbidity is the rule, rather than the exception, for people experiencing PTSD, research into whether certain patterns of comorbidity are evident among trauma victims has important implications for informing intervention efforts. For example, despite the existence of empirically-supported PTSD treatments, translating these treatments into routine general clinical practice remains a challenge due to concern that psychiatric comorbidities may adversely affect patient treatment response (Cook, Schnurr, & Foa, 2004). Furthermore, non-response rates of

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over 50% are common in PTSD treatments (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008), and often times following treatment, recipients still meet diagnostic status (Bradley, Greene, Russ, Dutra, & Westen, 2005). Variations in success following treatment may stem from the fact that PTSD is a heterogeneous disorder with varying symptom presentation (Galatzer-Levy & Bryant, 2013) and, as mentioned, differing comorbidities. Identification of subgroups of trauma victims who differ according to severity of PTSD and comorbid psychiatric problems can directly inform the structure of treatment efforts. One useful methodological tool for addressing this question is latent class analysis (LCA). LCA is a person-centered statistical technique that identifies subgroups of individuals who share common characteristics (Collins & Lanza, 2010) and is often used as a tool to identify subgroups within a population that may be useful targets in future interventions.

Galatzer-Levy, Nickerson, Litz, and Marmar, 2012 used LCA to examine patterns of lifetime comorbidity among people with lifetime PTSD in the National Comorbidity Survey-Replication (NCS-R). The authors found three different patterns of comorbidity among those with PTSD: a class with comorbid mood/anxiety disorders; a class with comorbid mood/anxiety disorders and AoDs; and a class with low levels of comorbidity. Lending further support to these findings, Müller et al. (2014) recently replicated these results in an independent sample derived from the PsyCoLaus study, a population based cohort-study in Lousanne, Switzerland. While these studies represent an important step in elucidating patterns of psychiatric comorbidity in chronic PTSD, it is unknown whether a similar pattern is identifiable in more recent trauma victims. If there exist subgroups of recent trauma victims identifiable early post-trauma, then it may be possible to administer tailored interventions to these groups soon after trauma exposure.

Several factors may influence the pattern of psychiatric problems displayed by recent trauma victims. One is PTSD symptom severity. Trauma victims experience a range of PTSD symptom levels following trauma exposure (Breslau, Reboussin, Anthony, & Storr, 2005), with many individuals reporting subclinical levels of PTSD symptoms yet experiencing functional impairment comparable to full diagnostic PTSD (Stein, Walker, Hazen, & Forde, 1997). Additionally, trauma victims experiencing PTSD and MDD (Momartin, Silove, Manicavasager, & Steel, 2004; Shah, Shah, & Links, 2012) or AoDs (Saladin et al., 1995) report both a greater number of—as well as more severe—PTSD symptoms compared to people with PTSD alone. Thus, it would be valuable to determine whether PTSD symptom severity is a discerning factor characterizing subgroups of recent trauma victims.

In addition to PTSD symptom severity, both gender and interpersonal trauma history may be useful variables to include when investigating the pattern of psychiatric problems experienced by recent trauma victims. Females are twice as likely as males to meet criteria for PTSD (for review see Tolin & Foa, 2006). Furthermore, there are known gender differences in the prevalence of psychiatric disorders commonly comorbid with PTSD; females display greater rates of mood and anxiety disorders, and males display greater rates of AoDs (Kessler, 1994). Additionally, interpersonal traumas have the highest probability of resulting in PTSD (Breslau et al., 1998), a history of interpersonal trauma increases an individual's risk for PTSD given the experience of a subsequent trauma (Breslau & Anthony, 2007), and interpersonal trauma increases the risk for both subsequent MDD and AoDs (Hedke et al., 2008). Collectively, this research suggests that the inclusion of gender and interpersonal trauma history as indicator variables is essential when examining the presence of latent classes of recent trauma victims that differ according to PTSD symptom severity and comorbid psychiatric disorders because it reduces the possibility of model misspecification.

In summary, research investigating potential subgroups of recent trauma victims is needed to inform intervention efforts. Existing research has identified clinically relevant subgroups of adults suffering from chronic PTSD; however, no study to date has examined whether similar subgroups are present soon after trauma. The current study sought to fill this gap using LCA to examine whether there are subgroups of recent MVA victims who differ in terms of gender, interpersonal trauma history, PTSD symptom severity, and the presence of current MDD and AoDs assessed 6-weeks post-MVA. Furthermore, unlike prior studies utilizing LCA, we examined whether differences between the subgroups on the variables included in the LCA were statistically significant, providing a more thorough examination of the characteristics defining each subgroup. While we did not make any specific hypotheses regarding the number of classes determined by our analyses, we did predict that the classes would differ on PTSD symptom levels and rates of comorbid MDD and AoDs. Additionally, consistent with the literature, we hypothesized that the classes would be differentiated by gender and interpersonal trauma history such that women would be more likely to have current MDD (while men would be more likely to have current AoDs) and that an interpersonal trauma history would be associated with a more severe PTSD symptom presentation.

2. Methods

2.1. Participants

Three hundred fifty-six non-amnesic MVA victims (211 male, 145 female) admitted to a level-1 trauma center were recruited during their hospital stay. Ages ranged from 18 to 87 ($M = 38.66$, $SD = 16.21$), and approximately 88% were Caucasian, 10% were African American, 0.3% were Hispanic, and 1% reported other ethnicities. Six weeks post-MVA, 249 (138 male, 111 female) participants provided at least partial follow-up data. Age and education were unrelated to retention ($ps > 0.05$); however, non-Caucasians and males were more likely to be lost to follow-up ($ps < 0.05$).

Not more than 5% of the data for PTSD symptom severity were missing; therefore, imputation based upon an expectation maximization algorithm was used for this variable (Bentler, 2004). While no more than 6% of the MDD, AoDs, or interpersonal trauma history data were missing, imputation was not performed given the conceptual difficulties with imputing dichotomous variables.

2.2. Procedures

The following procedures were approved by the Human Subjects Review Boards of Summa Health System, Akron General Medical Center, and Kent State University. MVA victims admitted to one of two level-1 trauma centers with Glasgow Coma Scale scores ≥ 14 were approached by the head trauma nurse. Participants were administered the Mini Mental Status Exam (MMSE; Folstein, Folstein, & McHugh, 1975) in order to determine ability to give informed consent. If a patient was deemed eligible, a researcher approached the patient, explained the study in detail, and obtained written informed consent. During the initial in-hospital interview, demographic information was collected.

Follow up assessments were conducted 6-weeks post-MVA in participants' homes by a Master's level clinical psychology graduate student. During this assessment, PTSD symptoms were assessed with the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995), current MDD and AoDs were assessed using the Structured Clinical Interview for DSM-IV (SCID-IV; First, Gibbon, Spitzer, & Williams, 1996), and interpersonal trauma history was assessed using the Traumatic Stress Schedule (TSS; Norris, 1990). For the

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