Examination of polytrauma typologies: A latent class analysis approach

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ABSTRACT

Potentially traumatizing events (PTE) are highly prevalent, and are associated with detrimental effects on psychological health, including increased risk of posttraumatic stress disorder (PTSD). Multiple endorsed PTEs (polytraumatization) may have even greater effects on a person's health than the impact of a single index event. To better understand patterns of polytraumatization, person-centered analytic techniques such as Latent class analysis (LCA) are recommended. The current study used LCA to explore latent subgroups of people based on their endorsement of PTEs, thus defining patterns in PTE exposure. The sample included 850 participants who endorsed at least one PTE on a web-administered Trauma History Questionnaire (THQ). Results indicated a best-fitting 3-class solution: (1) a class with a greater probability of experiencing interpersonal PTEs and other PTEs, (2) a class with moderate PTE exposure and higher probability of mugging and accidents, and (3) a class with low PTE exposure. Differences in age, gender, and PTSD symptom severity accounted for class membership.

Results suggest the experience of interpersonal PTEs may be a risk factor for additional lifetime PTE exposure, and is associated with increased PTSD severity. Additional findings underscore the heterogeneity of trauma experiences, highlighting the importance of examining such patterns in future research.

1. Introduction

The experience of multiple types of potentially traumatizing events (PTE) is prevalent and more normative than the experience of just one PTE (Kessler et al., 1995). While it is clear that polytraumatization is associated with greater functional impairment and emotional distress (Agorastos et al., 2014; Karam et al., 2014), the correlates and outcome of individuals with multiple PTEs remains an open area of investigation. Therefore, it is critical to acknowledge and assess the heterogeneity embedded in the PTEs and the impact of differing polytraumatization patterns (Briere et al., 2016). No study to our knowledge has empirically examined polytraumatization patterns assessing a broad array of PTEs in a large general population adult sample; this is the focus of the current study.

1.1. Heterogeneity in trauma types

Prevalence estimates suggest 50–75% of the population will experience a PTE, and the majority will experience multiple PTEs (Kilpatrick et al., 2013). Some reported PTEs include crime-related encounters, interpersonal violence, accidents, natural disasters, and witnessing life-threatening situations (Friedman, 2013). Prevalence rates of different PTEs are possibly influenced by demographic variables; for example, women are more likely to experience sexual assault (Finkelhor et al., 2014), while men are generally more likely to experience accidents or physical assault (Tolin and Foa, 2006). Younger individuals are more likely to experience abuse and neglect (Briggs et al., 2013), whereas older people are more likely to experience loss of a loved one (Ogle et al., 2013).

Different PTEs are associated with differing psychological and physical correlates. Exposure to combat, for example, may place a soldier at increased risk of developing PTSD (Oursa et al., 2014) and specifically complex PTSD (Wolf et al., 2015). PTEs that cause physical injury in civilians may place individuals at an increased risk for anxiety, depression, and chronic pain, which may have a reciprocal relationship with long-term disability (Schweininger et al., 2015). Psychological effects of natural disasters, including PTSD and depression, are uniquely exacerbated by displacement, loss of property, financial, and family health concerns (Gill et al., 2011). Loss and bereavement for a loved one place an individual at risk for chronic or complicated grief and depression (Galatzer-Levy and Bonanno, 2012).

The differential links of demographic, psychological, and physical correlates from specific PTEs suggest the possibility of increasing complexity with the experience of multiple types of PTEs. Indeed, the approach of focusing on a singular event may underestimate the dynamic impact of the interacting effects of multiple PTEs (Kilpatrick et al., 2009). Therefore, additional research focused on the prevalence and patterns of multiple PTEs may deepen our understanding of trauma

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exposure and risk for PTSD.

1.2. The experience of multiple traumas: polytrauma

The experience of a single PTE is associated with the risk for experiencing further trauma (Banyard et al., 2001; Casey and Nurius, 2005). Of those who report experiencing a significant PTE, at least 25% have been impacted by more than one PTE (Resnick et al., 1993; Kessler et al., 1995), and many individuals experience more than one type of PTE. The experience of multiple PTEs has been referred to by different names in the existing literature including re-traumatization, re-victimization, life-time trauma, cumulative trauma, poly-victimization, and polytraumatization (Stein et al., 2017; Gustafsson et al., 2009; Finkelhor et al., 2009). The experience of polytrauma is associated with negative mental health outcomes, such as heightened risk of PTSD and greater PTSD severity (Briere et al., 2016), and greater risk of depression (Agorastos et al., 2014). Polytrauma may also significantly influence physical health outcomes, leading to lower functional independence, increased risk of substance dependence, and greater risk of somatic disorders (Karam et al., 2014; Turner and Lloyd, 1995; Afari et al., 2014).

Several explanations have been proposed to understand the reasons for the adverse impact of polytraumatization. In terms of the dose-dependent perspective, the physical and psychological toll of experiencing multiple PTEs has a cumulative effect, with each additional trauma increasing risk for psychological disturbance, functional deficits, and poorer quality of life (Turner and Lloyd, 1995). Since individual types of PTE may have difference strength of impact, however, the dose-dependent perspective likely does not fully account for individual differences.

The type of PTE is also critical to consider in addition to the total number of PTEs. For example, the experience of childhood sexual trauma is a risk factor for subsequent lifetime PTEs, with approximately half of female victims of childhood sexual abuse later experiencing sexual revictimization in adulthood (Banyard et al., 2001). Similarly, witnessing parental intimate partner violence in childhood may be associated with increased likelihood of childhood physical abuse (Finkelhor et al., 2009). The increased risk of compounding PTEs may then result in increased risk of negative psychological and physical health outcomes (Karam et al., 2014).

More broadly, the experience of interpersonal trauma may play a unique role in determining risk for further trauma and symptom outcomes. Interpersonal PTEs, including assault, physical abuse, and sexual abuse, often lead to increased self-blame and maladaptive cognitions, which then in turn significantly impact daily functioning (Alisic et al., 2014). In fact, cumulative interpersonal PTEs are shown to predict PTSD to a much greater extent than non-interpersonal PTEs (Briere et al., 2016). Thus, interpersonal trauma specifically requires further exploration to understand its impact in the context of polytraumatization.

Prior research has examined polytraumatization patterns using advanced statistical techniques, including latent class analysis (LCA) and latent profile analyses (LPA). LCA and LPA are modeling techniques that group categorical or continuous data according to similarities in distributions, ultimately creating descriptive “clusters” or “classes” (Dean and Raftery, 2010). Table 1 presents a summary of findings from relevant LCA studies known to the authors. While these studies provide support for the current research approach, most studies have focused primarily on children or young adults. Focus on younger age groups does not appropriately assess the impact of multiple PTEs across a wider lifespan ‘window’. Additionally, a web-based survey approach, as used in the present study, to assess a large general population sample has not yet been utilized in LCA studies of polytrauma patterns. It is possible that a web-based survey method may increase self-disclosure in responses given an anonymous format. Lastly, few studies have assessed a broad array of PTEs as in the current study; most studies have restricted their assessment to specific PTE types such as intimate partner violence or bullying patterns (Tossone et al., 2015).

To address the aforementioned limitations, the present study examined evidence for polytrauma subtypes, specifically highlighting the prevalence and patterns of polytrauma. A web-based trauma questionnaire battery was chosen to reach a large and diverse sample of individuals residing in locations throughout the country. The present study assessed (1) latent subgroups of people based on their endorsement of PTEs; and (2) construct validity of the optimal latent class solution using the constructs of PTSD, alcohol use, age, and gender. Consistent with prior literature, we expected to find a latent class with predominant interpersonal trauma types (Galatz-Levy et al., 2013). Further, due to the heightened risk of subsequent PTEs following an interpersonal trauma (Briere et al., 2016), we hypothesized that the latent class endorsing a higher probability of interpersonal trauma would also endorse other PTEs compared to other identified latent classes. Additionally, we expected certain demographic variables, such as gender (Tolin and Foa, 2006), to predict membership in an interpersonal trauma class, and expected the group with the greatest frequency of different types of PTEs to have the poorest psychological outcomes (Turner and Lloyd, 1995), including higher PTSD severity (Briere et al., 2016) and greater alcohol use (Turner and Lloyd, 1995).

2. Methods

2.1. Procedure and participants

Institutional review board (IRB) approval was obtained prior to data collection, and the investigation was conducted in accordance with the latest version of the Declaration of Helsinki. Data for the present study was obtained as part of a larger Amazon Mechanical Turk (MTurk) study of trauma and psychopathology in the general population. MTurk is an online survey platform where participants complete pre-selected surveys and are compensated with a nominal fee. This platform has been shown to provide reliable and valid survey data while offering the opportunity to examine individuals from a large geographic region, in this case the United States (Buhrmester et al., 2011). To increase validity, four “validity check” questions were embedded in the questionnaires. A participant’s data was only included in final analyses if all four validity questions were answered correctly.

MTurk users who opted to participate in the present study were first asked to read an electronic informed consent notice. Following informed consent, participants completed a survey battery, which included a demographic questionnaire, the Trauma History Questionnaire (THQ), PTSD Checklist – Civilian Version (PCL-C), and Alcohol Use Disorders Identification Test (AUDIT). Due to the sensitive nature of questions presented on the THQ and PCL-C, a list of referrals to psychological services and hotlines was provided following participation. All participants were compensated between $1.50 and $2.50 at the time of study submission.

2.2. Measures

2.2.1. Demographic questionnaire

Participants first completed a demographic questionnaire inquiring about age, sex, years of education, and ethnicity in a multiple choice format.

2.2.2. Trauma History Questionnaire (THQ)

Trauma history was assessed using the Trauma History Questionnaire (THQ; Green, 1996). The THQ uses a self-report format in which participants are asked to indicate whether specific PTEs have occurred in their lifetime. History of crime related events, general disasters, and physical and sexual PTEs are assessed via 24 questions using a yes/no format. The THQ was established by basing the questionnaire on previously validated trauma measures, and the
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