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PTSD Symptom Severity and Psychiatric Comorbidity in Recent Motor Vehicle Accident Victims: A Latent Class Analysis

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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.

Keywords

PTSD/Posttraumatic Stress Disorder; Depression; Alcoholism/Alcohol Use Disorder; Substance Use Disorder; Trauma; Intervention

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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 et al., 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 over 50% are common in PTSD treatments (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008), and oftentimes 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 and 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 and colleagues (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 3 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 and colleagues (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. Method

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 18–87 ($M = 38.66$, $SD = 16.21$), 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 ($ps < 0.05$).

No 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 symptom 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 CAPS and SCID-IV data, audio recordings of the interviews were collected and a random 10% of the recordings were reviewed by an independent interviewer for the purposes of establishing reliability (reported below).

2.3. Measures

The Clinician-Administered PTSD Scale (CAPS) was used to assess PTSD symptom severity 6-weeks post-MVA (Blake et al., 1995). The CAPS is a semi-structured clinical interview that assesses both the frequency and intensity of PTSD symptoms experienced in the past month and can be used to yield both a categorical PTSD diagnosis and a measure of continuous PTSD symptom severity. In the current study, PTSD diagnosis was used for descriptive purposes and PTSD symptom severity was used in the LCA. PTSD symptom severity was determined by summing the frequency and intensity ratings associated with each of the 17 PTSD symptoms assessed by the CAPS. The strong psychometric properties of the CAPS are well established (Weathers, Keane, & Davidson, 2001). Interrater reliability for the CAPS in the current study was strong ($r = 0.98, p < 0.001$).

The Structured Clinical Interview for the DSM-IV (SCID-IV) was used to assess current MDD and AoDs. The SCID-IV is a semi-structured clinical interview that is used to make diagnoses for DSM axis-I disorders (First et al., 1996). The depression and alcohol/drug modules of the SCID-IV have been found to have good validity and reliability (Kranzler et al., 1996; Riskind, Beck, Berchick, Brown, & Steer, 1987; Skre, Onstad, Torgersen, & Kringlen, 1991). A kappa of 1.00 indicating perfect agreement was found for the dichotomously scored (i.e., diagnosis present/absent) depression module, while a kappa of 0.70 was found for the dichotomously scored alcohol/drug module in the current study.

A self-report version of the Traumatic Stress Schedule (TSS) was used to assess interpersonal trauma history (Norris, 1990). Participants indicated whether they had ever experienced 9 different traumatic events. Participants were coded as having an interpersonal trauma history if they endorsed exposure to one or more of the following events: robbery/mugging, physical assault, or sexual assault. The TSS has been used in a variety of populations (Flett, Kazantzis, Long, MacDonald, & Millar, 2002; Goldberg & Garno, 2005; Thompson & Kingree, 1998), and has been shown to demonstrate strong test-retest reliability (reviewed in Norris & Hamblen, 2004).

3. Data Analysis Plan

The LCA was performed in *MPlus* version 5 (Muthén & Muthén, 2007). The indicator variables included in the LCA consisted of a mix of continuous (i.e., PTSD symptom severity) and categorical variables (i.e., current MDD, current AoDs, interpersonal trauma history, and gender). Given the relationships that exist between PTSD, MDD, AoDs and interpersonal trauma history/gender we chose to include gender and interpersonal trauma history as indicator variables, rather than covariates, in order to reduce the possibility of model misspecification. While the term “latent class analysis (LCA)” is sometimes reserved for latent class models consisting entirely of categorical variables, we chose to refer to the latent class model in the current study as a LCA given that a majority of the variables included in the analysis are categorical (4 of the 5), as well as the fact that the *MPlus* user manual refers to latent class models as latent class analyses regardless of the level of measurement belonging to the indicator variables (Muthén & Muthén, 2007, pp. 134–135). Consistent with recommendations, a variety of statistical and non-statistical criteria were evaluated to determine the optimal latent class model (Marsh, Lüdtke, Trautwein, & Morin,

2009; Marsh, Hau, & Wen, 2004). In terms of statistical criteria, for each latent class model estimated, the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and sample size adjusted Bayesian Information Criterion (SSA-BIC) were evaluated. For these fit indices, lower values indicate better model fit. Additionally, the bootstrap likelihood ratio test (BLRT) was examined for each model estimated. The BLRT is a statistical test that generates a bootstrapped sample to compare the log likelihoods of the k and the $k-1$ class solutions (where k is the number of classes estimated in a given model). A statistically significant finding indicates that the k class is a better fit to the data than the $k-1$ class. The BLRT is one of the most effective statistical tools for accurately identifying the correct number of classes in LCA (Nylund, Asparouhov, & Muthén, 2007). Finally, entropy was examined for each model. Entropy scores provide an indication of the classification accuracy of the model and range between 0 and 1 – with values near 1 indicating better model fit. In terms of non-statistical criteria, we gave consideration to the interpretability and the size of latent classes associated with each model estimated.

To determine how the latent classes resulting from the best fitting latent class model differed on the indicator variables included in the LCA, a one-way analysis of variance was used to compare the PTSD symptom severity levels associated with each of the classes at 6-weeks post-MVA. Furthermore, to aid in understanding the clinical relevance of these symptom levels, each class was described according to where it fell on the range/categorization of scores possible on the CAPS (i.e., 0–19: asymptomatic/few symptoms; 20–39: mild PTSD symptoms; 40–59: moderate PTSD symptoms; 60–79: severe PTSD symptoms; ≥ 80 : extreme PTSD symptoms) as described in the CAPS manual (Blake et al., 1995). Finally, Pearson chi-square tests were used to determine class differences on current MDD, current AoD, interpersonal trauma history, and gender

4. Results

4.1. Descriptive Statistics

At 6-weeks, 25 participants met PTSD diagnostic status (10.0%). The overall mean for PTSD symptom severity was $M = 25.60$ ($SD = 20.71$), 12.6% met criteria for current MDD, 10.1% for current AoDs, 48.7% reported an interpersonal trauma history, and 44.6% were female.

4.2. Latent Class Analysis

Fit indices for the latent class models estimated are presented in Table 1. As the number of latent classes estimated increased, the AIC, BIC, and SSA-BIC fit indices decreased, with a 4-class model demonstrating the best fit. In contrast, when a 5-class model was estimated, the AIC, BIC, and SSA-BIC values all increased relative to the 4-class solution. With respect to the BLRT, the values associated with this test reached non-significance with the estimation of the 5-class model, indicating that a 4-class model best fit the data. Additionally, the entropy value of the 5-class solution decreased relative to the 4-class model – suggesting an increase in classification error with the addition of a fifth class. Furthermore, examination of the 4-class model (reported below) demonstrated that the classes associated with this model differed in meaningful ways on the majority of the

variables included in the LCA and while one of the classes consisted of less than 5% of the participants, only one variable in the 4-class model (i.e., gender in class 4) reached a boundary value (i.e., a value of 0 or 1). This reduces concerns that extracting 4-classes from the data was resulting in model overfit (i.e., extracting too many classes), which can result in small classes possessing limited utility (Geiser, 2013). Given this converging evidence, the 4-class model was selected as the best representation of the data.

Table 2 contains the results of the one-way ANOVA and the Pearson chi-square tests examining the differences between the classes associated with the 4-class model on the variables included in the LCA. Class 1 (resilient: 61.8%) consisted of people who reported PTSD symptom severity levels that fell in the asymptomatic range on the CAPS and that were significantly lower relative to the other classes. Additionally, people in class 1 were less likely to meet criteria for current MDD compared to the other 3 classes and were less likely to meet criteria for current AoDs relative to class 3. Finally, people in class 1 were less likely to report having an interpersonal trauma history and were less likely to be female relative to the other 3 classes.

Class 2 (mild psychopathology: 26.5%) consisted of people who reported PTSD symptom severity levels that fell in the mild symptomatology range on the CAPS and that were significantly lower than class 3 and 4, but higher than class 1. In addition, people in class 2 were less likely to have current MDD than people in class 3 and 4, but more likely than people in class 1. Although marginally significant, people in class 2 were also less likely to have a current AoDs diagnosis compared to class 3. People in class 2 were more likely to have an interpersonal trauma history compared to class 1 and less likely than class 3. Finally, class 2 had a comparable number of females as class 3 but a significantly smaller proportion of females than class 4 and a larger proportion than class 1.

Class 3 (moderate psychopathology: 7.6%) consisted of people who reported PTSD symptom severity levels that fell in the severe symptomatology range on the CAPS and that were significantly higher than class 1 and 2, but lower than class 4. People in class 3 were more likely to have current MDD compared to class 1 and 2 but less likely than class 4. People in class 3 were marginally more likely to have a current AoDs diagnosis compared to class 2 and significantly more likely than class 1. Additionally, people in class 3 were more likely to have an interpersonal trauma history compared to class 1 and 2, but did not differ significantly from class 4. Finally, class 3 was comparable to class 2 regarding the percent of females but had fewer females than class 4, and more than class 1.

Class 4 (severe psychopathology: 4.0%) was comprised of people who reported PTSD symptom severity levels that fell in the extreme symptomatology range on the CAPS and that were significantly higher than the other 3 classes. Additionally, people in class 4 were more likely to meet criteria for current MDD relative to the other classes; however, they did not differ from the other classes in terms of current AoDs diagnosis. A statistically significantly greater proportion of people in class 4 reported an interpersonal trauma history compared to class 1, yet reported similar levels relative to classes 2 and 3. Finally, a larger proportion of people in class 4 were female compared to the other 3 classes.

5. Discussion

The present study is the first to identify specific subgroups of recent trauma victims who differ according to PTSD symptom severity and psychiatric comorbidity. Four latent classes best fit the data: resilient, mild psychopathology, moderate psychopathology, and severe psychopathology latent classes. A graded level of psychopathology distinguished the classes from one another – with the most pronounced difference being the severity of PTSD symptoms and the prevalence of current MDD. Specifically, the resilient class reported the lowest PTSD symptom severity levels and the lowest prevalence of current MDD, while the severe psychopathology class demonstrated the highest PTSD symptom severity levels and the highest prevalence of current MDD. The mild and moderate psychopathology classes fell in between the resilient and severe psychopathology classes on these dimensions. In contrast, differences in the prevalence of AoDs across the 4-classes were not as consistent. However, the moderate class had a significantly greater rate of current AoDs (despite a greater number of females) than the resilient class and a marginally greater rate than the mild psychopathology class suggesting that current AoDs may be an important feature of this class.

While it is surprising that the classes observed were not largely differentiated by the prevalence of current AoDs, there are several potential explanations for this finding. First, PTSD and MDD are distress disorders (Cox, Clara, & Enns, 2002), while AoDs are externalizing disorders (Krueger, 1999); thus, at a core symptom level, a stronger relationship likely exists between PTSD/MDD compared to PTSD/AoDs. Second, while the rate of current AoDs in the present study is consistent with other studies (Blanchard, Hickling, Taylor, Loos, & Geradi, 1994; O'Donnell et al., 2004), the prevalence rate was smaller than that of MDD. This smaller prevalence rate likely reduced our power to detect differences in AoDs between the classes. Finally, given that males are more likely to meet criteria for AoDs (Kessler, 1994), the differential male attrition may have contributed to the null results obtained. Thus, one or more of these factors may help to account for the non-significant differences observed on the prevalence rate of AoDs among the latent classes in the current study.

With respect to gender, those in the severe psychopathology class consisted entirely of females, while those in the resilient class consisted of fewer females compared to all other classes. However, it is notable that the mild and moderate psychopathology classes consisted of roughly the same number of females, yet differed significantly from one another on PTSD symptom severity levels and current MDD rates.

Although only a trend level difference – and thus requiring replication in future studies – this finding may be explained by the higher prevalence of interpersonal trauma in the moderate class relative to the mild psychopathology class. Traumas of an interpersonal nature increase risk for both PTSD and MDD (Breslau et al., 1998; Hedke et al., 2008), and the tendency for women to experience greater interpersonal trauma may account for gender differences in PTSD (Olf, Langeland, Draijer, & Gersons, 2007). Thus, the higher rate of interpersonal trauma among the moderate psychopathology class may be responsible for the

greater PTSD symptom severity and prevalence rate of MDD reported by this class relative to the mild psychopathology class.

Overall, results from the current study support the perspective that posttraumatic psychopathology is best represented on a continuum (Broman-Fulks et al., 2006); however, unlike past research, given that the current study utilized a person-centered statistical technique, the results obtained lend themselves more readily to clinical application. Specifically, the present study allows for making distinctions along this continuum by distinguishing subgroups of trauma victims who differ according to the PTSD symptom severity levels and psychiatric comorbidities experienced. This feature has important implications for intervention efforts designed for recent victims of traumatic injury. For example, researchers have advocated the development of stepped care interventions for hospitalized injury victims. In the context of treating mental health problems stemming from injury, stepped care models involve a 3-stage process of (1) identifying victims that may be at high risk for psychiatric disorders while in hospital, (2) identifying those individuals displaying continued psychiatric distress and who may require treatment in the weeks following hospital discharge, and (3) delivering interventions to those high risk individuals experiencing continued distress as a result of their trauma (O'Donnell, Bryant, Creamer, & Carty, 2008). The feasibility of stepped care models for recent trauma victims has been demonstrated (Zatzick et al., 2004; Zatzick et al., 2013) and has been shown to be effective in identifying a majority of trauma victims who may be in need of intervention within 6-weeks of their trauma (O'Donnell et al., 2012).

Results from the current study suggest several important variables that should be assessed to determine those individuals at highest risk for continued post-traumatic distress. Furthermore, given the graded severity of psychopathology characterizing the observed subgroups, our results shed light on those individuals who may be in greatest need for intervention, as well as how interventions should be tailored to address the particular psychiatric problems being experienced by an individual. More specifically, our results suggest that roughly two-thirds of MVA victims (i.e., the resilient class) experience low levels of psychopathology 6-weeks post-MVA and can likely be triaged from further monitoring/delivery of mental health services. Another quarter of MVA victims (i.e., the mild psychopathology class) report PTSD symptom severity and co-occurring MDD that warrants further monitoring and possible referral to mental health treatment. Finally, two substantially smaller groups of MVA victims report significant psychiatric distress warranting intervention. Furthermore, PTSD, MDD, and AoDs are the most salient problems experienced by one of these groups (i.e., the moderate psychopathology class), while PTSD and MDD are the most significant problems experienced by the other group (i.e., the severe psychopathology class).

In interpreting the data from this study, it is important to note that the present study was based upon a sample of recent MVA victims and may not generalize to more highly traumatized samples or victims of other types of traumatic events. However, given the prevalence and mental health impact of traumatic injury due to MVAs, the sample in the current study represents an important first examination of the pattern of PTSD symptom severity and psychiatric comorbidity in recent trauma victims. Future research should seek

to determine if the latent classes observed in the current study extend to other types of recent trauma victims – in particular samples in which a higher overall prevalence rate of current AoDs is present in order to determine if the null results obtained in the current study are due to a real phenomenon or the low overall prevalence of AoDs in the current study.

Furthermore, given the differential attrition that was observed, it is unclear how results from the current study may extend to samples consisting of a greater number of males and non-Caucasians.

6. Conclusions

Despite these limitations, results from the present study represent an important first step in our understanding of the pattern of PTSD symptom severity levels and associated psychiatric comorbidities in recent MVA victims. Furthermore, our findings highlight the need for the early identification of those individuals who may experience various negative posttraumatic mental health outcomes following trauma so that appropriate interventions can be implemented.

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Highlights

- Latent class analysis was used with recent motor vehicle accident victims
- Resulting subgroups differed on PTSD symptom severity and psychiatric comorbidity
- Tailored interventions targeting these psychiatric problems are warranted

Table 1

Fit Indices for the Latent Class Models

	AIC	BIC	SSA-BIC	BLRT	Entropy
1-class	3235.58	3256.68	3237.66	-	-
2-class	3101.97	3144.18	3106.14	145.60***	0.92
3-class	3087.76	3151.07	3094.01	26.21***	0.86
4-class	3075.92	3160.34	3084.26	23.83***	0.86
5-class	3075.97	3181.49	3086.39	11.95	0.83

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SSA-BIC = sample size adjusted Bayesian Information Criterion; LMR-A = Lo-Mendell-Rubin Adjusted LRT Test; BLRT = bootstrap likelihood ratio test

** $p < 0.01$,

*** $p < 0.001$

Table 2

Class Probabilities and Conditional Probabilities for the 4-Latent Class Model

	Resilient (Class 1)	Mild Psychopathology (Class 2)	Moderate Psychopathology (Class 3)	Severe Psychopathology (Class 4)	Class Differences
	61.8%	26.5%	7.6%	4.0%	
<i>F</i> (3, 245) = 617.61 ***					
PTSD Symptom Severity					
(M) (SE)	12.87 (0.59)	35.42 (0.79)	63.06 (1.31)	85.58 (3.12)	1 vs. 2 2 > 1 1 vs. 3 3 > 1 1 vs. 4 4 > 1 2 vs. 3 3 > 2 2 vs. 4 4 > 2 3 vs. 4 4 > 3
MDD					
(% present) (SE)	0.03 (0.01)	0.17 (0.03)	0.37 (0.04)	0.90 (0.02)	χ^2 (1, <i>n</i> = 218) = 14.58 *** χ^2 (1, <i>n</i> = 172) = 33.08 *** χ^2 (1, <i>n</i> = 163) = 97.66 *** χ^2 (1, <i>n</i> = 84) = 3.46 ⁺ χ^2 (1, <i>n</i> = 75) = 23.67 *** χ^2 (1, <i>n</i> = 29) = 7.49 **
AoD					
(% present) (SE)	0.07 (0.02)	0.11 (0.03)	0.26 (0.03)	0.20 (0.03)	1 vs. 2 <i>ns</i> 1 vs. 3 3 > 1 1 vs. 4 <i>ns</i> 2 vs. 3 3 > 2 2 vs. 4 <i>ns</i> 3 vs. 4 <i>ns</i>
Interpersonal Trauma					
(% present) (SE)	0.40 (0.04)	0.57 (0.04)	0.81 (0.03)	0.70 (0.04)	χ^2 (1, <i>n</i> = 208) = 5.25 * χ^2 (1, <i>n</i> = 159) = 10.00 ** χ^2 (1, <i>n</i> = 153) = 3.49 ⁺ χ^2 (1, <i>n</i> = 85) = 3.22 ⁺ χ^2 (1, <i>n</i> = 76) = 0.61 χ^2 (1, <i>n</i> = 26) = 0.44
Gender					
(% female) (SE)	0.36 (0.04)	0.53 (0.04)	0.58 (0.04)	1.00 (0.00)	1 vs. 2 2 > 1 1 vs. 3 3 > 1 1 vs. 4 4 > 1 2 vs. 3 3 > 2 2 vs. 4 <i>ns</i> 3 vs. 4 <i>ns</i>

Resilient (Class 1)	Mild Psychopathology (Class 2)	Moderate Psychopathology (Class 3)	Severe Psychopathology (Class 4)	Class Differences
61.8%	26.5%	7.6%	4.0%	$\chi^2(1, n = 76) = 7.93^*$ $\chi^2(1, n = 29) = 5.82^*$

Note. *PTSD Symptoms* = Posttraumatic stress disorder symptoms; *MDD* = Major depressive disorder; *AoD* = Alcohol or drug use disorder

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$