

Posttraumatic Stress Disorder (PTSD) symptom profiles among people who have
experienced abuse: Findings from the NESARC-III study

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Abstract

Greater recognition of diversity in psychological responses to traumatic events has led to increased exploration of post-trauma symptom typologies and risk factors for more ‘complex’ presentations. **Objectives:** We sought to identify unique PTSD symptom profiles associated with the experience of physical and sexual abuse and to determine whether exposure in childhood, type of abuse, frequency of abuse and familial support were associated with profiles indicating increased symptom complexity. **Method:** We analysed data from 6,769 American adults ($M=43.93$ years, $SD=15.35$, 70.9% female) from the National Epidemiologic Survey on Alcohol and Related Conditions-III who reported histories of physical or sexual abuse. Latent Class Analysis was used to identify distinct profiles of the twenty PTSD symptoms outlined in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5). Abuse in childhood, type of abuse, frequency of childhood abuse, emotional support in childhood and a range of demographic variables were compared across classes. **Results:** Five classes were identified: High All (19.6%), Threat (14.4%), Dysphoric (13.7%), Moderate Threat (29.4%) and Low Symptom (22.9%). Contrary to our hypotheses, trauma exposure in childhood did not predict class membership while type of abuse did. The High All and Dysphoric classes had greater frequency of childhood abuse, lower support in childhood, and a history of sexual abuse when compared to their less complex, predominantly fear-based counterparts (Threat and Moderate Threat classes respectively). **Conclusions:** These constellations of DSM-5 PTSD symptoms may be a proxy for increased “complexity” and may indicate a need for alternative or additional therapeutic interventions.

Keywords: Posttraumatic Stress Disorder; DSM-5; Complex PTSD; sexual abuse; child maltreatment

Clinical Impact Statement:

Our study identified a number of factors which predict relatively complex and severe constellations of posttraumatic stress disorder (PTSD) symptoms. These included high levels of childhood abuse, lower levels of support in childhood and the experience of sexual rather than physical abuse which predicted classes defined by high levels of all symptoms and high levels of dysphoric symptoms. It is hoped that recognition of the diversity of presentations following trauma will lead to treatment tailored to individual needs. These findings suggest that those with a more complex profile may have greater need for corrective relational experiences which may be found within therapy and supported by it.

Posttraumatic Stress Disorder (PTSD) symptom profiles among people who have experienced abuse: Findings from the NESARC-III study

First described in the *Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition* (DSM-III; APA, 1980) as a fear-based response, pervasive among Vietnam War veterans, Posttraumatic Stress Disorder (PTSD) is now understood to often present in varied ways (e.g. with anger, shame and loneliness). With the latest iteration of the DSM, the *Diagnostic and Statistical Manual of Mental Disorders, 5th edition* (DSM-5; APA, 2013), the American Psychological Association (APA, 2013) aimed to capture this complexity by presenting a broader conceptualisation of PTSD (Friedman et al., 2011). Additional symptoms were incorporated under a newly defined cluster, ‘Negative Alterations in Cognitions and Mood’.

Unlike the *International Classification of Diseases* (ICD-11; World Health Organisation, 2018) ICD-11 which separates changes in self-concept and emotional/interpersonal functioning from the PTSD diagnosis, attributing them to Complex PTSD (CPTSD), DSM-5 PTSD symptoms include: pervasive negative emotional states; negative beliefs about oneself, others and the world; and feelings of interpersonal detachment (APA, 2013). While capturing the complexity of some people’s post-trauma responses, the DSM-5 PTSD diagnosis has been criticised for alluding to homogeneity and lacking the specificity required to guide appropriate treatment (Friedman et al., 2011). It has been argued that there are too many potential combinations of symptoms (Galatzer-Levy & Bryant, 2013), which has led to exploration of the way symptoms typically cluster using latent class/profile analysis (LCA/LPA). These are “person centred” as opposed to “variable centred” approaches, identifying subgroups of individuals based on shared patterns of responding across variables (O’Donnell et al., 2017).

LCA and LPA have been used to identify typologies of DSM-5 PTSD symptoms in a handful of studies (Byrne et al., 2019; Campbell et al., 2020; Minihan et al., 2018; Murphy et

al., 2019; Nugent et al., 2019). All excluding Campbell et al. (2020), used samples of people with the same trauma exposure (either veterans, refugees or people exposed to an oil spill). While they differed in the number of resulting profiles, all studies identified two particular types: one with high likelihood of all symptoms (including alterations in cognitions and mood) and one with higher re-experiencing symptoms than changes in cognitions and mood. Predictors of broader symptom endorsement included greater number of childhood adversities (Murphy, et al., 2019) and number of prior traumas, particularly various forms of assault (Nugent et al., 2019).

Two of the studies identified profiles labelled 'High Symptom' (high levels of all symptoms), 'Threat'/'Threat-Reactivity' (characterised by greater re-experiencing and avoidance than alterations in cognitions and mood) and 'Dysphoric' (differentiated by greater severity of mood alterations than re-experiencing symptoms) (Byrne et al., 2019; Campbell et al., 2020). Byrne et al. (2019) found the 'Threat' profile was more strongly associated with military-related trauma as the worst experienced, while sudden abandonment by partner, parent, or family was more likely the worst event experienced by those in the 'Dysphoric' class. These findings are suggested to indicate that life-threatening traumatic events operate more on re-experiencing/avoidance/hyper-arousal symptoms as opposed to interpersonal traumas which may have greater effects on mood, self-concept and interpersonal functioning (Byrne et al., 2019).

Proponents of the distinction between fear-based and more complex presentations have aimed to identify underlying mechanisms, including features of the traumatic experience. Childhood abuse is considered a prototypical risk factor for CPTSD because of its interpersonal, often prolonged nature and multiple forms (e.g. physical, sexual and verbal; Hyland et al., 2017). Many studies have assessed the effect of experiencing multiple different types of trauma, termed 'cumulative trauma', on symptom complexity (e.g. Frost et al., 2020;

Karam et al., 2014). Fewer have studied the effects of frequency/duration of each traumatic experience, however duration of exposure to participants' longest traumatic event was found to predict a more complex presentation and not a fear-based profile (van der Kolk et al., 2005).

Some explanations of why childhood abuse is so strongly related to complex psychopathology go beyond its chronicity, emphasising the disruption to typical neurological development of self-regulatory functions at the age it occurs (Friedman et al., 2015; Knefel et al., 2018). There is mixed evidence for the importance of age at exposure and many studies do not adequately test this relationship due to confounding factors. Some studies have found stronger effects of cumulative trauma in childhood than in adulthood on symptom complexity but used samples of people with traumatic experiences in both childhood and adulthood (Cloitre, et al., 2009; Knefel, et al., 2018) or didn't control for childhood trauma when examining the effects of cumulative adulthood trauma (Cloitre et al., 2019; Palic et al., 2016). Hyland et al. (2017) found that among a birth cohort sample of 2591 Danish 24-year-olds, childhood sexual abuse was the only trauma type more strongly associated with a CPTSD as opposed to an ICD-11 PTSD-type profile. Some adulthood trauma types were assessed in this study however sexual assault during adulthood was not, limiting interpretability of the importance of trauma exposure in childhood in differentiating symptom presentations.

The interpersonal severity of trauma is also considered a risk factor for symptom complexity and appeared more critical than trauma exposure in childhood in two recent studies. Karatzias et al. (2019) found that number of interpersonal traumas in both childhood and adulthood predicted CPTSD but not the fear-focused ICD-11 PTSD diagnosis. Similarly, Palic et al. (2016) found no difference in likelihood of CPTSD between the samples who had experienced trauma in childhood and adulthood "of severe interpersonal intensity". However, the authors note the possibility that childhood trauma histories account for the majority of risk

for CPTSD as this was not systematically assessed in the adulthood trauma samples (Palic et al., 2016).

Extending the above findings, Cloitre et al. (2019) assessed an interpersonal feature of trauma (relationship to perpetrator) and found that out of all childhood trauma types, only abuse by caregivers was significantly associated with CPTSD. Furthermore, sexual assault by non-caregivers and kidnapping/abduction were the only significant predictors of ICD-11 PTSD. These findings point to disrupted attachment relationships as a potential mechanism underlying the link between childhood abuse and symptom complexity, aligning with attachment theory (Murphy et al., 2016). Whether the above risk factors distinguishing the ICD-11 diagnoses also differentiate DSM-5 derived symptom profiles remains largely unclear.

Potential protective factors for developing complex presentations post-trauma have received far less attention. A recent study among a clinical sample suggests that positive relationships in childhood may be one such protective factor (Karatzias et al., 2020). Controlling for adverse childhood experiences, increased support in childhood was associated with lower CPTSD symptoms, and adverse events were more strongly associated with ICD-11 PTSD than CPTSD symptoms. The authors take this to suggest that adverse and positive experiences operate uniquely, and that the absence of emotional support in childhood may be the key predictor of more complex responses to trauma.

The first aim of the current study was to explore the predominant typologies of PTSD symptoms using DSM-5 criteria in a large community survey of people with histories of physical and/or sexual abuse. Secondly, the relative effects of trauma exposure in childhood, frequency of child abuse and degree of familial support on PTSD symptom complexity were examined.

We hypothesized that at least three classes would be educed, similar to those previously identified using DSM-5 criteria (Hypothesis 1): a consistently high symptom endorsement class, a consistently low endorsement class, and a class with a high likelihood of re-experiencing symptoms but not negative alterations in cognitions and mood (Byrne et al., 2019; Campbell et al., 2020). The LCA was largely exploratory however, as no previous study using DSM-5 criteria limited their sample to those with abuse histories. Based on the literature reviewed above, we hypothesized that after controlling for type of abuse and demographic characteristics, a history of abuse in childhood, higher frequency of childhood abuse and lower emotional support in childhood would: a) be less likely among the class with lowest symptom endorsement than that with the highest (Hypothesis 2); and b) be more common among classes endorsing negative alterations in cognitions and mood than those without (Hypothesis 3).

Method

Participants and Procedure

The current study uses data derived from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC-III; Grant et al., 2014). A data use agreement and ethics approval [masked for peer review] was granted for use of the data for the current study. The NESARC-III study used multistage probability methods to randomly select a representative sample ($N = 36,309$) of non-institutionalized US residents 18 years and older (Grant et al., 2014). Computer-assisted face-to-face interviews were conducted by trained interviewers between April 2012 and June 2013 to gather information on alcohol/drug use disorders among other mental and physical health difficulties. Respondents gave informed consent and received \$90.00 for survey participation.

Data are reported for the 6769 participants of the 36,309 who: a) endorsed a history of either physical or sexual abuse on the PTSD diagnostic questionnaire; b) had complete

demographic information; and c) had data for at least one PTSD item (required for the full information maximum likelihood (FIML) approach to handling missing data in Mplus; Muthén & Muthén, 1998–2017). 42 cases were excluded due to missing values on demographic variables or on all PTSD symptom items.

Measures

All variables were derived from the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-5 Version (AUDADIS-5). The AUDADIS-5 is a structured, in-person diagnostic interview designed for use by non-clinician interviewers. Items of the AUDADIS-5 were mapped to DSM-5 criteria.

PTSD symptoms: The PTSD diagnostic questionnaire was used to derive a score for each DSM-5 symptom (either 1 if endorsed, or 0). Separate items corresponding to the same DSM-5 symptom were collapsed such that a symptom was considered present if any item relating to that symptom was endorsed. Psychometric properties of the PTSD diagnostic questionnaire are cited elsewhere, including diagnostic test-retest reliability in the fair range (Grant et al., 2015; Hasin et al., 2015a, b).

Trauma exposure in childhood: Trauma exposure in childhood was operationalised as either with or without childhood physical/sexual abuse based on endorsement of these trauma types from the list of Criterion A stressors in the PTSD diagnostic questionnaire.

Type of abuse: Similarly, cases were coded as with or without sexual abuse (and therefore physical abuse only) based on endorsement of either adulthood or childhood sexual abuse from the list of Criterion A stressors.

Frequency of childhood abuse: The AUDADIS-5 includes a 29-item questionnaire assessing childhood maltreatment, adapted from the Adverse Childhood Experiences study (Dube et al., 2003). The questions were originally part of the widely used and well-validated Conflict Tactics scale (Straus, 1979) and Childhood Trauma Questionnaire (Bernstein et al.,

1994). Nine items assessed physical, sexual & emotional abuse in childhood beginning with “Before you were 18, how often did a parent/other adult living in your home...”, and rated on a 5-point Likert scale measuring frequency of abuse (0=Never, 1=Almost never, 2=Sometimes, 3=Fairly often, 4=Very often). Scores on these items were summed to create a total frequency score (ranging from 0-36). Good reliability ($\alpha=.88$) was demonstrated among the current sample.

Emotional support: A total score of the five items on the childhood maltreatment questionnaire relating to familial support was computed (ranging from 0-20). These items have been reverse coded elsewhere to reflect ‘emotional neglect’ and were originally a part of the Childhood Trauma Questionnaire (CTQ; Dube et al., 2003). Acceptable reliability has been evidenced for the emotional neglect scale for the CTQ (Bernstein et al., 2003). In the current study, the scale demonstrated excellent reliability ($\alpha=.92$).

Demographic variables: Gender, age, higher education (diploma/degree vs high school or less) and ethnicity (White, Black, First Nations, Asian & Hispanic) were measured.

Data Analysis

LCA was used in Mplus (Version 8.3; Muthén & Muthén, 1998–2017) to model PTSD symptom classes, based on patterns of scores across the 20 dichotomous indicators of DSM-5 PTSD symptoms. LCA models for 1 through 7-class solutions were compared based on model fit statistics including the Akaike information criterion (AIC; Akaike, 1974), Bayesian information criterion (BIC; Schwarz, 1978), and sample size-adjusted BIC (Sclove, 1987) goodness-of-fit indices (lower values correspond to improved model fit). The results of three likelihood ratio tests are also reported: the bootstrap likelihood ratio test (BLRT; McLachlin & Peel, 2000), the Lo-Mendell-Rubin likelihood ratio test (LMRLRT; Lo et al., 2001) and the Vuong-Lo-Mendell likelihood ratio test (VLMLRT; Lo et al., 2001), which provide a p-value indicating whether a model has better fit than that with one less class (Nylund et al., 2007).

The entropy values are also reported, with values closer to 1 indicating stronger class classification accuracy (Geiser, 2010). The number of random starts was set to 1,000, with 200 optimizations for the final stage of analysis and results were replicated with twice the number of random starts to ensure the best model fit. Participants were assigned to their most likely classes based on conditional probabilities. Subsequent multinomial regression analyses were used to examine predictors of latent class membership in the Statistical Package for the Social Sciences (SPSS) version 24. An alpha level of .05 (2-tailed) was used for all statistical tests.

Results

Demographic characteristics, descriptive statistics and Cronbach's alpha reliability estimates are summarized in Table 1. Of the 6,769 participants, 70.9% were female. Mean participant age was 43.93 years (SD = 15.35, range: 18-90 years) and completion of higher education was reported by 66.2% of participants. Reported ethnicities were White (57.4%), Black (20.6%), First Nations (2.6%), Asian (2.3%) and Hispanic (17.1%). Sexual abuse was reported by 52.0% of participants and 69.4% reported physical abuse. For 54.7% of participants, either kind of abuse occurred before the age of 18.

Latent Class Analysis

Fit statistics for the LCAs are provided in Table 2. BIC values continued to decrease up to seven classes, which is not unusual for LCAs (van de Schoot et al., 2017). Therefore, based on both the LMRLRT and the VLMRLRT a 5-class solution was selected. The probabilities of endorsing each PTSD symptom for the five classes are illustrated in Fig.1 and the proportion of each class endorsing each symptom can be found in Supplementary Table 1. The first class is characterised by a high probability of endorsing all symptoms (except for risky behaviour and inability to recall trauma) and was labelled "High All" (n = 1327, 19.6%). This group was considered to be comprised of participants with a relatively

“complex” pattern of symptoms. The second class, labelled “Threat” (n = 973, 14.4%), had a high probability of re-experiencing and avoidance symptoms but only moderate probability of negative alterations in cognitions, mood and arousal. Conversely, the third class, “Dysphoric” (n = 927, 13.7%), had only moderate re-experiencing, avoidance and arousal symptoms and higher negative alterations in cognitions and mood. The “Dysphoric” class differed from the “Threat” class most in their greater rates of feeling emotionally detached from others and unable to experience positive emotions. The third class, “Moderate Threat” (n = 1990, 29.4%) had a similar pattern to the “Threat” class but differed in degree; only moderate probability of re-experiencing and avoidance and low probability of negative alterations in mood and arousal. Finally, the “Low Symptom” (n = 1552, 22.9%) class was characterised by low probabilities of symptom endorsement apart from a moderate probability of re-experiencing symptoms. As a post-hoc exploratory analysis, we considered the rates of past 12-months major depressive disorder. Rates were 36.6%, 25.3%, 30.1%, 15.0% and 8.6% for the High All, Threat, Dysphoric, Moderate Threat and Low Symptom classes respectively.

Multinomial Regression Results: Predictors of Class Membership

The reporting of effects of trauma features and demographic characteristics on PTSD symptom class membership is focused on the five most meaningful class comparisons in Table 3, which align with hypotheses 2 and 3. However, the interested reader is directed to Supplementary Table 2 for a summary of all possible comparisons.

To test the possibility of multicollinearity between some of the variables in the analyses, a linear regression was run to review variance inflation factor (VIF) values, where a value greater than 10 indicates collinearity issues (Field, 2009). No VIF value for any variable was greater than 1.92, indicating multicollinearity was not a concern.

Contrary to our hypotheses, trauma exposure in childhood did not distinguish classes, and sexual abuse (as opposed to solely physical abuse) was a significant predictor of class

membership across comparisons ($p < .001$). The Low Symptom class was particularly distinguishable from the others in its lower likelihood of sexual as opposed to physical abuse history ($p < .001$ - $p = .015$). In line with hypothesis 2, the Low Symptom class had significantly lower frequency of childhood abuse compared to the High All class ($OR = 0.87$, $p < .001$) but emotional support was not a distinguishing factor. The Low Symptom class were also more likely to be older in age, and male ($ps < .001$), as well as more likely to complete higher education than the High All class ($OR = 1.43$, $p < .001$). Those in the Low Symptom class were also less likely to be a First Nations person ($OR = 0.55$, $p = .03$) and more likely to be Asian than the High All class ($OR = 1.94$, $p = .036$).

To test our third hypothesis that participants with a more complex symptom typology would have a more pervasive history of childhood abuse and lower support than those with a fear-based profile, we compared the High All and Threat classes. Compared to the Threat class, the more “complex” High All class was significantly more likely to have experienced sexual abuse ($OR = 1.44$ 1.28 , $p = .002$), a greater frequency of childhood abuse ($OR = 1.05$, $p < .001$) and lower emotional support in childhood ($OR = .98$; $p = .01$). They were also more likely to be younger and to not have received higher education than the Threat class ($OR = .99$, $p < .001$; $OR = .70$, $p < .001$).

Again, in line with hypothesis 3, the difference in trauma history between those with a fear-based profile (Threat class) and those with greater endorsement of mood and cognition symptoms (Dysphoric class) were compared. These classes did not differ on type of abuse or frequency of childhood abuse but the Dysphoric class did report significantly lower emotional support in childhood ($OR = .97$; $p < .001$). These classes also differed by gender ($p = .008$) and higher education ($p = .023$). The last comparison relevant to hypothesis 3 was between the two classes sharing equal endorsement of fear-based symptoms and differing on cognition and mood symptoms (Dysphoric and Moderate Threat classes). The Dysphoric class (with

higher rates of cognition and mood symptoms) reported significantly higher frequency of childhood abuse (OR = 1.04, $p < .001$) and less emotional support than the Moderate Threat class (OR = .97, $p = .002$). The Dysphoric class was also more likely to have experienced sexual than solely physical abuse and less likely to have received higher education than the Moderate Threat class (OR = 1.45, $p = .001$; OR = 0.78, $p = .005$).

Finally, we wanted to determine which elements of trauma history were shared and which elements differentiated the two classes with highest mood and cognition changes and differing fear-based symptoms (High All and Dysphoric classes). While the High All class did not differ from the Dysphoric on amount of emotional support, they had significantly greater frequency of childhood abuse (OR = 1.05, $p < .001$). They were also more likely to be female and younger than the Dysphoric class (OR = 1.62, $p < .001$; OR = .99, $p < .001$).

Discussion

The aim of the current study was to explore patterns of DSM-5 PTSD symptoms and associated risk factors among people who have experienced abuse derived from a large population-based survey. Fit indices indicated a five-class solution with similar constellations of symptoms to those previously found using DSM-5 criteria. In support of Hypothesis 1, there was a class with consistently high (High All) and low (Low Symptom) endorsement of symptoms as well as a “Threat” class which had a greater likelihood of re-experiencing symptoms than negative alterations in cognitions and mood. Additionally, there was a class with a similar pattern of symptoms (but lower in likelihood) to the Threat class (Moderate Threat) and a class with the opposite pattern to the Threat class – for whom mood and cognition symptoms were relatively prominent (Dysphoric). Hypotheses 2 and 3 received partial support given that type of abuse was a significant predictor of class membership and exposure in childhood (Criterion A abuse in childhood as opposed to adulthood only) was not. The Low Symptom class was significantly less likely than all other classes to have

experienced sexual abuse. In partial support of Hypothesis 2, the Low Symptom class and High All class were also distinguished by frequency of abuse in childhood but not by emotional support.

Consistent with Hypothesis 3, the High All and Dysphoric classes had greater frequency of abuse, lower support in childhood, and a history of sexual rather than physical abuse when compared to their less complex, predominantly fear-based counterparts (Threat and Moderate Threat classes respectively). The High All and Dysphoric classes also had the highest rates of major depressive disorder among the identified classes. A relatively reduced level of emotional support in childhood distinguished the Dysphoric class from the Threat class and frequency of abuse was key in distinguishing the Dysphoric class from the High All class. These results and their implications for our understanding and assessment of diverse psychological responses to abuse are discussed in the paragraphs below.

Given the large community-based nature of the sample, it is unsurprising that more classes provided better fit than has been found previously (e.g. Byrne et al., 2019; Campbell et al., 2020). Specifically, the current LCA resulted in two classes with lower proportionate endorsement than those found by Campbell et al. (2020) among participants meeting PTSD diagnostic criteria. Classes were distinguished most by their overall likelihood of endorsement across all symptoms, consistent with other studies using non-clinical samples (e.g. Breslau et al., 2005). However, on two intermediate level classes (Threat and Dysphoric), there was also a degree of crossover, providing qualitative distinctions.

Similar to Campbell et al.'s (2020) interpretation of their resultant classes, the High All class is broadly similar to an ICD-11 CPTSD presentation, with high likelihood of persistent negative affect, exaggerated beliefs and interpersonal detachment (even though the ICD-11 CPTSD diagnosis captures difficulties beyond DSM-5 PTSD criteria). The Threat and Moderate Threat classes on the other hand, may reflect the ICD-11 conceptualisation of PTSD

with their lower likelihood of exaggerated beliefs, anhedonia and interpersonal detachment than of re-experiencing, avoidance and hyperarousal symptoms. The Dysphoric class had the inverse pattern of symptom endorsement to the Threat class which may indicate a muted CPTSD-like presentation, or as has been suggested in other studies, the presence of comorbid mood disorders (e.g. Pietrzak et al., 2011; Campbell et al., 2020).

The current findings confirm that DSM-5 PTSD criteria can be used to identify distinct symptom presentations, varying in complexity. The fact that these patterns of DSM-5 PTSD symptoms have been consistently found across different samples suggests there are clear subtypes of post-trauma responding (Byrne et al., 2019; Campbell et al., 2020). It is noteworthy that even among those with histories of abuse (usually associated with negative changes in cognitions, mood and interpersonal functioning), are two classes with predominantly fear-based symptoms and one with very low symptom endorsement. The community-based nature of this sample allowed for greater potential variability in symptom endorsement as well as the identification of both risk and protective factors among those with abuse histories.

Our crude adulthood/childhood trauma distinction did not predict class membership and the measure of frequency of abuse in childhood seems to have better accounted for differences in symptom endorsement. This finding highlights the need for nuanced measures rather than dichotomous (presence vs. absence) indicators of abuse in childhood in order to capture the diversity of abuse experiences (Van Wert et al., 2019). Both type of abuse and frequency of abuse in childhood seem to influence severity of overall psychopathology (comparing the Low Symptom class with the High All class), as well as endorsement of specific symptoms (comparing profiles with varying endorsement of alterations in cognitions and mood).

Consistent with previous findings, sexual abuse appears a particularly strong risk factor for symptom severity and complexity (e.g. Hyland et al., 2017). Sexual abuse, particularly in attachment-based relationships, is understood to result in distorted memories and beliefs about the self and others in order to protect the relationships with trusted adults necessary for survival (Bernstein & Freyd, 2014) but may also be experienced as a form of betrayal (Finkelhor & Browne, 1985). The ‘grooming’ often involved in building and subsequently betraying the victim’s trust has also been found to additionally predict symptom severity beyond the experience of sexual abuse itself (Wolf & Pruitt, 2019). A further explanation may be that sexual traumas have been associated with prominent shame and disgust (Coyle et al., 2014; Feiring & Taska, 2005) which may also contribute to overall symptom complexity.

It may be unsurprising that frequency of childhood abuse is associated with more severe and complex pathology given Herman’s (1992) original definition and previous findings (e.g. van der Kolk et al., 2005). While the measure of frequency used was not without limitations, its inclusion was an advantage of this study. It is acknowledged that the effect of ‘frequency’ may also be confounded by that of experiencing multiple types of abuse (Kessler, 2000) and of the relationship to perpetrator (many items referring to behaviour of “adults in your home”). Nevertheless, distinct effects of emotional support within the family were found, suggesting that this indicator of attachment relationship quality captured something different to the frequency of abuse measure.

It appears that levels of childhood emotional support were lower for participants in High All and Dysphoric groups when compared to the Threat classes. Indeed, this was the only distinguishing factor between the Threat and Dysphoric classes, while the classes with the highest likelihood of mood/cognition changes (High All and Dysphoric) did not differ in the amount of support received in childhood (only frequency of abuse). Consistent with

Karatzias et al. (2020), these findings may be taken to suggest that low levels of emotional support may primarily influence symptoms pertaining to altered cognitions, emotion regulation and interpersonal functioning. Further exploration of potential mechanisms is required, but preliminary research into effects on neural development suggest that experiences which are threatening (abuse) as opposed to depriving (neglect) may operate on different brain mechanisms (Ioannidis et al., 2020).

Classes also differed in their demographic characteristics. While the role of gender in post-trauma symptomology remains unclear (Brewin et al., 2017), Thompson et al. (2004) found that physical abuse in childhood was associated with mental illness in adulthood for women but not for men, perhaps explaining the overrepresentation of men in the Low Symptom class. Similarly, it is unclear why age and ethnicity differed across classes (First Nations people overrepresented in the High All compared to Low Symptom class) but it is understood that minority stress and racism can undermine parenting and heighten risk of child maltreatment (Van Wert et al., 2019) and it is noted that previous studies have reported higher rates of mental health difficulties among first nations people (Firestone et al., 2015; MacMillan et al., 2008). The lower rates of higher education among the High All class may also be influenced by socioeconomic or minority status as well as the functional impairment associated with a greater number of PTSD symptoms (Campbell et al., 2020).

It is hoped that recognition of these consistently found patterns in post-trauma symptomology will enhance clinicians' assessment of and response to more complex symptom presentations, regardless of which diagnostic system they use. It seems that even DSM-5 PTSD criteria may allow a preliminary streaming of participants into appropriate treatment. While prolonged exposure therapy may be best-suited to treating a Threat-based profile, those with a more complex profile may require a greater focus on stabilisation, skill-building (emotion regulation and interpersonal) and cognitive work in the context of a warm

and containing therapeutic relationship (Cloitre et al. 2020; Grossman et al., 2017). It has been suggested that due to the lack of attuned connection experienced by complex trauma survivors, the therapeutic relationship is an essential vehicle for recovery, providing a disparate relational experience (Cronin et al., 2014; Grossman et al., 2017).

The current findings underscore the importance of emotionally supportive contexts in protecting against more complex psychopathology, akin to those reported in studies of at-risk youth (Hambrick et al., 2018; Werner, 1989). It may be particularly important for treating clinicians to further support those who have suffered emotional neglect (likely presenting with a High All or Dysphoric profile) by working at the level of the family system, advocating for their needs within external support systems (educational, medical etc.), and supporting connectedness with others through skills training.

In addition to the limitations already mentioned, this study would have benefitted from a measure of frequency of abuse in adulthood as well as of supportive relationships in adulthood, to more appropriately assess the importance of trauma exposure in childhood. Even though it is common in large epidemiological surveys to assess child maltreatment with only a subset of questions from comprehensive scales (Afifi, et al., 2017), well-validated measures would be preferable in future research. Future exploration of latent PTSD symptom typologies may also benefit from dimensional scales of symptom frequency/ severity and subsequent LPA, to capture greater variability in symptomology. Better yet, nuances in symptom profiles may be explored by separating out different kinds of beliefs (about the self vs. others) and of affect (Litz et al., 2018). Further research may also look into changes in symptom endorsement over time, risk factors for persistently complex psychopathology and responsiveness to treatment.

The current findings extend previous evidence of DSM-5 PTSD symptom typologies to a sample of physical and sexual abuse survivors, suggesting consistent subtypes of post-

trauma responses. Risk factors for symptom complexity were identified, such that the classes with greater endorsement of negative alterations in cognitions and mood were more likely to have experienced sexual than physical abuse, greater frequency of abuse in childhood and less emotional support in childhood, compared to their fear-based counterparts. These findings confirm the ability of DSM-5 PTSD criteria to capture distinct presentations of varying complexity. Future research can add nuance and specificity to these typologies and confirm their aetiology and progression over time.

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Table 1*Demographic Characteristics and Descriptive Statistics*

Variable	<i>N</i>	%
Female gender	4797	70.9
Ethnicity		
<i>White</i>	3884	57.4
<i>Black</i>	1395	20.6
<i>First Nations</i>	177	2.6
<i>Asian</i>	154	2.3
<i>Hispanic</i>	1159	17.1
Higher education	4481	66.2
Sexual abuse	3518	52.0
Physical abuse	4701	69.4
Trauma exposure in childhood	3702	54.7
	<i>M (SD)</i>	<i>α</i>
Frequency of childhood abuse	7.65 (7.64)	.88
Emotional support	15.05 (5.47)	.92
Age	43.93 (15.35)	-

Table 2.*Incremental Fit Statistics and Classification Accuracy for Latent Class Model for DSM-5 PTSD criteria*

No. of classes	Loglikelihood (LL)	AIC	BIC	Sample size-adjusted BIC	BLRT p-value	LMRLRT	LMRLRT p-value	VLMRLRT <i>p</i> -value	Entropy	Proportions per class based on most likely membership
1	-84632.16	169304.32	169440.72	169377.17	-	-	-	-	-	1
2	-66232.22	132546.44	132826.07	132695.78	<.0001	36602.27	<0.001	<0.001	0.92	.44/.56
3	-62627.35	125378.70	125801.55	125604.53	<.0001	7171.02	<0.001	<0.001	0.88	.25/.37/.39
4	-61731.83	123629.67	124195.74	123931.98	<.0001	1781.42	<0.001	<0.001	0.83	.31/.26/.16/.27
5	-61280.70	122769.40	123478.69	123148.20	<.0001	897.43	<0.001	<0.001	0.81	.20/.14/.14/.29/.23
6	-60961.67	122173.346	123025.86	122628.64	<.0001	634.62	0.21	0.21	0.78	.14/.16/.15/.14/.18/.23
7	-60930.13	121752.27	122748.00	122284.05	<.0001	460.59	0.17	0.17	0.77	.11/.14/.09/.12/.17/.21/.17

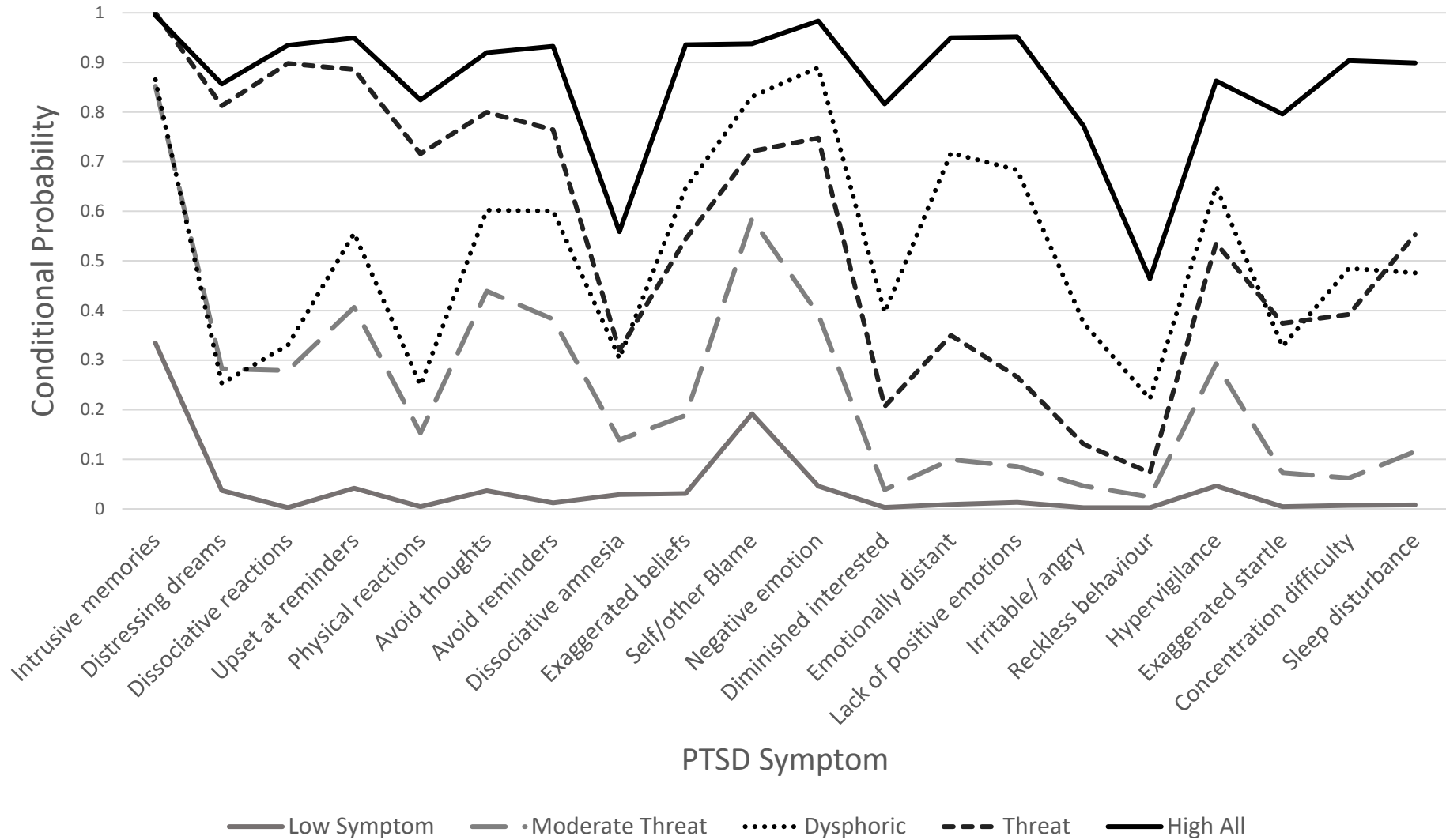
Table 3.*Key Comparisons of PTSD Symptom Classes using Multinomial Regression Analyses*

Class Comparison	Estimate	SE	Odds ratio	95% Confidence Interval	p
<i>Low Symptom vs. High All</i>					
Trauma exposure in					
childhood	0.15	0.11	1.16	0.93-1.45	0.18
Abuse type (sexual)	-0.76	0.11	0.47	0.38-0.58	<0.01
Frequency of childhood abuse	-0.15	0.01	0.87	0.85-0.88	<0.01
Emotional Support	0.01	0.01	1.01	0.99-1.03	0.29
Gender (female)	-1.08	0.10	0.34	0.28-0.41	<0.01
Age	0.02	0.00	1.02	1.02-1.03	<0.01
Higher education	0.36	0.09	1.43	1.20-1.71	<0.01
Ethnicity (White)					
Black	0.14	0.11	1.15	0.93-1.42	0.21
First Nations	-0.59	0.27	0.55	0.33-0.94	0.03
Asian	0.66	0.32	1.94	1.05-3.61	0.04
Hispanic	0.07	0.12	1.07	0.85-1.35	0.56
<i>High All vs. Threat</i>					
Trauma exposure in childhood	-0.19	0.12	0.82	0.65-1.04	0.11
Abuse type (sexual)	0.36	0.12	1.44	1.14-1.80	<0.01
Frequency of childhood abuse	0.04	0.01	1.05	1.03-1.06	<0.01
Emotional Support	-0.02	0.01	0.98	0.96-0.99	0.01
Gender (female)	0.18	0.11	1.20	0.96-1.50	0.11
Age	-0.01	0.00	0.99	0.98-0.99	<0.01
Higher education	-0.36	0.10	0.70	0.58-0.84	<0.01
Ethnicity (White)					
Black	0.11	0.12	1.12	0.89-1.41	0.35
First Nations	0.14	0.25	1.15	0.71-1.87	0.57
Asian	-0.05	0.38	0.95	0.45-1.99	0.89
Hispanic	-0.08	0.12	0.93	0.73-1.17	0.52
<i>Dysphoric vs. Threat</i>					
Trauma exposure in childhood	-0.02	0.13	0.98	0.76-1.25	0.86
Abuse type (sexual)	0.20	0.12	1.22	0.96-1.55	0.11
Frequency of childhood abuse	0.00	0.01	1.00	0.98-1.01	0.76
Emotional Support	-0.04	0.01	0.97	0.95-0.99	<0.01

Gender (female)	-0.30	0.11	0.74	0.59-0.93	0.01
Age	0.00	0.00	1.00	0.99-1.00	0.34
Higher education	-0.23	0.10	0.79	0.65-0.97	0.02
Ethnicity (White)					
Black	0.19	0.13	1.21	0.95-1.55	0.13
First Nations	-0.17	0.29	0.84	0.48-1.48	0.56
Asian	0.31	0.37	1.36	0.66-2.79	0.41
Hispanic	-0.06	0.13	0.95	0.73-1.22	0.67
<i>Dysphoric vs. Moderate</i>					
<i>Threat</i>					
Trauma exposure in childhood	-0.11	0.11	0.90	0.73-1.12	0.34
Abuse type (sexual)	0.37	0.11	1.45	1.18-1.79	<0.01
Frequency of childhood abuse	0.04	0.01	1.04	1.02-1.05	<0.01
Emotional Support	-0.03	0.01	0.97	0.96-0.99	<0.01
Gender (female)	0.09	0.10	1.09	0.91-1.32	0.34
Age	-0.01	0.00	1.00	0.99-1.00	0.06
Higher education	-0.25	0.08	0.78	0.66-0.93	0.01
Ethnicity (White)					
Black	-0.05	0.11	0.95	0.77-1.17	0.63
First Nations	0.18	0.27	1.19	0.70-2.03	0.52
Asian	-0.11	0.29	0.90	0.51-1.60	0.72
Hispanic	-0.01	0.12	0.99	0.51-1.24	0.92
<i>High All vs. Dysphoric</i>					
Trauma exposure in childhood	-0.17	0.12	0.84	0.67-1.07	0.16
Abuse type (sexual)	0.17	0.12	1.18	0.94-1.48	0.16
Frequency of childhood abuse	0.47	0.01	1.05	1.03-1.06	<0.01
Emotional Support	0.11	0.01	1.01	0.99-1.03	0.21
Gender (female)	0.48	0.11	1.62	1.31-2.02	<0.01
Age	-0.01	0.00	0.99	0.98-1.00	<0.01
Higher education	-1.30	0.09	0.88	0.73-1.05	0.16
Ethnicity (White)					
Black	-0.08	0.12	0.92	0.73-1.05	0.50
First Nations	0.31	0.26	1.37	0.82-2.29	0.24
Asian	-0.36	0.36	0.70	0.35-1.41	0.32
Hispanic	-0.02	0.12	0.98	0.77-1.25	0.86

Note. The latter of each pair of classes is the reference group for each comparison. Reference group for binary variables in brackets.

Figure 1. Post-Traumatic Stress Disorder (PTSD) symptom classes.



Supplementary Table 1

Percentage of each latent class endorsing each PTSD DSM-5 symptom

PTSD	B1	B2	B3	B4	B5	C1	C2	D1	D2	D3	D4	D5	D6	D7	E1	E2	E3	E4	E5	E6
Class																				
1	99.4	85.4	92.8	94.7	82.1	91.4	92.5	55.4	93.1	93.2	97.5	80.7	94.3	94.4	76.4	46.0	85.3	78.8	89.5	89.1
2	100.0	80.8	89.6	88.4	71.4	79.4	76.3	31.9	54.1	71.9	74.5	20.6	34.6	26.4	12.9	7.3	53.1	37.2	39.0	55.3
3	86.4	25.1	32.8	55.3	24.8	60.0	59.9	30.2	64.5	82.7	88.6	39.4	71.2	67.6	37.1	22.0	64.6	32.5	48.1	47.6
4	85.0	28.1	27.8	40.6	15.3	43.8	38.0	13.8	18.7	58.1	39.0	3.9	9.9	8.5	4.6	2.4	29.1	7.2	6.2	11.5
5	33.4	3.7	0.3	4.2	0.5	3.7	1.2	2.9	3.1	19.1	4.6	0.3	0.9	1.4	0.3	0.3	4.6	0.5	0.7	0.8

Supplementary Table 2

Multinomial Regression Analyses Predicting PTSD Symptom Class Membership

Comparison Group	Reference Group															
	High All				Threat				Dysphoric				Moderate Threat			
	<i>B</i>	<i>SE</i>	<i>OR</i>	95% CI	<i>B</i>	<i>SE</i>	<i>OR</i>	95% CI	<i>B</i>	<i>SE</i>	<i>OR</i>	95% CI	<i>B</i>	<i>SE</i>	<i>OR</i>	95% CI
Threat																
Age at Exposure (childhood)	0.19	0.12	1.21	0.96-1.53												
Abuse type (sexual)	-0.36	0.12	0.70	0.56-0.87												
Frequency of childhood abuse	-0.04	0.01	0.96	0.94-0.97												
Emotional Support	0.02	0.01	1.02	1.01-1.04												
Gender (female)	-0.18	0.11	0.83	0.67-1.04												
Age	0.01	0.00	1.01	1.01-1.02												
Higher education	0.36	0.10	1.44	1.19-1.73												
Ethnicity (White)																
Black	-0.11	0.12	0.89	0.71-1.13												
First Nations	-0.14	0.25	0.87	0.54-1.41												
Asian	0.05	0.38	1.05	0.50-2.20												
Hispanic	0.08	0.12	1.08	0.85-1.37												
Dysphoric																
Age at Exposure (childhood)	0.17	0.12	1.19	0.94-1.50	-0.02	0.13	0.98	0.76-1.25								
Abuse type (sexual)	-0.17	0.12	0.85	0.67-1.07	0.20	0.12	1.22	0.96-1.55								
Frequency of childhood abuse	-0.05	0.01	0.95	0.94-0.97	0.00	0.01	1.00	0.98-1.01								
Emotional Support	-0.01	0.01	0.99	0.97-1.01	-0.04	0.01	0.97	0.95-0.99								
Gender (female)	-0.48	0.11	0.62	0.50-0.77	-0.30	0.11	0.74	0.59-0.93								
Age	0.01	0.00	1.01	1.01-1.02	0.00	0.00	1.00	0.99-1.00								
Higher education	0.13	0.09	1.14	0.95-1.37	-0.23	0.10	0.79	0.65-0.97								
Ethnicity (White)																
Black	0.08	0.12	1.08	0.86-1.36	0.19	0.13	1.21	0.95-1.55								
First Nations	-0.31	0.26	0.73	0.44-1.23	-0.17	0.29	0.84	0.48-1.48								
Asian	0.36	0.36	1.43	0.71-2.88	0.31	0.37	1.36	0.66-2.79								
Hispanic	0.02	0.12	1.02	0.80-1.30	-0.06	0.13	0.95	0.73-1.22								
Moderate Threat																
Age at Exposure (childhood)	0.28	0.10	1.32	1.08-1.61	0.08	0.11	1.09	0.88-1.34	0.11	0.11	1.11	0.90-1.38				
Abuse type (sexual)	-0.54	0.10	0.59	0.48-0.71	-0.17	0.10	0.84	0.69-1.03	-0.37	0.11	0.69	0.56-0.85				
Frequency of childhood abuse	-0.08	0.01	0.92	0.91-0.93	-0.04	0.01	0.96	0.95-0.97	-0.04	0.01	0.96	0.95-0.98				

Emotional Support	0.02	0.01	1.02	1.00-1.03	-0.01	0.01	0.99	0.98-1.01	0.03	0.01	1.03	1.01-1.05				
Gender (female)	-0.58	0.10	0.56	0.47-0.68	-0.39	0.10	0.68	0.56-0.82	-0.09	0.10	0.91	0.76-1.10				
Age	0.02	0.00	1.02	1.01-1.02	0.00	0.00	1.00	1.00-1.01	0.01	0.00	1.01	1.00-1.01				
Higher education	0.38	0.08	1.46	1.24-1.71	0.02	0.09	1.02	0.85-1.21	0.25	0.09	1.28	1.08-1.52				
Ethnicity (White)																
Black	0.13	0.10	1.14	0.94-1.39	0.24	0.11	1.28	1.03-1.58	0.05	0.11	1.05	0.85-1.30				
First Nations	-0.49	0.23	0.61	0.39-0.97	-0.35	0.25	0.71	0.43-1.16	-0.18	0.27	0.84	0.49-1.43				
Asian	0.46	0.31	1.59	0.87-2.90	0.41	0.31	1.51	0.82-2.78	0.11	0.29	1.11	0.63-1.97				
Hispanic	0.03	0.11	1.03	0.84-1.28	-0.05	0.11	0.96	0.77-1.19	0.01	0.12	1.01	0.81-1.27				
Low Symptom																
Age at Exposure (childhood)	0.15	0.11	1.16	0.93-1.45	-0.04	0.12	0.96	0.76-1.20	-0.02	0.12	0.98	0.78-1.23	-0.13	0.10	0.88	0.73-1.06
Abuse type (sexual)	-0.76	0.11	0.47	0.38-0.58	-0.40	0.11	0.67	0.54-0.84	-0.60	0.12	0.55	0.44-0.69	-0.23	0.09	0.80	0.66-0.96
Frequency of childhood abuse	-0.15	0.01	0.87	0.85-0.88	-0.10	0.01	0.90	0.89-0.92	-0.10	0.01	0.91	0.89-0.92	-0.06	0.01	0.94	0.93-0.95
Emotional Support	0.01	0.01	1.01	0.99-1.03	-0.01	0.01	0.99	0.97-1.01	0.02	0.01	1.02	1.00-1.04	-0.01	0.01	0.99	0.98-1.01
Gender (female)	-1.08	0.10	0.34	0.28-0.41	-0.90	0.10	0.41	0.34-0.49	-0.60	0.10	0.55	0.45-0.67	-0.51	0.08	0.60	0.52-0.70
Age	0.02	0.00	1.02	1.02-1.03	0.01	0.00	1.01	1.00-1.02	0.01	0.00	1.01	1.01-1.02	0.01	0.00	1.01	1.00-1.01
Higher education	0.36	0.09	1.43	1.20-1.71	0.00	0.09	1.00	0.83-1.20	0.23	0.09	1.26	1.05-1.51	-0.02	0.08	0.98	0.85-1.14
Ethnicity (White)																
Black	0.14	0.11	1.15	0.93-1.42	0.25	0.12	1.28	1.02-1.61	0.06	0.11	1.06	0.85-1.33	0.01	0.09	1.01	0.84-1.20
First Nations	-0.59	0.27	0.55	0.33-0.94	-0.45	0.29	0.64	0.37-1.12	-0.28	0.30	0.76	0.42-1.37	-0.10	0.26	0.90	0.54-1.50
Asian	0.66	0.32	1.94	1.05-3.61	0.61	0.32	1.85	0.99-3.43	0.31	0.30	1.36	0.76-2.43	0.20	0.22	1.22	0.80-1.86
Hispanic	0.07	0.12	1.07	0.85-1.35	-0.01	0.12	0.99	0.78-1.26	0.05	0.12	1.05	0.82-1.34	0.04	0.10	1.04	0.85-1.26

Note. Reference group for binary variables in brackets. *B*= estimate; *OR*= odds ratio.

Light gray $p < .05$. Medium gray $p < .01$. Dark gray $p < .001$.