Validation of the Ukrainian caregiver-report version of the Child and Adolescent Trauma Screen (CATS) in children and adolescents in Ukraine.

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Abstract

Objective: Emerging research indicates that the ongoing conflict in Ukraine has led to an increased prevalence of war-related posttraumatic stress disorder (PTSD) in children and adolescents. The current study sought to test the psychometric properties of a Ukrainian-translated measure of PTSD for children and adolescents; the Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017).

Methods: Participants were an opportunistic sample of $N = 2{,}004$ parents living in Ukraine who provided data on themselves and one target child in their household as part of The Mental Health of Parents and Children in Ukraine Study. The latent structure of the parent-reported CATS was tested using confirmatory factor analysis (CFA), composite reliability (CR) estimates were estimated, and criterion validity was assessed.

Results: The latent structure of the parent-reported CATS was best reflected by a three-factor model and a four-factor model in the pre-school and child and adolescent sample, respectively. Estimates of internal reliability were high for both samples. Criterion validity was supported through associations with external measures of internalizing, externalizing, and attention problems. Parent-report child milestone development delays and prior psychological or pharmacological support were associated with higher average scores on the CATS symptom scales. The prevalence of probable PTSD for the preschool sample was 15.4% (n = 77) and the prevalence of probable PTSD for the child and adolescent sample was 14.4% (n = 217).

Discussion: This study supports the psychometric properties of the Ukrainian parent-reported CATS which can be used routinely in clinical practice for the caregiver-rated assessment of PTSD.

Keywords: war; children; adolescents; PTSD; validity; reliability.

Clinical Impact Statement

This study demonstrates that the Ukrainian parent-reported CATS is a valid and reliable measure of PTSD for children and adolescents. This is the first ever study to test and provide support for the psychometric properties of the CATS in children and adolescents living in an active war zone. The availability of this empirically validated measure should facilitate the identification and treatment of at-risk Ukrainian children and adolescents. This measure can be used in a variety of settings in Ukraine such as in- and out-patient services, private practice, and by paediatricians, as well as in neighbourhood countries which host Ukrainian refugees to ensure that these children and adolescents receive the support they need.

Validation of the Ukrainian Child and Adolescent Trauma Screen (CATS) in children and adolescents in Ukraine

The Ukrainian people have endured unimaginable loss and suffering as a result of the full-scale Russian invasion of their country on February 24, 2022. Children and their families have encountered mass violence, trauma, destruction, and displacement (UNICEF, 2023), with it estimated that over 7,155 civilians have been killed (including 438 children) and over 11,662 civilians injured (including 851 children) (United Nations, 2023). It is anticipated that the war will have profoundly detrimental impacts on the mental health of Ukrainians for generations to come (e.g., Patel & Erickson, 2022), including children and adolescents where the impacts on mental health are expected to be severe enough to persist into adulthood and on a scale that has not been seen since World War II (Elvevåg & DeLisi, 2022). Because of this, the availability of Ukrainian-translated measures of common psychological difficulties that can occur in the context of war is crucial to support mental health professionals in accurately identifying children and parents who are at risk and implementing interventions to promote recovery (Shevlin et al., 2022).

One of the most commonly observed psychological disorders in children and adolescents living in war-affected populations is posttraumatic stress disorder (PTSD) (Catani, 2018). Recently, a Ukrainian-translated version of the Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017) was developed (Ukraine: The International Trauma Consortium, 2022). The CATS measures potentially traumatic events, posttraumatic stress symptoms and functional impairment, and can be used to identify possible diagnostic cases of PTSD, in both pre-schoolers (i.e., 3-6 years) and children and adolescents (i.e., 7-17 years). The symptoms comprising the CATS directly align with the PTSD criteria set forth in the

fifth version of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association [APA], 2013). DSM-5 PTSD comprises 20 symptoms organized across four symptom clusters of re-experiencing, avoidance, negative alterations in cognitions and mood (NACM), and alterations in arousal and reactivity (AR) (Friedman, 2013; Miller et al., 2014). Diagnostic criteria for DSM-5 PTSD includes exposure to a Criterion A traumatic event, at least one re-experiencing symptom, at least one avoidance symptom, at least two NACM symptoms, and at least two AR symptoms. Symptoms must be associated by functional impairment and be present for a duration of at least one month (APA, 2013). DSM-5 included adapted and more developmentally sensitive PTSD diagnostic criteria for children aged six years and younger (APA, 2013). For this adapted PTSD criteria, it is necessary that at least one avoidance or NACM symptom is present, which is a substantial shift from the standard diagnostic criteria that required at least one avoidance and two NACM symptoms (APA, 2013). The validity and reliability of the CATS as a measure of DSM-5 PTSD in children and adolescents has been supported in numerous studies, while few studies have investigated the psychometric properties of the CATS in pre-school aged samples (for review see Dowdy-Hazlett et al., 2021). However, no study thus far has tested the psychometric properties of the CATS in children and adolescents living in an active war situation, a crucial endeavour given that PTSD is the most common form of psychopathology among war-affected children and adolescents (Attanayake et al., 2009).

A recent study by Martsenkovskyi et al. (2023) examined the prevalence and predictors of PTSD among pre-schoolers (3-6 year old) and school-aged children (7-17 year old) as measured using the CATS – Caregiver report form. They found that 18.5% of pre-schoolers and 14.2% of school-age children met criteria for a probable diagnosis of DSM-5 PTSD. Further research is now necessary to determine whether the caregiver report version of the CATS produces valid and reliable scores of probable PTSD among this population.

Consequently, the aims of the current study were to test the (1) symptom structure of the Ukrainian CATS, (2) reliability of the scores from the Ukrainian CATS, and (3) examine convergent-divergent validity patterns of the Ukrainian CATS through associations with external measures of internalizing, attention, and externalizing problems, and (4) criterion validity of the Ukrainian CATS subscales via associations with a range of predictor variables.

Methods

Participants and procedures

Data for the present study was derived from *The Mental Health of Parents and Children in Ukraine Study*, which sought to explore the impacts of Russia's war on Ukraine on the mental health and day-to-day lives of parents and their children in Ukraine. Inclusion criteria for the study included being aged 18 years or older, currently living in Ukraine, having at least one child under the age of 18 years, and being able to complete the survey in Ukrainian. Data was collected by the survey company *TGM Research*, who maintain nationally representative survey panels in 130 countries including Ukraine. The data was collected between July 15th and September 5th, 2022. Given the ongoing conflict and mass displacement of people in Ukraine, opportunistic sampling methods were used to recruit participants. Nevertheless, it was made a point to recruit participants living in different regions of Ukraine, as well as of different sexes and ages. Participants were contacted by *TGM Research* via email, in-app notification, or text message, and provided with information about the nature of the study. Consenting participants completed the survey online and were remunerated for their time by the survey company. Ethical approval for the study was obtained from the SI Institute of Psychiatry, Forensic Psychiatric Examination and Drug Monitoring at the Ministry of Health of Ukraine.

The required sample size was determined to be 1,752, using the following assumptions: a combined prevalence rate of 24% for PTSD and CPTSD in the general

population (Steel et al., 2009), a confidence interval of 95%, and a margin of error of 2%. As a result, 2,000 people was set as our target sample size. The final sample comprised of 2,004 parents who provided data on both themselves and one target child within the household (i.e., the child who was next to celebrate their birthday). Of those 2,004 parents, 24.9% (n = 499) provided information on pre-schoolers (i.e., 3-6 years) and 75.1% (n = 1505) provided information on children and adolescents (i.e., 7-17 years). Rates of trauma exposure and prevalence estimates of PTSD were estimated for the entire survey sample of pre-schoolers (n = 499) and children and adolescents (n = 1505). Only those parents who reported that their child was directly or indirectly exposed to war-related traumatic stressors were included as the analytic samples (pre-schoolers: n = 252, children and adolescents: n = 833). The mean age of the pre-school survey sample was 5.03 (SD = 0.80, Median = 5, Range = 4-6 years) and the mean age of the child and adolescent survey sample was 11.61 (SD = 3.14, Median = 12.00, Range = 7-17 years). Further descriptive statistics for the pre-school and child and adolescent survey samples are provided in Table 1.

Measures

Posttraumatic stress symptoms and PTSD: The CATS (Sachser et al., 2017) is a screening measure designed to assess for potentially traumatic events, posttraumatic stress symptoms and functional impairment according to the DSM-5 PTSD criteria. A caregiver-report version of the CATS is available for pre-school children aged 3 to 6 years while both a self-report and caregiver-report version are available for children and adolescents aged 7 to 17 years. The pre-school version of the CATS assesses the PTSD symptoms with 16 items while the child and adolescent version is comprised of 20 items. In the present study, the caregiver report version of the pre-school and child and adolescent CATS was used for both groups of young people. The trauma checklist was not implemented due to limited assessment time. But prior to completing the questionnaire, participants were asked if their

child had been exposed, directly or indirectly, to any event during the war that he or she found extremely scary. Caregivers then rated the presence of symptoms using a four-point Likert scale with responses ranging from 0 ('Never') to 3 ('Almost Always'). There are an additional five items that measure functional impairment associated with symptoms across multiple domains (i.e., school/work, hobbies, family relationships, general happiness, getting along with others) that are answered on a 'Yes' or 'No' basis. The CATS can be used to measure symptom severity or to identify probable diagnostic status. The severity scoring method involves summing responses to the sixteen questions for the pre-school sample and the twenty questions for the child and adolescent sample, producing possible scores ranging from 0 to 48 and 0 to 60, respectively. A total score ≥15 is indicative of a probable PTSD diagnostic status for pre-schoolers and a total score ≥21 is indicative of a probable PTSD diagnostic status for children and adolescents. Probable diagnostic status can be calculated according to the DSM-5 PTSD model for pre-schoolers and the standard DSM-5 PTSD model which can be used for children and adolescents (described in introduction). Symptom endorsement is indicated by response values of 2 ('Often') or 3 ('Almost Always'). Prior research has evidenced excellent reliability of the caregiver-report CATS (e.g., Sachser et al., 2017).

Predictor variables

Psychosocial functioning: The Paediatric Symptom Checklist (PSC-17; Gardner et al., 1999) is a brief measure designed to evaluate a child's emotional and behavioral problems in the areas of attention, internalizing distress, and externalizing distress. The PSC-17 is available in both self-report and caregiver-report versions, and the latter was used in this study. The response structure of the PSC-17 was amended slightly for the present study to capture potential changes in emotional or behavioral problems since the onset of the Russian war, with caregivers rating the presence of symptoms using a three-point Likert scale (0 =

Less Often, 1 = The Same, 2 = More Often). The PSC-17 can be used to derive a total scale score (range = 0-34) as well as total scores on the attention subscale (range = 0-10), internalizing subscale (range = 0-10), and externalizing subscale (range = 0-14). For the purposes of the current study, total scores on the attention, internalizing, and externalizing subscales were used. In the present study, internal reliability was excellent for the total scale (α = .87), internalizing subscale (α = .77), and externalizing scale (α = .80), and was adequate for the attention scale (α = .65).

Child-related Variables: Predictor variables included child age (in years), child gender (0 = female, 1 = male), delayed milestone development (such as delay in speech development or walking without support) (0 = no, 1 = yes), and child with prior psychological or pharmacological support for emotional or behavioral problems (0 = no, 1 = yes).

Analytic procedures

The main analyses were conducted in four phases. First, sample descriptive statistics were estimated. Second, two alternative confirmatory factor analytic (CFA) models were tested to determine the latent structure of the CATS for the preschool sample. **Model 1** was a one-factor model (all CATS items load onto a single 'PTSD' latent variable), and **Model 2** was a three-factor model (according to DSM-5 definition). **Model 1** was a one-factor model (all CATS items load onto a single 'PTSD' latent variable), and **Model 2** was a four-factor model (according to DSM-5 definition). Model 1 was used a baseline model, and Model 2 was expected to provide a better fit as symptoms should be reflective of the belonging DSM-5 clusters. If Model 2 was a better description of the data, this also provided evidence for the multi-dimension nature of PTSD. All models were tested using the robust maximum likelihood estimator (MLR; Yuan & Bentler, 2000) in Mplus 8.4 (Muthén & Muthén, 2017).

Model fit was assessed according to standard recommendations (Hu & Bentler, 1999) where 'acceptable' model fit is indicated by a non-significant chi-square value; Comparative Fit Index (CFI; Bentler, 1990) and Tucker-Lewis Index (TLI; Tucker & Lewis, 1973) values ≥.90; and Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1992) and Standardized Root Mean Square Residual (SRMR; Jöreskog & Sörbom, 1981) values ≤.08. The Bayesian Information Criterion (BIC; Sclove, 1987) was used to compare the two models with the model with the lower value being the better fitting model. A difference of at least 10 points is assumed to reflect strong evidence in favour of the model with the lower value (Raftery, 1995).

The third phase, following identification of the best-fitting CFA model, involved calculating composite reliability estimates. Composite reliability estimates have been shown to provide a more accurate estimation of internal reliability as compared to Cronbach's alpha (Raykov, 1997).

Fourth, bivariate associations between the latent variables derived from the best-fitting CFA model and age as well as total scores on the PSC-17 subscales (i.e., internalizing, externalizing, and attention scores) were examined within a structural equation modelling framework. A series of independent samples t-tests were conducted to compare means across the CATS scales for the categorical variables (i.e., gender, delayed milestone development, and child with prior psychological or pharmacological support for emotional or behavioral problems). These analyses were conducted using SPSS Version 28.0. To control for the heightened risk of Type 1 errors given the multiple comparisons, a Bonferroni correction was applied, and a new alpha level was set for the pre-school sample (0.05/9 = 0.006) and for the child and adolescent sample (0.05/12 = 0.004).

Results

Sample descriptives

For those aged 3- to 6-years old, the mean CATS score was 11.38 (SD = 7.69, Median = 8.00, Range = 0 – 38) and the most commonly reported functional impairment domain was general happiness (66.3%, n = 167). The CATS items with the highest mean scores for this sample were *'Being jumpy or easily startled'* (M = 1.07, SD = 0.86), *'upsetting thoughts or images about the war. Or re-enacting an event they experienced or witnessed in play'* (M = 0.89, SD = 0.61), and *'Problems with concentration'* (Mean = 0.89, SD = 0.85). For 7- to 17-year olds, the mean CATS score for was 16.07 (SD = 10.00, Median = 14.00, Range = 0 – 60) and the most commonly reported functional impairment domain was general happiness (77.0%, n = 641). The CATS items with the highest mean scores for this sample were '*Feeling very emotionally upset when reminded of a stressful event related to the war'* (M = 1.19, SD = 0.83), *'Trying not to remember, think about or have feelings about the war'* (M = 1.11, SD = 0.95), and *'Upsetting thoughts or images about the war. Or re-enacting an event they experienced or witnessed in play'* (M = 1.02, SD = 0.75).

CFA results

Table 2 provides the CFA fit statistics for the pre-school and child and adolescent samples. Although the chi-square statistic was significant for Model 1 and 2 in both samples, this should not be taken as evidence to reject the models as the chi square statistic is positively associated with sample size (Tanaka, 1987). For the pre-school sample Model 2 (i.e., three-factor model) provided adequate fit to the data and provided superior fit across all fit statistics compared to Model 1 (i.e., the one-factor model). For the child and adolescent samples, Model 2 (i.e., four-factor model) provided adequate fit to the data and provided superior fit across all fit statistics compared to Model 1 (i.e., the one-factor model). The

difference in BIC values between Model 2 and Model 1 for both samples exceeded 10 points, supporting this model as best-fitting.

Table 3 includes the standardized factor loadings and factor correlations for Model 2 for the pre-school sample. The majority of factor loadings were positive, strong, and statistically significant ($p < .001$), ranging from .50 to .81. Factor correlations were all statistically significant ($p < .001$) and ranged from .84 to .94. Table 4 includes the factor loadings and factor correlations for Model 2 for the child and adolescent sample. All factor loadings were positive, strong, and statistically significant ($p < .001$), and ranged from .55 to .83. Factor correlations were all statistically significant ($p < .001$) and ranged from .55 to .94.

Reliability results

The composite reliability estimates for each subscale were high for both the pre-school sample (Re-experiencing = .80, avoidance and NACM = .81, AR = .84) and the child and adolescent sample (re-experiencing = .83, avoidance = .77, NACM = .85 , AR = .83). Moreover, composite reliability estimates were high for the overall score for both the pre-school sample (.92) and the child and adolescent sample (.93).

Associations with age and external variables

As shown in Table 5, age was not significantly associated with any of the latent variables for the pre-school sample but was weakly, positively, and significantly associated with all latent variables for the child and adolescent sample. There were moderate-to-strong, positive, and statistically significant associations between internalizing scores and all latent variables for both samples. There were low-to-moderate, positive, and statistically significant associations between externalizing scores and the re-experiencing, NACM and avoidance, and AR latent variables for the pre-school sample, while there was a low, positive, and statistically significant association between externalizing scores and the re-experiencing

latent variable for the child and adolescent sample. Finally, there were strong, positive, and statistically significant associations between attention scores and all latent variables for the pre-school sample, while there were low-to-moderate associations between total attention scores and all latent variables for the child and adolescent sample.

Group differences in average CATS scales scores

For the pre-school sample (see Table 6), there were no associations between gender, nor prior psychological or pharmacological support for emotional or behavioral problems and total scores on any of the CATS scales. There was a significant association between delayed milestone development and total scores on the avoidance and NACM scale as well as the AR scale. For the child and adolescent sample (see Table 6), there was no association between gender and any of the CATS scales. Those with delayed milestone development had significant higher scores on the re-experiencing, NACM, and AR scales, while those with prior psychological or pharmacological support for emotional or behavioural problems had significantly higher scores on all scales.

Discussion

The primary objective of this study was to assess the validity and reliability of the parent-reported Ukrainian CATS among children and adolescents living in Ukraine during the Russian war. This was the first ever study to examine the psychometric properties of the CATS in children and adolescents living in an active war situation. For the pre-school sample, a three-factor model consistent with the DSM-5 model of PTSD for children aged six years and older was found to provide the best fit to the data. Moreover, consistent with prior research using the English, Norwegian, and German translations of the parent-reported CATS (Sachser et al., 2017), a four-factor model consistent with the DSM-5 model of PTSD was found to provide an acceptable representation of the symptom structure of the Ukrainian

CATS for the child and adolescent sample. All items loaded robustly onto their respective latent variables for both samples, and all latent variables were significantly correlated with each other. For the pre-school sample, all latent variables were highly correlated with one another (>.84), indicating poor distinguishability between these latent variables. Similarly, for the child and adolescent sample, all latent variables were highly correlated with one another (>.81), except for avoidance and re-experiencing (r = .57). Nevertheless, the support of the three-factor model in the pre-school sample and the four-factor model in the child and adolescent sample indicates that the parent-reported Ukrainian CATS is a valid and appropriate tool for capturing the symptom content of PTSD as described in the DSM-5 model. Similar to prior studies (e.g., Akkus et al., 2021; Sachser et al., 2017; Sachser et al., 2018), the Ukrainian CATS demonstrated high levels of internal reliability in both samples.

The second objective of this study was to examine convergent-divergent validity patterns of the Ukrainian CATS in very young children and older children and adolescents. Findings demonstrated moderate-to-strong associations between internalizing scores and all of the CATS latent variables. Moreover, there were strong associations between attention scores and all CATS latent variables (i.e., re-experiencing, NACM and avoidance, AR) for the pre-school sample, while for the child and adolescent sample the associations were weak-to-moderate. Finally, there were weak-to-moderate associations between externalizing scores and all latent variables (i.e., re-experiencing, NACM and avoidance, AR) for the pre-school sample, while there were weak associations between externalizing scores and the intrusion latent variable for the child and adolescent sample. These findings follow a similar trend to those observed in the initial validation study also using parent-reported CATS (Sachser et al., 2017). The magnitude of the associations was somewhat lower in the present study but this is likely due to the fact that we focused on the subscale scores of the CATS while the initially study focused on the total score, and thus avoided attenuated effects due to multicollinearity.

Nevertheless, like Sachser et al. (2017), the Ukrainian CATS demonstrated the expected patterns of convergent-divergent validity.

This study also explored the association between a range of child-related variables and the CATS scales. Findings demonstrated that age was significantly albeit weakly associated with all CATS latent variables for the child and adolescent sample while there were no significant associations for the pre-school sample. This is to be expected given that older adolescents experience increased exposure to traumatic events and are more likely to engage in high-risk activities, placing them at greater risk of PTSD (Nooner et al., 2012). Within the Ukrainian context, it is likely that older adolescents have a greater awareness of ongoing events and are less shielded from the realities of war as compared to their younger counterparts. Moreover, the current study utilized the parent-reported Ukrainian CATS and hence, it is possible that parents may struggle to a greater degree to identify the presence of PTSD symptoms in pre-schoolers (Meiser-Stedman et al., 2017). The results also showed that there were no gender differences in the average scores on the CATS scales for either sample. Although there is a substantial body of research demonstrating that females are more likely to acquire PTSD, much remains to be determined regarding the stage of development at which this gap develops (Garza & Jovanovic, 2017). Moreover, in the present sample, all participants are exposed to the same traumatic situation, which may cancel out any potential gender effects. Parent-reported child developmental milestone delay was associated with higher average scores on both the NACM and avoidance and AR scales for the pre-school sample and was associated with higher average scores on the re-experiencing and AR scales for the child and adolescent sample. These findings are generally consistent with a prior study where parent-reported child developmental milestone delay was identified as one of the strongest predictors of PTSD in Ukrainian pre-schoolers and children (Martsenkovskyi et al., 2022). It is not surprising that developmental milestone delay and NACM symptoms were

positively correlated for the pre-school group given that developmental milestone delay may include deficits in cognitive and emotional development. Parents could find it challenging to distinguish between symptoms that are specific to trauma and those that are due to developmental milestone delays. Finally, prior experience of psychological or pharmacological support was associated with higher average scores across all CATS scales for the child and adolescent sample. This is unsurprising given that it is widely established that psychological problems prior to a trauma represents a risk factor for the development of PTSD in children and adolescents (Connor et al., 2015; McLaughlin et al., 2013; Trickey et al., 2012). It is also possible that these participants had experienced trauma prior to the war, with research demonstrating prior trauma exposure as a significant risk factor of later PTSD (Copeland et al., 2007).

There are some limitations associated with this study. First, given the ongoing conflict and the mass displacement of people in Ukraine, it was not possible to obtain a representative sample. Nevertheless, steps were taken to ensure representativeness of the sample with respect to sex, age, and living location in Ukraine. Second, findings from the present study are based on parental reports. Prior research has indicated that the use of parent-reports alone can lead to underreporting of PTSD symptoms (Scheeringa et al., 2006), while symptoms of PTSD in young children can often go unrecognized by parents (Meiser-Stedman et al., 2017). Prior research has shown moderate-to-high correlations between children's self-reports and parent reports (Sachser et al., 2017), and thus, future research may benefit from investigating the psychometric properties of a self-report version of the Ukrainian CATS. The gender variable in the current study had a sizable missingness rate for both sample (39.5% of pre-school sample and 37.7% of the child and adolescent sample). This was due to an error in the initial survey where gender of the child was not inquired about. Efforts were made to re-contact participants to determine the gender of their child, with responses obtained from

61.8% of the participants. Hence, the findings regarding gender differences may not be generalisable to the sample as a whole. Finally, the trauma checklist that is part of the CATS was not implemented in the current study due to time constraints with the implementation of the survey and the broad scope of the survey, and hence, it was not possible to ascertain the linked to the war or other traumatic experiences.

In conclusion, this study was the first to examine the psychometric properties of the CATS in a war-affected child and adolescent population. Findings from the present study support the validity and reliability of the parent-reported Ukrainian version of the CATS. Given the urgency of addressing the psychological impact of the Russian war on Ukraine, the availability of an empirically validated measure of PTSD for young people should facilitate the identification and treatment of at-risk children and adolescents. This measure could not only be utilized in a variety of settings in Ukraine including in- and out-patient services, private practice, and by paediatricians, but could also be utilized in neighbourhood countries such as Poland which has hosted the vast majority of Ukrainian refugees. Using this measure will facilitate effective identification of children who need mental health treatment, which would ultimately facilitate the entry into the psychiatric/psychotherapeutic care system.

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Table 1: Demographic characteristics of pre-school and child and adolescent samples

	Pre-school sample (n = 499)	**Child and adolescents (n = 1505)**
	% (n)	**% (n)**
Child Gender [a]		
Male	32.3% (n = 161)	31.1% (n = 468)
Female	28.3% (n = 141)	31.1% (n = 468)
Child with prior psychological or pharmacological support for emotional or behavioural problems	13.8% (n = 69)	12.4% (n = 186)
Child with delayed milestone development	17.6% (n = 88)	8.4% (n = 127)
Parent marital status		
Married or living with their partner	82.4% (n = 411)	76.5% (n = 1152)
Other	17.6% (n = 88)	97.9% (n = 353)
Education parent		
School education	37.1% (n = 185)	37.4% (n = 563)
University education	62.9% (n = 314)	62.6% (n = 942)
Employment parent		
Full-time employment	32.7% (n = 163)	42.1% (n = 634)
Other	67.3% (n = 336)	57.9% (n = 871)
Current living location in Ukraine		
Western Ukraine	25.9% (n = 129)	24.5% (n = 368)
North Ukraine	26.3% (n = 131)	28.0% (n = 422)
Central Ukraine	19.8% (n = 99)	17.7% (n = 266)
Eastern Ukraine	4.8% (n = 24)	5.4% (n = 81)
Forced to move to another part of Ukraine	33.9% (n = 169)	27.0% (n = 406)
Forced to move to another country	13.0% (n = 65)	8.4% (n = 126)
Area of residence		
Rural	31.1% (n = 155)	23.1% (n = 347)
Urban	68.9% (n = 344)	76.9% (n = 1158)
Property type		
Apartment or house	97.2% (n = 485)	96.5% (n = 1453)
Emergency housing	2.8% (n = 14)	3.5% (n = 52)
Parent gender		
Female	67.3% (n = 336)	31.1% (n = 468)
Male	32.7% (n = 163)	31.1% (n = 468)
Parent age group		
18-29 years	39.1% (n = 195)	10.5% (n = 158)
30-39 years	57.7% (n = 288)	78.1% (n = 1175)
50-59 years	3.2% (n = 16)	11.4% (n = 172)
Emergency worker status		
Parent	13.4% (n = 67)	11.6% (n = 174)
Relative	42.3% (n = 211)	39.9% (n = 600)

[a] data on gender variable missing for 39.5% (n = 197) of pre-school sample and 37.7% (n = 569) of the child and adolescent sample.

Table 2: Fit Statistics for CFA models

Model	**χ^2 (df)**	**TLI**	**CFI**	**RMSEA (90% C.I.)**	**SRMR**	**BIC**
Pre-school sample (n = 252)						
Model 1: One-factor model	262.270* (104), $p < .001$	.872	.889	.078 (.066, .089)	.056	7781.941
Model 2: Three-factor model	231.208* (1011), $p< .001$	.892	.909	.072 (.059, .084)	.052	7753.973
Child and adolescent sample (n=833)						
Model 1: One-factor model	1024.559* (170), $p <.001$	.845	.827	.078 (.073, .082)	.057	32380.344
Model 2: Four-factor model	626.585* (164), $p < .001$	.903	.916	.058 (.053, .063)	.044	31875.357

Note: χ^2 = chi-square test, TLI= Tucker Lewis Index, CFI= Comparative Fit Index, RMSEA= Root Mean Square Error of Approximation,

*p<.001

Table 3: Standardized factor loadings for trauma-exposed pre-school sample

	Mean (SD)	Re-experiencing	NACM & Avoidance	AR
1. Upsetting thoughts or images about the war. Or re-enacting an event they experienced or witnessed in play.	0.89 (0.61)	.496		
2. Having bad dreams related to the war.	0.75 (0.71)	.614		
3. Acting, playing, or feeling as if a stressful event related to the war is happening right now.	0.85 (0.70)	.693		
4. Feeling very emotionally upset when reminded of a stressful event related to the war.	0.99 (0.77)	.751		
5. Strong physical reactions when reminded of a stressful event related to the war (sweating, heart beating fast).	0.63 (0.80)	.758		
6. Trying not to remember, think about or have feelings about the war.	0.69 (0.85)		.503	
7. Avoiding anything that is a reminder of the war (activities, people, places, things, talks).	0.58 (0.82)		.508	
8. Increase in negative emotional states (afraid, angry, guilty, ashamed, confusion).	0.87 (0.81)		.781	
9. Losing interest in activities s/he enjoyed before a stressful event. Including not playing as much.	0.69 (0.78)		.773	
10. Acting socially withdrawn.	0.40 (0.68)		.589	
11. Reduction in showing positive feelings (being happy, having loving feelings).	0.46 (0.61)		.682	
12. Being irritable. Or having angry outbursts without a good reason and taking it out on other people or things.	0.75 (0.81)			.699
13. Being overly alert or on guard.	0.74 (0.77)			.728
14. Being jumpy or easily startled.	1.07 (0.86)			.812
15. Problems with concentration.	0.89 (0.85)			.703
16. Trouble falling or staying asleep.	0.85 (0.77)			.633
Factor correlations				
Re-experiencing	-	-		
Avoidance & NACM		.84	-	
AR		.89	.96	-

*Note: NACM = negative alterations in cognition and mood, AR = alterations in arousal and reactivity

Table 4: Standardized factor loadings for trauma-exposed child and adolescent sample

	Mean (SD)	RE	Avoidance	NACM	AR
1. Upsetting thoughts or images about the war. Or re-enacting an event they experienced or witnessed in play.	1.02 (0.75)	.583			
2. Having bad dreams related to the war.	0.88 (0.68)	.710			
3. Acting, playing or feeling as if a stressful event related to the war is happening right now.	0.78 (0.73)	.724			
4. Feeling very emotionally upset when reminded of a stressful event related to the war.	1.19 (0.83)	.741			
5. Strong physical reactions when reminded of a stressful event related to the war (sweating, heart beating fast).	0.79 (0.86)	.751			
6. Trying not to remember, think about or have feelings about the war.	1.11 (0.95)		.747		
7. Avoiding anything that is a reminder of the war (activities, people, places, things, talks).	0.92 (0.92)		.834		
8. Not being able to remember an important part of a stressful event they experienced during the way	0.44 (0.67)			.547	
9. Negative changes in how s/he thinks about self, others or the world after a stressful event related to the war.	0.73 (0.76)			.700	
10. Thinking the stressful event happened because s/he or someone else did something wrong or did not do enough to stop it.	0.34 (0.65)			.547	
11. Having very negative emotional states (afraid, angry, guilty, ashamed).	0.73 (0.74)			.753	
12. Losing interest in activities s/he enjoyed before the stressful event.	0.88 (0.82)			.714	
13. Feeling distant or cut off from people around her/him.	0.69 (0.79)			.718	
14. Not showing positive feelings (being happy, having loving feelings).	0.64 (0.74)			.680	
15. Being irritable. Or having angry outbursts without a good reason and taking it out on other people or things.	0.84 (0.76)				.688
16. Risky behaviour or behaviour that could harmful.	0.37 (0.63)				.599
17. Being overly alert or on guard.	0.83 (0.74)				.646
18. Being jumpy or easily startled.	1.00 (0.76)				.733
19. Problems with concentration.	0.91 (.80)				.695
20. Trouble falling or staying asleep.	0.98 (0.81)				.617
Factor correlations					
Re-experiencing	-	-			
Avoidance		.57	-		
NACM		.81	.81	-	
AR		.84	.55	.94	-

*Note: Re = re-experiencing, NACM = negative alterations in cognition and mood, AR = alterations in arousal and reactivity

Table 5: Standardized bivariate correlations for the latent factors and mental health outcomes.

	Pre-school sample			
	Age	Internalizing	Externalizing	Attention
Re-experiencing	-.018	.397***	.214**	.404***
Avoidance & NACM	.001	.442***	.349***	.450***
AR	-.011	.427***	.286***	.520***
	Child and adolescent sample			
Re-experiencing	.149***	.370***	.169***	.275***
Avoidance	.170***	.237***	.034	.133***
NACM	.163***	.572***	.250	.273***
AR	.058***	.454***	.323	.434***

Note: *p < .05, ** p < .01, ***p < .001

NACM = negative alterations in cognition and mood, AR = alterations in arousal and reactivity

Table 6: Group differences in average CATS scale scores

			Re-experiencing				Avoidance & NACM				AR			
	Group	**N**	**M**	**SD**	**t**	**d**	**M**	**SD**	**t**	**d**	**M**	**SD**	**t**	**d**
Pre-school sample														
Gender	Female	67	4.00	2.41	-1.469	-	3.72	3.24	-.056	-	4.60	2.83	-1.268	-
	Male	83	4.69	3.31			3.75	3.40			5.23	3.19		
Delayed milestone development	Yes	48	4.98	3.04	-2.499	-	4.88	3.60	**-2.809**	.43	6.08	3.10	**-2.936**	.48
	No	204	3.92	2.55			3.43	3.12			4.65	2.82		
Prior psychological/pharmacological support	Yes	45	4.76	3.14	-1.766	-	4.24	3.49	-1.233	-	5.58	3.26	-1.668	-
	No	207	3.98	2.55			3.58	3.20			4.78	2.84		

Child and adolescent sample	**Group**	**N**	**M**	**SD**	**t**	**d**	**M**	**SD**	**t**	**d**	**M**	**SD**	**t**	**d**	**M**	**SD**	**t**	**d**
Gender	Female	267	4.58	2.86	-0.902	-	2.01	1.74	-0.246	-	4.30	3.77	-0.917	-	4.66	3.31	-1.343	-
	Male	249	4.81	3.13			2.04	1.64			4.61	3.92			5.04	3.26		
Delayed milestone development	Yes	73	6.33	3.44	**-4.424**	.58	2.41	1.71	-1.988	-	6.81	4.46	**-4.785**	.63	7.16	3.94	**-5.180**	.69
	No	760	4.49	2.87			2.00	1.67			4.24	3.61			4.71	3.14		
Prior psychological/pharmacological support	Yes	118	6.31	3.36	**-5.933**	.62	2.62	1.73	**-4.136**	.40	6.58	3.84	**-6.798**	.66	6.86	3.36	**-7.125**	.69
	No	715	4.38	2.81			1.94	1.65			4.11	3.63			4.60	3.17		

Note: t-values in bold are significant at $p < .004$

data on gender variable missing for 39.5% (n = 197) of pre-school sample and 37.7% (n = 569) of the child and adolescent sample.