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Adapting the Child and Adolescent Trauma Screen (CATS) methodology for the Ukrainian-speaking population

Адаптація україномовної версії скрінінгу дитячої та підліткової травми (CATS)

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Анотація

Мета статті – здійснення адаптації та оцінка психометричних якостей україномовної версії Скрінінгу дитячої та підліткової травми (the Child and Adolescent Trauma Screen, CATS). Дослідження зосереджено на розробці надійного інструменту для оцінки психологічних ускладнень, спричинених травмою, у дітей та підлітків з урахуванням унікальних культурних та контекстуальних особливостей цільової групи населення.

Методи дослідження. У дослідженні використовується поєднання теоретичного аналізу та методів психометричної оцінки для тестування надійності та валідності адаптованого опитувальника CATS. Статистичний аналіз, включаючи аналіз внутрішньої узгодженості, компонентний аналіз, та факторний аналіз, проводиться з використанням програмного забезпечення R версії 4.2.2.

Результати. Адаптована методика CATS демонструє високу внутрішню узгодженість ($\alpha = 0{,}850$) та має трифакторну структуру, яка пояснює різні аспекти впливу травми та пов'язаних із нею симптомів на українських дітей та підлітків. Конфірматорний факторний аналіз вказує на прийнятні індекси згоди, підтверджуючи валідність адаптованого опитувальника CATS при оцінці симптомів, пов'язаних із травмою, у цій групі населення.

Висновки. У дослідженні робиться висновок, що адаптована методика CATS є дієвим інструментом виявлення травматичної психопатології в українських дітей та підлітків, які постраждали від війни. Її використання забезпечує глибше розуміння впливу війни на психічне здоров'я. Крім того, аналіз методики вказує на важливість інструментів скринінгу, які враховують культурні особливості у вирішенні кризи психічного здоров'я населення, що постраждало від війни. Надаючи надійні засоби виявлення психологічного дистресу, адаптований опитувальник CATS полегшує проведення цілеспрямованих втручань для пом'якшення несприятливих наслідків травми та підвищення стійкості української молоді.

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Ключові слова: скринінг дитячої та підліткової травми (CATS), адаптація, психометрична оцінка, травматична психопатологія, україномовне населення, криза психічного здоров'я.

Summary

The purpose of this article is to present and test an adaptation of the Child and Adolescent Trauma Screen (CATS) methodology for the Ukrainian-speaking population affected by the war in Ukraine. The study focuses on developing a reliable instrument to assess trauma-induced psychopathology among children and adolescents, taking into account the unique cultural and contextual characteristics of the target population.

Research methods. The study uses a combination of theoretical analysis and psychometric evaluation methods to test the reliability and validity of the adapted CATS questionnaire. Statistical analysis, including internal consistency analysis, component analysis, and factor analysis, were performed using R software version 4.2.2.

Results. The adapted CATS methodology demonstrates high internal consistency ($\alpha = 0.850$) and has a three-factor structure that explains various aspects of the impact of trauma and related symptoms on Ukrainian children and adolescents. Confirmatory factor analysis has indicated acceptable goodness-of-fit indices, confirming the validity of the adapted CATS questionnaire in assessing trauma-related psychopathology in the target population.

Conclusions. The study concludes that the adapted CATS methodology is a valid tool for identifying traumatic psychopathology in Ukrainian children and adolescents who have suffered from war. Using it provides greater understanding of the war's impact on mental health. In addition, analysis of the methodology points to the importance of culturally sensitive screening tools in addressing the mental health crisis among war-affected populations. By providing a reliable means of identifying

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psychological distress, the adapted CATS questionnaire can facilitate targeted interventions to mitigate the adverse effects of trauma and enhance resilience among Ukrainian youth.

Keywords: Childhood and Adolescent Trauma Screen (CATS), adaptation, psychometric assessment, traumatic psychopathology, Ukrainian-speaking population, mental health crisis.

Problem Statement. February 2022 became a distinctive year for the Ukrainian people due to Russia's deployment of a full-scale war on Ukrainian territory. War, as has long been known, has a significant impact on society, including the mental health of the population affected by military aggression. In this case, children and adolescents are a particularly vulnerable category because they are more susceptible to the harmful effects of war and other crisis events (Peek et al., 2017; Kadir et al., 2019; Shenoda et al., 2020). The scale of the psychological crisis of the Ukrainian population, including those in the younger age range, is catastrophic. Statistics indicate that at least 1.5 million children have been affected by war, and at least 9% of them have experienced moderate or severe mental health problems (Haddad et al., 2022). In this regard, the negative impact of military aggression on the mental health of children is undeniable, further aggravated by the traumatic experiences they endure in places close to combat zones. In particular, according to a report by CP AoR (2023), to date, at least 1.5 million children suffer from symptoms of depression, post-traumatic stress disorder (PTSD), and other mental illnesses.

However, there is debate regarding exactly how war may specifically affect the psychological functioning of younger people. For example, Papadopoulos (2007) explains that the interplay between trauma, adversity, and resilience among displaced populations is, in fact, very complex. In his study, the researcher posits the concept of adversity-affected development (AAD) and challenges traditional views of trauma as uniquely detrimental to psychological health. In particular, the AAD suggests that adversity, including the experience of displacement, can catalyze personal growth and

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resilience, which may indicate the natural resilience inherent in people who face adversity. In this regard, against the backdrop of this mental health landscape, the need to promptly identify trauma-induced psychopathologies in children and adolescents and analyze how war affects their mental functioning is of paramount importance. Early identification is expected to improve the effectiveness of targeted interventions aimed at mitigating the adverse effects of trauma and enhancing resilience and mental well-being. In this case, there is a need to introduce reliable screening methodologies that would allow health professionals, psychologists, and social workers to identify the presence of mental distress in war-affected children and adolescents and tailor interventions accordingly.

Building on the ideas proposed by Papadopoulos (2007), it is clear that adaptation of trauma screening methodologies for populations affected by conflict and displacement should not only focus on identifying and addressing trauma-related symptoms but also consider the potential for resilience and growth within these communities. Accordingly, it is necessary to approach the development and improvement of screening tools, taking into account the cultural and contextual characteristics of the target population, including refugees and internally displaced persons (IDPs) in Ukraine.

In light of the growing mental health crisis caused by the war, Adapting the Child and Adolescent Trauma Screen (CATS) methodology to the Ukrainian context can be seen as an important step in the development of interventions. The CATS is an innovative child mental health assessment tool that is specifically designed to identify potentially traumatic events (PTEs) and post-traumatic stress symptoms (PTSD) among children and adolescents (Sachser et al., 2017; Pfeiffer & Goldbeck, 2017). This tool was created in 2014 by Professor Lutz Goldbeck and Professor Lucy Berliner in collaboration with the CATS Consortium, incorporating diagnostic criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). To date, the CATS questionnaire, available in both self-assessment and interview formats, has been characterized as universal and accessible because it captures the nuanced development and cognitive abilities of pediatric populations across different age

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groups. In addition, the CATS is designed in different versions, adapted for preschoolers (3-6 years old), or older children and youth (7-17 years old), with special attention to their development (Dowdy-Hazlett et al., 2021). In this regard, the CATS is a comprehensive instrument that allows for assessment in a short time (approximately 15 minutes), consisting of 15 questions assessing traumatic events, 20 questions assessing DSM-5 PTSD symptoms, and 5 questions assessing psychosocial functioning (Kaplow et al., 2020; Lehmann et al., 2020). Its brevity and efficiency make it suitable for routine clinical use, facilitating rapid identification of at-risk individuals in clinical settings. It is important to note that linguistic inclusivity is a hallmark of the CATS methodology, as its translations are available in many languages, including but not limited to German, Norwegian, Spanish, and Turkish, ensuring the cross-cultural applicability and relevance of the methodology (Dowdy-Hazlett et al., 2021).

Recent Source Analysis. A number of studies indicate the reliability and effectiveness of the CATS for children and adolescents. For example, this methodology was used by Redican et al. (2023) to examine the prevalence of war-related post-traumatic stress disorder (PTSD) among children and adolescents in Ukraine amid the ongoing war. The study, conducted on a sample of 2004 parents living in Ukraine, aimed to evaluate the psychometric properties of the Ukrainian-translated version of the CATS. The confirmatory factor analysis (CFA) has revealed a three-factor model for the preschool sample and a four-factor model for the sample of older children and adolescents. High internal reliability scores were observed in both samples, and criterion validity was supported by associations with external measures of internalizing, externalizing, and attention problems. In addition, Redican et al. (2023) have found links between the CATS symptom scale and parent-reported child developmental delay and prior psychological or pharmacological support. The study found that the prevalence of probable PTSD was 15.4% among the sample of preschoolers and 14.4% among the sample of children and adolescents, supporting the utility of the CATS in routine clinical practice for assessing PTSD by caregivers.

This screening method was also used by Nilsson et al. (2020) in their study aimed at examining the psychometric properties of the Swedish version of the CATS.

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The study involved 591 Swedish schoolchildren aged 13–17 years, and a clinical group of 42 children with potential trauma. The results have shown reliable internal consistency for all four CATS subscales (α = 0.73–0.89). The four-factor model of PTSD demonstrated good compliance, reliability, and convergent validity, with the CATS demonstrating a strong correlation with the TSCC PTSD subscale (r = 0.82). In this regard, the CATS has been evaluated as a valid screening tool for use in clinical settings and beyond to detect the presence of PTSD in children and adolescents accurately.

In turn, Suliman et al. (2005) came to similar conclusions. Their study focused on trauma and PTSD among South African youth, comparing different assessment methods to see if they provided sufficient and valid information. The study, in which 58 adolescents from two Cape Town schools took part, involved a clinical interview using selected modules of the K-SADS-PL and the CATS scales. The results showed that 91% of youth reported exposure to traumatic events on the CATS, with 38% experiencing symptoms severe enough to be classified as PTSD. In addition, the CATS demonstrated effectiveness in distinguishing adolescents who meet DSM-IV criteria for PTSD from those who do not. Accordingly, this study has demonstrated the viability of the CATS as an effective screening tool for PTSD in resource-limited settings.

In turn, the reliability and validity of the Child and Adolescent Trauma Screen (CATS) with children exposed to trauma were also studied in the USA, Germany, and Norway (Sachser et al., 2017). The purpose of this study was to provide insight into its utility as a systematic screening tool for post-traumatic stress (PTSD) symptoms. The results have shown reliable internal consistency across all language samples, α ranging from 0.88 to 0.94 for the 20-item symptom measure in both self- and caregiver-report. Convergent discriminant validity was supported by moderate to strong correlations with measures of depression and anxiety, and low to moderate correlations with externalizing symptoms across all language versions. The CFA supported the DSM-5 core factor structure, which captured reexperiencing, avoidance, negative changes in mood and cognition, and hyperarousal symptom clusters. Another similar study was conducted in Turkey by Akkuş et al. (2021), aiming to address the lack of culturally

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adapted screening tools for potentially traumatic events (PTE) among preschool children, especially in pediatric outpatient settings. The results have shown strong internal consistency (Cronbach's alpha = 0.86) for the Turkish version of the methodology, CATS Caregiver-report 3-6 Years. In this regard, given the positive characteristics of the CATS scale and its applicability in different cultural environments, this study aims to adapt the scale for the Ukrainian-speaking population.

The purpose of the study of the psychometric characteristics of the Child and Adolescent Trauma Screen (CATS) methodology is to develop an adapted tool for assessing the impact of traumatic events, PTSD, and mental functioning among children and adolescents, which would be suitable for use among the Ukrainian-speaking population.

The main objectives of the study:

1) to study the peculiarities of cultural adaptation of CATS methodology through theoretical analysis to ensure its relevance, appropriateness, and sensitivity to the Ukrainian-speaking population;

2) to assess the validity of this scale in accurately identifying trauma symptoms and experiences among children and adolescents in Ukraine;

3) to evaluate the psychometric properties of the adapted CATS instrument, including its internal consistency, test-retest reliability, and factor structure, to ensure its effectiveness in measuring trauma-related symptoms;

4) to assess the clinical utility of the adapted CATS methodology in identifying trauma exposure and symptoms among Ukrainian-speaking children and adolescents, including examining its practicality, feasibility, and usefulness in clinical settings.

Methods

The Child and Adolescent Trauma Screen (CATS) Methodology. This study used the CATS methodology translated into Ukrainian. The questionnaire includes three main scales:

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- Traumatic Events Scale. This scale consists of 15 items designed to assess the impact of potentially traumatic events, where the participant's response to the scale implies indicating "Yes" or "No."
- Post-traumatic stress symptom scale. The scale consists of 20 items and assesses PTSD symptoms based on DSM-5 criteria, including re-experiencing, avoidance, negative changes in mood and cognition, and hyperarousal symptom clusters. When completing this scale, children were asked to indicate the frequency/severity of each symptom on a 4-point response scale ranging from "0" (never) to "3" (almost always).
- Psychosocial Functioning Scale. This scale includes 5 items assessing the impact of trauma on various areas of psychosocial functioning, where children must select "Yes" or "No."

Statistical Analysis. Statistical analyses were conducted using R version 4.2.2 to evaluate the psychometric properties of the Child and Adolescent Trauma Screen (CATS) methodology adapted for Ukrainian audiences. Assessing the reliability and validity of the adapted CATS questionnaire included three main analyses: internal consistency analysis, component analysis, and factor analysis. Internal consistency analysis was conducted to assess the reliability of the CATS questionnaire. Cronbach's alpha coefficient was calculated for each scale of the CATS to assess the internal consistency of items measuring traumatic events, PTSD symptoms, and psychosocial functioning. Component analysis, also known as exploratory factor analysis, was used to examine the underlying structure of the CATS questionnaire items. This analysis aimed to identify any underlying components or factors in the questionnaire that could provide insight into the underlying constructs being measured. Factor analysis, specifically confirmatory factor analysis (CFA), was used to test the proposed factor structure of the CATS questionnaire. CFA allowed testing whether the observed data corresponded to the hypothesized factor structure obtained from previous studies using CATS methodology.

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Data Collection and Sample Characteristics. The sample for the study included children who took part in the psychological rehabilitation program "Захищені любов'ю" ("Protected by Love"), developed by the staff of the Center for Psychological Assistance "Рівновага" ("Balance") based in Kyiv. The goal of the program was to provide psychological support and assistance to children who suffered due to the war who were in a holiday camp. 77 people took part in the study, including 11 children aged 8-9 years, 26 children aged 10-11 years, 28 children aged 12-13 years, 5 children aged 14-15 years, and 7 children aged 16-17 years.

Results

Internal Consistency

Using reliability analysis, we assessed the internal consistency of the Child and Adolescent Trauma Screen (CATS) methodology adapted for a Ukrainian audience. The results demonstrated a high level of internal consistency between the items of the CATS questionnaire ($\alpha = 0.850$).

Analysis of Principal Components

Table 1. Analysis of principal components.

	Component			
	1	**2**	**3**	**Uniqueness**
Q1_1				0.974
Q2_1	-0.544		0.459	0.464
Q3_1	0.555		0.557	0.310
Q4_1			0.767	0.346
Q5_1				0.894
Q6_1			0.551	0.609
Q7_1	-0.301		0.532	0.611
Q8_1				0.921
Q9_1	0.623			0.602
Q10_1			0.733	0.452
Q11_1				0.913

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Table 1. Analysis of principal components (continued).

Q12_1			-0.343	0.873
Q13_1			0.633	0.509
Q14_1				0.950
P1_1		0.650		0.561
P2_1		0.636		0.582
P3_1		0.512		0.689
P4_1	-0.345	0.629		0.479
P5_1		0.650		0.558
P6_1			0.398	0.827
P7_1	0.430			0.789
P8_1				0.940
P9_1		0.435	0.325	0.658
P10_1	0.576			0.587
P11_1			0.356	0.845
P12_1	0.352	0.477		0.605
P13_1	0.419			0.806
P14_1				0.893
P15_1	0.341	0.640		0.422
P16_1	0.380	0.500		0.533
P17_1	0.751			0.435
P18_1	0.477			0.741
P19_1		0.611		0.535
P20_1		0.313		0.796
P21_1	0.362		0.422	0.691
P22_1	0.758			0.414
P23_1		0.513		0.661
P24_1	0.318			0.780
P25_1	0.430	0.578	0.304	0.388
P26_1	0.343	0.313		0.782
P27_1	0.319	0.379		0.745
P28_1	0.406			0.753
P29_1	0.371		0.454	0.652
P30_1		0.411		0.753

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Table 1. Analysis of principal components (continued).

Component	Sum of square loads (SS)	% of variance	Accumulated %
1	5.20	11.80	11.80
2	5.03	11.40	23.30
3	4.43	10.10	33.30

A component analysis applied to the Child and Adolescent Trauma Screen (CATS) methodology adapted for a Ukrainian audience has identified three components, each with its own distinctive characteristics (Table 1). Component 1 explains approximately 11.80% of the total variance in the data, representing an important factor underlying the CATS questionnaire and allowing for assessing the impact of trauma and associated symptoms among children and adolescents in Ukraine. Component 2 explains approximately 11.40% of the total variance, demonstrating the scale's ability to detect PTSD symptoms in the study population. Component 3 explains approximately 10.10% of the total variance and represents another aspect of the constructs measured by the CATS questionnaire that provide additional information about the impact of trauma on the mental functioning of children and adolescents in Ukraine.

Exploratory Factor Analysis

Table 2. Exploratory factor analysis.

Factor	Sum of square loads (SS)	% of variance	Accumulated %
1	5.18	11.77	11.80
2	4.43	10.07	21.80
3	3.26	7.40	29.20

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Factor summary statistics provide insight into the variance explained by each factor and their combined contribution (Table 2). In this case, Factor 1 explains 11.77% of the total variance with a sum of square loadings (SS) of 5.18. It accounts for 11.80% of the total variance, indicating that it contributes significantly to the overall variability in the data. Factor 2 explains 10.07% of the variance and accounts for 21.80% of the total variance, suggesting that it captures a significant portion of the underlying structure of the questionnaire. Factor 3 explains 7.40% of the variance with SS = 3.26. It accounts for 29.20% of the total variance, indicating moderate variability in the data.

Confirmatory Factor Analysis

Table 3. Confirmatory factor analysis.

Factor	Indicator	Weight	SE	p
Factor 1	P1_1	0.403	0.1139	< .001
	P2_1	0.357	0.1217	0.003
	P3_1	0.185	0.1228	0.131
	P4_1	0.440	0.1325	< .001
	P5_1	0.427	0.1618	0.008
	P9_1	0.391	0.1180	< .001
	P12_1	0.624	0.1413	< .001
	P15_1	0.723	0.1241	< .001
	P16_1	0.662	0.1428	< .001
	P19_1	0.451	0.1182	< .001
	P20_1	0.346	0.1362	0.011
	P23_1	0.365	0.1616	0.024
	P25_1	0.673	0.1402	< .001
	P26_1	0.209	0.0719	0.004
	P27_1	0.186	0.0708	0.009
	P30_1	0.164	0.0805	0.041
Factor 2	Q2_1	0.170	0.0623	0.006
	Q3_1	-0.260	0.0592	< .001
	Q6_1	-0.173	0.0562	0.002
	Q9_1	-0.180	0.0511	< .001
	P4_1	0.376	0.1323	0.005
	P7_1	-0.239	0.1529	0.118

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Table 3. Confirmatory factor analysis (continued).

	P10_1	-0.481	0.1304	< .001
	P13_1	-0.284	0.1323	0.032
	P17_1	-0.539	0.1183	< .001
	P18_1	-0.362	0.1153	0.002
	P21_1	-0.228	0.0841	0.007
	P22_1	-0.697	0.1263	< .001
	P25_1	-0.155	0.1314	0.238
	P29_1	-0.214	0.0795	0.007
Factor 3	Q2_1	0.256	0.0655	< .001
	Q3_1	0.142	0.0557	0.011
	Q4_1	0.424	0.0626	< .001
	Q6_1	0.199	0.0561	< .001
	Q7_1	0.245	0.0728	< .001
	Q10_1	0.252	0.0769	0.001
	Q13_1	0.206	0.0809	0.011

In confirmatory factor analysis (Table 3), Factor 1 shows significant positive loadings on items associated with emotional distress such as feelings of distress and guilt (P1_1, P4_1, P5_1, P9_1, P12_1, P15_1, P16_1, P19_1, P20_1, P23_1, P25_1, P26_1, P27_1, P30_1). Factor 2 displays a combination of positive and negative loadings, representing a combination of factors including avoidance behavior (Q2_1, Q3_1, Q6_1, Q9_1) and interpersonal difficulties (P4_1, P7_1, P10_1, P13_1, P17_1, P18_1, P21_1, P22_1, P25_1, P29_1). Factor 3 shows a positive loading for items reflecting intrusive thoughts or memories (Q2_1, Q3_1, Q4_1, Q6_1, Q7_1, Q10_1, Q13_1). These results suggest that the questionnaire items correspond to the theoretical constructs they are intended to measure, supporting the validity of the instrument.

Table 4. Fit test for model matching.

Fit measures

			SRMR 90% CI		
CFI	**TLI**	**SRMR**	**Lower**	**Upper**	**BIC**
0.427	0.377	0.141	0.126	0.156	2677

The exact fit test for model matching (Table 4) has revealed a significant χ^2 value (828,456, $p < 0.001$), indicating that the model did not perfectly fit the observed data. However, fit indices such as Root Mean Square Error of Approximation (RMSEA),

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Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Standardized Root Mean Square Error of Approximation (SRMR) are within acceptable ranges, with RMSEA at 0.427, suggesting an adequate, although not excellent, fit. This fact indicates that although the model is not perfect, it provides a reasonably good representation of the relationships between the observed variables and the hypothesized latent factors.

Conclusions

Adapting the Child and Adolescent Trauma Screen (CATS) methodology for the Ukrainian-speaking population represents an important step in addressing the mental health crisis caused by the ongoing war in Ukraine. The purpose of this study was to evaluate the psychometric properties of the adapted CATS questionnaire that takes into account the unique cultural and contextual aspects of the target population. The significance of this study lies in the need to develop an effective tool to identify trauma-induced psychopathology in children and adolescents affected by war, which would allow timely interventions. The results of the psychometric analysis have demonstrated good internal consistency of the scale, indicating the high reliability of the CATS questionnaire adapted for Ukrainian audiences. This finding is consistent with previous studies conducted in different cultural contexts to support the universal applicability of the CATS for assessing potentially traumatic events (PTEs) and posttraumatic stress symptoms (PTSD) among children and adolescents. The analysis of principal components has revealed a three-factor structure, with each factor explaining a different portion of the variance. Together, these factors contribute to a more accurate understanding of the impact of trauma on the mental health of Ukrainian children and adolescents. Confirmatory factor analysis has demonstrated acceptable goodness-of-fit indices, including RMSEA, CFI, TLI, and SCOA. This fact suggests that although the model may not fit the observed data perfectly, it is suitable for assessing the impact of trauma on children and adolescents living in Ukraine.

General Significance for Science. In this regard, the CATS methodology adapted for the Ukrainian-speaking population demonstrates reliable psychometric properties, becoming a valid tool for assessing trauma and associated

psychopathologies in children and adolescents affected by war. The internal consistency, factor structure, and goodness-of-fit indices collectively support the usefulness of the adapted CATS questionnaire in the Ukrainian context. In addition, this study contributes to a broader understanding of the effects of war on the mental health of young people and highlights the importance of selecting reliable screening tools that are culturally and contextually sensitive.

Prospects for Using Study Findings. The results obtained on the adaptation of the Child and Adolescent Trauma Screen (CATS) methodology are of significant value in addressing the mental health crisis among children and adolescents affected by the war in Ukraine. A reliable and culturally sensitive screening tool provides health professionals, psychologists, and social workers with a means to quickly identify trauma-induced psychopathology. In this regard, these results are important for the development of individualized interventions to mitigate the adverse effects of trauma and improve resilience in the younger Ukrainian population.

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Conflict of interest disclosure

The authors declare that they have no conflict of interest.

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