

## Exploring the Factor Structure and Psychometric Properties of the Urdu Version of the Child PTSD Symptom Scale in School-Aged Children

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### Abstract

**Background:** Trauma exposure is a widespread and global problem, and a significant gap persists in the current body of literature concerning the empirical development of a globally appropriate factor structure for post-traumatic stress disorder (PTSD) in schoolchildren and adolescents. In order to develop diagnostically effective frameworks that can guide for assessment, diagnose, and intervention, it is paramount to gain an inclusive understanding of the fundamental features of PTSD and their possible ramifications for the functioning of youngsters. To address this requirement, this study sought to examine the psychometric properties of the widely used Child PTSD Symptom Scale (CPSS) which designed to examine PTSD's symptoms in youngsters.

**Method:** A purposive sampling technique and a cross-sectional research approach were used in the present study. The back standard translation method was utilized to adopt and translate CPSS in Pakistani school students. This study was divided into two phases: a pilot and a main study. In the pilot study, the Urdu-translated CPSS version was administered to thirty school students whose ages ranged from 13 to 17 years to establish test-retest reliability. In the main study, one hundred eighty participants were recruited from private schools located in Rawalpindi and Islamabad, Pakistan, between June 2022 and August 2022.

**Results:** The findings confirmed the three-factor model that is aligned with and supports DSM-IV criteria for PTSD, and it could be a valuable and most appropriate tool for research and clinical practice in Pakistani schoolchildren. This scale highlights the CPSS's reliability and cross-cultural validity to evaluate PTSD symptoms in a Pakistani context.

**Conclusions:** This study's findings confirmed the three-factor model that is aligned with and supports DSM-IV criteria for PTSD, and it could be a valuable and most appropriate tool for research and clinical practice in Pakistani schoolchildren. The overall finding supports the cross-cultural validation and reliability of the Urdu CPSS among Pakistani school students, helping research efforts and mental health assessment.

**Keywords:** Post-traumatic stress disorder, child PTSD symptom scale, psychometric properties, children and adolescents

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## Background

Over the past few decades, children and adolescents have often encountered stressful situations that can trigger negative psychosocial and psychological responses. Traumatic events can have a profound adverse impact on human brain development during early life, making this developmental period especially vulnerable to the deleterious effects of adverse experiences. It is imperative for mitigating the consequences of trauma to identify any deficiencies in social-emotional skills and quickly refer people for suitable treatment (Spehr et al., 2019). Almost 80% of teenagers globally endure the harmful repercussions of trauma. The way in which a person responds to trauma is affected by the interaction of their personal qualities and the precise attributes of the stressor. Childhood trauma intensely impacts the functioning of the body, brain, and mind, possibly rendering people more susceptible to the development of emotional disorders (Kuzminskaite et al., 2021; Sharma-Patel et al., 2011; Sherin & Nemeroff, 2011).

Moreover, young people can exhibit a broad range of reactions in response to natural calamities and other sorts of mass trauma. These negative reactions may encompass mental health problems, including difficulties in concentration, symptoms akin to post-traumatic stress disorder, feelings of anxiety, and behavioural problems. It's important to recognize and identify that childhood trauma can have permanent and complex adverse impacts on children's physical and mental health throughout their lifespans (Kuzminskaite et al., 2021). The extended and prolonged effect of trauma on children often leads to developmental trauma disorder that affects the children beyond the devastating effects of PTSD (Bonanno et al., 2010; Spinazzola et al., 2021). However, numerous risk and resilience characteristics have an impact on how children react to disasters. For instance, a child's post-disaster adjustment may be influenced by the child's pre-existing traits, contextual factors including social support availability, the degree of trauma exposure, other life stresses, and family factors like parenting styles and parent mental health (Kuzminskaite et al., 2021).

A substantial body of studies has significantly advanced our understanding of the associations between mental health issues and childhood trauma that persist into adulthood. The importance of childhood trauma, with a special concentration on forms including physical or sexual abuse and psychological neglect and mistreatment, has been an essential theme in earlier research (Worrell, 2022; Bartlett & Steber, 2014; Schäfer & Fisher, 2011; Teicher et al., 2006). Although many other types of childhood adversity, including parental loss, separation, and conflict, as well as bullying, are linked to later psychopathology, it seems that childhood trauma has especially potent and enduring effects. Childhood trauma has been linked to the emergence of the majority of psychiatric illnesses, including mood and anxiety disorders, eating disorders, personality disorders, dissociative disorders, and substance abuse, after accounting for other psychosocial risk factors (Downey & Crummy, 2022; Worrell, 2022).

Self-report assessments, clinical interviews, and structured diagnostic interviews are just a few of the tools that have been developed to help in the diagnosis of PTSD in kids and teenagers. Self-report assessments have some

benefits, even though structured interviews have long been thought of as one of the most reliable methods of PTSD assessment. Self-report assessments, as opposed to clinical interviews, are typically more condensed, require less time from the doctor, and have a lower administrative load (Kerns et al., 2022; Stewart et al., 2017; Paul, 2017).

The Child PTSD Symptom Scale (CPSS) was developed by Foa et al. (2001). It is a widely used examination instrument for child-reported posttraumatic stress disorder (PTSD) symptoms. It uses a four-point Likert-type instrument to measure the intensity of 17 PTSD symptoms according to DSM-IV criteria in both children and adolescents (Hasson et al., 2021; Foa et al., 2018; Stewart et al., 2017; Nixon et al., 2013a; Foa et al., 2001). It is a brief, simple-to-administrate measure that is free to use and has a significant amount of potential to be useful for both research and therapeutic practices (Foa et al., 2001; Foa et al., 2018; Stewart et al., 2017). It has been translated into and made available in Hebrew (Helpman et al., 2015), Indonesian (Wa et al., 2008), Korean (Meyer et al., 2015), Spanish (Serrano-Ibáñez et al., 2018), Russian, Turkish (Kadak et al., 2014), and Nepalese (Kohrt et al., 2011). Only a few studies have been particularly designed to test the CPSS across various cultural contexts and validate it in languages other than English. This study evaluated the cross-cultural validation and reliability of the CPSS in a student sample. Despite its frequent use, there is no universal factor analysis of this measure in the existing literature.

There is an important debate across scholars on the component structure of PTSD, as DSM-IV outlines three factors whereas DSM-5 presents four sets (APA, 2013). Many previous adult studies have often supported and confirmed the four-component model, while studies on adolescents have used different models to fit the data, with robust links between PTSD variables and different age groups (Walsh et al., 2012; Ford et al., 2009).

### **Evidence of the Uni-factor structure of PTSD in children**

In Stewart et al. (2017) study, they examined CPSS to better comprehend how it assess symptoms of posttraumatic stress disorder (PTSD) in adolescents. They recruited 206 participants and found that contrary to the expected three-factor structure, both confirmatory and exploratory factor analysis was confirmed a single-factor structure. This uni-factor structure exhibited high reliability, concurrent and discriminant validity in student's sample. A similar study conducted by López-Soler et al. (2018), they further examined the construct validity of the CPSS. This study found a single-factor structure suggestion, deviating from the three or four-factor structures identified in DSM-IV and DSM-5. However, the CPSS reflected high internal consistency and discriminant validity in adolescents.

### **Evidence of three-factor structure of PTSD in children**

In a Kassam-Adams et al. (2010) study, the precision of PTSD symptoms about general distress and depression was examined, along with their link to functional impairment in adolescents who had faced acute single-incident trauma. They used the CPSS, and a CFA was carried out on adolescents. These adolescents had been examined for around half a year after accidental injuries. This study

explored the fit of six various models for the component structure of PTSD symptoms, which was associated with clusters of symptoms and the display of functional impairment. The findings exhibited that the DSM-IV proposed 3-factor model, which was comprised of PTSD-specific, general dysphoria symptoms, and depression-specific symptoms, provided a satisfactory model fit for adolescents that revealed the co-occurrence of depression and PTSD symptoms.

In a study conducted by Nixon et al. (2013), they also established the psychometric properties of the CPSS, which were examined and modified in this study. This study included two samples. The first sample was traumatized children who were recruited from hospitals, and the second sample was those who were seeking treatment. The study exhibited good internal reliability and validity of CPSS in both samples. Children with PTSD exhibited significantly higher symptoms as compared to those without a clinical diagnosis, which was confirmed by structured clinical interviews. The CPSS also revealed convergent and discriminant validity, demonstrating its potential as a diagnostic instrument with high specificity (72% and 84%) when children were categorized based on the full DSM-IV.

In a study conducted by Fawziah et al. (2020), the construct reliability and validity of the CPSS were examined in Yemeni students who had faced two years of airstrikes and internal war. Principal Components Analysis identified three factors, which were behavioral, emotional, and cognitive domains. The CFA also confirmed a three-factor structure that developed the CPSS as a reliable and valid tool for examining PTSD symptoms in school students.

## Method

### Research design

The main aim of the present study is to cross-culturally adapt, translate, and establish the construct validity of the CPSS in a school sample. The back standard method was applied to translate and cross-culturally adapt CPSS in school students. The CPSS underwent a cross-cultural adaptation, and the translation process followed the standard translation method. In the first phase, a Subject Matter Expert (SEM) committee approach was used, which included bilingual experts with psychology backgrounds and native Urdu speakers to forward translation from English to Urdu that improved ambiguities in the literal translation. Afterwards, the same bilingual professionals used the SEM approach to reevaluate the CPSS in both Urdu and English. After that, a back translation method was used to translate from Urdu to English and address language disparities. Cross-language validation was performed to fix discrepancies and confirm contextual accuracy. This involved examining the scale's items and choosing the most suitable ones using committee consensus. The study was conducted using a two-phase approach. (1) Pilot study, (2) main study. Last but not least, a pilot study examined the psychometric properties of the translated version to develop cross-language validity with 30 school students.

### The Child PTSD Symptom Scale (CPSS)

It was developed by Foa et al. (2001) to examine self-reported PTSD symptoms in children and adolescents. The first seventeen items assessed symptom severity based on the DSM-IV three-cluster model, which included avoidance, hyperarousal, and re-experiencing. Responses to

each item are rated on a four-point Likert scale from "not at all" to "nearly often." Higher scores exhibited a higher prevalence of PTSD, and lower scores reflected a lower tendency for PTSD. (Hermosilla et al., 2021; Foa et al., 2018, 2001).

### Sample

This study was divided into two phases: a pilot and a main study. In the pilot study, the Urdu-translated CPSS version was administered to thirty school students whose ages ranged from 13 to 17 years to establish test-retest reliability. The test was administered twice, after a two-week interval, to 30 school students. Cross-language validity and test-retest reliability of CPSS were examined using the back translation method. In the main study, one hundred eighty school students were recruited to examine the construct validity of the Urdu version of CPSS. The main study used Pearson correlation analyses and exploratory factor analysis (EFA) to examine CPSS's internal consistency of items, Cronbach's alpha reliability, and construct validity in school students. In the main study, 180 school students, comprised of 106 females (58.9%) and 74 males (41.1%), were recruited from private schools located in Rawalpindi (n = 141, 78.9%) and Islamabad (n = 38, 21.1%), Pakistan, between June 2022 and August 2022.

### Procedure

This study was approved by the institutional ethical review board of Foundation University Islamabad, Pakistan, and followed the guidelines of the American Psychological Association. One hundred eighty participants were from private and government schools in Rawalpindi and Islamabad, Pakistan. Verbal and written informed consent was obtained from parents and students. This study was conducted with the permission of the higher authorities of different schools. The participants were assured that their personal information would be kept confidential and used only for research purposes in the present study. Exploratory factor analysis and item total correlation and reliability analysis were used to analyze the internal consistency of items, alpha-Cronbach reliability, and construct validity of scales in students sampled from Pakistan.

## Results

### Pilot Study

Table 2 exhibited the mean and standard deviation (SD), Pearson product-moment correlation coefficient, and test-retest reliability of the Urdu and English versions of the CPSS in a school student sample. The English and Urdu versions of the CPSS demonstrated a positive association, which confirmed the coherence of the two translated versions and their ease of comprehension. Conversely, it's notable that items 18 to 24 examine functional impairment ensuing from a traumatic event that was not incorporated into the pilot study. Therefore, these scale's items were encompassed in the forms given to the research participants in the pilot phase.

Table 3 exhibited the overall alpha Cronbach reliability of both the original and translated versions of the CPSS in the students' sample. The alpha Cronbach reliability values of both versions, CPSS-U (.85) and CPSS-E (.70), exhibit strong reliability. The findings also revealed the minimum and maximum range of items to the total correlation of overall both the Urdu and English versions. Therefore, both the Urdu and English versions of the scale

are supposed to be reliable and valid for use in clinical populations.

The findings in Table 4 highlight the strong internal consistency of the Urdu-translated versions for the school student's sample. Each of the items revealed a notably strong and significant association with the total scores. Remarkably, there were not any items with non-significant item-total correlation scores, demanding neither the revision nor the exclusion of any items in the Urdu-translated CPSS.

## Main Study

### Exploratory factor analysis

In Table 5, exploratory factor analysis (EFA) was performed to determine the most appropriate model and comprehensively examine the factor structure in the school's sample. A correlation matrix was also applied to comprehend the item response structure and explore possible original correlation patterns. The value of the Bartlett statistic (Bartlett = 4067.17,  $df = 236$ ;  $p = 0.000$ ) and a Kaiser-Meyer-Olkin (KMO = 0.61) were significant and showed valid factor structure of the Urdu version of the CASS. Additionally, eigenvalues were also determined to evaluate the number of variables accountable for the majority of data variability and guided through the Scree plot eigenvalue criteria. Initially, eigenvalues approximately ranged between 5.56 and 0.03, with six eigenvalues greater than 1. Notwithstanding the probability of retaining six factors, the uni-factorial structure, with an eigenvalue statistically significantly higher (5.75) in comparison to the other values (0.032–2.22) was highlighted. All items in the Urdu-CPSS version exhibited significant factor loadings on factor 1, which ranged from 0.34 to 0.83, revealing that the CPSS scale in the Pakistani school student sample appropriated a uni-dimensional factor structure. Conversely, item eight did not load onto this model. This study addresses the lack of convincing evidence for a unidimensional underlying component factor structure for childhood PTSD. Moreover, the three- and four-factor factor structures of the CPSS were examined and compared (Table 5). The selection of the most suitable model for the EFA dataset was decided based on the overall model's interpretability. The results of the present study confirmed and identified the three-factor model for the CPSS, except for the four-factor structure in the present study. Factors were retained based on the quantity of items, such as three or more items that exhibited substantial factor loadings on a single factor in the present study.

The final factorial structure of the CPSS was developed and confirmed, which included a three-factor structure as the most appropriate for Pakistani school students. All items revealed substantial loadings on their respective subscales. There were three items, including items 1, 4, and 6 that loaded onto all three factors suggestions but they were retained on a scale basis based on the factor with the highest loadings. Ten items of the scale had high substantial factor loadings on factor/subscale 1, whereas four items were significantly loaded on factor/subscale 2, and the rest of the three items loaded on factor 3. Factor 1 comprises symptoms related to emotional and physical reactions after traumatic event exposure. Factor 2 encompassed statements related to re-experiencing the traumatic event, whereas Factor 3 consisted of symptoms about avoidance.

## Discussion

The primary aim of this research was to examine the psychometric properties of the translated Urdu CPSS scale. It is imperative to examine the reliability and validity of clinical instruments when utilized in various samples. This study focused on evaluating the factorial structure of the Urdu-CPSS in schoolchildren, especially in a low- and middle-income (LMIC) country in Pakistan. This is very important due to the fact that the factor structure of the CPSS had not been formerly developed in an LMIC such as Pakistan.

This study Compared to different proposed single-factor and four-factor structure models, this study exhibited that the three-factor structure model was the most appropriate in the Pakistani situation. The results demonstrated that the three-factor structure model developed based on the DSM-IV criteria for PTSD was the best fit for the data in the EFA. Moreover, the CPSS revealed robust internal consistency and good psychometric properties for school students.

The different psychometric findings in different cultures and methodologies (CFA and EFA) recommended a lack of consistency in previous conceptual frameworks and empirical studies to evaluate posttraumatic stress in schoolchildren. The results of this study have noteworthy implications for therapists and researchers who are working in the Pakistani context with children and adolescents. They contribute to the comprehension of PTSD symptoms, prevalence, assessment, and treatment in schoolchildren. In spite of the significance of measuring the mental health of children, it is still a challenging job because of One major problem is the lack of culturally suitable measurement instruments, which is particularly known in non-Western, low-income countries like Pakistan. Research scholars can gain valuable insights by evaluating psychological tools established and utilised in different economic and cultural settings, mostly in resource-poor non-Western contexts. Further factor analyses should be performed with diverse samples in terms of country, language, age, and exposure to trauma to validate previous study findings. While the present study provided robust evidence for the internal consistency and cross-culture validation of the Urdu version of the CPSS in Pakistani school children.

### Limitations and implication

The present study has many limitations. Firstly, there is a dire need for more advanced cross-cultural research with larger sample sizes to cross-culturally validate the CPSS for the Urdu-speaking population, particularly in light of constant modifications to DSM-V diagnoses and assessments for children and adolescents. This study mostly included adolescents who had experienced a variety of possibly traumatic situations, but the population was primarily composed of adolescents dealing with acute or injury-related medical problems. Moreover, this did not establish the criteria of convergent and divergent validity in this study.

**Table 1***Characteristics of studies investigating the factor structure of the Child PTSD Symptom Scale*

Author	Sample size	Type of sample	Language	Factor	Type of analysis
Kassam-Adams et al., 2010	479 (M, F)	Children in the ED or inpatient unit	English	Three-factor structure	CFA
Nixon et al., 2013	253 (M, F)	Children and adolescents from Emergency department or pediatric inpatient ward	English	Three-factor structure	CFA
Meyer et al., 2015	259 (M, F)	Children and adolescents with recent exposure to a potentially traumatic event	Spanish and English	Four-factor model	CFA
Gudiño & Rindlaub, 2014	161 (M, F)	Latino school students	Spanish and English	Three-factor model	CFA
Stewart et al., 2017	206 (M, F)	6 <sup>th</sup> to 12 <sup>th</sup> grade school students	English	Uni-factorial structure	CFA, EFA
López-Soler et al., 2018	221 (M, F)	Children aged between 8-17 years who had suffered chronic intra-family mistreatment by their attachment figures	English	Uni-factorial structure	EFA, CFA
Fawziah et al., 2020	902 (M, F)	School students with an age range of 10- 27 years children who received	Arabic	Three-factor structure	EFA, CFA
Hasson et al., 2021	149 (M, F)	post-release services (PRS) after reunification with family or a sponsor	Spanish, English	Thee-factor structure	EFA
Hermosilla et al., 2021	570 (M, F)	Children receiving Child-Friendly Spaces (CFS) intervention after the 2015 earthquakes	Nepali	Three and Four-factor models	CFA, EFA

**Table 2**

*Mean and standard deviation (SD), Pearson product-moment correlation coefficient, and test-retest reliability of the Urdu and English versions of the Child Post-Traumatic Stress Disorder Symptom Scale (CPSS) in a school student sample (N = 30).*

LEC-5	Test (E)	Retest (U)	Correlation Coefficient	p-value
Child Post-Traumatic Stress Disorder Symptom Scale (CPSS) (24 items)				
Mean	31.63	31.63	.95**	.000
SD	10.84	10.84		
Range	1.33	1.33		

**Table 3**

*Alpha Cronbach Reliability of the English version (CPSS-E) and the translated (CPSS-U) in school students samples.*

	CPSS-U ( $\alpha$ )	CPSS-E ( $\alpha$ )	CPSS-U (Item-total)	CPSS-E (Item-total)
CPSS total (24 items)	.85	.70	.16*-.81**	.16*-.78**

**Table 4**

*Item to total correlation of Urdu and English versions for CPSS in school students (N=180).*

Items	CPSS-E	CPSS-U
1	.50**	.44**
2	.16*	.16*
3	.64**	.57**
4	.73**	.53**
5	.68**	.60**
6	.58**	.70**
7	.57*	.48**
8	.42**	.27**
9	.42**	.33**
10	.55**	.54**
11	.67**	.45**
12	.68**	.66**
13	.61**	.63**
14	.78**	.81**
15	.78**	.74**
16	.68**	.61**
17	.58**	.41**

**Table 5**

*Factor loadings of 17 items through the Principal Component Analysis by using Direct Oblimin Method*

Item	n	Score Range	One factor structure			Three-factor structure				Four-factor structure			
			M (SD)	S	K	Factor 1	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3	Factor 4
C1	180	0-3	1.01 (1.14)	.55	-1.26	.47	<b>.47</b>	.45	-.31	<b>.47</b>	.45	-.31	-.36
C2	180	0-3	.75 (.81)	.93	.37			<b>.50</b>			<b>.50</b>		
C3	180	0-3	.62 (.76)	1.23	1.28	.67	<b>.67</b>			<b>.67</b>			
C4	180	0-3	1.19 (.87)	.259	-.67	.46	.46	<b>.59</b>	-.32	.46	<b>.59</b>	-.32	
C5	180	0-3	1.04 (1.07)	.77	-.65	.60	.54		<b>.57</b>	<b>.60</b>		.57	-.33
C6	180	0-3	1.68 (1.21)	-.19	-1.54	.69	.32	.32	<b>.69</b>	<b>.69</b>	.32	.32	
C7	180	0-3	1.12 (1.30)	.54	-1.48	.45	.45		<b>.62</b>	.45		<b>.62</b>	
C8	180	0-3	.50 (.91)	1.43	.61				<b>.61</b>			<b>.61</b>	
C9	180	0-3	.86 (.94)	1.04	.28	.34	<b>.34</b>			.34			<b>.79</b>
C10	180	0-3	1.23 (1.32)	.37	-1.66	.60	<b>.60</b>	-.67		<b>.60</b>	-.67		
C11	180	0-3	.89 (.96)	.92	-.07	.53	<b>.53</b>	-.40	-.39	<b>.53</b>	-.40	-.39	
C12	180	0-3	1.02 (1.27)	.66	-1.32	.71	<b>.71</b>		-.33	<b>.71</b>		-.33	
C13	180	0-3	1.87 (1.10)	-.66	-.89	.66	<b>.66</b>			<b>.66</b>			
C14	180	0-3	1.94 (1.16)	-.66	-1.08	.83	<b>.83</b>			<b>.83</b>			
C15	180	0-3	1.74 (1.19)	-.31	-1.45	.75	<b>.75</b>			<b>.75</b>			
C16	180	0-3	1.79 (1.10)	-.36	-1.21	.69	<b>.69</b>			<b>.69</b>			
C17	180	0-3	1.60 (1.23)	-.21	-1.55	.34	.34	<b>.68</b>		.34	<b>.68</b>		
<b>Eigen Values</b>						5.75	5.57	2.22	1.81	5.57	2.22	1.81	1.29
<b>% of variance</b>						32.79	32.79	13.07	10.65	32.79	13.07	10.65	7.26
<b>Cumulative variance</b>						32.79	32.79	45.87	56.53	32.79	45.87	56.53	64.15



Future research should enroll diverse trauma exposures in adolescents and highlight a comprehensive assessment of criterion, divergent, and convergent validity.

### Conclusion

This study aimed to examine the psychometric properties of the Urdu CPSS scale in Pakistani school adolescents. The findings confirmed the three-factor model that is aligned with and supports DSM-IV criteria for PTSD, and it could be a valuable and most appropriate tool for research and clinical practice in Pakistani schoolchildren. This scale highlights the CPSS's reliability and cross-cultural validity to evaluate PTSD symptoms in a Pakistani context. The variability in psychometric results across methodologies and cultures revealed the necessity for consistency in the study. These findings contribute to and highlight the proper assessment and diagnosis of PTSD in Pakistani adolescents and emphasize the significance of contextually appropriate assessment tools. The overall finding supports the cross-cultural validation and reliability of the Urdu CPSS among Pakistani school students, helping research efforts and mental health assessment.

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### Ethical Consideration

The study was approved by Department of Psychology, Foundation University School of Science and Technology, Pakistan. Consent Form was taken before

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