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Validation of the Child PTSD Symptom Scale (CPSS) in Spanish adolescents

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Abstract

Background: One of the most frequently used instruments to assess posttraumatic stress in children and adolescents is the Child PTSD Symptom Scale. However, there has been limited evaluation of its construct validity in the Spanish language despite Spanish being one of the most widely spoken languages in the world. **Objective:** To provide data on the psychometric properties of the CPSS in a sample of Spanish adolescents, to establish the internal consistency of the measure, and to examine its criterion validity. **Method:** The participants were 339 adolescents (172 boys and 167 girls, mean age 13.95) exposed to peer violence during the previous year. **Results:** Confirmatory factor analysis demonstrated a good fit to the four-factor dysphoria model. The alpha reliabilities for the overall measure and its subscales were suitable. **Discussion:** The Spanish version of the scale has sound psychometric properties with good reliability and validity. Moreover, it integrates the four-factor structure corresponding to the dimensions of PTSD described in the DSM-V.

Keywords: Peer abuse, Child PTSD Symptom Scale, spanish adolescents, factor structure, psychometric properties.

Resumen

Validación española de la Child PTSD Symptom Scale (CPSS) en adolescentes. **Antecedentes:** la Child PTSD Symptom Scale es uno de los cuestionarios más utilizados para evaluar el estrés postraumático en niños y adolescentes. Sin embargo, es escasa la investigación acerca de la validez de constructo de la versión en español de este instrumento, a pesar de tratarse de uno de los idiomas más hablados en el mundo. **Objetivo:** validar la versión española de esta escala en una muestra de adolescentes. **Método:** los participantes fueron 339 adolescentes (172 varones y 167 mujeres, con una media de edad de 13,95 años) que cumplían los criterios de haber sufrido violencia por parte de sus iguales durante el año previo al estudio. **Resultados:** el análisis confirmatorio mostró un buen ajuste del modelo de cuatro factores de disforia. Los coeficientes de fiabilidad para la medida global y sus subescalas fueron adecuados. **Discusión:** la versión española la escala presenta buenas propiedades psicométricas y una estructura factorial que se corresponde a los criterios para el trastorno de estrés postraumático del DSM-V.

Palabras clave: abuso entre iguales, Child PTSD Symptom Scale, adolescentes españoles, estructura factorial, propiedades psicométricas.

A large number of children and adolescents are victims of traumatic experiences, the most common being bullying, cyberbullying, and emotional, physical, and/or sexual abuse, including that perpetrated by peers. Posttraumatic stress disorder (PTSD) is one of the most prevalent disorders among children and adolescents who have experienced a traumatic event. A recent meta-analysis showed that 16% of children and adolescents exposed to a traumatic event subsequently developed PTSD (Alisic et al., 2014). The *Diagnostic and statistical manual of mental disorders- 5th edition* ([DSM-V] American Psychiatric Association [APA], 2013) adds four new clusters of symptoms to this disorder: intrusion, avoidance, negative alterations in cognition and mood, and alterations in arousal and reactivity. Therefore, instruments with good psychometric proprieties to assess PTSD among adolescents are needed.

One such instrument is the Child PTSD Symptom Scale (CPSS) developed by Foa, Johnson, Feeny, and Treadwell (2001). The CPSS is brief, easy to administer, available for free, and has great potential for research and clinical applications. It comprises 17 items. The total symptom score and three symptom clusters of the CPSS demonstrated suitable internal consistency, as well as high test–retest reliability for both the total score and the three subscales (intrusion, avoidance, and arousal symptoms) (Foa et al., 2001). The CPSS has demonstrated very good convergent and some support for its discriminant validity has also been obtained (Nixon, Sterk, & Pearce, 2012; Stewart, Ebesutani, Drescher, & Young, 2015). Cross-cultural translations of the scale have shown good reliability and validity, including Hebrew (Rachamim et al., 2011) and Turkish versions (Kadak, Boysan, Ceylan, & Çeri, 2014). In spite of this, there has been limited evaluation of the instrument's construct validity and its psychometric properties in the Spanish language, although Spanish is one of the most widely spoken language in the world.

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Several studies aimed at analyzing the dimensions of PTSD have been performed and a meta-analysis demonstrated that the dysphoria model outperformed the numbing model in almost all subsamples (Yufik & Simms, 2010). However, in the study by Helpman et al. (2014) based on responses to the CPSS findings demonstrated that the model that best fit the data was the four-factor numbing model, compared to the three-factor model (intrusion, avoidance, and arousal symptoms), a three-factor dysphoria model (intrusion, dysphoria, and arousal), and a four-factor dysphoria model (intrusion, avoidance, dysphoria, and arousal).

Gudiño and Rindlaub (2014) examined the CPSS and its psychometric properties in a sample of Latino students who were exposed to chronically elevated levels of community violence. Their results supported a three-factor model (re-experiencing/intrusion, avoidance, and arousal), but did not support the four-factor numbing or four-factor dysphoria models (King, Leskin, King, & Weathers, 1998; Simms, Watson, & Doebbeling, 2002, respectively). High internal consistence was obtained for the total scale (α = .92). Meyer, Gold, Beas, Young, and Kassam-Adams (2014) also tested the psychometric properties of the CPSS in Latino children residing in USA. Compared to the Spanish version, the English version had a better fit to the data for all the models of the PTSD symptoms structure. The four-factor numbing and dysphoria models had the best fit for both versions. Nevertheless, the fit indices were quite modest, particularly for the Spanish model (Meyer et al., 2014), which indicates that this version of the CPSS lacks construct validity.

The first aim of the present study was to provide data on the factor structure of the CPSS in a sample of Spanish adolescents who had experienced peer abuse (i.e., bullying, cyberbullying, and/or dating violence) during the previous year. Five models were examined: a single-factor model, the DSM-IV-TR three-factor model, the three-factor dysphoria model, the four-factor numbing model, and the four-factor dysphoria model corresponding to the dimensions of PTSD described in the DSM-V (APA, 2013). The second aim was to establish the internal consistency of the measure and to examine its criterion validity.

Method

Participants

The original sample comprised 699 high-school students from Málaga (Spain). 49 participants were eliminated due to incomplete responses and 274 participants were also eliminated because they did not fulfil the criterion of having been exposed to peer violence during the previous year. Therefore, the final sample comprised 339 adolescents (172 boys and 167 girls; mean age 13.95 years; *SD* = 1.29).

The participating students reflected the general characteristics of children attending urban secondary schools in Andalusia (Spain). Most students (85.3%) were between 13 and 17 years of age. Of the total sample, 94.7% were living with their families (with both or one of their parents, and with their brothers/sisters, if applicable).

Instruments

All participants were requested to give written information regarding their age, gender, educational level, and school year.

Adolescent Victimization through Mobile Phone and Internet Scale (CIBVIC; Buelga, Cava, & Musitu, 2012). This questionnaire includes 8 items refer to mobile phone cyberbullying and 10 items to internet cyberbullying experienced over the previous year. The items are rated on a 4-point Likert-type scale. Cronbach's alpha for this questionnaire was 0.81.

Self-reported Victimization Questionnaire (Cava, Musitu, & Murgui, 2007). The questionnaire uses a 20-item scale are rated on a 4-point Likert-type on which participants indicate how often during the last school year they have experienced 20 victimizing experiences. Ten items refer to peer overt victimization (physical and/or verbal assault), and 10 items refer to peer relational victimization (social ostracism). Cronbach's alpha for this questionnaire was 0.90.

Conflict in Adolescent Dating Relationships Inventory (Spanish version, Fernández-Fuertes, Fuertes, & Pulido, 2006). The brief 34-item scale was used to assess five types of intimate violence in adolescent dating relationships: sexual abuse, relational abuse, verbal or emotional abuse, threatening behaviour, and physical abuse. The items are rated on a 4-point Likert-type scale. Cronbach's alpha for this questionnaire was 0.89.

Emotional Quotient Inventory Youth Version (Spanish version, López-Zafra, Pulido, & Berrios, 2014). The EQ-i:YV is a self-report measure that assesses the level of emotional and social functioning in children and adolescents of 7 to 17 years of age. This study used the 8 items that measure general mood. The instrument uses a 5-point scale. Cronbach's alpha for this questionnaire was 0.83.

Satisfaction with Life Scale (Spanish version, Atienza, Pons, Balaguer, & García-Merita, 2000). This questionnaire was developed as a measure of subjective global life satisfaction and well-being. It includes 5 items rated on a 5-point Likert-type scale ranging from 1 (totally disagree) to 5 (totally agree). Cronbach's alpha for this questionnaire was 0.74.

Kessler Psychological Distress Scale (Spanish version, Vargas, Villamil, Rodríguez, Pérez, & Cortés, 2011). The questionnaire includes 10 items that refer to the level of anxiety and depressive symptoms experienced during the last month. The items are rated on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). Cronbach's alpha for this questionnaire was 0.84.

KIDSCREEN-10 Index (Spanish version, Erhart et al., 2009). It assesses perceived health-related quality of life. The 10 items are rated on a 5-point scale ranging from 1 (none of the time) to 5 (all of the time). It also includes a question on perceived health. Cronbach's alpha for this questionnaire was 0.75.

Child PTSD Symptom Scale (CPSS; Foa, Johnson, Feeny, & Treadwell, 2001). Comprises 17 items corresponding to PTSD symptoms and is designed for use with children aged 8-18 years. Participants rate how often each symptom has occurred in the past month on a 4-point scale ranging from 0 (not at all) to 3 (5 or more times a week). The total score is calculated by summing all items (see below for further details). Both English and Spanish versions are available. The Spanish version was used in the current study, although some items were slightly reworded to facilitate understanding by Spanish populations. A list of the items in the questionnaire can be requested from the authors.

Procedure

The current study was part of a larger school-based study of traumatic stress events in adolescents, which received institutional review board approval at the University of Málaga (Spain).

Teachers, parents, and students were informed about the aim of the research before they agreed to participate. The protocol for the study was approved by the Institutional Review Board of the school. After parental consent had been obtained and prior to data collection, children voluntarily agreed to participate in the study. Assessments were conducted in small groups of 20 to 25 students and a single trained clinical psychologist controlled the procedure. All tests followed the authors' instructions on use of the instruments and were conducted during school hours. Each participant anonymously completed a battery of instruments, which were always presented in the same order.

Data analysis

Univariate and multivariate distributions were analysed. Inspection of Mahalanobis d^2 values indicated that there were no multivariate outliers in the sample. Little's MCAR test was used and missing values were replaced by using the multiple imputation method.

Means, standard deviations, and correlations were calculated for each variable. To test the factor structure of the CPSS, a confirmatory factor analysis (CFA) was performed. Maximum likelihood estimation was used for the analyses. To test model fit, a chi-squared statistic was used as an absolute index of goodness of fit. The model fit was considered to be satisfactory according to the following criteria (Ullman, 2006): a) the adjusted goodness-of-fit-index (AGFI) and the comparative fit index (CFI) with values of .90 indicating a good fit; b) the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR) were less than .08. In all CFA analyses, correlations between errors were constrained to zero, items were constrained to load on only one factor, and factors were free to correlate.

Comparisons between nested models were conducted using the S-B χ^2 test (Satorra & Bentler, 2001). Comparisons between non-nested models were conducted by comparing the Akaike information criterion (AIC). Firstly, we assessed the model fit of each of the five models examined. We then compared the nested models followed by the non-nested models. Once the best-fitting model was found, it was modified by modelling the error terms that were correlated and the model fit was assessed again.

A series of moderated multiple regression analysis were then performed to analyse the effects of the interaction of the CPSS scores and general mood and happiness, and the interaction of the CPSS scores and life satisfaction, on psychological distress and health-related quality of life. A series of standardized product variables were then created to represent interactions between the CPSS scores and psychological distress, and between the CPSS scores and health-related quality of life. Interaction effects were only analysed in those cases in which the predictors significantly predicted the outcome variables considered in the analyses.

Internal consistency was calculated using Cronbach's α coefficient for the total score and for the score of each factor. To assess the criterion validity of the CPSS, associations were analysed between the CPSS global score and general mood and happiness, life satisfaction, psychological distress, and health-related quality of life, while controlling for sex.

Results

Descriptive and preliminary analyses

Preliminary examinations of the data revealed that the overall level of missing data was 4.73%. Missing values were imputed after finding no statistically reliable deviation from randomness using Little's MCAR test, χ^2 (119) = 90.133, p = 0.07. The remaining analyses were conducted on the imputed data set.

The types of abuse reported by the participants were as follows: cyberbullying by mobile phone (49.4%), by internet (41.2%), or by both (32.5%), bullying (11.2%), bullying and some type of cyberbullying (28.9%), dating violence (36.3%), or all these types of abuse (10.0%). As shown in Table 1, score ranges, means and standard deviations for each variable were calculated. Table 1 also shows the partial correlations between the measures considered in the study while controlling for sex. Medium significant negative effect size correlations were found between the scores on the CPSS and general mood and happiness, life satisfaction, and health-related quality of life. A medium significant and positive effect size was found between the CPSS and global psychological distress.

Girls had higher scores than boys on the CPSS and reported greater psychological distress, and had lower scores on happiness and perceived health-related quality of life. The mean CPSS total score for the whole sample was 29.19 (*SD* = 9.19), and 53.4% of participants met or exceeded the clinical cutoff of 11 established by Foa et al. (2001). When a cutoff score of 15 was used, as recommended by the International Society of Traumatic

Table 1
Descriptive statistics and partial correlations between measures while controlling for sex

			Total sample (N = 339)		Boys (n = 172)		Girls (n = 167)					
Variable	Range		Mean	SD	Mean	SD	Mean	Mean	Partial correlations			
	Min	Max							2	3	4	5
1. CPSS	17	63	29.19	9.19	27.55	8.23	30.89	9.82	-.25	-.23	.46	-.24
2. EQ-i: YV	12	40	29.73	5.30	30.80	4.77	28.63	5.60	1	.55	-.32	.61
3. SWLS	5	20	15.31	3.23	15.56	3.13	15.05	3.32		1	-.33	.58
4. K10	11	47	27.38	6.89	25.77	6.70	29.03	6.43			1	-.34
5. KIDSCREEN-10	23	49	38.23	5.12	39.16	4.62	37.28	5.44				1

Note: CPSS = Child PTSD Symptom Scale; EQ-i: YV = Emotional Quotient Inventory Youth Version; SWLS = Satisfaction with Life Scale; K10 = Kessler Psychological Distress Scale. All correlations are significant at $p < .000$

Stress Studies (2012), 34.8% of participants met the criteria for a diagnosis of PTSD. When a clinical cutoff score of 16 or greater was used, recommended by Nixon et al. (2013), 30.9% of the participants were identified as having probable PTSD.

Factor structure

Model fit was assessed for each model (see Table 2). The nested models were then compared (i.e., the four-factor numbing model and the three-factor model, as well as the four-factor dysphoria model and the three-factor dysphoria model). A significant difference was found between the four-factor numbing model and the three-factor model, χ^2 (3) = 35.93, $p < .000$. The four-factor numbing model, χ^2 (113) = 317.00, provided a better fit than the three-factor model, χ^2 (116) = 352.94. A significant difference was found between the four-factor dysphoria model and the three-factor dysphoria model, χ^2 (3) = 42.45, $p < .000$. The four-factor dysphoria model, χ2 (111) = 306.43, provided a better fit than the three-factor dysphoria model, χ^2 (116) = 323.86.

Table 2
Fit indices for confirmatory factor analyses

	S-B χ^2	AGFI	RMSEA	SRMR	CFI	AIC
One-factor model	523.57	.77	.10	.06	.80	591.57
DSM-IV three-factor model	352.94	.85	.08	.05	.88	426.94
Three-factor dysphoria model	323.86	.87	.07	.04	.90	397.86
Four-factor numbing model	317.01	.87	.07	.04	.90	397.01
Four-factor dysphoria model	306.43	.92	.06	.03	.95	390.43

Note: S-B χ^2 = Santorra-Bentler χ^2 test; AGFI = adjusted goodness-of-fit-index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; CFI = comparative fit index; AIC = akaike information criterion

The AIC goodness-of-fit index was then used to compare the remaining models. Table 2 shows that the four-factor dysphoria model had the lowest value and the best fit. The results of the evaluation of the final model indicated an adequate fit, χ^2 (108) = 306,43, $p = .000$, NFI = .92, CFI = .95, RMSEA = .06. This final model included four factors: intrusion (items 1-5), avoidance (items 6-8), dysphoria (items 9-15), and arousal (items 16 and 17) (see Figure 1). Factor loadings were equal or more than .51.

Criterion validity

We analysed the effects of the interactions between the global score of the CPSS and general mood and happiness, as well as the effects of the interactions between the global score on the CPSS and life satisfaction, on psychological distress and health-related quality of life (see Table 3). Psychological distress was significantly predicted by general mood and happiness, and by the total CPSS score. The interaction between general mood and the CPSS score added significant incremental variance, 1.8%, $B = .016$, $p = .003$. General mood and CPSS score were significantly and independently associated with health-related quality of life, although no interaction effects were found. Life satisfaction and the global score on the CPSS significantly and independently predicted psychological distress, although no interaction effects were found. Furthermore, life satisfaction and CPSS scores were significantly and independently associated with health-related quality of life, but no interaction effects were found.

Internal consistency

The CPSS total symptom scale demonstrated high internal consistency with the full sample ($\alpha = .90$). Internal consistency was moderate to good within the subscale symptom factors: $\alpha = .80$ on the re-experiencing/intrusion subscale, $\alpha = .70$ on the avoidance subscale, $\alpha = .83$ on the dysphoria subscale, and $\alpha = .74$ on the arousal subscale.

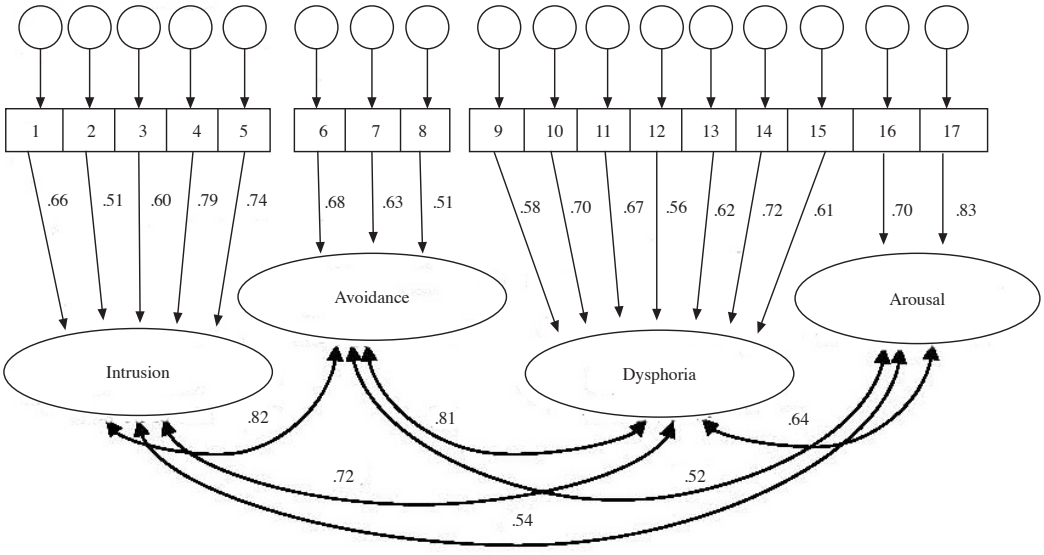

Figure 1. Confirmatory factor analysis of the four-factor dysphoria model of the CPSS corresponding to the dimensions of PTSD described in the DSM-V

Table 3
Moderated multiple regression analyses

	Psychological distress			Health-related quality of life		
Predictor variables	**β**	**ΔR²**	**R²**	**β**	**ΔR²**	**R²**
General mood and happiness	-.26*		.30	.61*		.40
CPSS	.48*	.16*		-.13**	.01**	
Interaction	.15*	.02*		-.07	.00	
Life satisfaction	-.24*		.29	.55**		.35
CPSS	.46*	.17*		-.15*	.02**	
Interaction	.08	.01		-.04	.00	

* $p < 0.01$; ** $p < 0.05$

Discussion

Although the CPSS is a widely used measure to assess PTSD in young people, to the best of our knowledge this study is the first to examine the factor structure and psychometric properties of the CPSS in a Spanish sample. The purpose was to determine the factor structure of the Spanish version of the CPSS in a sample of adolescents who had experienced peer abuse during the previous year. In addition, the internal consistency and criterion validity of the questionnaire were examined.

The adolescents had been exposed to some type of peer abuse in a non-negligible percentage. Moreover, 30.9% of participants in this study met the criteria for a diagnosis of PTSD when considering the recommendations of the International Society of Traumatic Stress Studies (2012), increasing up to 53.4% according to the clinical cutoff established by Foa et al. (2001).

Confirmatory factor analyses suggested that the findings are best described by the four-factor dysphoria model. In fact, the models that have been most consistently replicated across studies are the four-factor models of King et al. (1998) and Simms et al. (2002). Using the CPSS, Kassam-Adams, Marsac, and Cirilli (2010) found that both the numbing four-factor model and the dysphoria four-factor model had a good fit in a sample of children and adolescents who had experienced unintentional injury. In the study by Meyer et al. (2014) the dysphoria four-factor model had a slightly better fit in the Spanish sample, which was also the case in the current study. Hukkelberg & Jensen (2011) also found that the dysphoria four-factor model had the best fit to the observed data. Overall, the results suggest that four dimensions define PTSD in youth samples, which is in line with proposals regarding adult data (i.e., King et al., 1998; Simms et al., 2002).

The Spanish version of the CPSS had sound psychometric properties with good reliability and validity. The total symptom scale exhibited high internal consistency and reliability for the subscales and was similar to the initial validation study by Foa et al. (2001) and subsequent psychometric analyses (Gillihan, Aderka, Conklin, Capaldi, & Foa, 2013; Gudiño & Rindlaub, 2014; Kadak et al., 2014; Meyer et al., 2014; Rachamim et al., 2011; Stewart et al., 2015). Regarding criterion validity, the total symptom scale correlated with all the measures considered in the study. Nevertheless, no interaction effects were found between the CPSS scores and general mood and happiness in the prediction of health-related quality of life. In addition, no interaction effects were found between the CPSS scores and life satisfaction in the prediction of psychological distress or health-related quality of life. Hence, higher scores on PTSD independently predicted psychological distress and health-related quality of life. The global score on the CPSS moderated the relationship between general mood and happiness and global psychological distress, which suggests that this negative relationship was stronger when CPSS scores were high. Thus, the results suggest that adolescents with higher scores on PTSD, as measured by the CPSS, would feel less happy, more distressed, and have a poorer quality of life.

This study has several limitations. Firstly, due to the logistic difficulties arising from this study being part of a larger project, the diagnostic utility of the CPSS was not assessed because of the lack of a diagnostic interview measure. The properties of the Spanish version of the CPSS should be examined in clinical samples. Secondly, measurement invariance tests were not conducted between the boys and girls because of the relatively small sample size. Future studies should include a larger sample to examine whether the CPSS items are invariant across populations. Thirdly, data were collected by self-report measures alone, which likely introduced some shared method variance across all the assessment measures. Finally, the test-retest reliability of the CPSS was not analysed, which is an important aspect for future research on its use in Spanish youth.

Despite these limitations, this Spanish version of the CPSS provides clinicians and researchers with a valid and reliable measure of PTSD among Spanish adolescents. Moreover, it integrates the four-factor structure corresponding to the dimensions of PTSD described in the DSM-V (APA, 2013).

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