ORIGINAL ARTICLE

Psychometric Properties of the Parent-Report Version of the UCLA PTSD Reaction Index for DSM-5

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Abstract

The UCLA PTSD Reaction Index for DSM-5 (RI-5) is a developmentally appropriate and well recognized screening tool for the assessment of Post-Traumatic Stress Disorder (PTSD) in children and adolescents. The children/adolescent self-report version of the RI-5 has been thoroughly studied in very recent years, showing adequate psychometric properties. Despite such results, the utility of the parent/caregiver-report version, which also integrates the RI-5 system, remains to be explored. As such, the present study aimed to test the general psychometric properties of the parent/caregiver-report version of RI-5, based on a sample of 457 children and adolescents, aged between 7 and 17 years, exposed to at least one potentially traumatic experience, and their respective primary caregivers. The RI-5 total score and categories revealed good internal consistency reliability. The total number of traumas reported emerged as a significant predictor of the RI-5 total score. The RI-5 total score proved to be significantly correlated with more internalizing and externalizing problems, but correlation coefficients were below .70, serving as an indicator of discriminant validity. The four-factor structure of the RI-5 was supported through confirmatory factor analysis. In conclusion, the present study provided preliminary evidence supporting the utility of the parent/caregiver-report version of the RI-5 for research purposes and for clinical assessment and treatment, anchored on a multiple informant perspective of child psychopathology.

Keywords PTSD · Child/adolescent · Polyvictimization · Confirmatory factor analysis

Exposure to traumatic events is a relatively common phenomenon associated with a myriad of negative physical and emotional outcomes (e.g., Baumeister et al., 2016; Dvir et al., 2014; Heim & Nemeroff, 2001; Teicher & Samson, 2016) that may profoundly impact child developmental trajectories and processes (e.g., Copeland et al., 2007; Kaplow & Widom, 2007; Mueser & Taub, 2008). In fact, years of research have been reporting high prevalence of trauma exposure during childhood and adolescence, reaching up to 71% (e.g., Finkelhor et al., 2007, 2009; McChesney et al.,

2015), and suggesting that the occurrence of polyvictimization during the first years of life is more common than one would expect (McLaughlin et al., 2013).

Post-Traumatic Stress Disorder (PTSD) is a direct consequence of exposure to a traumatic event (e.g., Copeland et al., 2007; Yehuda et al., 2015). It has been demonstrated in a meta-analytic study, gathering 43 samples, that almost 16% of children and adolescents exposed to at least one traumatic event eventually develop PTSD, and that those exposed to interpersonal trauma and girls are at particular risk (Alisic et al., 2014). Those authors have suggested – quite aligned with more recent claims (Mavranezouli et al., 2020) – that early assessments and diagnoses are essential, in order to attenuate the putative negative consequences of PTSD in child short and long-term adaptation (Bolton et al., 2000).

Important changes in the diagnostic criteria for PTSD were introduced in the transition from DSM-IV to DSM-5 (American Psychiatric Association, 1994, 2000, 2013; North et al., 2016). Diagnostic criteria for DSM-5 considers (direct or indirect) exposure to a traumatic stressor as the hallmark of the disorder (Criterion A) and proposes a four-cluster

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organization of PTSD symptomatology (and no longer the tripartite model supported by DSM-IV; American Psychiatric Association, 2000), including intrusion (Criterion B), avoidance (Criterion C), alterations in cognition and mood (Criterion D), and arousal (Criterion E). DSM-5 adds a dissociative subtype, characterized by persistent or recurrent symptoms of derealization and depersonalization, and creates a separate, developmentally appropriate, and complete set of criteria for young children (American Psychiatric Association, 2013).

The revision of the PTSD criteria for DSM-5 required updated versions of existing measures for the assessment of trauma and PTSD in children and adolescents, aligned with DSM-5 changes and refinements. A handful of adapted assessment tools have been accumulated. Some important examples, as they serve as gold-standard diagnostic measures are the Clinician-Administered PTSD Scale for DSM-5–Child/Adolescent version (CAPS-CA-5; Pynoos et al., 2015) or the Child PTSD Symptom Scale—Interview version for DSM-5 (CPSS-5-I; Foa et al., 2018). Notwithstanding promising results, showing that those are valid and reliable resources for the assessment of DSM-5 PTSD symptoms in traumatized children and youth (Doric et al., 2019; Kaplow et al., 2020; Takada et al., 2018), most of the available measures are lengthy and require extensive training, preventing their widespread use. Despite some important efforts (e.g., Lang & Connell, 2017), brief, cross-culturally valid and developmentally informed measures of childhood PTSD remain, to this day, needed.

The UCLA PTSD Reaction Index for DSM-5

The UCLA PTSD Reaction Index for DSM-5 (RI-5) was developed to be a screening assessment measure reflecting diagnosis criteria of PTSD according to DSM-5 and based on a developmentally informed view of the manifestation of disorder symptoms in children and adolescents (Pynoos & Steinberg, 2014; Pynoos et al., 2009). This is a widely used instrument for the assessment of traumatized children and adolescents (Kaplow et al., 2020; Steinberg et al., 2013), consisting of two versions: a child/adolescent self-report version and a parent/caregiver-report version. Despite the existence of such versions, only the child/adolescent self-report version has been thoughtfully studied over the past few years, showing adequate psychometric properties (Doric et al., 2019; Kaplow et al., 2020; Modrowski et al., 2021; Takada et al., 2018), as presented below.

In the United Sates of American, a recent study (Kaplow et al., 2020) has reported excellent internal consistency values for the total scale ($\alpha = .94$) of the child/adolescent self-report of the RI-5 and has confirmed adequate criterion-referenced validity ($r = .68$ for total scale). Also, in the same study, referring to treatment-seeking children and adolescents between the ages of 7 to 18 years, it was observed that the child/adolescent self-report version of the RI-5 presents good levels of diagnostic precision, as well. The total number of traumas reported, and the child/adolescent age were found to be significant predictors of PTSD diagnosis.

The psychometric properties of the child/adolescent self-report version of the RI-5 have been equally examined outside of the United States of America, in several countries, including, as examples, Chile, Zambia, and Japan, maintaining appropriate values of internal consistency ($\alpha = .92$, Doric et al., 2019; $\alpha = .85$, Takada et al., 2018). Studies have also established both discriminant and convergent validity. Regarding the former, in a cross-cultural study, Doric et al. (2019) found that the associations between the RI-5 total scale and symptoms of anxiety and depression, albeit statistically significant, were below .70 across all the 11 countries included in the study, which included Portugal – i.e., the locale where the research reported herein was conducted. When it comes to the convergent validity, a study (Takada et al., 2018) has shown that the child/adolescent self-report version of the RI-5 was correlated (moderately, but significantly) with the different subscales of the Trauma Symptom Checklist for Children (Briere, 1996).

Research has investigated the factor structure of the child/adolescent self-report version of the RI-5, as well. A study conducted in Japan with a sample of 318 children and youth exposed to single or multiple traumatic events has confirmed the four-factor structure of the RI-5 through confirmatory factor analysis (Takada et al., 2018). Similar findings were reported by another study using a culturally diverse sample and based on the same technique (Doric et al., 2019). More recently, based on a sample of 455 polyvictimized adolescents, exposed to multiple types of traumatic stressors, a Bayesian Structural Equations Modeling technique has provided further evidence for the acceptability of the four-factor structure of the RI-5 (Modrowski et al., 2021).

As mentioned above, the child/adolescent self-report version of the RI-5 is accompanied by a parent/caregiver-report version, that maintains the same four-factor structure, according to the diagnosis criteria proposed by the DSM-5. Nevertheless, the latter has received less attention from the scientific community, and studies on its psychometric properties remain non-existent. Conducting research seeking to address this gap in the literature is urgent. The importance of incorporating multiple informants reports in the assessment and diagnosis of child psychopathology is today well-recognized by both researchers and clinicians and supported by theoretical perspectives on normal and abnormal child development (Achenbach, 2006). Therefore, incorporating the reports of those who share close relationships with the child (as parents, for example), using validated tools, is imperative

for mental health professionals to make informed decisions for assigning diagnosis of child PTSD (and thus for planning treatments), as it allows the analyses of possible (dis) agreements and the identification of additional symptoms not reported by the traumatized child/adolescent (Grant et al., 2020).

In light of the above, the present study aims to explore the psychometric properties of the parent/caregiver-report version of the RI-5, including reliability, validity, and factorial structure, based on a sample of Portuguese children and adolescents, aged 7 to 17 years, and their respective caregiver; findings will add to the scientific knowledge already provided for the child/adolescent self-report version of the RI-5.

Method

Participants and Procedures

Participants included 457 children and adolescents (279 girls, 61.1%), aged between 7 to 17 years ($M = 11.30$, $SD = 2.98$), who experienced at least one potentially traumatic event, as well as their primary caregivers. Caregivers were between 21 and 65 years of age ($M = 42.55$, $SD = 6.17$). Mothers were mostly the primary caregivers (95.2%), followed by fathers ($n = 17$, 3.7%), stepmothers ($n = 2$, 0.4%), aunts ($n = 2$, 0.4%) and grandmother ($n = 1$, 0.2%). Most of the caregivers ($n = 263$, 57.5%) completed a university degree, while the remaining 194 (42.5%) had up to 12 years of formal education. Most of them ($n = 341$, 75%) were married or living in a non-marital partnership and were employed ($n = 392$, 85.8%). All participants had Portuguese as their native tongue, and all data collection was carried out in Portuguese.

The present study is part of a wider research project about the effects of early adversity on child socioemotional and cognitive development. Participants were recruited from Parent Associations from elementary to secondary schools and from online Parent Support Groups. Caregivers with more than one child between the ages of 7 to 17 years were asked to complete a set of questionnaires about the youngest child in the study age range, to obtain sociodemographic information, and assess PTSD symptoms (using RI-5) and children's emotional and behavioral difficulties (using the well-known Strengths and Difficulties Questionnaire). A sample of 1,015 children and adolescents was obtained. Considering the purposes of the study, only the children and adolescents exposed to at least one potentially traumatic event were included in this study, reaching a final sample of 457 participants. All study procedures were approved by the institutional review board of the University [blinded review]. Informed consents were obtained from all participants included in the study.

Measures

Sociodemographic Questionnaire Caregivers reported on sociodemographic information about the child/adolescent (e.g., sex, age), the household and themselves (e.g., sex, age, years of education, marital and employment status).

UCLA PTSD Reaction Index for DSM-5 (RI-5, parent/caregiver-report version; Pynoos & Steinberg, 2014; Pynoos et al., 2009). Based on the DSM-5, the parent/caregiver-report version of the RI-5 aims to assess the presence of PTSD symptoms in children and adolescents, between the ages of 7 to 17 years. The first part of this instrument screens for child exposure to 22 potentially traumatic events (serious accidental injury, illness/medical trauma, community violence, domestic violence, school violence/school emergency, physical assault, disaster, sexual abuse, physical abuse, neglect, psychological maltreatment/emotional abuse, interference with caregiving, sexual assault, kidnapping/abduction, terrorism, bereavement, separation, war/political violence, forced displacement, trafficking/sexual exploitation, bullying and witnessed suicide), in accordance with DSM-5 Criterion A. In the second part of the instrument, which corresponds to the PTSD Symptom Scale, caregivers are asked to rate how frequently (from 0 – None [no days] to 4 – Most [almost every day]) their child/adolescent has experienced past-month PTSD symptoms. The RI-5 is composed of 27 items that correspond to the different symptoms criteria of DSM-5, including Criterion B (intrusion, 5 items), Criterion C (avoidance, 2 items), Criterion D (alterations in cognition and mood, 13 items), and Criterion E (arousal, 7 items). Considering all 27 items, a total scale score is also calculated. The RI-5 includes four additional items assessing dissociative symptoms (e.g., "My child feels like he/she is seeing himself/herself or what he/she is doing from outside his/her body, like watching himself/herself in a movie").

For the purposes of this study, the parent/caregiver-report version of the RI-5 was translated into Portuguese based on a several steps approach. First, the RI-5 was translated from English into Portuguese. Then, a back-translation was performed by a bilingual speaker, not involved in the study. Discrepancies were then searched for and solved by consensus, and the translated version was revised by two experts on child psychopathology. Cognitive debriefing was performed with a group of five parents. Each parent was asked to complete the RI-5, and to identify any confusing items or difficult to understand. The necessary adjustments were made resulting in the final-translated version.

Strengths and Difficulties Questionnaire (SDQ, parent/caregiver-report version; Goodman, 2001). The SDQ is a widely used questionnaire that screens for emotional and behavior

difficulties in children and adolescents, aged 4 to 17 years. Caregivers were asked to rate 25 attributes displayed by the child in the last six months, using a 3-point scale ranging from 0 (not true) to 2 (very true). The SDQ includes the following subscales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviors. For the present study, scores on internalizing behaviors—which includes emotional symptoms and peer problems—and on externalizing behaviors— which includes conduct problems and hyperactivity/inattention—were calculated and included in the main analysis. In this study, the SDQ internal consistency was adequate (e.g., Internalizing scale, Cronbach alpha = .78; Externalizing scale, Cronbach alpha = .82).

Data Analytic Plan

Descriptive statistics were first calculated, including the mean values of the RI-5 total scale score, of each category (B, C, D, and E) and of the dissociative symptoms score. Linear regressions were performed to examine whether the total number of potentially traumatic events is a predictor of the RI-5 scores, controlling for child sex and age, as it may provide further support for the validity of the parent/caregiver-report version of the RI-5 (Steinberg et al., 2013). Pearson correlations were carried out to determine the correlations between each RI-5 item and the RI-5 total scale score, as well as between each category, the dissociative symptoms score, and the total scale score. Composite Reliability values were calculated to evaluate the internal consistency of the RI-5 total scale score and of each category. The internal consistency of the dissociative subscale was calculated based on Cronbach's alpha, as this scale was not included in the confirmatory factor analysis (CFA), as described below. Internal consistency reliability was considered appropriate if the coefficients were ≥ .70 (Hair et al., 2013). Based on previous work on the psychometric properties of the child/adolescent-report version of the RI-5 (Doric et al., 2019; Takada et al., 2018), a CFA with WLSMV method of estimation was performed to test the original four-factor structure of the parent/caregiver-report version of the RI-5, informed by DSM-5. The WLSMV is a more appropriate method for items with ordinal nature (Rhemtulla et al., 2012). Dissociative symptoms were not included in the CFA, since they represent an extension of the main PTSD diagnostic criteria (American Psychiatric Association, 2013). As supported by others (Doric et al., 2019), the inclusion of dissociative items on the CFA model could affect the general underlying factor structure of the four categories. Several indices were generated to evaluate the overall fit of the model, including the comparative fit index (CFI), Tucker–Lewis index (TLI), standardized root mean square residual (SRMR), the parsimony-adjusted CFI (PCFI) and the root-mean-squared error of approximation (RMSEA). An adequate fit is obtained when CFI > .90, TLI > .90, SRMR < .08, PCFI > .70, and RMSEA < .08 (Bentler & Bonett, 1980; Hu & Bentler, 1999;

Shi et al., 2019). Standardized factor weights (λ) were calculated to assess the adequacy of each item of the four RI-5 categories, with λ below .50 suggesting problems with the model fit (Joseph et al., 2010). Less than 1% of missing values was found, for each item; therefore, mean imputation was performed. Given previous research showing that the exposure to potentially traumatic events is related to the emergence of internalizing and externalizing problems (Dvir et al., 2014; Teicher & Samson, 2016), Pearson correlations between all RI-5 scores and the SDQ internalizing and SDQ externalizing scales were also performed. Correlation coefficients below 0.70 were indicative of possible discriminant validity, following the work of Doric et al. (2019). All analyses were performed using IBM SPSS Statistics and Lavaan package in R.

Results

The mean number of potentially traumatic events experienced by a child was 2.44 ($SD = 1.74$), ranging from 1 to 10 events. Sixty-one percent of the sample have been exposed to two or more potentially traumatic events. Approximately, 65.9% ($n = 301$) of children experienced the death of a close person; 47.7% ($n = 218$) were exposed to bullying; 28.2% ($n = 129$) experienced painful or scary medical treatment; 18.8% ($n = 86$) experienced or witnessed a serious accident; 16.4% ($n = 75$) witnessed domestic violence; 16% ($n = 73$) experienced separation from their primary caregivers; 15% ($n = 69$) experienced school or neighbourhood violence; 7.7% ($n = 35$) were exposed to emotional abuse and 6.8% ($n = 31$) to neglect; 7.4% ($n = 34$) experienced physical assault; 5.3% ($n = 24$) experienced a natural disaster; 4.4% ($n = 20$) experienced physical abuse and 1.3% ($n = 6$) sexual abuse; 1.1% ($n = 5$) witnessed sexual assault; 1.1% ($n = 5$) had been kidnapped; and 0.7% ($n = 3$) witnessed the suicide attempt of a close person. Boys were significantly exposed to more traumatic events in comparison to girls ($t_{(339.753)} = -2.16$, $p < .05$).

Table 1 presents demographic information and the mean of the total scale score, of each category and of the

Table 1 Descriptive Statistics

	M	*SD*	**Min**	**Max**
Child sex (girls)	61.% ($n = 279$)			
Child age (in years)	11.30	2.98	7	17
RI-5 Total Scale	17.83	9.72	7	60
RI-5 Criterion B category	1.88	2.91	0	11
RI-5 Criterion C category	1.1	1.45	0	6
RI-5 Criterion D category	3.98	4.56	0	22
RI-5 Criterion E category	10.87	3.24	7	24
RI-5 Dissociative subtype	.29	.93	0	10
SDQ Internalizing problems	3.66	3.34	0	15
SDQ Externalizing problems	5.86	3.91	0	20

Table 2 Effects of Total Number of Traumas on RI-5 Total Scale Scores, Categories and Dissociative Symptoms, Controlling for Child Sex and Age

	Total Number of Traumas		Child Sex[a]		Child Age		Model	
	β	p	β	p	β	p	F	R²
RI-5 Total Scale	.48	< .001	.22	.60	−.04	.35	43.63***	.23
RI-5 Criterion B category	.39	< .001	−.04	.34	−.10	.02	24.64***	.14
RI-5 Criterion C category	.29	< .001	.02	.34	0	.93	13.86***	.08
RI-5 Criterion D category	.46	< .001	−.02	.62	.02	.60	40.56***	.21
RI-5 Criterion E category	.39	< .001	.11	.013	−.08	.07	30.34***	.17
RI-5 Dissociative subtype	.15	.010	.12	.01	−.04	.37	6.40***	.04

*** $p < .001$

[a] girls = 0, boys = 1

dissociative subtype score of the parent/caregiver-version of the RI-5. As presented in Table 2, the total number of traumatic events reported by caregivers proved to be a significant predictor of the RI-5 total scale score, as well as of each category (all $p < .001$) and dissociative symptoms ($p < .01$). Child age emerged as a significant and negative predictor of Criterion B ($\beta = -.10$, $p = .02$), and a marginal predictor of Criterion E ($\beta = -.08$, $p = .07$), revealing that younger participants, showed significantly more intrusive and arousal symptoms than older children. Child sex proved to be a significant predictor of Criterion E ($\beta = .11$, $p < .01$) and of the dissociative subtype score ($\beta = .12$, $p < .01$), suggesting that boys displayed more arousal and dissociative symptoms than girls (please, see Table 2).

Table 3 summarizes the means, standard deviations, skewness, and median scores of all RI-5 items, and inter-item correlation for each item with the total score. Items showed moderate to strong correlations with the total scale score ($r = .35$ to $.61$; all $p < .001$). Table 4 presents the correlations between the parent/caregiver-report version of the RI-5 total scale score, each category, and dissociative symptoms. All correlations proved to be statistically significant (all $p < .001$).

Internal consistency reliability analyses for the RI-5 total scale score, each category and dissociative subtype score are showed in Table 5. Results revealed a good internal consistency for the RI-5 total scale score (.96). The internal consistencies of the RI-5 categories and dissociative symptoms were all within acceptable to good ranges (.74–.91).

Bivariate correlations between the SDQ internalizing and externalizing scores and the RI-5 total scale score, categories and dissociative symptoms were examined for evidence of discriminant validity. All correlations proved to be positive and statistically significant (all $p < .001$; please, see again Table 4); correlation coefficients, however, did not exceed .70.

The four-factor structure of the parent/caregiver-report version of the RI-5 was confirmed. Data revealed an adequate model fit (χ^2 (318) = 577.58, $p < .01$, CFI = .95, TLI = .95, SRMR = .08, RMSEA = .04, PCFI = .86[1]) (Fig. 1). The standardized regression weights for all items were analysed. Data indicated that all Criteria B, C and D items had high factorial weights. The same pattern of results was found for Criterion E items, with exception of item 1, showing a $\lambda = .35$.

Discussion

To the best of our knowledge, this was the first study to examine the psychometric properties of the parent/caregiver-version of the RI-5, using a diverse sample of traumatized Portuguese children and adolescents. Aligned with the literature (e.g., Finkelhor et al., 2007, 2009; McChesney et al., 2015), polyvictimization emerged in the present study as a common phenomenon: 61% of those children and adolescents were exposed to more than one potentially traumatic event. Bereavement, separation, and domestic violence were among the most frequent negative experiences reported in the study. This is in line with previous research (e.g., Adams et al., 2016). Authors have concluded that bereavement is one of the most frequent negative life experiences reported among children and adolescents, along with exposure to domestic violence, loss, and separation (Briggs et al., 2013; McChesney et al., 2015; Mueser & Taub, 2008).

Overall, results from this study provided preliminary evidence on the utility of the parent/caregiver-report version of the RI-5. The internal consistency values proved to be acceptable for the total scale score and for each category of the RI-5. Such findings are consistent with previous results from studies examining the reliability of the child/adolescent-report version of the RI-5. In a Japanese study, authors have demonstrated sound internal consistency reliability

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[1] Because Laavan package do not report PCFI, it was used the following formula: CFI x degrees of freedom of the model / degrees of freedom of the baseline model.

Table 3 Item Statistics and Interitem Correlation

#Item	Criterion	*M*	*SD*	Skewness	*Mdn*	*r*[a]
1	E	0.86	0.99	0.79	1	.35
2	D	0.44	0.74	1.56	0	.56
3	C	0.40	0.77	1.89	0	.48
4	E	0.57	0.82	1.37	0	.47
5	B	0.24	0.57	2.39	0	.59
6	D	0.15	0.51	3.89	0	.41
7	D	0.22	0.57	2.76	0	.42
8	E	0.98	1.01	0.66	1	.57
9	D	0.71	0.76	0.74	1	.45
10	B	0.40	0.68	1.67	0	.54
11	B	0.75	0.87	0.89	1	.61
12	D	0.29	0.65	2.38	0	.56
13	C	0.70	1.03	1.27	0	.58
14	B	0.34	0.73	2.34	0	.56
15	D	0.41	0.79	1.92	0	.59
16	D	0.28	0.61	2.22	0	.58
17	D	0.31	0.67	2.39	0	.61
18	B	0.14	0.43	3.55	0	.53
19	D	0.19	0.54	3.30	0	.57
20	E	0.09	0.39	4.76	0	.42
21	E	0.44	0.80	1.82	0	.53
22	D	0.23	0.59	2.89	0	.54
23	D	0.28	0.65	2.52	0	.40
24	E	0.50	0.81	1.59	0	.56
25	D	0.36	0.63	1.74	0	.61
26	E	0.19	0.52	3.13	0	.48
27	D	0.12	0.38	3.73	0	.41
28	Dissociative	0.08	0.35	4.87	0	
29	Dissociative	0.04	0.24	5.90	0	
30	Dissociative	0.10	0.36	4.11	0	
31	Dissociative	0.06	0.28	4.75	0	

[a]Pearson correlations; all *p* < .001

for the total score and for all RI-5 categories and dissociative symptoms (Takada et al., 2018). A similar pattern of results was found in other studies carried out with traumatized American children and adolescents (Adams et al., 2016; Steinberg et al., 2013). Additionally, and consistent

with previous investigation (e.g., Doric et al., 2019; Takada et al., 2018), statistically significant inter-item correlations were found.

Also, of note, significant and strong correlations emerged between the total scale score and the Criteria B, D and E

Table 4 Correlations between RI-5 Total Scale Score, Categories and Dissociative Symptoms and Internalizing and Externalizing Problems

	1	2	3	4	5	6	7
1. RI-5 Total Scale							
2. RI-5 Criterion B category	.81						
3. RI-5 Criterion C category	.67	.61					
4. RI-5 Criterion D category	.93	.68	.52				
5. RI-5 Criterion E category	.82	.50	.41	.66			
6. RI-5 Dissociative subtype	.41	.31	.25	.38	.37		
7. SDQ Internalizing problems	.69	.55	.37	.68	.54	.28	
8. SDQ Externalizing problems	.55	.33	.30	.46	.62	.30	.44

Pearson correlations; all correlation, *p* < .001

Table 5 Internal Consistencies of the Parent/Caregiver-Report Version of the RI-5: Total Scale, Categories and Dissociative Symptoms Scale

	Internal Consistency[a]
RI-5 Total Scale	.96
RI-5 Criterion B category	.86
RI-5 Criterion C category	.74
RI-5 Criterion D category	.91
RI-5 Criterion E category	.81
RI-5 Dissociative subtype[b]	.81

[a]as measured by Composite Reliability

[b]the internal consistency for the dissociative symptoms was measured with Cronbach's alpha, since this subtype category was not included on the confirmatory factorial analysis

categories of the RI-5. Regarding the correlation between the total scale score and the Criterion C, only a moderate coefficient value emerged. This finding may be explained by the two-item composition of the Criterion C category and has already been reported by others examining the psychometric properties of the child/adolescent-report version of the RI-5 (Takada et al., 2018). The correlations between the dissociative subtype score and the total scale score and each category of the RI-5 were also found to be statistically significant; however, coefficients proved to be weak. Such finding may be explained by the uncommon nature of the dissociative symptoms (Stein et al., 2013), which can make it difficult for caregivers to identify or make sense of dissociative reactions in their children.

Also supporting the utility of the parent/caregiver-report version of the RI-5, the total number of traumatic events reported by caregivers emerged as a significant predictor of the total scale score of the RI-5, as well as of each category and dissociative symptoms. These results are in line with a great amount of research suggesting that the exposure to multiple types of traumas is associated with the presence of a higher number and more complex pattern of PTSD symptoms (Briere et al., 2008; Briggs et al., 2013; Jakob et al., 2017). In this regard, consider the studies by Finkelhor et al. (2007) and by Karam et al. (2014), revealing that polyvictimization is one of the strongest predictors of the presence of trauma symptoms, and that children and adolescents exposed to more than four potentially traumatic events are at elevated risk to show a more complex pattern of PTSD symptoms, including dissociation.

Child age and sex also emerged, in this study, as predictors of PTSD symptomatology. In particular, age was found to be a significant individual predictor of Criterion B category, with younger children showing more intrusive symptoms. The presence of this type of symptoms among younger children, which

may include symptoms of re-experiencing and reenactments of the traumatic situation or having nightmares without specific content, may be the result of elevated difficulties in understanding and putting into words their experiences (Dyregrov & Yule, 2006). Regarding child sex, boys exhibited significantly more reactivity and dissociative symptoms than girls. This result is not surprising. Even though the literature has demonstrated that girls tend to be at higher risk of experiencing PTSD symptoms (Alisic et al., 2014), traumatized boys have been described as showing higher activation and reactivity (Cox et al., 2008; Forresi et al., 2020). Researchers have suggested that this phenomenon may be explained by a vasopressin hormonal deregulation – most frequently observed in boys – involved in the response to stressful situations (Christiansen & Elklit, 2012). Additionally, boys have also shown more dissociative symptoms than girls; thus, data from this study meets the conclusions of some previous research (Stein et al., 2013). In fact, authors have proposed that the evolution of dissociative symptoms among traumatized children and youth may be sex-related, with boys displaying greater dissociative symptoms over time, than girls (Bernier et al., 2013). It may also be the case that boys were exposed to more severe traumatic experiences, explaining the links between being a boy and the presence of a more complex pattern of PTSD symptoms, including dissociation. Our results seem to support this possibility: in the present sample, boys have been significantly exposed to more potentially traumatic events than girls.

PTSD symptoms and internalizing and externalizing problems proved to be significantly correlated. These are expecting findings, given evidence showing that exposure to traumatic events place children at risk for internalizing and externalizing difficulties (e.g., Grasso et al., 2013). However, it should be noted that correlations coefficients proved to be below .70; this is similar to the pattern of results observed in studies analyzing the utility of the child/adolescent-report version of the RI-5 (Doric et al., 2019). It is likely that the parent/caregiver-report version of the RI-5, including each category and dissociative symptoms, is assessing constructs that differ from the more common emotional (e.g., anxiety, depression) and behavioral problems. Thus, data from this study provides preliminary support for discriminant validity.

The final analysis of this study showed that the original structure of the RI-5, which is in accordance with the four-factor model proposed by DSM-5, was globally acceptable. Studies focused on the adequacy of the child/adolescent-report version of the RI-5 have provided also evidence supporting a four-factor structure of the disorder (Modrowski et al., 2021; Takada et al., 2018), in different countries, including in Portugal – i.e., the locale where the research reported herein was conducted (Doric et al., 2019). Despite such results, in the present study, however, one E item presented low values of standardized regression weights. Doric et al. (2019) found similar results in their study. In particular,

Fig. 1 Four-Factor CFA Model of the Parent/Caregiver-Report Version of the RI-5 with Standardized Regression Weights for all RI-5 Category Items
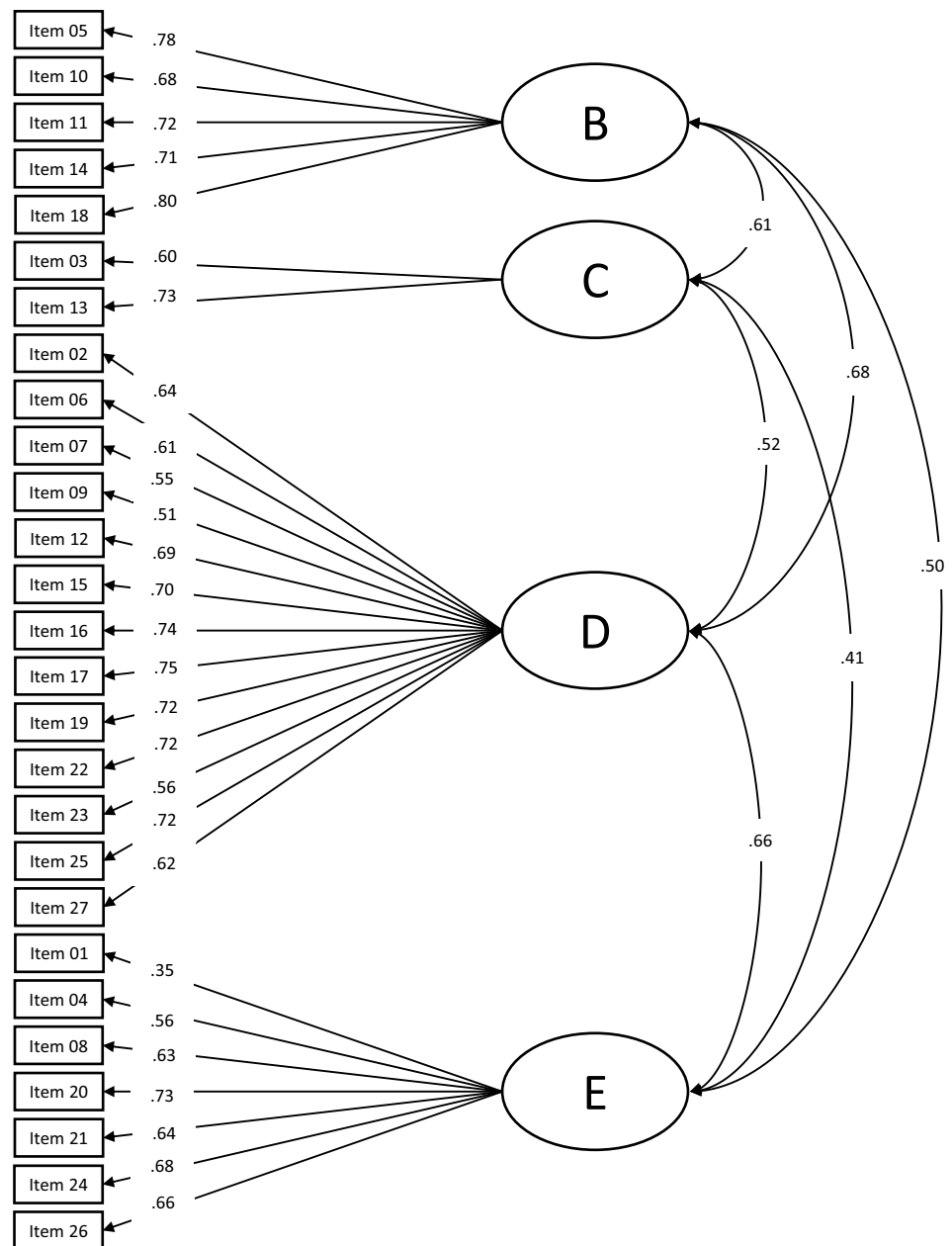
those authors reported low values of standardized regression weights in items from the E category in 9 out 11 countries, including Portugal. Although it has been suggested that the structure of the RI-5 is adequate and that adding or subtracting factors does not seem to improve the fit of the model, even when different techniques are applied (Modrowski et al., 2021), the possibility that key items (for the assessment of symptoms of PTSD) are missing from RI-5 should be considered. It may also be the case that some RI-5 items, including those measuring arousal, may be particularly sensitive to cultural and societal effects, differing in their relevance or in the way they are interpreted, from one society to the other, as suggested elsewhere (Doric et al., 2019).

The current research comprises a number of strengths. Most importantly, and for the best of our knowledge, this is the first study testing the psychometric properties of the parent/caregiver-report version of the RI-5. Therefore, it opens a new window for a multi-informant perspective to be adopted using a brief, developmentally appropriate, widely used, and well-validated PTSD screening tool. However, there are limitations to this research that merit attention. It should be noted that details from the traumatic experiences were not assessed in this study, including child age at the time of occurrence of the traumatic event or even the duration of exposure. This limitation is noteworthy. In this regard, consider, as an example, a study from Kaplow

and Widom (2007), suggesting that early exposure to specific types of traumas (e.g., maltreatment) may especially increase the risk for mental health difficulties. Future research should test whether RI-5, in its different versions, is equally able to assess and diagnose PTSD in diverse samples of traumatized children and adolescents (e.g., early versus later onset of the disorder, single versus multiple traumas). Moreover, this study did not include a second tool for the assessment of PTSD in children and adolescents, that would have allowed testing for convergent validity, due to a lack of validated assessment tools in Portuguese to assess PTSD symptoms in children/adolescents, also based on DSM-5. This study, however, will inform future studies. Notably, it opens the possibility for future research to develop and validate other (complementary) instruments, in Portuguese, for the assessment and diagnosis of PTSD in children/adolescents. Even though the need for multiple informants in PTSD screening is already well-established (Grant et al., 2020), future studies should also examine the utility and added value of combining both parent and child/youth report using the RI-5. Test–retest reliability should be examined. Finally, it is highly recommended that the psychometric properties of the parent/caregiver-report version of the RI-5 are tested, in the future, by other researchers, using cross-culture designs and incorporating clinical samples.

Conclusion

To the best of our knowledge, this was the first study to test the psychometric properties of the parent/caregiver-report version of the RI-5, a well-known and widely used measure for the assessment of PTSD symptoms in children and adolescents, aged 7 to 17 years. Results suggested that this version of the scale may be a valuable tool for measuring PTSD in children and adolescents, showing sound internal consistency reliability for the total scale and each PTSD criteria. Future studies should further expand the utility of the parent/caregiver-report version of the RI-5 for the assessment of children and adolescents from different cultures exposed to a variety of traumatic events.

Declarations

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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