

# Screening for Preschool Posttraumatic Stress Disorder with the Child Behavior Checklist

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**Objective** To examine the psychometric properties and utility of a Child Behavior Checklist–Posttraumatic Stress Disorder (CBCL–PTSD) Scale to screen for posttraumatic stress disorder (PTSD) in traumatized preschool children. **Method** Data for this study were drawn from a study of young child trauma and consisted of 62 traumatized children, 23 months through 6 years of age. The children’s mothers were interviewed about PTSD symptoms and then completed the Child Behavior Checklist (CBCL). **Results** The modified CBCL–PTSD correlated highly with the number of PTSD symptoms from the interview ( $r = 0.66$ ). The CBCL–PTSD scale predicted PTSD symptoms above and beyond the internalizing and externalizing scales of the CBCL. A cutoff score of nine on this scale possessed the best sensitivity and specificity in classifying those traumatized children who met diagnostic criteria for PTSD. **Conclusion** The modified CBCL–PTSD scale could be a useful cost-effective tool to screen for PTSD in traumatized, preschool-age children.

**Key words** Child Behavior Checklist; posttraumatic stress disorder; preschool.

The prevalence of sexual abuse, physical maltreatment, domestic violence, unintentional injuries, and major catastrophes emphasize the need to assess the psychological impact of traumatic events on children. One of the psychological sequelae of such events for young children is posttraumatic stress disorder (PTSD). It is important for clinicians in primary care and other medical settings to have an adequate method of screening for this disorder in children following traumatic events. Wolfe, Gentile, and Wolfe (1989) proposed that a subset of 20 items in the Child Behavior Checklist (CBCL) (Achenbach & Edelbrock, 1983) could serve as a screen for posttraumatic symptomatology. In this study, the researchers assess the psychometrics and utility of a similar screen for PTSD in 1- to 6-year-old children for the first time.

The CBCL has potential usefulness as a screen in medical settings in which children are seen for follow-up care postinjury (e.g., orthopedics clinics), routinely undergo invasive procedures (e.g., hematology/oncology services), or have their only contact with a health professional in the primary care setting. This measure is

simple to administer and requires no training. A further advantage, given the various psychological problems which children may have following trauma, is that the CBCL also provides well-validated scales to assess for elevations in other internalizing and externalizing problems.

Following the demonstration by Wolfe, Gentile, and Wolfe (1989) that their proposed 20-item Child Behavior Checklist–Posttraumatic Stress Disorder (CBCL–PTSD) Scale yielded higher scores for their sexually abused sample than from a normative sample, several other investigations with older children followed. Pynoos, Frederick, Nader, Arroyo, Steinberg, Eth, Nunez, & Fairbanks (1987) showed that the CBCL–PTSD performed similarly to the PTSD Reaction Index (Pynoos, Steinberg, & Goenjian, 1996), in that maternal factors (PTSD symptoms and supportiveness) predicted significant variance in each measure. King et al. (2000) found significant improvement in CBCL–PTSD scale scores following treatment for PTSD.

Ruggiero and McLeer (2000) studied 80 sexually abused children between the ages of 6 and 16 and

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showed adequate internal consistency for the scale (Cronbach's  $\alpha = .85$ ). The children who met diagnostic criteria for PTSD scored significantly higher on this scale than those who did not meet diagnostic criteria, and the CBCL-PTSD scale correlated significantly ( $r = 0.57$ ) with the total number of PTSD symptoms. These researchers found eight to be the best possible cutoff score, correctly classifying 87% of the children with PTSD, although misclassifying 38.5% of the children without PTSD.

In this study, the researchers examined the validity of a modified CBCL-PTSD scale in a sample of younger traumatized children. The scale was modified by removing those items that did not appear in the preschool forms of the CBCL. The first hypothesis was that children who had the full diagnosis of PTSD would have higher CBCL-PTSD scores than those who did not have the full diagnosis (criterion validity). Second, the CBCL-PTSD score would correlate strongly with the number of PTSD symptoms endorsed by the parent interview. The association of the CBCL-PTSD score with the diagnosis and with the number of PTSD symptoms are different questions because the diagnosis is based on an algorithm. The researchers' third hypothesis was that modified CBCL-PTSD scale would be a more precise screen for PTSD compared to the internalizing and externalizing broad-band scales of the CBCL (i. e., incremental, validity) An additional goal of this study was to determine the cutoff score on the scale that possessed the highest degrees of sensitivity and specificity in screening for PTSD in young children.

## Method

### Participants

The sample for this study consisted of 62 traumatized children, 23 months through 6 years of age, drawn from an ongoing study of young-child trauma (Scheeringa, Zeanah, Myers, & Putnam, 2003). The traumatized children were actively recruited over a period of 18 months from all possible cases in an intensive care inpatient unit of a level 1 trauma center ( $n = 21$ , mostly automobile collisions), three battered women's shelters ( $n = 19$ , witnessed domestic violence), an outpatient mental health program that specializes in treating violence-exposed children ( $n = 9$ , witnessed domestic or community violence), and a pediatric cancer program ( $n = 6$ , invasive medical procedures of repeated spinal taps and bone marrow aspirations). Seven additional cases were discovered by word of mouth (dog bite, three vehicle collisions, and three sexually abused). Three individuals

from the inpatient site refused to participate when approached. The domestic violence participants were given the study information by the shelter staff and the researchers do not know how many refused to call. The cancer patients represented all active patients at that time and none refused. For those with repeated types of experiences, data was not systematically collected on the number of incidents. Inclusion criteria were that the child (a) was between 20 and 83 months of age at the time of the event and the assessment, (b) experienced an event that was life-threatening or witnessed a life-threatening event to his/her parent or sibling, (c) was English-speaking, and (d) showed at least one PTSD symptom more than 2 months after the event. At least one symptom was required to ensure that only symptomatic subjects were enrolled.

Exclusion criteria were (a) disabling preexisting medical disorders, (b) severe developmental disorders, and (c) for the hospitalized injury victims, Glasgow Coma Scale score less than seven in the emergency room. No potential subjects met the exclusion criteria. One participant was excluded from the analyses due to a missing CBCL form. The resulting sample for this set of analyses was 61 traumatized children between the ages of one and six ( $M = 4.1$  years,  $SD = 1.4$ ). The sample was evenly distributed as to both gender (55.7% male) as well as race (54% Black, 46% White). The mean duration from the time of the last trauma to the assessment was 11.4 months (median 7.5 months, range 2–52 months).

## Measures

### Child Behavior Checklist

Depending on the age of the child, a preschool version or the 4- to 16- year-old version of the CBCL (Achenbach & Edelbrock, 1983) was used. Most of the preschool versions used were the 2–3 years version, and the 1.5–5 years version was used on the later subjects when this version became available. Because the items used in the PTSD scale from the 2–3 and 1.5–5 years forms were identical, these will be referred to collectively as the preschool forms. This measure is completed by a parent or a caregiver to report on children's behavior. Raw scores were used in all analyses. Both versions of the CBCL generate two broad-band scales, internalizing and externalizing (Achenbach, 1991). The 1 week test-retest reliability for the broad-band scales range from 0.82 to 0.95. In an examination of the validity of the scales, Achenbach (1991) found that 113 of the 118 individual item scores were higher for clinically referred than nonreferred youth. Five of Wolfe et al.'s (1989) 20-item scale had to be dropped as there were no analogous items on the preschool

**Table I.** Modified Child Behavior Checklist–Posttraumatic Stress Disorder Scale

4- to 18-year-old form	Preschool forms
1. Argues a lot	1. Defiant
2. Cannot concentrate or cannot pay attention for long	2. Cannot concentrate or cannot pay attention for long
3. Cannot get his/her mind off certain thoughts, obsessions	3. Clings to adult or too dependent
4. Clings to adults or too dependent	4. Fears certain animals, situations, or places
5. Fears certain animals, situations, or places other than school	5. Nervous, high-strung, or tense
6. Feels others are out to get him/her	6. Nightmares
7. Nervous, high-strung, or tense	7. Too fearful or anxious
8. Nightmares	8. Nausea and feels sick
9. Too fearful or anxious	9. Stomachaches and cramps (without medical cause)
10. Feels too guilty	10. Vomiting and throwing up (without medical cause)
11. Headaches	11. Stubborn, sullen, or irritable
12. Nausea and feels sick	12. Sudden changes in mood or feelings
13. Stomachaches and cramps	13. Wakes up often at night
14. Vomiting and throwing up	14. Unhappy, sad, or depressed.
15. Secretive and keeps things to self	15. Withdrawn or does not get involved with others
16. Stubborn, sullen, or irritable	
17. Sudden changes in mood or feelings	
18. Trouble sleeping	
19. Unhappy, sad, and depressed	
20. Withdrawn and does not get involved with others	

forms. The resulting PTSD scale used in this study consists of 15 items that are presented in Table I. Of these 15 items, 6 are also part of the internalizing scale and 3 are part of the externalizing scale. These items were not removed when calculating the internalizing and externalizing scores to maintain the completeness of those scales.

#### Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children

PTSD symptoms were assessed with the Posttraumatic Stress Disorder Semi-Structured Interview and Observational Record for Infants and Young Children (Scheeringa, et al., 2003). This interview yields both a count of the number of PTSD symptoms and a categorical diagnosis. An earlier study using this interview revealed a median interrater reliability of 0.74 for both the endorsement of individual symptoms and the diagnosis of PTSD in children (Scheeringa, Peebles, Cook, & Zeanah, 2001). The alternative diagnostic criteria proposed by Scheeringa et al. (2001) were used as the criteria to diagnose PTSD in the children. In this alternative set of criteria, the wording of five of the 17 Diagnostic and Statistical Manual for Mental Disorders, fourth edition (*DSM-IV*) symptoms is slightly modified to be more developmentally sensitive or behaviorally anchored without changing the intent of the symptoms. Recurrent and intrusive distressing recollections were modified so that it was not mandatory that distress be apparent. Flashbacks could be endorsed if

behavioral manifestations of a flashback were observed, even if the children could not self-report on the internal experience due to limited verbal capacities. Diminished interest in activities was noted to include constriction of play. Detachment and estrangement from others was noted to include behavioral observations of social withdrawal. Irritability and outbursts of anger was modified to include extreme temper tantrums and fussiness. The *DSM-IV* algorithm is used except that endorsement that the child's immediate response show extreme emotional or behavioral reactions [criterion A(2)] is not required, and only one avoidance/numbing symptom (Cluster C) is required rather than three. These alternative criteria have been found more valid than the *DSM-IV* criteria for younger children as they have been found to be more sensitive in diagnosing symptomatic and incapacitated children in two sites and four studies (Ohmi et al., 2002; Scheeringa et al., 2001; Scheeringa, Zeanah, Myers, & Putnam, 2003).

The CBCL was completed by the parent or caretaker after the interview for diagnostic symptoms as part of a larger assessment procedure conducted in the laboratory.

#### Results

The modified CBCL–PTSD scale used in this study demonstrated adequate internal consistency for both the 4- to 18-year-old form (Cronbach's  $\alpha = .87$ ) and the 2- to 3-year-old form (Cronbach's  $\alpha = .83$ ). In this sample 16

of the 61 children (26.2%) met the diagnostic criteria for PTSD from the interview. The mean CBCL-PTSD scores for those children who met diagnostic criteria for PTSD ( $M = 15.12$ ,  $SD = 5.5$ ) was significantly different from the mean of those children who did not meet diagnostic criteria by this interview ( $M = 7.71$ ,  $SD = 5.67$ ),  $F(1, 59) = 20.73$ ,  $p < .0001$ .

The correlation of the CBCL-PTSD scale with the total number of symptoms of PTSD from the interview was  $.66$  ( $p < .0001$ ) and was higher in magnitude than the correlations of both the internalizing ( $r = .57$ ,  $p < .0001$ ) and externalizing ( $r = .42$ ,  $p < .001$ ) scales. Hierarchical linear regression was then performed entering the modified CBCL-PTSD scale first, the CBCL internalizing scale second, and the CBCL externalizing scale last. The internalizing scale was entered prior to the externalizing scale because internalizing symptoms are more closely related to PTSD and thus were expected to account for more variance in PTSD than externalizing symptoms. The results indicated that the modified CBCL-PTSD scale explained 43% of the variance in children's PTSD symptoms,  $F(1, 56) = 43.95$ ,  $p < .001$ . Neither the internalizing nor the externalizing scales explained significant additional variance in children's PTSD symptoms. When the order of entry was reversed, CBCL externalizing was entered first and explained 18% of the variance,  $F(1, 56) = 12.62$ ,  $p < .01$ . CBCL internalizing was entered second and explained an additional 16% of the variance,  $F(1, 56) = 13.61$ ,  $p < .01$ . CBCL-PTSD was entered last and explained an additional, and significant, 11% of the variance,  $F(1, 56) = 10.62$ ,  $p < .01$ . This demonstrated that even though the internalizing and externalizing scales significantly positively correlated with the number of PTSD symptoms, the CBCL-PTSD scale possessed predictive power above and beyond those scales, that is, incremental validity.

The final analysis addressed the best cutoff score for the modified CBCL-PTSD scale. For these analyses, following the method of Ruggiero and McLeer (2000), the items were coded dichotomously, with all positive responses scored as "1," and all negative responses scored as "0." The most appropriate cutoff score appears to be 9. This cutoff identified 75% of all true positives (sensitivity) and 84.4% of all true negatives (specificity). Further, 63% of those children who scored 9 or higher were diagnosed with PTSD (positive predictive value), and 90% of children scoring lower than 9 did not have PTSD (negative predictive value). A score of eight produced similar results with a sensitivity of 75% and a specificity of 84.4%. In contrast, a score of 10 substantially lowered sensitivity to 62.5% while only minimally

increasing specificity to 88.9%. Thus, for screening purposes, a score of nine on this scale seems appropriate to warrant further assessment for preschool PTSD.

## Discussion

In this study the researchers examined the psychometrics and the utility of a modified CBCL-PTSD scale to screen for PTSD in traumatized preschool children. This sample was younger than samples in which the CBCL scale was previously tested (Ruggiero & McLeer, 2000). The results supported the researchers' hypotheses. The PTSD-CBCL score was significantly higher in children who had the full diagnosis of PTSD, and correlated highly with the number of PTSD symptoms from the interview. Perhaps most importantly, the scale demonstrated incremental validity above and beyond the internalizing and externalizing scale, contrary to the conclusion of Ruggiero & McLeer (2000). Further, the modified scale possessed adequate sensitivity and specificity, as a score of nine on the researchers' scale accurately classified 75% of the children who met diagnostic criteria for PTSD although misclassifying less than 15% of the non-PTSD group.

It should be noted that the utility of the modified CBCL-PTSD scale is in screening for PTSD, not diagnosis. The data from this sample attest that the sole use of the modified CBCL-PTSD scale to diagnose PTSD would miss some true cases and incorrectly diagnose a portion of non-cases. Nonetheless, in a sample of children with known traumas, the CBCL would be a useful, cost-effective measure to see which children warranted further assessment.

Limitations of this measure include that two PTSD symptoms—diminished interest in significant activities and exaggerated startle response—are behaviors that potentially could be reliably observed and reported on by parents, but are not part of the CBCL. Also, some items in the CBCL-PTSD scale are not diagnostic items of PTSD even though they do possess face validity as posttraumatic symptomatology (e.g., feels too guilty and somatic symptoms). Another limitation of this study is its inability to directly compare the utility of the modified CBCL-PTSD scale and the original CBCL-PTSD scale. The age of the researcher's sample, and thus the unavailability of five of the original items for many of the children, made this impossible. Future studies of children 4 years and older could directly compare the performance of the original CBCL-PTSD scale and the modified CBCL-PTSD scale. The sample was a mixture of types of traumas and may not be generalizable to a purely medical trauma sample. Lastly, this analysis possessed a

sufficient sample size (20 cases per predictor) by most guideline for multiple regression, but not by a more conservative guideline that would recommend 107 cases (Tabachnik & Fidell, 2001). A larger sample may have produced different results

These limitations aside, the results of this study support the utility of the revised CBCL-PTSD in busy medical settings, where the occurrence of trauma is often brought to the attention of medical professionals. This scale could be a useful follow-up assessment to go along with continuing medical care for injuries sustained as a result of the trauma. A further advantage, given the various psychological problems which children may have following trauma, is that the CBCL also provides scales to assess for elevations in other internalizing and externalizing problems. Thus, the utility of the CBCL in screening for PTSD in children following trauma comes not only from the performance of the modified CBCL-PTSD scale but also from the existence of the other well-validated scales of the CBCL.

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