Use of a Psychosocial Screen to Detect Children With Symptoms of Posttraumatic Stress Disorder: An Exploratory Study

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Objective.—The aim of this study was to evaluate the sensitivity and specificity of the parent and youth versions of the 17-item Pediatric Symptom Checklist (PSC-17) for identifying children with symptoms of posttraumatic stress disorder (PTSD).

Methods.—Cross-sectional convenience samples of children aged 8 to 10 years treated at a primary care pediatrics practice in New York City were recruited. The PSC-17 and its 5-item internalizing subscale were used in both parent- and youth-completed formats. Posttraumatic stress disorder symptoms were identified with the University of California, Los Angeles posttraumatic stress reaction index (UCLA RI), used as a structured interview with the child.

Results.—One hundred fifty-six children enrolled in the study. Twenty-two percent of children met the UCLA RI cutoff for likely PTSD. The youth version of the PSC-17 and its 5-item internalizing subscale identified these children with sensitivities of 78% and 75% and specificities of 77% and 77%, respectively, relative to the UCLA RI. The parent version of the PSC-17 and the internalizing subscale had poorer sensitivities of 44% and 25% and similar specificities of 79% and 92%, respectively.

Conclusions.—Symptoms of PTSD can be identified using the youth self-report version of the PSC-17. A 5-item subscale of the PSC-17 also performed well and can readily be used in primary care settings.

KEY WORDS: mental health; Pediatric Symptom Checklist; primary care

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Psychosocial screening of children in primary care pediatric settings has relied primarily on parental report by using screening instruments designed to identify generalized psychosocial distress,[1,2] such as the Pediatric Symptom Checklist (PSC). However, there is evidence that parents are not reliable reporters regarding internalizing disorders such as posttraumatic stress disorder (PTSD).[1,3–5] Also, there is little information regarding whether the PSC can identify disorder-specific symptoms such as those associated with PTSD.[6] In this exploratory cross-sectional study, we sought to assess whether the PSC is an effective screen for child posttraumatic stress disorder symptoms by comparing parent and child responses on the PSC to responses on a measure designed to identify PTSD symptoms, which was administered as a structured interview to children by trained assessors.

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METHODS

Participants and Recruitment

This study was reviewed and approved by the Institutional Review Board of Mount Sinai School of Medicine. It was conducted at the pediatric primary care practice of the Mount Sinai School of Medicine, a practice that primarily serves residents of East Harlem, an ethnically diverse and economically disadvantaged community. We recruited a convenience sample of 156 children aged between 8 and 10 by approaching families in the waiting room. Participation rate was 83%. Potential participants were excluded only if they could not answer basic questions in English. Researchers recruited participants in the waiting room on various days. On average, 3 to 4 days were covered per week (for time periods ranging from 3 to 6 hours each day) for a total of 94 recruitment/assessment days. Review of recruitment data revealed no systematic bias toward any given day of the week or toward mornings versus afternoons.

After parental informed consent and child assent were obtained, parents and children completed the questionnaires separately in a private space. The investigator read all questions aloud with the children to assure comprehension of each item.

Measures

Sociodemographic Questionnaire

A questionnaire given to caregivers asked about gender, age, race/ethnicity, primary home language, medical

problems, emotional/behavior problems, use of mental health services (ever and in the past 12 months), history of foster care, and caregiver identity (eg, mother, father).

Pediatric Symptom Checklist

The 17-item Pediatric Symptom Checklist (PSC-17) is a widely used brief version of the PSC and has been shown to be reliable and internally consistent, with a Cronbach's α of 0.89.[6–10] The items on the PSC-17 can be divided into 3 subscales (internalizing, externalizing, and attention) intended to help the clinician focus his/her assessment on areas of possible dysfunction. Because this study involved assessment for symptoms of an internalizing disorder (PTSD) the 5-item internalizing subscale was included in analyses. This subscale has a Cronbach's α of .79.[7] Positive scores on the PSC-17 and the internalizing subscale correlate well with other parent and youth report measures such as the Child Behavior Checklist.[6] If an internalizing subscale was missing 2 or more items, it was considered invalid; if 1 item was missing, the series mean was substituted for this value.

University of California, Los Angeles Posttraumatic Stress Reaction Index

The University of California, Los Angeles posttraumatic stress reaction index (UCLA RI) assesses children's reactions to traumatic experiences.[11–15] It is a scale designed for children aged 7 to 18 years of age and is comprised of 3 parts. Part I is a brief lifetime trauma screen asking about the occurrence of certain significant life events, such as natural disasters, family violence, and medical emergencies. If more than 1 event has occurred, the child chooses the most bothersome one to focus on and the rest of the scale is completed with this event in mind. Part II asks about specific aspects of this trauma and Part III asks about the frequency of specific symptoms over the past month. Items in Part II are tied to the symptoms comprising the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria for a diagnosis of posttraumatic stress disorder.[11] The UCLA RI has good test-retest reliability with a coefficient of 0.84. A cutoff score of 38 has a sensitivity of 0.93 and specificity of 0.87 against a PTSD diagnosis obtained using the child and adolescent version of the Clinician Administered Posttraumatic Stress Disorder Scale.[11]

The UCLA RI can be used either as a self-report or as a structured interview. In this study, it was administered as an interview because this facilitates comprehension and permits exploration and elaboration of responses. Of note, for this exploratory study, although a clinical psychiatric diagnosis was not utilized, the UCLA RI was administered as a structured interview by trained assessors and therefore is used as a measure of likely PTSD based on its clinical cutoff score of 38.

Statistical Analysis

For descriptive analyses, we used independent *t* tests for continuous variables and chi-square tests for categorical data. For the latter, in cases where there were fewer than 5 subjects per cell, the Fisher exact test was used. In our study, statistical analyses were performed using SPSS 14 (SPSS Inc, Chicago, Ill), and tests of statistical significance for these were based on 2-tailed tests. Sensitivity and specificity were calculated according to standard statistical procedures for assessing the accuracy of medical tests[16] and were run using Stata 9.0 statistical software (StataCorp LLP, College Station, Tex). For comparison of the areas under the receiver operating characteristics (ROC) curve for the different test scales assessed, we used the roccomp procedure in Stata 9.0.

RESULTS

Participants

Table 1 describes the characteristics of the participants. Nonparticipants did not differ in terms of age, gender, or

Table 1. Characteristics of Sample Population

	Total (N = 145)	PTSD−* (n = 113)	PTSD+ (n = 32)	*P* value
Mean age (SD)†	9.0 (0.8)	9.0 (0.8)	8.9 (0.9)	.61
Female, %‡	54	54	53	.93
Latino/Hispanic (caregiver), %‡	61	62	57	.58
Black, non-Latino (caregiver), %‡	36	37	30	.48
English as primary language, %§	91	89	97	.30
Any medical problems, %‡	51	53	44	.37
Any emotional/behavioral problems, %‡	26	22	41	.03
Ever seen by mental health professional, %‡	35	32	45	.19
Mental health professional was seen in last 12 months, %‡	27	23	39	.09
Community violence reported, %†	57	50	81	.001
Family violence reported, %‡	35	30	50	.04
Any trauma reported, %§	96	95	100	.34
Parent PSC‖ score (SD)†*	10.6 (5.8)	9.8 (5.6)	13.4 (5.7)	.002
Youth PSC score (SD)†*	12.4 (5.2)	11.1 (4.7)	17.0 (4.2)	<.001

*PTSD indicates posttraumatic stress disorder.
†*t* test; SD indicates standard deviation.
‡Chi-square test.
§Fisher exact test.
‖PSC indicates Pediatric Symptom Checklist.

race. One hundred forty-five of our 156 participants did not have missing items on the PSC-17. These 145 participants constitute our observation base. Participating caregivers were largely mothers (85%), 7% of the caregivers were fathers, 3% were grandmothers, 3% were aunts, and 2% were other.

UCLA RI

As shown in Table 1, a majority (96%) of the children had a traumatic event in their past. Trauma reported included interpersonal violence, car crashes, medical illnesses, and related stressors such as surgery, and death of a sibling, parent, or grandparent. When children mentioned interpersonal violence, it was in a variety of contexts, including domestic violence, corporal punishment, sexual abuse, bullying, and community violence such as street fights and shootings.

Thirty-four children (22%) met or exceeded the UCLA RI cutoff score of 38 for likely PTSD. Children with a high level of PTSD symptoms did not differ from other participants in terms of gender, age, or race/ethnicity. Children who met or exceeded the UCLA RI cutoff score had significantly higher mean scores on the parent and youth versions of the PSC-17 (13.4 vs 9.8; $P = .002$, and 17.0 vs 11.1; $P < .001$, respectively). They were also significantly more likely to have a caregiver report that they had emotional/behavioral problems (41% vs 22%; $P = .03$), and there was a trend toward a higher likelihood of having seen a mental health professional in the past 12 months (39% vs 23%; $P = .09$).

PSC-17 Detection of PTSD Symptoms

The youth version of the PSC-17 was much more sensitive than the parent version at detecting likely PTSD based on the UCLA RI (0.78 vs 0.44, respectively; Table 2). The internalizing subscale followed a similar pattern, with sensitivity for the youth version (0.75) far in excess of the sensitivity of the parent version (0.25). All of the scales had specificities of 0.77 or greater. Of particular note, the brief internalizing subscale was as sensitive and specific in detecting likely PTSD as was the full PSC-17. A ROC curve (Figure) constructed for the youth and parent versions of the PSC-17 showed better performance as a screening tool by the youth version (area under the ROC curve [AUC] = 0.83, 95% confidence interval [CI], 0.74–0.91) compared with the parent version (AUC = 0.67, 95% CI, 0.57–0.77). A statistical test comparing the AUC results for these 2 scales suggested that they were significantly different (chi-square = 6.68; $P < .01$). To assess whether younger child data impacted our PSC results, we reanalyzed our data excluding children aged younger than 9 and found that neither mean PSC scores nor percentages with positive scores changed.

Table 2. Sensitivity and Specificity of a Positive PSC* in Identifying Symptoms of Likely PTSD†

Measure	Sensitivity	95% CI‡	Specificity	95% CI
PSC-17 (score ≥15)§				
Parent	0.44	0.28–0.61	0.79	0.70–0.85
Youth	0.78	0.61–0.89	0.77	0.68–0.84
Internalizing subscale (score ≥5)				
Parent	0.25	0.13–0.42	0.92	0.86–0.96
Youth	0.75	0.58–0.87	0.77	0.68–0.84

*PSC indicates Pediatric Symptom Checklist.
†PTSD indicates posttraumatic stress disorder.
‡CI indicates confidence interval.
§PSC-17 indicates 17-item Pediatric Symptom Checklist.

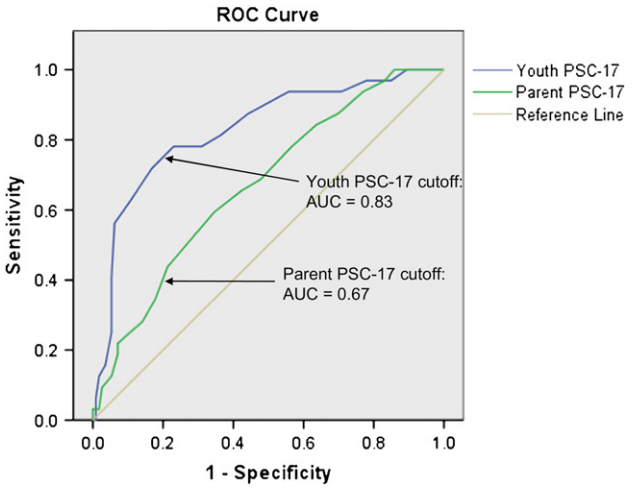

Figure. *Comparison of receiver operating characteristics (ROC) curves for youth versus parent 17-item Pediatric Symptom Checklist (PSC-17), for identification of children with symptoms of likely posttraumatic stress disorder.*

DISCUSSION

The PSC-17 was able to identify children with likely PTSD based on the UCLA RI. A 5-item subscale of the PSC performed as well as the full 17-item version with respect to identifying children with likely PTSD. The youth version was much more sensitive than the parent version, identifying approximately double the number of children with symptoms of likely PTSD. This discrepancy is both statistically significant and clinically important, because current screening tools often are based on a parent-completed screen and do not incorporate a child-completed screen. These data suggest that information directly provided by a school-age child is especially important when assessing PTSD symptoms.

This sample of children had very high levels of psychosocial dysfunction and reported high use of mental health services. In the Great Smoky Mountains Study, Farmer and colleagues[17] found that 54% of 9-, 11-, and 13-year-old children in their extremely well-designed epidemiological study had used mental health services at some point in their lives, a rate much higher than the rate in our studied population. In addition, our questions defined mental service utilization broadly by including counselors as mental health professionals; we also did not assess frequency of contact with mental health services.

The children in our study have been exposed to high rates of traumatic events, and large numbers of children suffer from symptoms of likely posttraumatic stress disorder, probably as a consequence. It should be noted that these rates are consistent with those reported by Hoven

and colleagues[18] in their study of New York City children following 9/11, where 20.1% of fourth and fifth grade children in this study were reported to have probable PTSD. Other studies of PTSD in urban inner city children have revealed similarly high rates of symptomatology. For example, a study of PTSD in an inner city child psychiatry clinic found that 13% of patients had PTSD.[19] Of particular note, in our institution, Shemesh and colleagues[15] found that almost 30% of children attending the emergency department had symptoms of PTSD. The children in the Shemesh study were drawn from the same community as the children in our practice.

The study has several limitations. Although we used the UCLA RI as a structured interview with trained assessors, the assessors were not mental health clinicians. Because of this, our results reflect a probable diagnosis of PTSD. Also, since this is an inner city, low socioeconomic status, predominantly minority sample of English-speaking school-age children, its results may not be generalizable to children of other backgrounds or ages.

This exploratory study suggests that the use of a generalized psychosocial screen may be useful in identifying 8- to 10-year-old children with internalizing problems, including those with PTSD symptoms. It also indicates that the child's self-report on the PSC-17 is much better at identifying these children than the parent report on the PSC-17. Importantly, a 5-question subscale performed as well as the 17-item version of the PSC. This brief scale can be completed in a short time. Paired with a single question about the occurrence of trauma, it appears to be very promising as an extremely brief screen in primary care settings.

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