Comparison of Parent and Child Reports of Emotional Trauma Symptoms in Pediatric Outpatient Settings

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ABSTRACT. *Objective.* Exposure to emotionally traumatic events is common among children who are treated in pediatric medical care settings, and it is important to recognize the emotional reactions that children might develop as a response to the trauma. Practitioners sometimes rely on parental reports of the child's emotional reactions, but these reports may be biased by the parent's own posttraumatic symptoms. Understanding the differences between parent and child reports of the child's emotional symptoms is essential to guide proper diagnosis and care. This study evaluated discrepancies in parental versus child reports of the child's emotional trauma symptoms in pediatric medical care settings.

Methods. We enrolled children and adolescents (age: 8–19) who had not previously received a diagnosis of a psychiatric disorder and were treated in pediatric specialty care clinics at Mount Sinai Medical Center in New York. We used the UCLA posttraumatic stress reaction index, child, adolescent, and parent versions, to evaluate child and parent reports of symptoms of posttraumatic stress disorder (PTSD) in the child. The Impact of Event Scale was used to evaluate the parents' own posttraumatic symptoms. We conducted a "best estimate" psychiatric diagnostic procedure to determine whether the child met diagnostic criteria for PTSD and evaluated the association between the diagnostic status (as determined by the "best estimate" procedure) and the results of the questionnaires.

Results. A total of 115 patients and parents consented to the study, and 76 completed the evaluation. Sixty-four percent of the parents identified the child's traumatic experience as their own most traumatic experience, too. The child's self-report of PTSD symptoms was significantly correlated with the diagnosis of PTSD in the child. In contrast, parents' reports of their child's PTSD symptoms were not significantly associated with the child's diagnosis. Parents' own posttraumatic symptoms were associated with parental reports of the child's overall PTSD symptoms (correlation coefficient: 0.283).

Conclusions. When a child is emotionally traumatized, the parent's own posttraumatic stress may influence his or her report and interpretation of the child's symptoms. Clinicians who evaluate children and adolescents for PTSD in medical care settings should directly seek the child's report and should not rely exclusively on parental reports. Parental reports of a child's PTSD symptoms can offer insights into the parent's own level of posttraumatic stress. *Pediatrics* 2005;115:e582–e589. URL: www.pediatrics.org/cgi/doi/10.1542/peds.2004-2201; *posttraumatic stress disorder, psychological impact.*

ABBREVIATIONS. PTSD, posttraumatic stress disorder; DSM-IV-TR, *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*; PTSRI, Posttraumatic Stress Reaction Index; IES, Impact of Event Scale; K-SADS-P/L, Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime version.

Exposure to emotionally traumatic events is prevalent in children and adolescents.[1,2] Posttraumatic stress disorder (PTSD) is a debilitating emotional response to traumatic events.[3] Significant PTSD symptoms have been reported to be present in 6% to 30% of surveyed children in various settings in the United States.[4,5] It is important to recognize and treat these symptoms, because PTSD is associated with increased rates of health care utilization,[5] disability,[6] and medical and psychiatric adversity[6–8] in affected patients.

Many of the criteria of PTSD[3] require the presence of subjective emotional states or experiences (eg, fear, reexperiencing of the event). In children, assessment of the presence of these emotional states or reactions is complicated, because children may be less likely than adults to report specific emotions or to understand their meaning when asked about them directly. Because of that, provisions in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR) definition of trauma and PTSD[3] allow, in the case of affected children, the substitution of behavioral observations (eg, "disorganized behavior") for subjective symptoms (eg, "fear"). The prevailing psychiatric classification system, therefore, recognizes that one commonly has to rely on parental observations of a child's behavior to assess the emotional impact of adversity.

Relying on parental report poses its own set of difficulties. First, the current definition of PTSD, even with the specific allowances made for developmental differences in reporting symptoms, still requires determinations regarding the child's emotional state, yet parents may not always know the extent of subjective distress and range of emotions that are experienced by the child, especially when

these symptoms are "internalizing" (eg, mood, anxiety) rather than behavioral. Indeed, in 1 study, a main benefit that parents perceived in participating in an emotional trauma screening survey was finding out new information about the child's trauma-related symptoms, which they did not appreciate before the survey.[5] Second, in many instances, an event that is perceived as traumatic by the child is also traumatic to the parent. This could be either because the parent was an indirect participant in the same trauma or because the trauma's impact on the child may be, in itself, distressing to the parent. The parent, in turn, could develop his or her own substantial PTSD symptoms to that event.[5] These symptoms may affect the parent's interpretation of the child's emotions and behavior. It therefore is possible that a parent who is traumatized by an event will be more likely to report traumatic stress symptoms in the child, regardless of whether the child actually has them.

In instances in which parental reports about a child's PTSD symptoms differ from the child's account, the clinician should attempt to interpret the discrepancy. Parent–child discrepancies can enrich the psychiatric interview process and provide important material to explore in treatment. However, in PTSD screening studies or clinical efforts that do not involve an extensive interview component, these discrepancies could render the results very difficult to interpret. Furthermore, even in settings in which an extensive clinical evaluation is offered, it is useful to know how to interpret parent–child discrepancies to guide the focus and technique of the therapeutic intervention. Several studies commented on the discrepancy between parent and child report of emotional symptoms.[9,10] Specifically with regard to PTSD, studies of parents of children who have experienced a traumatic event found that the child's trauma or PTSD leads to or is associated with emotional trauma symptoms in the parent, too.[11–16] The experience of a traumatic event by the parent may lead to emotional trauma symptoms in the offspring and even to biological alterations in the offspring's hypothalamo-pituitary-adrenal axis.[13,14] However, despite the documentation that the experience of traumatic events has an impact on both parents and children, we are not aware of any study that evaluated the relationship between the parent's report of the child's posttraumatic symptoms versus the child's report of his or her own symptoms against an extensive psychiatric diagnostic procedure that assesses the existence of PTSD in the child. Because the parents are affected by the child's trauma[12,16] and because the child is also affected by the parents' symptoms, it is important to try to evaluate discrepancies in reporting of the child's symptoms for clinical as well as research purposes. It will also be useful to try to find reasons for the discrepancy in reporting (when it exists).

Medical illnesses and their treatments are potentially traumatic experiences that are frequently encountered in medical care settings.[6] When a child is ill, the traumatic emotional experience that is associated with this illness is frequently shared by the parent, too.[5,6,12] When PTSD symptoms develop in patients who are medically ill, they are associated with poor health outcomes[6–8,17]; therefore, it is important to recognize these symptoms.[6] Hence, medically ill children are a particularly interesting group of traumatized youths in which one would wish to examine discrepancies between child and parent reports of PTSD symptoms that are experienced by the child.

In September 2000, we started a program to assess medically ill children for psychiatric morbidity. We assessed both children and their parents for posttraumatic stress symptoms using PTSD self-report questionnaires. The present study evaluates the relationships among a "best estimate"[18,19] psychiatric diagnosis of PTSD in the child, the child's own report about PTSD symptoms, and the parent's report about the child's symptoms. We also evaluate the correlation between the parents' own posttraumatic symptoms and their reports about the child's symptoms. Child–parent discrepancies can vary with age; hence, we stratified our sample according to a predetermined age criterion (children and adolescents) in secondary analyses. The presented data could inform the future use and interpretation of parental versus child reports of PTSD during an evaluation of the child in pediatric medical care settings.

METHODS

Patients

Patients were referred for evaluation by primary care pediatricians or pediatric subspecialists. We asked clinicians to refer patients who were not under current psychiatric care and were not in urgent or even imminent need of a psychiatric consultation or treatment (according to the referring physicians' judgment). This presented an opportunity to look at treatment-naïve patients who had not received a diagnosis but were not in urgent psychiatric need (so that our extensive evaluation procedure would not hinder necessary care). Inclusion criteria were age 8 to 19 years, the existence of a chronic medical illness that is currently stable, and elapsing of ≥6 months since the last major surgical or medical procedure. This last criterion was used to avoid the inclusion of children who were extremely distressed as a result of a medical condition at the time of evaluation. Exclusion criteria were cognitive barriers that precluded understanding of the study procedure or the measures used, medical illnesses that required an inpatient admission during the evaluation (excluded until stabilized), active suicidal risk, or the need for an immediate psychiatric evaluation (unable to wait until the end of our diagnostic procedure). The study involved a full parental consent/child assent procedure and was approved by the Institutional Review Board at Mount Sinai Medical Center.

Procedure

Referred patients scheduled an initial meeting with an evaluator, during which inclusion/exclusion criteria were evaluated, consent was obtained, and parent and child self-report measures were given and explained. These measures included the UCLA Posttraumatic Stress Reaction Index (PTSRI), parent, child, and adolescent versions, all of which report about the child's symptoms, and the Impact of Event Scale (IES), which asks the parents to report about their own symptoms. The evaluator proceeded to interview the parent and the child, separately, using a full version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime version (K-SADS-P/L). A separate nonstructured clinical psychiatric interview of the parent and child (interviewed separately at first, then together) was either scheduled or performed in tandem with this one. The psychiatric interview was performed by a "triple-board" graduate, that is, a physician trained as a pediatrician, psychiatrist, and

a child psychiatrist. The final diagnosis was decided on in a consensus meeting, which incorporated various sources of information, with the exception of the self-report tools, which were not reviewed until the diagnosis was determined. We followed a "best estimate" diagnostic procedure, which is explained below.

Masking (Blinding) of Evaluators

Interviews with parents and children were performed in separate rooms. Questionnaire scores were not available to interviewers until after the "best estimate" meeting was held and the diagnosis was determined and recorded. K-SADS-P/L evaluators were not aware of the purpose of the study inasmuch as it was related to PTSD symptoms: the stated aim of the study was primarily to look at the diagnosis of depression in medically ill children. The K-SADS-P/L diagnosis was recorded before the "best estimate" meeting took place.

Assessments

PTSRI

The PTSRI, 1998 version,[20] was the first PTSD screen to be used in children. It has been validated against clinical diagnoses.[21] The 1998 version includes 3 components; the first is an emotional trauma screen, which consists of 11 questions that ask about several kinds of potentially traumatic events. In the second component, the respondent is asked to pick and describe the most traumatic event among those identified in the screen. In the third component, respondents are queried regarding the presence of DSM-IV-TR PTSD symptoms, which are rated 0 to 4 on a Likert scale, with 4 being the highest rating. A cumulative score is obtained using 17 items from the third component of the questionnaire, corresponding to DSM-IV-TR symptom criteria. The PTSRI was administered to children in its 2 versions: a child version (8–12 years of age) and an adolescent version (above 12 years of age). The authors of the PTSRI report a convergent validity of 0.70 to 0.82 for the PTSD diagnosis as obtained from clinician-rated instruments, a test-retest reliability of 0.84, a Chronbach's α in the range of 0.90 across versions, and an intraclass correlation coefficient of 0.93 for adolescents evaluated with the DSM-III-R version.[21] The authors recommend the use of a cutoff score of 38 for PTSD status; they report a sensitivity of 0.93 and a specificity of 0.87 for the detection of PTSD using this cutoff.[21]

IES

The IES[22] was used to determine emotional distress in the primary caregivers (parents). The primary caregivers were asked to identify the "worst experience of their lives" and answer the IES questions with regard to that event. The IES is a 15-item self-report questionnaire. Respondents rate how often they experienced each of the 15 PTSD symptoms during the last 7-day period on a 4-point scale. Test-retest reliability for the total score has been reported at $r = 0.93$ over a 1-week interval.[23] Mean scores have been found to discriminate between groups that do or do not meet PTSD criteria.[23,24] Correlations with structured clinical interviews for the diagnosis of PTSD have been reported to be statistically significant, at $r = 0.48$ to 0.53. IES scores predicted PTSD ≥6 months after the experience of a traumatic event with a sensitivity of 92.3% and a specificity of 34.2%.[23] The IES has 2 subscales that are sometimes used separately (in our study, we used the cumulative score only), with correlations between these subscales ranging between 0.57 and 0.78 during and after therapy.[23] The IES has been the most widely used measure of posttraumatic stress symptoms in adults, and it has previously been examined in numerous clinical settings.[23] Diagnostic cutoff points have been established, but this questionnaire is most frequently used to determine a general level of distress rather than a categorical diagnosis of PTSD.[24]

K-SADS-P/L

The K-SADS-P/L[25] is a widely used semistructured interview tool for determining psychiatric diagnosis of children and adolescents. It has excellent[26] psychometric properties: test-retest for anxiety disorders has been reported at $r = 0.78$,[25] and validity against a consensus psychiatric diagnosis is $\kappa = 0.64$.[25] The P/L version assesses both present ("P") and lifetime ("L") diagnoses.

For the purposes of this study, we used only the "present" diagnoses as determined by K-SADS-P/L, because these are being compared with other tools (PTSRI and IES) that assess only present symptoms.

The K-SADS-P/L is a semistructured interview tool that presents an extensive array of scripted and semiscripted questions to the parent and the child, separately. This instrument takes between 1.5 and 4 hours to complete for each evaluated case. The questions are grouped according to domains of child psychopathology and are asked by a trained mental health professional. The evaluator records the child's and the parent's answers and determines the diagnoses using this input as well as the evaluator's clinical impression, with specific guidelines that are provided in the text. In cases of discrepancies between the parent and the child reports, the evaluator discusses the specific module in more detail with the parent and the child jointly to arrive at the final determination. The evaluator makes the final determination on the basis of the information provided during these interviews and the subsequent joint review.

In the present study, K-SADS-P/L evaluators were doctoral-level psychologists who were trained in pediatric assessments in their predoctoral internship. There were 4 different evaluators during the duration of the study; each participated in training sessions with taped cases. Interrater reliability among the evaluators was determined at the end of the sessions. Furthermore, each evaluator started with 2 training cases of medically ill children who were assessed under immediate supervision of an experienced K-SADS evaluator. Training cases are not included in the analyses. In post hoc analyses, we calculated the degree of agreement (κ statistic) between K-SADS assessments and "best estimate" diagnoses for the entire cohort as a way to assess the diagnostic reliability of the doctoral-level psychologists who participated in this study.

"Best Estimate" Diagnostic Determination

Even the most extensive psychiatric interview or assessment tool may be misleading in medically ill children because of the potential overlap between medical and psychiatric symptoms.[27] Because of that, we chose to use a "best estimate" diagnostic procedure as the gold standard against which to evaluate the rating scale data. A best estimate procedure involves the use of >1 clinician in determining the diagnosis, the use of >1 source of information (including medical records and other informants as appropriate), and a meeting in which accumulated data are discussed and a diagnosis is determined by the more experienced clinician who is reviewing all available data.[18,19] For this study, for the "best estimate" diagnosis, we conducted at least 4 separate psychiatric interviews (with parent and child) by the psychologist and by a child and adolescent psychiatrist who is also a pediatrician. The psychiatrist also conducted a review of the medical records and contacted the primary pediatrician (or nurse practitioner who was caring for the child) for information. The evaluators did not discuss the case before the meeting, so as to keep the assessment sessions independent. The final "best estimate" diagnosis was determined in a consensus meeting, attended by the evaluators, who discussed the findings obtained in the multiple evaluations. When consensus was not reached, the physician made the final determination. This event occurred in only 1 instance during the study.

Diagnosis of PTSD

We used the DSM-IV-TR classification for the diagnosis of PTSD.[3] The DSM-IV-TR diagnostic features of PTSD are summarized in Table 1.

Statistical Analysis

Analyses used the SPSS 12.0 statistical package. For comparisons between 2 continuous variables, we used multivariate analyses (when looking at a group of related variables) and Pearson correlations (for correlations between specific variables within the group). PTSD symptoms in the child can be regarded either as a continuous variable (the PTSRI general score, the usual way in which the scale is used) or as a threshold phenomenon (yes/no PTSD, using a predetermined cutoff score). The authors of the PTSRI recommend the use of a cutoff of 38 to determine PTSD status when using this questionnaire.[21] In analyses, we treated the

TABLE 1. Criteria for PTSD

A. Experience of a traumatic event: the person experienced a traumatic event or events, and the person's response involved fear, helplessness, or horror (in children, this may be expressed instead by disorganized or agitated behavior).

B. Intrusion criteria cluster: the traumatic event is reexperienced in ≥1 of the following ways:
Recurrent and intrusive distressing recollections of the event (in young children, repetitive play may occur)
Recurrent distressing dreams of the event (in children, there may be frightening dreams without specific content)
Acting or feeling as if the traumatic event were recurring (in young children, trauma-specific reenactment may occur)
Intense psychological distress at exposure to cues that resemble an aspect of the traumatic event
Physiological reactivity on exposure to such cues

C. Avoidance criteria cluster: persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, as indicated by ≥3 of the following:
Efforts to avoid thoughts, feelings, or conversations associated with the trauma
Efforts to avoid activities, places, or people that arouse recollections of the trauma
Inability to recall an important aspect of the trauma
Markedly diminished interest or participation in significant activities
Feeling of detachment or estrangement from others
Restricted range of affect (eg, unable to have loving feelings)
Sense of a foreshortened future (eg, does not expect to have a career, marriage, children, or a normal life span)

D. Hyperarousal criteria cluster: persistent symptoms of increased arousal (not present before the trauma), as indicated by ≥2 of the following:
Difficulty falling or staying asleep
Irritability or outbursts of anger
Difficulty concentrating
Hypervigilance
Exaggerated startle response

E. Duration of the disturbance (symptoms in criteria B, C, and D) is >1 month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Adapted from the DSM-IV-TR.[3]

PTSRI both as a continuous variable (score) and as a dichotomy (yes/no at or above the threshold). When the PTSRI is used as a continuous variable, the question is whether parent or child reports of a higher intensity of posttraumatic symptoms in the child are associated with the diagnosis of PTSD in the child as determined by the diagnostic procedure. This question contrasts a continuous variable (PTSRI score) with a dichotomy (yes/no PTSD by the diagnostic procedure), and the analyses used a logistic regression model. When the PTSRI is used as a dichotomy, the question is to what extent does the finding of an above-threshold score on the parent's or the child's report agree with the diagnosis of PTSD in the child. This question contrasts 2 dichotomies; we calculated the κ statistic to determine the degree of agreement between the parent's above-threshold scores, the child's above-threshold scores, and the diagnosis of PTSD. Because age might play a role in parent–child discrepancies, we conducted separate analyses for children (aged 8–12) and adolescents (aged above 12–19), corresponding to the 2 versions of the PTSRI questionnaire. Statistical tests were 2 tailed whenever applicable, and .05 was chosen as the level of statistical significance.

RESULTS

The study commenced on September 2000 and ended on May 2003. During this time, 125 patients were referred for evaluation, 115 consented, 1 was excluded because of active suicidal thoughts, 12 were excluded because of an acute exacerbation of their medical illness that led to admission during the evaluation, 21 dropped out (did not finish the extensive evaluation procedure, which lasted between 3 and 6 hours depending on the level and the nature of the psychiatric symptoms), and 5 declined to answer the PTSRI questionnaires. The final cohort consisted of 76 children and adolescents. The 21 patients who dropped out did not differ significantly from the rest of the cohort in their age or racial composition. However, there were more dropped-out patients with diabetes than any other patient group in the present study (12 of the 21 patients who dropped out had diabetes, compared with only 22% of the final cohort; see below). The 5 patients who did not answer the PTSRI questionnaire differed somewhat in their ra-

cial composition from the rest of the group: 1 was black (20%), 1 was Hispanic (20%), and the rest were white (80%). The composition of the rest of the group is described below.

Patient Baseline Characteristics

Patients were 8 to 19 years of age (mean: 13.7; SD: 3.2). The primary medical illnesses that the patients experienced are presented in Table 2. The distribution of medical illnesses reflects the size of the specific specialty clinics at Mount Sinai Medical Center and also the degree of collaboration with each program. A total of 59% of the sample were female, 58% were white, 36% were Hispanic, 5% were black, and 1% were from East-Asian origins. Eleven (14.4% of the sample) children received the "best estimate" diagnosis of PTSD in this cohort. All of the children identified at least 1 traumatic event in their life. The most commonly cited event was related to their medical illness or its treatment (95% of cases), followed by a violent interpersonal incident (4%) and a non-

TABLE 2. Primary Medical Illnesses of Children in the Final Cohort

Medical Illness	% of Cohort
Chronic liver disease/status posttransplantation	31
Diabetes	22
Chronic heart disease/status posttransplantation	10
Severe food allergy	6
Joint disease	8
Chronic gastrointestinal disease	3
Lung disease	8
Neurological disorder	4
Chronic kidney disease	3
Endocrine disorder	3
Malignancy	1
Metabolic illness	1

violent death of a family member (1%). This distribution of stressors is likely a reflection of the setting and referral procedures used.

Agreement Between K-SADS and "Best Estimate" Assessments of PTSD

The κ computed for agreement between K-SADS and "best estimate" diagnosis of PTSD in the entire cohort was 0.67 ($P < .001$), establishing a good concordance between K-SADS evaluators and the eventual diagnosis.

Associations Between Parent PTSRI Scores, Child PTSRI Scores, and the Diagnosis of PTSD in the Child

The distribution of PTSRI scores in the parent and the child assessments was as follows (range, mean, SD): parent PTSRI: 2 to 56, 19.6, 12.1; child PTSRI: 0 to 56, 18.4, 11.6. Separate logistic regression models (Table 3) were used to examine the relationships between children's self-reports of the level of traumatic stress symptoms that they experienced or parents' report of their perception of the level of the child's posttraumatic symptoms with the PTSD diagnostic status of the child as determined by the "best estimate" procedure. Using the child and the parent scores as dichotomies (yes/no at or above the predetermined PTSD threshold score of 38), we also calculated a κ statistic to determine the degree of agreement between parent and child reports of the existence of above-threshold PTSD in the child and the psychiatric diagnostic determination (Table 4).

Looking at the scores as continuous variables, the parent PTSRI scores (parents' report of the child's symptoms) were not significantly correlated with the existence of a best-estimate PTSD diagnosis in the child in the present cohort ($P = .153$). The child's PTSRI scores (child's self-report of the child's symptoms), however, were significantly correlated with the best-estimate diagnosis ($P = .010$). Similarly, when treated as dichotomies, the child's reports of above-threshold PTSD were in better agreement with the final diagnosis than the parent reports (Table 4). Therefore, whether used as a diagnostic threshold or as a symptom severity score, children's reports were superior to parents' reports in their level of agreement with the diagnosis of PTSD in the child. However, the κs for either informer are relatively low (Table 4), suggesting that the evaluators took both parent and child report into account, as well as, perhaps, other factors, in establishing the diagnosis (ie, a large systematic bias by the evaluators toward

TABLE 4. Agreement Between Parents' PTSRI Above-Threshold Scores (≥38), Children's PTSRI Above-Threshold Scores, and the Diagnosis of PTSD in the Child

	κ	P
Parent report	.124	.266
Child report	.221*	.050*

* Significant results.

the reports of either parent or child is not likely in the present cohort).

Age Effects

We further divided the sample into children (aged 8–12; $n = 29$) and adolescents (aged above 12–19; $n = 47$). This subanalysis is exploratory; the relatively small number of patients in each group raises the possibility of a type 2 error. Table 5 presents the results of logistic regression analyses for the relationship between parent and child or adolescent PTSRI scores (rating the child/adolescent's PTSD symptoms) and the "best estimate" diagnosis of PTSD in the child/adolescent. In these analyses, the only significant association was between the adolescents' self-reported PTSD symptoms and the "best estimate" diagnosis. Parental reports about their adolescents' symptoms were especially nonindicative of the "best estimate" diagnosis ($P = .52$).

Parents' Own PTSD Symptoms Are Correlated With Parents' Report of Their Child's Symptoms

Parents answered questions about their posttraumatic symptoms (IES questionnaire), resulting from their own stressful experiences. IES scores ranged between 0 and 64 (mean: 27.8; SD: 17.5). Parents' own posttraumatic stress scores (IES) were significantly correlated with parental reports about the child's level of posttraumatic stress (PTSRI: correlation coefficient: 0.283; $P = .015$). We separately analyzed the 27 cases in which the parents reported posttraumatic symptoms related to a trauma that was not the same as the child's reported trauma. This analysis was undertaken to determine whether parents' PTSD symptoms are correlated with their report of their child's response only in cases in which the traumatic events are the same for the parent and the child or also when the child's traumatic event is different from the parent's own traumatic experience. Parents' traumatic symptoms in these cases were still correlated with their report of the child's traumatic stress symptoms (correlation coefficient: 0.319; $P = .042$). We then analyzed the responses of the 49 parents who did report that the child's experience was traumatic to them, too. Here, the correlation between the parent's traumatic stress scores (IES) and the parent's report of the child's traumatic stress symptoms (PTSRI) was 0.335 ($P = .004$). Thus, the correlation between parent stress rating and child stress rating by the parent was significant regardless of whether the stressful events were the same for the child and the parent.

We examined the relationships between parental symptoms of PTSD on the IES, the specific domains of symptoms of PTSD that the parent reported in the

TABLE 3. Associations (Logistic Regression) Between Child-Rated and Parent-Rated PTSD Symptom Scores (as Measured by the PTSRI Scale) and the "Best Estimate" Diagnosis of PTSD in the Child

	Significance	OR	95% CI
Parent-rated PTSRI	0.153	1.042	0.99–1.10
Child/adolescent-rated PTSRI	0.01*	1.078*	1.02–1.14*

OR indicates odds ratio; CI, confidence interval.
* Significant results.

TABLE 5. Associations (Logistic Regression) Between Child or Adolescent-Rated and Parent-Rated PTSD Symptom Scores (Measured by the PTSRI Scale) and the "Best Estimate" Diagnosis of PTSD in the Child/Adolescent.

	Significance	OR	95% CI
Child-rated (8–11 years of age) PTSRI	.11	1.09	0.98–1.21
Parent-rated PTSRI, for children.	.11	1.10	0.98–1.23
Adolescent-rated (12–19 years of age) PTSRI	.03*	1.08*	1.01–1.16*
Parent rated PTSRI, for adolescents.	.52	1.02	0.95–1.10

OR indicates odds ratio; CI, confidence interval.
* Significant results.

child (parent PTSRI), and these same domain scores that children reported for themselves (child PTSRI scores). First, using multiple correlation, we looked at the correlation between parental distress (IES scores) and parent-reported child PTSD symptoms on the 3 PTSD domains B through D (Intrusion, Avoidance, Hyperarousal; see Table 1 for definitions of each of these domains). We found that the parent's own distress is significantly ($P = .043$) correlated with the parent's report of his or her child's PTSD symptoms when these 3 PTSD domains were entered into the analysis together. Second, we looked at the correlation between parents' report of PTSD symptoms in the child (parent total PTSRI score) and the children's report of the 3 PTSD symptom domains. We found that the parent's report of total PTSD symptoms in the child was not significantly correlated ($P = .106$) with the child's report of his or her own PTSD symptoms when these 3 PTSD domains were entered into the analysis together. Then, we evaluated the correlations of each of these domains (B–D), as reported by the parent, with parental distress (IES score), and with the same domain as reported by the child. Table 6 presents the Pearson coefficients and significance levels for these correlations. Parents' own posttraumatic stress symptoms were significantly correlated with parental reports of hyperarousal symptoms in the child ($P = .005$). It is interesting that the parents' report of hyperarousal symptoms in the child was not significantly correlated with the child's self-reported hyperarousal symptoms. The opposite was true for avoidance symptoms: parents' reports of child's avoidance were significantly correlated with the child's account and were not significantly correlated with the parents' own posttraumatic stress. Note that the hyperarousal PTSD domain is describing physiologic reactions experienced by a survivor of traumatic events (eg, lack of sleep, increased startle response); the avoidance domain includes observable behaviors

(eg, avoiding reminders of the trauma). These results indicate that parents' reports of the child's trauma-related behavior (avoidance) are the ones that are least affected by the parent's own distress, whereas parental reports of the child's symptoms of physiologic reactivity are most influenced by the parent's own subjective distress. This finding is of particular importance to practitioners who may be called on to treat this group of symptoms (eg, lack of sleep, irritability).

DISCUSSION

In the present cohort, parents' reports of posttraumatic stress symptoms in their children and adolescents were not significantly associated with the "best estimate" diagnosis of PTSD in the child, whether they were used as a continuous variable (degree of symptoms) or as a dichotomy (yes/no PTSD according to the parent). Conversely, children's and adolescents' reports of their own posttraumatic stress symptoms were significantly associated with the existence of a "best estimate" PTSD diagnosis in the child or the adolescent, whether used as a continuous variable or as a dichotomy. A child's report of PTSD symptoms, therefore, is especially important to obtain in the course of evaluation; it is not enough to rely on parental information to make the diagnosis. Parent–child disagreement with the "best estimate" diagnosis was most pronounced in the adolescent (aged 12–19) group.

Parents' own PTSD symptoms (IES scores) were correlated with parents' reports of the child's presumed PTSD symptoms, regardless of whether these parental self-reports were about the same stressful incident as the child's identified traumatic event. Parents' reports of PTSD symptoms in the child, therefore, may be influenced by the parents' own subjective experience and symptoms of PTSD. Parents' reports of child PTSD symptoms could be used to provide an indirect insight into the parent's own

TABLE 6. Correlations Between the Parents' Report of Specific PTSD Symptom Domains in the Child, the Parents' Own PTSD Symptoms, and the Child's Report of the Same Symptom Domain

Compared With	Parent-Reported Symptom Domain in the Child		
	Intrusion (Correlation/Significance)	Avoidance (Correlation/Significance)	Hyperarousal (Correlation/Significance)
Parent posttraumatic stress (IES score)	.270/.04*	.167/.20	.358/.005*
Child posttraumatic stress (child PTSRI score) symptoms of the same domain	.366/.003*	.263/.03*	.106/.40

Correlation = Pearson coefficient.
* Significant results.

reaction to the trauma. These results resemble those of Renouf and Kovacs,[28] who studied child and parent reports of depression in the child. Looking at a cohort of school children, these authors found that maternal depression is correlated with the mother's report of depression in the child. They are also in line with several reports of posttraumatic symptoms in parents of children who experienced a traumatic event.[11,12] It is interesting that a study that evaluated anxiety symptoms found that parental reports were more closely related to the consensus diagnosis of anxiety disorders in a child.[10] We found that the opposite is true for PTSD; the difference between our results and the results reported for anxiety disorders could be related to the impact of the trauma itself. The impact of a traumatic event (that a child is experiencing) on the parent may be far greater than the impact of a child's general anxiety symptoms, therefore skewing the parental perception in the case of traumatized children (but less so in children with anxiety disorders in general). Because the parents' symptoms mediate the child's response to the traumatic event[29,30] and may even lead to permanent biological alterations in the offspring,[13,14] it seems that it would be useful to assess parents' posttraumatic symptoms along with the child's for diagnostic as well as therapeutic reasons.

Traumatic experiences are frequently "shared" by parent and child.[12–16] This is particularly likely in the context of chronic medical illness. In our cohort, 64% of the parents identified the child's trauma as the most traumatic experience that the parent had. In studies of adults who experienced a severe medical illness themselves (a myocardial infarction), we found that 10% to 20% of the adults whom we studied met a predetermined threshold criterion on the IES for PTSD.[8,17] In the present cohort, using the same questionnaire, 40% of the parents of medically ill children would have met that threshold criterion. Although this is not a "head to head" comparison, these data indicate that a child's medical illness can be more traumatic to a parent than even a life-threatening illness that an adult experiences himself or herself.

We found that parental report of a child's avoidance symptoms or behaviors (eg, that the child refuses to go near the area where the traumatic event occurred) were not significantly correlated with the parents' own PTSD symptoms, but they were significantly correlated with the child's account of these symptoms. However, parents' reports of their child's hyperarousal symptoms were significantly correlated with the parent's own posttraumatic symptoms (IES) but were not associated with the child's report of hyperarousal. Therefore, parents' reports of hyperarousal symptoms in their children could be viewed as an indicator of the parent's but not necessarily the child's symptoms. In our experience, physiologic hyperarousal symptoms (lack of sleep, irritability, hypervigilance, increased startle response) may be a focus of parents' concerns when presenting to pediatric care for their child. Because we found that parents' reporting of these symptoms in the child is associated with parental distress (and is not

associated with the child's report of these symptoms), it would probably be useful to ask about the parents' emotions when these symptoms are described in the child. In contrast, it seems that parents' reports of a child's avoidance behavior are less influenced by the parent's own experiences.

Eleven (14% of evaluated cases) children in this cohort met the full DSM-IV-TR criteria for PTSD. This is a higher percentage than the one reported in community samples (~6%[4]), explained by the fact that we interviewed a high-stress sample. Nevertheless, the small absolute number of cases may limit the ability to generalize some of the findings, especially those related to subsample characteristics (eg, child vs adolescent ratings). It is important to note that exposure to emotionally traumatic events may lead to other disorders, notably adjustment disorders, depression, and anxiety disorders[6]; these were not included in our analyses. If they had been included, then a substantially larger proportion of children in our cohort would have been found to be experiencing adverse emotional consequences of the illness and its treatment.

The strengths of this study include the use of a "best estimate" diagnostic procedure (consisting of 4 separate diagnostic interviews with each case, including a full K-SADS-P/L interview), the enrollment of patients who all were exposed to traumatic experiences, the masking of the evaluators, and our ability to look at specific PTSD symptom domains. All patients experienced a medical illness, and it is possible that our findings are limited to medically ill children and their families. We assessed children and adolescents who were 8 to 19 years of age; therefore, our conclusions may not pertain to children who are younger than 8. Limitations also include the relatively small number (11) of PTSD cases as discussed above. Furthermore, that a little more than one third of the original cohort declined to participate in the trauma survey represents a threat to the ability to generalize these findings owing to selection bias (it could be that families who agreed to participate had different types of experiences than those who elected not to participate). It could be that the extensive psychiatric evaluation procedure, which typically lasted >3 hours and involved 2 evaluators and at least 4 sessions, was a deterrent. Offering such an extensive evaluation to children and parents, most of whom did not even perceive themselves as "psychiatric patients," was indeed a challenge and is the reason that very few previous studies, none in children, have used the "best estimate" procedure in medically ill patients who are not self-identified as psychiatric patients. For the purposes of this study, we thought that this procedure was essential. There is another potential reason for the substantial number of patients who declined to participate. Avoidance is one of the hallmarks of PTSD, and patients who had prominent avoidance symptoms may have been more reluctant to discuss their traumatic exposure with us and therefore may have chosen not to participate. It therefore is possible that the true rate of PTSD in our cohort was even higher than the rate that we report here. It is also possible that the dis-

crepancy between parent and child report was higher than we observed, because it could be the case that parents' reluctance to discuss their and their child's traumas with us may have been related to parents' concern that the child's reactions will come as a surprise to them.

CONCLUSIONS

The diagnosis of PTSD in children is significantly associated with the child's self-report of PTSD but less clearly associated with parents' reports of these symptoms in their offspring. This phenomenon seems to be especially true in the adolescent age range. We documented that parents of medically ill children are at high risk for developing significant PTSD symptoms because of their child's trauma. The parents' own PTSD symptoms may, in turn, influence their report and interpretation of the child's symptoms—in particular, the child's hyperarousal symptoms. Clinicians who evaluate children and adolescents for PTSD in medical care settings therefore should directly seek the child's report of PTSD symptoms and should not rely exclusively on parents' reports. Parents' reports of a child's PTSD symptoms can be of greater use in children than adolescents and can offer insights into the parent's own level of posttraumatic stress, regardless of the child's age. More research is needed to find out whether similar results hold true in other settings (eg, child psychiatry clinics).

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