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A Diagnostic Interview for Acute Stress Disorder for Children and Adolescents

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Abstract

The goal of this study was to develop a semi-structured clinical interview for assessing acute stress disorder (ASD) in youth and test its psychometric properties. Youth (N = 168) with an acute burn or injury were administered the acute stress disorder module of the Diagnostic Interview for Children and Adolescents (DICA-ASD). The DICA-ASD demonstrated strong psychometric properties, including high internal consistency (α = .97) and perfect diagnostic inter-rater agreement (K = 1.00). Participants diagnosed with ASD scored significantly higher than those not diagnosed on validated traumatic stress symptomatology measures but not on other symptomatology measures, providing evidence of convergent and discriminant validity. Preliminary evidence supports the reliability and validity of the first semi-structured clinical interview for diagnosing ASD in youth.

Trauma exposure among children and adolescents in the United States is highly prevalent. The National Child Traumatic Stress Network (NCTSN) reported in 2005 that 15% to 45% of children and adolescents in the general population are exposed to at least one traumatic event (NCTSN, 2005). Copeland, Keeler, Angold, & Costello (2007) found that 68% of the children in their representative sample had been exposed to a traumatic event before the age of 16. Other studies have shown that as many as 25% of children in a rural sample and 80% of children in an inner city sample report previous exposure to high-magnitude stressors, including experience of sudden injury from motor vehicle accidents and life-threatening violence (Breslau, Wilcox, Storr, Lucia, & Anthony, 2004; Costello et al., 2002). Injuries are a particularly common form of trauma exposure among children and adolescents in the United States (CDC, 2009). The Centers for Disease Control and Prevention reported that almost nine million children and adolescents under the age of 18 were seen in emergency departments nationwide due to unintentional injuries and approximately 200,000 were hospitalized in 2007 (CDC, 2009).

Exposure to and/or experience of traumatic events in general and more specifically to acute injuries, have been shown to lead to long-term psychological sequelae in children and adolescents (Giaconia et al., 1995; Kassam-Adams & Winston, 2004; Meiser-Stedman, Yule, Smith, & Dalgleish, 2005; Winston et al., 2002). The presence of posttraumatic symptoms can interfere with a child's social, educational, and biological development (Pelcovitz & Kaplan, 1996; Pynoos, 1996). Additionally, it has been demonstrated that once posttraumatic stress symptoms become persistent, posttraumatic stress disorder (PTSD) may be refractory to treatment (Nader, Pynoos, Fairbanks, & Fredrick, 1990; Shalev, Bonne, & Eth, 1996). More recent research suggests that the refractory nature of PTSD may be more

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salient in children and adolescents than has been demonstrated in adults (Scheeringa, Zeanah, Myers, & Putnam, 2005).

Acute stress disorder (ASD) encompasses core features of a child's initial psychiatric reactions to a traumatic event (Daviss et al, 2000; Koopman, Classen, Cardeňa, & Spiegel, 1995; Winston et al., 2002) that occur in the immediate aftermath of the event up to one month following the trauma (APA, 1994). To date, studies of traumatic stress reactions in children and adolescents have focused on PTSD. Using non-standardized interviews or questionnaires modified for obtaining a diagnosis of ASD, researchers have recently reported rates of ASD ranging from 19% to 28% among children and adolescents who sustained injuries post-assault and post-motor vehicle accident (Kassam-Adams & Winston, 2004; Meiser-Stedman, Yule, Smith, Glucksman, & Dalgleish, 2005; Saxe et al., 2005; Winston et al., 2002). A broad range of ASD symptoms (e.g., intrusive recollections, numbing, avoidance) from each of the diagnostic categories have been reported in separate cohorts of children and adolescents with injuries (Daviss et al., 2000; Saxe et al, 2005; Winston et al., 2002).

Although there are multiple measures for assessing trauma exposure and PTSD in children, there are few existing measures of ASD in children. [See Strand, Sarmiento, & Pasquale (2005), for a review of trauma assessment and screening tools and Ohan, Myers, & Collett (2002) for a review of PTSD instruments for children and adolescents.] Currently, there are four known instruments for assessing acute stress symptoms in children and adolescents: Child Acute Stress Questionnaire (Winston et al., 2002); Acute Stress Checklist (Kassam-Adams, 2002); Immediate Stress Response Checklist (Fein, Kassam-Adams, Vu, & Datner, 2001) and Child Stress Disorders Checklist (Saxe et al., 2003). All of these instruments provide a measure of acute stress symptomology; however, none are designed as a diagnostic measure. A reliable and valid diagnostic measure of ASD in children and adolescents is needed to enable both researchers and clinicians to address more systematically the mental health needs of children and adolescents in the immediate aftermath of a traumatic event.

Given the prevalence of pediatric trauma and its relevance to public health, assessing mental health symptoms acutely in children and adolescents who experience traumatic events is critical to preventing long-term problems. The goals of the present study were to develop and assess the psychometric properties of an acute stress disorder module of the Diagnostic Interview for Children and Adolescents. The DICA-ASD was developed by our group by adapting the PTSD module of Diagnostic Interview for Children and Adolescents (DICA-PTSD; Reich, 2000) for use with children in the acute aftermath of a trauma. The DICA-ASD was designed to offer a number of strengths for the assessment of acutely traumatized children: 1) to provide clinical diagnostic information; 2) to follow a semi-structured format, allowing for flexible probing for clinical information; and 3) to conform to the format of the DICA, one of the most widely used semi-structured interviews for assessing a broad range of psychiatric diagnoses in children. We tested the DICA-ASD in an acutely traumatized population of children and adolescents in the immediate aftermath of a burn or injury.

Method

Participants

All children admitted for hospitalization for an acute injury or a burn to two Boston area hospitals were approached for participation in this study. Participants were excluded from the study if (a) they or their parents did not speak sufficient English to complete the study instruments; (b) the child had a Glasgow Coma Scale ≤ 7 at the time of admission,

indicative of a severe head injury; or (c) the family lived > 2 hours from the hospital, as this would complicate planned study follow-up interviews.

Of the 56 eligible children with burns and 230 eligible children with non-burn injuries, 35 (63%) and 142 (62%) consented to participate in the study, respectively. Families who declined participation cited reasons including time commitment and lack of interest. There were no differences in age, gender, or mechanism of injury between those who consented to participate and those who declined. Participants missing more than three items (n = 9) on the DICA-ASD were excluded from analyses, leaving 168 participants in the current analyses.

Among children and adolescents with injuries enrolled and included in the current analyses (n = 134), the mean age was 13.5 years (SD = 3.6, range 7–18 years, Mdn = 14), and 75% are male. Based on self-report, 44% are African-American, 40% Caucasian, 13% Latino, 1% Asian American, and 2% multiracial or other. A trained trauma nurse coordinator assigned each participant an Injury Severity Score, a well validated index of injury severity in which the numerical score represents the degree of life threat associated with injury (Baker et al., 1974). The mean Injury Severity Score was 8.7 (SD = 6.4, range 1 to 27, Mdn = 9). Mechanisms of injury were 25% motor vehicle accident, 24% pedestrian struck, 13% falls, 11% gunshot wound, 10% stabbing, 7% assault, 6% sports injury, and 4% other. The mean length of hospital stay was 5.8 days (SD = 5.4, range 1–35 days).

Among children and adolescents with burns enrolled and included in the current analyses (n = 34), the mean age was 11.2 years (SD = 3.6 years, range 7–18, Mdn = 12), and 77% are male. Based on self-report, 74% are Caucasian, 14% African American, 6% Latino, 3% Native American, and 3% multiracial. The mean percentage of total body surface area burned was 18.9 (SD = 19.9, range 1–85%, Mdn = 10). Mechanisms of burn were 53% fire, 25% scalding, 13% explosion, 3% chemical, and 6% other. The mean length of hospital stay was 24.2 days (SD = 21.1, range 3–90 days).

Measures

The DICA-ASD is a 58 item semi-structured clinical interview that measures acute traumatic stress symptoms and provides a diagnosis of ASD in children and adolescents, 7 to 18 years of age. The DICA-ASD was adapted from the PTSD module of the DICA (Reich, 2000). The PTSD module of the DICA has demonstrated high reliability and validity across a variety of settings (Reich, 2000). To construct the DICA-ASD, the PTSD module of the DICA was modified to allow for the measurement of ASD symptomology by adding 5 symptom clusters related to dissociation identified in DSM-IV (APA, 1994): 1) a subjective sense of numbing, detachment, or absence of emotional responsiveness; 2) reduction of awareness of own surroundings; 3) derealization; 4) depersonalization; 5) dissociative amnesia. In addition, the existing symptom clusters of PTSD (reexperiencing, avoidance, hyperarousal) were included. The dissociative symptom questions were based on DSM-IV criteria for ASD (APA, 1994) and influenced by questions from other measures of acute dissociation, such as the Peritraumatic Dissociative Experiences Questionnaire (Marmar, Weiss, & Metzler, 1997) and the Child PTSD-RI (Pynoos & Eth, 1986; Pynoos et al., 1987).

The DICA-ASD consists of one traumatic event item (DSM-IV criterion A1), 3 immediate distress response items (A2), 26 dissociation symptom items based on the aforementioned five dissociation symptom categories (B), 5 reexperiencing symptom items (C), 2 avoidance symptom items (D), 7 arousal symptom items (E), 2 items assessing symptom duration (G), and 12 interference items (F). Each symptom item is rated on a three-point scale (1 = *no*, 2 = *sometimes*, and 3 = *yes*). Duration items are rated in days. Interference items are rated either on the three-point scale mentioned above or on a four-point scale (1 = *not at all*, 2 = *not too*

much, 3 = *somewhat*, and 4 = *quite a bit*). For a list of each ASD diagnostic criterion and a corresponding example of a DICA-ASD item, see Table 1.

The DICA-ASD diagnosis follows the guidelines of the DSM-IV (APA, 1994). To be assigned a diagnosis of ASD, a participant must have experienced a traumatic event (in this case a burn or injury) within the past month and must have responded to it with horror, terror, or helplessness. Participants must have endorsed the presence of three or more dissociative domains in addition to one symptom each in the domains of avoidance, hyperarousal, and re-experiencing. To account for the importance of time in relation to symptom response and to distinguish ASD from PTSD, questions were modified to be asked in terms of "at the time of the (traumatic event)" and "since the (traumatic event)." All questions were formatted to fit the style of the overall DICA. The DICA-ASD requires approximately 15 minutes to administer and 5 minutes to score. Interviewers should have a minimum of Masters-level training in psychology or a related field due to the need to gather and interpret clinical information. (See Appendix for an example of DICA-ASD format.) The full measure may be obtained from the first author upon request.

The Child Behavior Checklist (Achenbach, 1991) is a 118-item observer-completed measure of children's behavioral and emotional problems. It provides standardized ratings and descriptive information of children's symptoms grouped into a variety of Internalizing and Externalizing scales. For this study, five subscales from the Child Behavior Checklist were used. For the purposes of convergent validity, the PTSD, Anxious/Depressed, and Internalizing subscales were used. The PTSD scale was developed by Wolfe and Brit (1997) using DSM-III criteria and includes 23 items from the Child Behavior Checklist. This PTSD scale has demonstrated high internal consistency ($\alpha = .89$) and been shown to discriminate between children who have and have not been sexually abused and to decline between pre- and post-treatment among children treated for PTSD diagnosed using DSM-IV criteria (King et al., 2000). For the purposes of discriminant validity, the Delinquency and Thought Problems subscales were also used.

The Child Stress Disorders Checklist (Saxe et al., 2003) is a 36-item observer response instrument that measures symptoms of ASD and PTSD in children. In addition to adequate inter-rater and test-retest reliability, the Child Stress Disorders Checklist has demonstrated concurrent, convergent and discriminant validity. Internal consistency is high, $\alpha = .84$.

Procedure

Participants from both hospitals followed similar protocols. Once the child was deemed medically stable by the attending surgeon, the child and family were introduced to the study by a trained researcher. All families were informed that participation in the study was voluntary and to decline participation would not affect their level of care. Written informed consent from the guardian and written assent from the child, when developmentally appropriate, were obtained. Children and adolescents were interviewed with the DICA-ASD, and primary caregivers were administered the Child Behavior Checklist and the Child Stress Disorders Checklist during the hospital stay. Children admitted for burns were interviewed on average 17.3 days (*SD* = 19.9, range 0–92 days) following hospital admission, and children admitted for injury were interviewed on average 2.7 days (*SD* = 2.9, range 0–13) following admission. The children's nurses were also administered the Child Stress Disorders Checklist following the child and caregiver interviews. Families were paid for participation. The protocol received Institutional Review Board approval, and all established guidelines for the treatment of human participants were followed.

Three interviewers, one psychiatrist and two Masters-level graduate students, conducted the study interviews. We followed a joint interview method to assess inter-rater reliability

(Bruss, Gruenberg, Goldstein, & Barber, 1994; Malt, Huvsa, Lobo, & Rijssenbeek, 1996; Zimmerman, 1994). In this method, one rater interviews the participant as the other rater observes and scores the interview independently. To control for experimenter bias and expectancies, all raters were blind to the study hypotheses. Interviewers scored the interviews based on their own evaluation of the participant's response from the joint interview. The order of interviewers conducting the interviews was counterbalanced. After each interview, the interviewers discussed items deemed problematic and came to a consensus about the rating.

Data Analysis

Because the DICA-ASD is a new measure, we first describe participants' experiences in being administered the interview. We then address the issue of missing data. To determine the psychometric properties of the DICA-ASD, we calculated various measures of reliability and validity. Ratings of symptoms as reported by the children and adolescents were used to calculate the interview's internal consistency as a whole and the internal consistency of the added subset of dissociation questions. A measure of inter-rater reliability of interviewers was calculated using Cohen's kappa on a percentage of the total interviews. Validity analyses compared participants who did and did not meet criteria for ASD on the DICA-ASD module (APA, 1994) on established measures of traumatic stress. To determine discriminant validity, the diagnostic groups were compared on the Delinquency and Thought Problems scales of the Child Behavior Checklist. The impact of symptoms on functioning was problematic to assess in this cohort due to their hospitalization and the recency of the traumatic event.

Results

The DICA-ASD Interview Experience

Administration of the DICA-ASD required approximately 15 minutes. Both children and adolescents responded well to both the questions and format of the measure, as reflected by their ease in understanding of the questions (e.g. speed of response, lack of clarification questions) and their ability to answer all questions posed. In addition, participants frequently commented on this experience as a time in which they were able to talk fully about what happened to them, and they often stated that the experience encouraged conversation between family members. Anecdotally, having an interested person listening to their narratives seemed to have a "therapeutic" effect for many participants, allowing their emotional experiences to be heard amidst the sterile atmosphere of the hospital and focused life-saving efforts of the staff.

Missing Data

For reliability and validity analyses, the sample size was reduced as described below due to missing data. Missing data points among all measures were reviewed, and no pattern of "missingness" was evident, suggesting that data are missing at random. Table 2 presents the amount of missing data for each measure. Reasons for missing values included child refusal to answer a question, child stating that he or she could not remember, interviewer error, and primary caregiver or nurse skipping a questionnaire item.

Analyses were conducted to determine differences between those who had complete data on the DICA-ASD (n = 127) and those who did not (n = 41). No statistically significant differences were found between the groups on gender, race, age, Injury Severity Score and total body surface area burned, or length of hospitalization. Further examination of those who were missing items on the DICA-ASD revealed that only one participant's assignment of an ASD diagnosis could changed if data were complete.

Reliability Analyses

Internal consistency measures were calculated based on data from participants who answered all of the DICA-ASD items (n = 127). The DICA-ASD interview symptom items (n = 41) demonstrated high internal consistency (α = .97). Cronbach's alpha among the subsamples of children with burns and children with injuries were .85 (n = 26) and .98 (n = 101), respectively. The internal consistency of the subset of 23 dissociation items was also high (α = .96, n = 127). Cronbach's alpha for the dissociation items among the subsamples of children with burns and children with injuries were .83 (n = 26) and .96 (n = 101), respectively. These findings suggest that the DICA-ASD is internally consistent across these populations.

To assess inter-rater reliability, Cohen's kappa was calculated on 13 % of the interviews conducted. For both samples, perfect inter-rater agreement at the diagnostic level (κ = 1.00) was achieved.

Validity Analyses

Convergent validity was assessed by comparing children with (n = 60) and without (n = 105) a diagnosis of ASD as assessed by the DICA-ASD on the PTSD, Anxious/Depressed, and Internalizing subscales from the Child Behavior Checklist, and by nurse- and parent-report on the Child Stress Disorders Checklist. As shown in Table 3, statistically significant differences between those who did and did not meet criteria for a diagnosis of ASD were evident on all of the relevant Child Behavior Checklist subscales and on both the nurse and parent-report versions of the Child Stress Disorders Checklist.

Discriminant validity was assessed by comparing children with and without a diagnosis of ASD on the DICA-ASD on the Delinquency and Thought Problems scales from the Child Behavior Checklist. As shown in Table 3, no group differences were found on either scale.

Discussion

The purpose of this study was to develop and test the psychometric properties of a semi-structured clinical interview designed to assess acute stress symptomology to provide a diagnosis of acute stress disorder in children and adolescents. The resultant DICA-ASD has promising psychometric properties, supporting its use among children and adolescents who have experienced a traumatic medical burn or injury. Further validation of the DICA-ASD is warranted.

The DICA-ASD demonstrated internal consistency. The DICA-ASD demonstrated an overall internal consistency and an internal consistency for the subset of dissociation items comparable to other known measures of child acute stress symptomology such as the Child Acute Stress Questionnaire (Winston et al., 2002), the Immediate Stress Response Checklist (Fein, Kassam-Adams, Vu, & Datner, 2001) and the Child Stress Disorders Checklist (Saxe et al., 2003). The DICA-ASD also demonstrated high inter-rater reliability among both samples of children with burns and children with injuries.

The DICA-ASD demonstrated convergent and discriminant validity. Statistically significant differences on established measures of traumatic stress in children and adolescents were demonstrated between those who were and those who were not diagnosed with ASD by the DICA-ASD. Furthermore, the DICA-ASD diagnostic groups did not show significant differences on the discriminant validity measures of Delinquency or Thought Problems from the Child Behavior Checklist, scales not expected to measure traumatic stress specifically.

The dataset included missing data on each of the study measures. This missingness is likely a reflection of several factors, including interviewer and respondent error as well as respondent difficulty in assessing their symptoms in response to specific items. For the current analyses, methods such as imputation for handling missing data (Little & Rubin, 2002) were not considered appropriate in calculating DICA-ASD reliability and validity, given significant risk for producing biased estimates. Though a pattern of missingness was not detected, future research should examine whether particular DICA-ASD items are problematic for participants to understand, interpret, or report accurately.

Another limitation is the relatively small sample size, which did not allow for examination of possible developmental, gender, or race/ethnicity effects on the psychometric properties of the DICA-ASD. Of note, the predominantly male sample is reflective of gender differences in injury rates. Also, the generalizability of the findings may be limited by the fact that the data were gathered from children and adolescents during a hospitalization for an acute injury. To validate further the DICA-ASD, future research should assess larger samples of children and adolescents who have experienced a range of traumatic events and represent different ages and races/ethnicities to increase generalizability of results and to allow for the psychometric properties of the instrument to be studied for cultural and developmental validity.

Recognizing acute stress symptoms in children and adolescents is a critical first step in the path toward developing interventions to ameliorate traumatic stress responses and prevent the development of PTSD. The ability to recognize such symptoms requires the availability of psychometrically reliable and valid measures. The results of this study provide preliminary evidence that the DICA-ASD is a reliable and valid semi-structured clinical interview of ASD for children and adolescents. Interviewing children and adolescents with the DICA-ASD within days of the traumatic event is appropriate for assessing acute stress symptomology and ASD diagnosis. Benefits of the DICA-ASD include its ease of administration and attention to the child's report of his or her own symptoms, especially important given the presence of dissociation in ASD and the routinely poor concordance rates between parent and child reports of child psychological symptoms (Boyle et al., 1993; Brunshaw & Szatmari, 1988; Reich, 2000; Sylvester, Hyde & Reichler, 1987). Children and adolescents identified with ASD in the immediate aftermath of a traumatic event may benefit from an early referral for treatment. Such interventions may ultimately mitigate the often refractory long term effects of traumatic exposure.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

Achenbach, TM. Manual for the Child Behavior Checklist/1–18 and 1991 profile. Burlington, VT: University of Vermont Department of Psychiatry; 1991.

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV). Washington, DC: Author; 1994.

Baker SP, O'Neill B, Haddon W, Long WB. The Injury Severity Score: A method for describing patients with multiple injuries and evaluating emergency care. Journal of Trauma. 1974; 14:187–196. [PubMed: 4814394]

Boyle MH, Offord DR, Racine Y, Sanford M, Szatmari P, Fleming JE, et al. Evaluation of the diagnostic interview for children and adolescents for use in general population samples. Journal of Abnormal Child Psychology. 1993; 21:663–681. [PubMed: 8126319]

Breslau N, Wilcox H, Storr C, Lucia V, Anthony J. Trauma exposure and posttraumatic stress disorder: A study of youths in urban America. Journal of Urban Health: Bulletin of the New York Academy of Medicine. 2004; 81:530–544. [PubMed: 15466836]

Brunshaw JM, Szatmari P. The agreement between behaviour checklists and structured psychiatric interview for children. Canadian Journal of Psychiatry. 1988; 33:474–481.

Bruss GS, Gruenberg AM, Goldstein RD, Barber JP. Hamilton Anxiety Rating Scale interview guide: Joint interview and test-retest methods for interraterreliability. Psychiatry Research. 1994; 53:191–202. [PubMed: 7824679]

Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. (2009). Centers for Disease Control and Prevention (producer): National Center for Injury Prevention and Control; 2009 [Retrieved May 2009]. from http://webappa.cdc.gov/sasweb/ncipc/nfirates.html

Copeland WE, Keeler G, Angold A, Costello EJ. Traumatic events and posttraumatic stress in childhood. Archives of General Psychiatry. 2007; 64:577–584. [PubMed: 17485609]

Costello EJ, Erkanli A, Fairbank JA, Angold A. The prevalence of potentially traumatic events in childhood and adolescence. Journal of Traumatic Stress. 2002; 15:99–112. [PubMed: 12013070]

Daviss WB, Racusin R, Fleisher A, Mooney D, Ford JD, McHugo G. Acute stress disorder symptomology during hospitalization for pediatric injury. Journal of the American Academy of Child and Adolescent Psychiatry. 2000; 39:569–575. [PubMed: 10802974]

Fein JA, Kassam-Adams N, Vu T, Datner EM. Emergency department evaluation of acute stress disorder symptoms in violently injured youths. Annuals of Emergency Medicine. 2001; 38:391–396.

Giaconia RM, Reinherz HZ, Silverman AB, Pakiz B, Frost AK, Cohen E. Traumas and posttraumatic stress disorder in a community population of older adolescents. Journal of the American Academy of Child and Adolescent Psychiatry. 1995; 34:1369–1380. [PubMed: 7592275]

Kassam-Adams, N. Acute Stress Checklist (ASC-KIDS). Philadelphia, PA: Children's Hospital of Philadelphia; 2002.

Kassam-Adams N, Winston FK. Predicting child PTSD: The relationship between acute stress disorder and PTSD in injured children. Journal of the American Academy of Child and Adolescent Psychiatry. 2004; 43:403–411. [PubMed: 15187800]

King NJ, Tonge BJ, Mullen P, Myerson P, Heyne D, Rollings S, Martin R, Ollendick TH. Treating sexually abused children with posttraumatic stress symptoms: A randomized clinical trial. Journal of the American Academy of Child & Adolescent Psychiatry. 2000; 39:1347–1355. [PubMed: 11068889]

Koopman C, Classen C, Cardeňa E, Spiegel D. When disaster strikes, acute stress disorder may follow. Journal of Traumatic Stress. 1995; 8:29–46. [PubMed: 7712057]

Little, RJA.; Rubin, DB. Statistical analysis with missing data. 2nd ed.. New York: John Wiley; 2002.

Malt UF, Huyse FJ, Herzog T, Lobo A, Rijssenbeek AJ. The ECLW Collaborative Study, III: Training and reliability of ICD-10 psychiatric diagnoses in the general hospital setting: An investigation of 220 consultants from 14 European countries. Journal of Psychosomatic Research. 1996; 41:451–463. [PubMed: 9032709]

Marmar, CR.; Weiss, DS.; Metzler, TJ. The Peritraumatic Dissociative Experiences Questionnaire. In: Wilson, JP.; Keane, TM., editors. Assessing psychological trauma and PTSD. New York, NY: Guilford Press; 1997. p. 412-428.

Meiser-Stedman R, Yule W, Smith P, Glucksman E, Dalgleish T. Acute stress disorder and posttraumatic stress disorder in children and adolescents involved in assaults or motor vehicle accidents. American Journal of Psychiatry. 2005; 162:1381–1383. [PubMed: 15994725]

Nader K, Pynoos R, Fairbanks L, Frederick C. Children's PTSD reactions one year after a sniper attack at their school. American Journal of Psychiatry. 1990; 147:1526–1530. [PubMed: 2221168]

National Child Traumatic Stress Network. 2005 [Retrieved January 2005]. from http://www.nctsnet.org/nccts/nav.do?pid=ctr_gnrl_facts

Ohan JL, Myers K, Collett BR. Ten-year review of rating scales, IV: Scales affecting trauma and its effects. Journal of the American Academy of Child and Adolescent Psychiatry. 2002; 12:1401–1422. [PubMed: 12447027]

Pelcovitz D, Kaplan S. Post-traumatic stress disorder in children and adolescents. Child and Adolescent Psychiatric Clinics of North America. 1996; 5:449–471.

Pynoos, RS. Exposure to catastrophic violence and disaster in childhood. In: Pfeffer, CR., editor. Severe Stress and Mental Disturbance in Children. Washington, DC: American Psychiatric Press; 1996. p. 181-211.

Pynoos RS, Eth S. Witness to violence: The child interview. Journal of the American Academy Child and Adolescent Psychiatry. 1986; 25:306–311.

Pynoos RS, Frederick C, Nader K, Arroyo W, Steinberg A, Eth S, et al. Life threat and posttraumatic stress in school-age children. Archives of General Psychiatry. 1987; 44:1057–1063. [PubMed: 3689093]

Pynoos, R.; Rodriguez, N.; Steinberg, A.; Stuber, M.; Frederick, C. The UCLA PTSD Reaction Index for DSMIV (Revision 1). Los Angeles, CA: UCLA Trauma Psychiatry Program; 1998.

Reich W. Diagnostic Interview for Children and Adolescents (DICA). Journal of the American Academy of Child and Adolescent Psychiatry. 2000; 39:59–66. [PubMed: 10638068]

Saxe GN, Chawla N, Stoddard F, Kassam-Adams N, Courtney D, Cunningham K, et al. Child Stress Disorders Checklist: A measure of ASD and PTSD in children. Journal of the American Academy of Child and Adolescent Psychiatry. 2003; 42:972–978. [PubMed: 12874500]

Saxe G, Stoddard F, Chawla N, Lopez C, Hall E, Sheridan R, et al. Risk factors for acute stress disorder in children with burns. Journal of Trauma and Dissociation. 2005; 6:37–49. [PubMed: 16150668]

Scheeringa MS, Zeanah CH, Myers L, Putnam FW. Predictive validity in a prospective follow-up of PTSD in preschool children. Journal of the American Academy of Child & Adolescent Psychiatry. 2005; 44:899–906. [PubMed: 16113618]

Shalev AY, Bonne O, Eth S. Treatment of posttraumatic stress disorder: A review. Psychosomatic Medicine. 1996; 58:165–182. [PubMed: 8849635]

Sylvester CE, Hyde TS, Reichler RJ. The diagnostic interview for children and personality inventory for children in studies of children at risk for anxiety disorders or depression. Journal of the American Academy of Child and Adolescent Psychiatry. 1987; 26:668–675. [PubMed: 3667497]

Strand VC, Sarmiento TL, Pasquale LE. Assessment and screening tools for trauma in children and adolescents: A review. Trauma, Violence & Abuse. 2005; 6:55–78.

Winston FK, Kassam-Adams N, Vivarelli-O'Neill C, Ford J, Newman E, Baxt C, et al. Acute stress disorder symptoms in children and their parents after pediatric traffic injury. Pediatrics. 2002; 109:e90. [PubMed: 12042584]

Wolfe, VV.; Brit, JA. Child sexual abuse. In: Mash, EJ.; Terdal, LG., editors. Assessment of childhood disorders. New York: Guilford Press; 1997. p. 569-626.

Zimmerman M. Diagnosing personality disorders: A review of issues and research methods. Archives of General Psychiatry. 1994; 51:225–245. [PubMed: 8122959]

Table 1

Criterion for Diagnosis of ASD and a Corresponding Item on the DICA-ASD.

Criterion		DICA-ASD item
A	Traumatic event	Can you tell me what happened to you [traumatic event]?
A2	Response of horror, terror, or helplessness	When this happened to you, did you feel absolutely terrified?
B1	Subjective sense of numbing	At the time of the [traumatic event] did you feel spaced out or dazed?
B2	Reduction in awareness	At the time of the [traumatic event], did what was happening seem unreal to you?
B3	Derealization	At the time of the [traumatic event], did time seem different?
B4	Depersonalization	At the time of the [traumatic event], did your body feel different or changed?
B5	Dissociative amnesia	At the time of the [traumatic event], were there parts you could not seem to remember?
C	Re-experiencing	Since the time of the [traumatic event], have you had nightmares about [traumatic event] or other upsetting things?
D	Marked avoidance	Since the time of the [traumatic event], have you tried to stay away from anything or anybody that might remind you of the [traumatic event]?
E	Increased arousal	Since the time of the [traumatic event], do you feel more watchful about something or someone hurting you?
F	Interference	Have these feelings been a very big problem for you?
G	Duration	How long after [traumatic event], did any of these things start?

Note. DICA-ASD = acute stress disorder module of the Diagnostic Interview for Children and Adolescents.

Table 2

Missing Data by Measure

Measure	% of Items Missing				
	0 items	1 item	2 items	3 items	≥ 4 items
DICA-ASD	75.6%	16.7 %	4.8%	3.0%	0.0%[a]
CSDC-nurse	52.4 %	5.4%	4.2%	4.2%	33.9%
CSDC-parent	60.1%	10.1%	1.2%	0.6%	28.0%
CBCL-PTSD	69.6%	5.4%	0.6%	0.6%	23.8%
CBCL-Anxious/Depressed	69.6%	5.4%	1.2%	0.6%	23.2%
CBCL-Internalizing	65.5%	8.9%	0.0%	1.2%	24.4%
CBCL-Thought Problems	72.0%	3.0%	1.8%	0.0%	23.3%
CBCL-Delinquency	72.9%	3.6%	0.6%	0.0%	23.2%

Note. DICA-ASD = acute stress disorder module of the Diagnostic Interview for Children and Adolescents; CSDC = Child Stress Disorders Checklist; CBCL =Child Behavior Checklist.

[a]Participants with more than 3 items missing on the DICA-ASD (n = 9) were excluded from analyses.

Table 3

Convergent and Discriminant Validity of the DICA-ASD

	ASD present[a] M (SD)	ASD not present[b] M (SD)	*t*-test
Convergent validity			
CBCL-PTSD	11.16 (7.95)	6.64 (5.95)	−3.79**
CBCL-Anxious/Depressed	5.49 (5.54)	2.82 (3.57)	−3.03**
CBCL-Internalizing	10.00 (8.87)	6.17 (6.52)	−2.86**
CSDC-nurse	14.27 (11.62)	9.58 (9.71)	−2.67*
CSDC-parent	12.81 (11.28)	7.48 (8.38)	−2.01*
Discriminant validity			
CBCL Thought Problems	1.37 (2.11)	0.82 (1.14)	−1.68
CBCL Delinquency	4.02 (4.02)	2.90 (3.76)	−1.61

Note. DICA-ASD = acute stress disorder module of the Diagnostic Interview for Children and Adolescents; ASD = acute stress disorder; CBCL = Child Behavior Checklist; CSDC = Child Stress Disorders Checklist.

[a] ASD present group $n = 60$.

[b] ASD not present group $n = 105$.

* $p < .05$.

** $p < .01$.