Posttraumatic Stress Disorder Symptom Structure in Injured Children: Functional Impairment and Depression Symptoms in a Confirmatory Factor Analysis

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Objective: To examine the factor structure of posttraumatic stress disorder (PTSD) symptoms in children and adolescents who have experienced an acute single-incident trauma, associations between PTSD symptom clusters and functional impairment, and the specificity of PTSD symptoms in relation to depression and general distress. **Method:** Examined PTSD symptom structure in two samples of children (8 to 17 years of age) assessed an average of 6 months after unintentional injury: (1) a combined dataset of 479 children assessed with a PTSD symptom checklist, and (2) a sample of 204 children assessed via a standardized clinical interview. We evaluated the fit of six alternative models for the factor structure of PTSD symptoms, and the association of PTS symptom clusters with indicators of functional impairment. We then evaluated three models for the structure of PTSD and depression symptoms jointly, to examine specificity of PTSD versus general distress or mood symptoms. **Results:** In both samples, the DSM-IV 3-factor model fit the data reasonably well. Two alternative four-factor models fit the data very well: one that separates effortful avoidance from emotional numbing, and one that separates PTSD-specific symptoms from general emotional distress. Effortful avoidance and dysphoria symptoms were most consistently associated with impairment. The best-fitting model for PTSD and depression symptom clusters had three factors: PTSD-specific, depression-specific, and general dysphoria symptoms. **Conclusions:** The DSM-IV model for PTSD symptom categories was a reasonable fit for these child data, but several alternative models fit equally well or better, and suggest potential improvements to the current diagnostic criteria for PTSD in children. J. Am. Acad. Child Adolesc. Psychiatry, 2010;49(6):616–625. **Key Words:** posttraumatic stress disorder, confirmatory factor analysis, children, adolescents

Understanding the underlying dimensions of posttraumatic stress symptoms and their potential impact on child functioning is vitally important in creating clinically useful diagnostic systems that can guide assessment and intervention. Examining the extent to which current diagnostic criteria for posttraumatic stress disorder (PTSD), as applied to children and adolescents, reflect hypothesized underlying dimensions of human response to trauma is especially timely given upcoming revisions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) to create the fifth edition (DSM-V). Since much of the work on PTSD symptom structure has been conducted with adults, there is a particular need to expand our empirical knowledge base with regard to children and adolescents.

The constellation of symptoms that constitute a traumatic stress disorder was first officially laid out in the third edition of the DSM (DSM-III).[1] At that time, 12 traumatic stress symptoms were grouped into three categories: re-experiencing of the trauma, numbing of responsiveness, and a third category that mixed specific arousal symptoms, guilt, problems with sleep or memory, and avoidance of trauma reminders. The current three category symptom structure (re-experiencing, avoidance, arousal) was first articulated in the revised third edition


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of the DSM (DSM-III-R).[2] Changes in DSM-IV[3] focused on the definition of a traumatic stressor and the requirement that the symptoms cause clinically significant distress or functional impairment.

Since the DSM-IV was published, the increased availability of confirmatory factor analysis (CFA) methods has allowed researchers to assess the structure and dimensionality of PTSD symptoms. CFA studies have provided support for a number of alternative models of PTSD symptoms, with potential implications for revising DSM diagnostic criteria.[4-6] In the adult literature, two alternative models have received the greatest support: a four-factor model that separates active avoidance from emotional numbing[4] (referred to hereafter as the "Numbing" model), and a four-factor model that retains DSM-IV categories for trauma-specific symptoms but separates out those symptoms that reflect more general distress or dysphoria[6] (referred to hereafter as the "Dysphoria" model). A more recent model (tested in adults[7] and adolescents[8]) attempts to distill the core symptoms of traumatic stress by eliminating symptom overlap with other mood or anxiety disorders (removing five of the 17 DSM-IV PTSD criteria).

Several factors make it challenging to draw conclusions about the consistency of CFA results across studies. The use of different measures and methods to assess PTSD symptoms (clinical interview versus surveys) may lead to different conclusions about factor structure and model fit.[5] Studies examining PTSD factor structure have varied in the timing of PTSD assessment, the population sampled (seeking PTSD treatment, exposed to a known event, drawn from the general population), and the type(s) of trauma to which participants were exposed.

The rich adult literature in this area provides a useful starting point for understanding child traumatic stress, but we cannot assume that child or adolescent symptom structure, or the relationship of PTSD symptoms to functional impairment or to comorbid mood or anxiety symptoms, will mirror adult presentations. Studies that have used CFA to examine PTSD symptom structure in children or adolescents are summarized in Table 1. These studies include several adolescent samples with mixed trauma exposure,[8-11]and several samples of disaster-exposed children and adolescents.[12-15] CFA studies of trauma-exposed youth have been conducted in a number of countries,[14-15] and there is reasonable ethnic/racial diversity in the U.S. samples. A challenge in interpreting the body of findings from youth CFA studies is that there is little consistency in the symptom measures. Most studies have used checklists or brief surveys, or standardized interviews administered by telephone. To our knowledge, no CFA studies to date have examined child PTSD symptoms assessed via a face-to-face clinical interview.

Child and adolescent CFA studies to date have provided support for several alternative models of PTSD symptoms: (1) the DSM-IV 3-factor model;[8-11,14,15] (2) the four-factor Numbing model;[8,10,11] (3) a hierarchical model with three first-order factors (combined intrusion and effortful avoidance; numbing; arousal) and a second-order general PTSD factor;[10,12,13] and (4) a two-factor model (re-experiencing; combined avoidance/numbing/hyperarousal) based on 12 of the 17 DSM symptoms.[8] To our knowledge the four-factor Dysphoria model[6] has not been examined in youth. Other notable non-CFA studies include a multi-language, multi-national sample of adolescents[16] in which the DSM-IV model was supported by confirmatory principal components analyses, and an exploratory factor analysis in Cambodian refugee adolescents[17] that supported the four-factor Numbing model.

No significant differences in PTSD symptom structure have been found for boys versus girls[9-10,15] or for school-aged children versus adolescents.[12,15] Few studies have included children exposed to multiple types of trauma; however Saul et al.[10] found no meaningful differences in factor structure between adolescents with violent versus nonviolent trauma.

Diagnosis of disorder appropriately goes beyond assessing symptom presence to also evaluating the extent to which symptoms cause significant distress or impairment. To craft a useful diagnostic formulation for PTSD, it is important to understand the relationship of traumatic stress symptoms to functional outcomes and impairment, and to determine whether some PTSD symptom clusters are more likely than others to be associated with impairment. To our knowledge, past CFA studies in children have not assessed the relationship between symptom clusters and indicators of impairment.

Finally, another perspective on the specificity of posttraumatic reactions can be gained by examining the pattern of associations among PTSD