PSYCHOMETRICS OF THE DIMENSIONS OF STRESSFUL EVENTS (DOSE) SCALE IN CHILDREN EXPOSED TO VIOLENCE

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Introduction

DSM-IV requires exposure to a high magnitude stressor that leads to emotional distress (Criterion A) before a diagnosis of PTSD can be made. However, determining which experiences qualify as high magnitude stressors is not always easy. The traditional approach to this has been to ask if the child has been exposed to any of a list of experiences assumed to be high magnitude stressors. Such lists tended to include no more than 20 types of stressors, and the majority include 6 or fewer. What if a child or adolescent has had an experience not included on such a list, but the experience is considered by the child or a concerned adult to have traumatized the child?

Even If the child was exposed to an event included on a list of potential high magnitude stressors, it does not necessarily follow that he or she must have had traumatic reactions to the event (Fletcher, 2003). Each stressful event is a unique phenomenological experience for everyone who lives through that event. All the same, the literature does suggest specific characteristics or dimensions of high magnitude stressors that increase the likelihood that anyone exposed to stressors with these dimensions will react with symptoms of PTSD (Fletcher, 2003). The Dimensions of Stressful Events (DOSE; Fletcher, 1996b) is a measure designed to assess the characteristics or dimensions of high magnitude stressor events that the literature suggests increase the likelihood of a child or adolescent responding with PTSD symptomatology.

The DOSE is intended to help clinicians, researchers, and families better delineate the traumatizing aspects of a stressful event. It is designed for use for a range of settings (e.g., natural disaster, violent crime), for children of any age, and is completed by an interviewer with input from a caregiver and/or child. The measure is divided into 2 sections. The first section consists of 25 items corresponding to specific characteristics or dimensions of a potentially traumatic event (e.g., unexpectedness of event, were victim(s) and perpetrator(s) known to child, whether child was dislocated from home as a result of event). All items are summed to produce an overall score. The second section contains 24 items that assess the frequency and degree of child abuse experiences, as well as experiences that may mitigate the child's responses, such as the extent to which the parents support the child's claim. All of the current psychometrics of the DOSE are based on only the first section, as are the results reported here.

The Study Sample was derived from participants in the Children Who Witness Violence Program (CWWVP), a community-based intervention that has since 1999 provided mental-health services to urban children in Cuyahoga County, Ohio who have witnessed violence (Drotar et al., 2003). Data on the first dose were available for 1277 (44.9%) of these children.

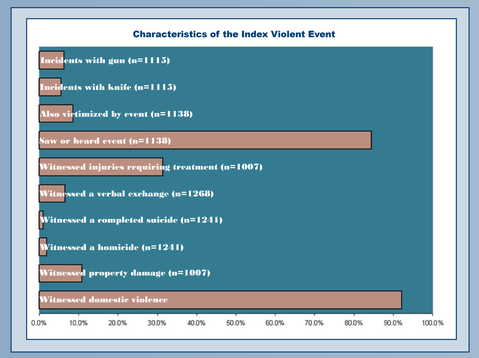
Measures

Depending on the child's age, traumatic symptoms were identified by one of two instruments. For children 8-16 years of age, symptoms of traumatic reactions were assessed with the Trauma Symptom Checklist for Children (TSCC; Briere, 1996), which contains six clinical scales: Anxiety, Depression, Anger, Dissociation, Posttraumatic Stress, and Sexual Concerns. For children 2-7 years of age, a modified version of the Pediatric Emotional Distress Scale (PEDS) was used (Saylor et al., 1999). The 21-item PEDS is a caregiver-completed instrument. Based on previous research on the psychometric and factor analytic properties of the PEDS with this population of children (Spilsbury et al., 2005), we used a modified 11-item version of the PEDS, which consists of two subscales: Act Out, and Internalize. Problem behaviors were identified by the Revised Behavior Problem Checklist (RBPC; Quay & Peterson, 1996), an 89-item caregiver completed instrument. The RBPC consists of six scales: Conduct Disorder, Socialized Aggression, Attention Problems-Immaturity, Anxiety-Withdrawal, Motor Excess and Psychotic Behavior.

Results

Table 1: Family Characteristics of the Sample (n=1277)

Family Characteristics	Mean (SD) or N (%)
Age (years)	
Child (n=1272)	7.6 (4.4)
Mother (n=965)	31.2 (6.9)
Father (n=870)	40.0 (7.9)
Child Sex	
Female	644 (50.4%)
Male	633 (49.6%)
Child Ethnicity	
% African-American	570 (44.7%)
% White	375 (29.4%)
% Other	75 (5.8%)
% Unknown ethnicity	256 (20.1%)



Characteristics of DOSE Treating Missing Items as Missing or Setting Missing Items to 0

	DOSE Total Missing Treated as Missing	DOSE Total Missing Set to 0
Valid cases	326	1277
Missing cases	951	0
Mean	23.0	21.18
Median	22.5	21.00
STD	4.85	5.70
Minimum Score	11	1
Maximum Score	38	38
Skew	.211	-.419
Std error skew	.135	.068
Kurtosis	-.102	.360
Std error kurt	.269	.137
Cronbach's alpha	.60	.63

Regression Analysis

Linear regression analyses of each of the TSCC and RBPC scales on age, gender, ethnicity (white vs. non-white), and DOSE totals indicated that **the DOSE significantly** predicted the TSCC PTS (raw beta = 1.001, se = 0.17, t = 5.91, p < .001), **Anxiety** (beta = 0.958, se = .20, t = 4.82, p < .001), **Depression** (beta = 0.832, se = .19, t = 4.30, p < .001), **Dissociation** (beta = 0.680, se = .20, t =3.40, p = .001), **Social Anxiety** (beta = 0.600, se = .23, t =2.65, p = .001), and **Anger** (beta = 0.435, se = .19, t =2.24, p < .03) scales, as well as the **RBPC Conduct Disorder** (beta = 0.391, se = .19, t =2.02, p < .05) and **Anxiety/Withdrawal** (beta = 0.354, se = .17, t =2.07, p < .05).

Correlations between DOSE Total Score & PEDS, RBPC, TSCC.

PEDS (2-11 year olds)		TSCC (8-16 year-olds)		RBPC (5-18 year olds)	
Total score (n = 77)	.279*	PTS[a] (n = 157)	.425***	Anxiety/ withdrawal (n = 151)	.186*
Anxious/ withdrawn (n = 81)	.264*	Anxiety (n = 159)	.415***	Conduct disorder (n = 147)	.198*
Fearful (n = 82)	.215	Depression (n = 156)	.352***	Socialized aggression (n = 160	.131
Act out (n = 82)	.229*	Dissociation (n = 154)	.263**	Attention problems / immaturity (n = 161)	.084
		Sexual Concern (n = 159)	.188*	Motor tension (n = 165)	.086
		Anger (n = 160)	.180*	Psychotic behavior (n = 165)	-.34

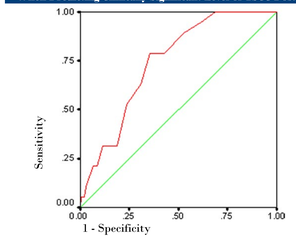
a. PTS = Post-traumatic stress. * < .05 ** < .01 *** < .001

These correlations demonstrate the convergent validity of the DOSE because it correlates significantly with domains it would be expected to relate to, such as the Post-traumatic Stress (PTS), Anxiety, Depression, and Dissociation subscales of the Trauma Symptom Checklist for Children (TSCC).

Moreover, the magnitude of the correlations is highest for domains conceptually most closely related to exposure to increasingly traumatizing characteristics of high magnitude stressors, as assessed by the DOSE. Note that the TSCC is a self-report measure, while the other two are completed by caregivers.

In order to establish a threshold score on the DOSE total that would signify exposure to enough characteristics of a high magnitude stressor frequently associated with increased likelihood of traumatic reactions, a ROC analysis was conducted, using the T-score > 65 (1.5 SD: Briere, 1996) threshold of the TSCC Post-traumatic Stress (PTS) scale as the standard against which to assess the sensitivity and specificity of the DOSE. The resulting ROC curve is shown in the figure below.

ROC Curve to Assess Sensitivity and Specificity Tradeoffs of the DOSE When Predicting Clinically Significant Level of TSCC Post-traumatic



The area under the curve for this ROC curve was .741 (95% CI = .645 - .838). A score of 23.5 or higher on the DOSE was associated with a sensitivity of .789 and a specificity of .645. ROC curves were also run for white and non-whites separately, and for boys and girls separately. Among whites only, a DOSE score of 23.5 or higher maximized the sensitivity (.889) and specificity (.571) of the DOSE when predicting clinically significant levels of Post-traumatic Stress per the TSCC; whereas, a score of 21.5 or higher maximized sensitivity (.875) and specificity (.500), with an area under the curve of .737 for whites and .707 for non-whites. Among boys only, a total DOSE score of 21.5 or higher on the DOSE maximized the sensitivity (.833) and specificity (.479), and a DOSE total of 23.5 maximized the sensitivity (.846) and specificity (.621) for girls, with an area under the curve of .744 for boys and .740 for girls.

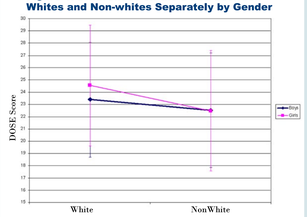
Correlations between DOSE Total Score and PEDS, RBPC, TSCC by Gender

	Boys (n)	Girls (n)
PEDS (2-11 year olds)		
Total score	.483** (32)	.141 (45)
Anxious/withdrawn	.573*** (34)	.085 (47)
Fearful	.456** (34)	.057 (48)
Act out	.277 (34)	.207 (48)
TSCC (8-16 year-olds)		
Post-traumatic Stress	.259* (79)	.550*** (78)
Anxiety	.284** (81)	.536*** (78)
Depression	.335** (83)	.369** (73)
Dissociation	.149 (79)	.349** (75)
Anger	.140 (83)	.230* (77)
Sexual concern	.195 (81)	.173 (78)
RBPC (5-18 year olds)		
Anxiety/withdrawal	.244* (77)	.109 (74)
Conduct disorder	.249* (77)	.148 (70)
Socialized aggression	.248* (82)	.051 (78)
Attention problems /immaturity	.184 (85)	-.046 (76)
Motor tension	.284** (87)	-.116 (78)
Psychotic behavior	.128 (86)	-.230* (79)

* < .05 ** < .01 *** < .001

When missing values were set to 0, the magnitude of correlations between the DOSE and all of the PEDS scales among boys were reduced (ranging from .21 to .26) but all remained significant, including the correlation with Act Out. At the same time, all but one of these correlations *increased* for girls, *and* all but the correlation with Act Out (.035) became significant as well (ranging from .16 to .21). The correlations between the DOSE and the TSCC scales were also reduced for boys, and only the correlations with the PTS scale (.155) and Anxiety (.141) remained significant, while all of the correlations between the DOSE and the TSCC scales remained significant (ranging from .15 to .34) for girls. For boys, the correlation with Conduct Disorder (.116) on the RBPC became nonsignificant and those with Attention Problems/Immaturity (.163) and Motor Tension (.159) became significant. For girls, the correlations with Anxiety/ Withdrawal (.195) and Attention Problems/Immaturity (.133) became significant, and that with Psychotic Behavior (-.052) was no longer significant.

Figure 1. Differences on the DOSE between Whites and Non-whites Separately by Gender



Scores of white boys did not differ significantly from scores of non-white boys (primarily African-American), $t(119) = 0.95$, $p = .35$. However, scores of white girls were significantly higher than those of non-white girls, , $t(141) = 2.40$, $p < .02$. When all missing values were scored 0, there were no longer significant differences across ethnic groups within either gender.

Discussion

The Dimensions of Stressful Life Events (DOSE) scale provides a reliable and valid method of screening for possible traumatic reactions to high magnitude stressors. Previous research has indicated that it is a better predictor of traumatic reactions than a count of exposure to stressful events (Fletcher, 1996a). The present study presents further evidence of its ability to predict traumatic reactions in children exposed to domestic violence. The results suggest that scores between 21.5 and 23.5 or higher are indicative of possible traumatic responses in children to high magnitude stressors.

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