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The Development of a Sexual Abuse Severity Score: Characteristics of Childhood Sexual Abuse Associated with Trauma Symptomatology, Somatization and Alcohol Abuse

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Abstract

Childhood sexual abuse (CSA) is common and is associated with both mental and physical health problems in adulthood. Using data from an age and sex-stratified population survey of Olmsted County, MN residents (n=610), we developed a sexual abuse severity score (SASS). The abuse characteristics of 156 CSA respondents were associated with self-reported trauma, somatization, and alcohol use. Characteristics included: age of first sexual abuse, more than one perpetrator, degree of coercion, severity of abuse (i.e. attempted intercourse is more severe than fondling), and the number of occurrences. This is one of the few reports to develop a risk summary that quantifies the severity of childhood sexual abuse.

BACKGROUND

Childhood sexual abuse (CSA) is common. Adjusted prevalence rates of CSA in the United States are estimated at 16.8% among adult women and 7.9% among adult men (Putnam, 2003). CSA is a significant risk factor for the development of mental health and behavioral problems in adulthood, especially depression and substance abuse (Putnam, 2003). Earlier work by Springs and Friedrich demonstrated that victims of CSA were more likely to report physical health symptoms, including greater levels of somatization and more health risk behaviors in victims compared with nonvictims (Springs & Friedrich, 1992). Dube found that more severe abuse, for example intercourse, correlated with graver long-term sequelae (Dube et al., 2005).

Previous research and clinical observation have suggested that a number of factors contribute to the degree of negative outcomes in CSA victims. A greater number of abusers and extended duration of abusive episodes over time are associated with abuse-related symptomatology (Briere & Runtz, 1988; Casey & Nurius, 2005). The presence of coercion such as the use of

force during victimization or completed intercourse is also connected with more symptomatology (Briere & Runtz, 1988; Dube et al., 2005; Friedrich, Whiteside, & Talley, 2004; Ketting & Feinauer, 1999). Negative long-term outcomes are present in victims regardless of the gender of the perpetrator (Dube et al., 2005; Friedrich et al., 2004). Abuse by a father figure as compared with an acquaintance or other family member and early age of victimization are related to poor adjustment (Casey & Nurius, 2005; Ketting & Feinauer, 1999). The current study examines factors related to CSA that have been shown to affect physical and mental health in adults and quantifies their association with somatization, trauma symptomatology, and alcohol abuse behaviors among a community sample of adults who have experienced CSA. The objective of the paper is to develop a “sexual abuse severity score” (SASS) that summarizes risk and may be useful in future research.

METHODS

Participants

An age- and sex-stratified sample (n=920) of adult residents of Olmsted County, MN was identified and mailed a validated, self-report, symptom questionnaire in 1994. This sample was obtained via the Rochester Epidemiology Project, a patient tracking system that has been in place since 1919 and enables researchers to obtain a representative sample of adults in this southeastern Minnesota County (Melton, 1996). A total of 610 adults returned questionnaires (66.3% return rate). Nonresponders were more likely to be male ($p<.05$) and had fewer years of postsecondary education ($p=0.04$) compared to responders. Sexual abuse was indicated by 156 respondents (26%) and these are the victims included in our sample. No abuse was reported by 450 respondents and 4 subjects did not respond to the abuse history items. The prevalence of abuse in the entire study sample was 36.6% for women (n=122) and 12.4% for men (n=34).

In the victim sample (n=156), 22% were male. The mean (SD) age of the victims at the time that they were surveyed was 39.9 (5.8) years. Of the respondents that provided race information, 98% were Caucasian. Demographics of the entire study sample are summarized in previous work (Friedrich, Whiteside, & Talley, 2002; Friedrich et al., 2004).

Instrument

The questionnaire included demographic information, a 24-item somatization scale (Talley, Zinsmeister, Van Dyke, & Melton, 1991), 20 items from the 33-item Trauma Symptom Checklist (Briere & Runtz, 1989); and two dichotomous items from the Self-Administered Alcoholism Screening Test (SAAST) (Colligan, Davis, & Morse, 1988). Variables describing sexual abuse were: age at first victimization, number of perpetrators, relationship to the perpetrator, level of coercion, nature of the abuse, age difference between the victim and perpetrator, gender of victim and perpetrator, frequency of abuse and length of time abuse occurred. These factors have been indicated for their association with poor adjustment; the study instrument is described in detail in other work (Friedrich et al., 2004).

Analysis

Creation of the Sexual Abuse Severity Score—The SASS was calculated by weighting various abuse characteristics and demographic factors based on previously published findings and clinical observations of the investigators. These included age at first abusive episode, number of abuse occurrences, nature of abuse, duration of abuse, number of perpetrators, level of coercion, and relationship to the perpetrator. These factors, as well as gender and age differences between the victim and the perpetrator, were considered for inclusion in the SASS using linear regression methods. Since data were collected for each of three age ranges (before age 14, between 14 and 17 years, and after 17 years), the models included age of first abuse, highest level of coercion experienced at any age, and the nature of the worst abuse.

Somatization, trauma, and alcohol abuse are three outcome measures that may be associated with abuse severity. Separate univariate linear regression models were fit with dependent variable somatization or trauma and each of the potential factors listed above as the independent variable. Non-parametric tests were used to see if potential SASS variables differed depending on whether the respondent endorsed zero, one, or two alcohol abuse items from the SAAST. Variables that were significantly associated with any of the three outcome measures were considered in multiple linear regression models with backward elimination.

Survey data are reported as median (IQR) for continuous and ordinal variables and are reported as number (percentage) for categorical variables. Smoothing splines were used to determine how to categorize variables for SASS inclusion. Males and females are compared on various demographic and abuse characteristics using non-parametric tests for continuous or ordinal variables and Fisher's exact test for categorical variables. In all cases, p-values less than 0.050 are considered statistically significant.

RESULTS

The focus of this investigation is the 156 respondents that reported sexual abuse. Respondents could indicate abuse episodes during three age categories for abuse: before age 14, between 14 and 17 years, and after 17 years. More than half of the victims reported abuse before 14 years of age (58%) and 42% reported abusive episodes in the each of the other two age categories. Forty-eight victims (31%) were abused before the age of 14 only, 21 (14%) were only abused between 14 and 17, 34 (22%) were first abused after age 17. Victims reported abuse during more than one age category with 20 (13%) indicating abuse before 14 and between 14 and 17, ten (6%) were abused both between 14 and 17 and after age 17, and eight (5%) were abused in the youngest and oldest timeframes. Fifteen subjects (10%) reported abuse across the three age categories.

From univariate analysis, it was determined that the SAAST items (alcohol) were only significantly associated with gender but were not associated with any of the other potential sexual severity measures. For this reason, we analyzed regression models to explore the demographic and abuse characteristics that were associated with trauma and somatization scores to guide the weighting of the SASS. Variables and their allocated weighting are presented in Table 1.

Table 2 shows the linear regression models for trauma and somatization related to the abuse characteristics. The parameter estimates in the multiple linear regression models were used to determine the weightings for each variable included in the SASS. Age of first abuse had a linear relationship with trauma and somatic complaints, with the trauma score decreasing by half a point with each year of age. Coercion and the nature of abuse were also related to trauma and somatic complaints with the trauma score increasing by about two points for each level of severity. We chose not to use the actual values for the entire range of occurrences (number of times abused) because the numbers are self report and approximations (15% of the abused sample responded "many" or "several" episodes of abuse and 64% indicated 1, 2, or 3 episodes of abuse). For this reason all subjects that reported ten or more occurrences were grouped and those that wrote in responses were included in this category. When a smoothing spline was fit to the data, there did not appear to be a difference in somatic or trauma scores for those that reported between four and nine occurrences so these were grouped into a single category. Occurrences of abuse were linearly related to trauma and showed a similar but nonsignificant ($p=0.083$) trend with somatization with about a one point increase in score for each increase in frequency category. The number of perpetrators was not related to somatic or trauma scores but was included with a small weight because of its importance in other studies (Briere & Runtz, 1988; Casey & Nurius, 2005). The relationship to the victim showed no clear pattern,

but with univariate linear regression, there was evidence that the perpetrator being a stranger was more traumatic ($p=0.040$) and being an authority figure, a caretaker, or a friend of a parent was associated with both more trauma ($p=0.010$) and more somatic complaints ($p=0.004$) than other relationships (acquaintance, friend, cousin, aunt, uncle, grandparent, sibling, step-sibling, parent, step-parent, and foster parent). Because this was inconsistent with past studies, we did not include this factor in the SASS (Kallstrom-Fuqua, Weston, & Marshall, 2004; Ketting & Feinauer, 1999).

Table 3 shows the factors and their frequency for the entire cohort and by gender. Male victims were significantly more likely to have been abused at some point by a female perpetrator than were female victims (36% v. 4%, $p<0.001$) and female victims were significantly more likely to have been abused by a male perpetrator than were male victims (98% v. 71%, $p<0.001$). Significantly more physical force, abuse frequency, and greater duration of abuse was noted with females compared to males ($p=0.007$). Table 3 also shows scores on the somatic, trauma, and alcohol questions as well as SASS for the entire cohort and by gender. Females scored significantly higher on somatic symptoms ($p=0.024$) and males reported significantly more problem alcohol behaviors ($p<0.001$). Females had significantly higher scores on the SASS, ($p=0.048$) than males.

DISCUSSION

Very few studies have focused on constructing a risk summary that quantifies the severity of childhood sexual abuse (Korbanka, 1997; Pitzner & Drummond, 1997). This is a difficult task due to the complex dimensions of sexual abuse and the challenge of categorizing them in a meaningful manner that might be generalizable across victims. In this scale we focused on abuse characteristic variables and related them to the symptomatology of CSA victims on somatic, trauma and alcohol scales. Protective factors also impact a victim's long-term sequelae (Jonzon & Lindblad, 2006; Kallstrom-Fuqua et al., 2004), but they were not investigated in this report. Future work would build on this scale, include protective factors and cut off scores that could then be validated as an instrument for predicting risk from exposure to childhood sexual abuse.

Potential limitations to this study include the self-report and retrospective nature of the data which contributes to the filtering of past experiences through more adult perspectives and the normal decay of memory. Despite the large sample size, some subcategories of CSA victims are small, especially among males. One fifth of the sample (22%) reported first abuse after age 17 years; due to the small numbers we did not eliminate these individuals from our analysis. Future work might examine the differences in sequelae of sexual abuse that first occurred in childhood versus adulthood. This study is one of the few published efforts to create a scale that quantifies the severity of CSA. Our results support other studies that examine the factors that are associated with CSA symptomatology (Dube et al., 2005; Heath, 1999; Jonzon & Lindblad, 2006; Lange et al., 1999; Springs & Friedrich, 1992).

Childhood sexual abuse events are associated with poor adult adjustment and it is important to identify key elements that might be related to this risk. We hope that the summarization of factors in the SASS will be applied as a potential tool to identify those most at risk so that preventive and early treatments might be offered to victims. The goal of such an application would be the reduction of long-term consequences and improved psychosocial and health outcomes.

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Table 1
Factors contributing to the Sexual Abuse Severity Score*

Factor	Points allocated
Age of first sexual abuse	
3–4	7
5–6	6
7–8	5
9–10	4
11–12	3
13–14	2
15–16	1
≥17	0
Number of perpetrators	
1	0
≥2	1
Maximum coercion ever experienced	
High (i.e., Physical force or weapons)	4
Moderate (i.e., Threats, bribes or verbal force)	2
None	0
Most severe abuse ever experienced	
Attempted intercourse, intercourse, or inserting an object	4
Fondling or being fondled, touching other's sex organ or sex organ being touched	2
Request of sex, kissing, other showing sex organ, or other looking at your sex organ	0
Number of occurrences of abuse	
1	0
2	1
3	2
4–9	3
≥10	4

* The score is calculated by summing the points. The highest possible score is 20.

Use of this Scale is not permitted without permission of the authors.

Table 2
Multiple linear regression models for trauma and somatization

SASS variable*	Somatization (N=155, R ² =0.25, p<0.001)				Trauma (N=156, R ² =0.26, p<0.001)			
	Parameter Estimate	SE	t	p	Parameter Estimate	SE	t	p
Intercept	172.29	26.22	6.57	<0.001	40.08	3.49	11.48	<0.001
Age of first sexual abuse	-3.87	1.06	-3.66	<0.001	-0.50	0.14	-3.57	<0.001
Coercion	22.15	5.05	4.39	<0.001	1.86	0.67	2.76	0.006
Nature of abuse	4.65	5.73	0.81	0.418	1.87	0.77	2.43	0.016
Number of times abused (Occurrences)	4.65	2.66	1.75	0.083	0.82	0.36	2.29	0.024
More than one perpetrator	-2.98	8.44	-0.35	0.724	-0.07	1.13	-0.06	0.952

* Age of abuse takes values from 1 to 17 where those first abused after the age of 17 are capped at 17. Coercion and nature of abuse are three level ordinal variables that range from 1 (least coercive or invasive) to 3 (most coercive or invasive). Number of instances of abuse is ordinal where 4-9 instances are combined as are 10 or more instances. All variables are treated as continuous for the regression models.

Table 3
Respondent characteristics overall and compared between genders

Characteristic	All	Males	Females	P [*]
	Median (IQR) [†]	Median (IQR)	Median (IQR)	
Age of first abuse	12 (10, 16.5)	12.5 (10, 16)	12 (9, 17)	0.708
One or more male perpetrators, n (%)	125 (93%)	20 (71%)	105 (98%)	<0.001
One or more female perpetrators, n (%)	14 (10%)	10 (36%)	4 (4%)	<0.001
More than one perpetrator, n (%)	69 (44%)	13 (38%)	56 (46%)	0.443
Relationship to perpetrator, n (%) [†]				
Father, mother, brother, sister	33 (23%)	4 (13%)	29 (25%)	0.225
Aunt, uncle, cousin, grandparent	20 (14%)	6 (19%)	14 (12%)	0.376
Stepparent or foster parent	3 (2%)	0 (0%)	3 (3%)	1.000
Authority figure, caretaker, or friend of parent	27 (18%)	5 (16%)	22 (19%)	0.800
Friend	45 (31%)	12 (39%)	33 (29%)	0.284
Acquaintance	48 (33%)	10 (32%)	38 (33%)	1.000
Stranger	28 (19%)	5 (16%)	23 (20%)	0.799
Coercion, n (%) [†]				
Physical force or weapons	54 (36%)	5 (16%)	49 (42%)	0.007
Threats, bribes or verbal force	66 (44%)	15 (47%)	51 (43%)	0.841
None	59 (39%)	16 (50%)	43 (36%)	0.221
Nature of abuse, n (%) [†]				
Attempted intercourse, intercourse, or inserting an object	68 (44%)	18 (53%)	50 (42%)	0.249
Fondling or being fondled, touching other's sex organ or sex organ being touched	69 (45%)	16 (47%)	53 (44%)	0.846
Request of sex, kissing, other showing sex organ, or other looking at your sex organ	42 (27%)	5 (15%)	37 (31%)	0.081
Number of times abused	2 (1, 11)	1 (1, 2)	3 (1, 18)	0.007
Duration of abuse	2 (1, 365)	1 (1, 25)	3 (1, 730)	0.008
Somatic symptoms	68 (45, 104)	60 (43, 75)	70.5 (46, 116)	0.024
Trauma symptoms	27 (24, 33)	27 (25, 32)	28 (24, 33)	0.848
Alcohol Positive, n (%) (SASST)				<0.001
0 Questions	125 (81%)	18 (55%)	107 (88%)	
1 Question	24 (16%)	11 (33%)	13 (11%)	
2 Questions	5 (3%)	4 (12%)	1 (1%)	
SASS	9 (6, 13)	8 (4, 11)	9 (6, 13)	0.048

[†]IQR= Interquartile range or the values for the 25th and 75th percentiles

* P-values comparing males and females come from rank sum tests for continuous variables and Fisher's exact tests for categorical variables.

[†] Percents do not sum to 100, because some individuals may have experiences in multiple categories.