Pathways Mediating Sexual Abuse and Eating Disturbance in Children

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Abstract: Objective: To examine the relationship between childhood maltreatment and eating disorders in a sample of children. Method: Twenty 10–15-year-old female children who were receiving treatment following reported childhood sexual abuse and 20 age-matched controls were compared on a series of measures assessing eating disorder behaviors, body image concerns, substance use, mood, impulsive behavior, and self-concept. Results: Sexually abused children reported higher levels of eating disorder behaviors, impulsive behaviors, and drug abuse than controls. Furthermore, behavioral impulsivity provided the strongest mediational effect between a history of childhood sexual abuse and purging and restrictive dieting behavior. Drug use proved to be a significant secondary mediator of the childhood sexual abuse eating disorder behavior association. Discussion: These data support the hypothesis that childhood sexual abuse is related to disordered eating in children, and extend similar findings that have been previously reported with adults. Behavioral impulsivity and drug use appear to be significant mechanisms that influence eating disorder behavior following childhood sexual abuse. © 2001 by John Wiley & Sons, Inc. Int J Eat Disord 29: 270–279, 2001.

Key words: sexual abuse; eating disorders; impulsivity

INTRODUCTION

A significant number of recent empirical studies, utilizing a variety of samples and measures, suggest that childhood sexual abuse is associated with eating-disordered
behavior (Bushnell, Wells, & Oakley-Brown, 1992; Dansky, Brewerton, Kilpatrick, & O’Neill, 1997; Garfinkel et al., 1995; Pribor & Dinwiddie, 1992; Steiger & Zanko, 1990; Wonderlich, Donaldson, et al., 1996; Wonderlich, Wilsnack, Wilsnack, & Harris, 1996). A comprehensive review of this literature further suggests that childhood sexual abuse serves as a general risk factor for bulimia nervosa, particularly when high degrees of psychiatric comorbidity are present (Wonderlich, Brewerton, Jocic, Dansky, & Abbott, 1997).

Like other risk factors for eating disorders, childhood sexual abuse is generally considered in the context of a multifactorial model of etiology (Connors & Morse, 1993; Everill & Waller, 1995; Wonderlich et al., 1997). This has led to an increased search for possible mediators, or mechanisms, to account for the association between childhood sexual abuse and disturbances in eating. Empirical studies suggest that a number of variables may have mediational significance in this relationship, including borderline personality disorder (Waller, 1992), adverse response to disclosure regarding the abuse (Waller & Ruddock, 1993), self-denigration (Pitts & Waller, 1993), and dissociation (Vanderlinden, Vandereycken, vanDyck, & Vertommen, 1993). A recent mediational analysis examining the association between emotional abuse and eating disturbance suggested that anxiety and dissociation served as significant mediators of this relationship (Kent, Waller, & Dagnan, 1999).

Other studies have examined correlates of eating disturbance in sexually abused individuals, assuming that these variables may serve some type of intervening function between sexual abuse and eating disturbance, although mediational testing was not conducted. For example, eating disturbance in sexually abused individuals has been shown to correlate with decreased social competence and a poor maternal relationship (Malinkrodt, McCreary, & Robertson, 1993), unreliable parenting (Smolak, Levine, & Sullins, 1990), severity of the abuse (Hastings & Kern, 1994), and symptoms of posttraumatic stress disturbance (Wonderlich, Donaldson, et al., 1996).

Although these studies begin to suggest possible mediational mechanisms between childhood sexual abuse and eating disturbances, there are methodological problems that limit the strength of the inferences that may be drawn. For example, many of these studies do not control for the age at which the abuse occurred. This results in samples of abuse situations ranging from incestuous abuse early in childhood to sexual abuse by a healthcare provider in adulthood. Furthermore, these studies have relied exclusively on adult subjects asked to recall their abuse and eating disorder experiences retrospectively, which may introduce retrospective recall bias of key variables.

The present study attempts to overcome these limitations by focusing on children, thus reducing variability associated with the age at the time of sexual victimization as well as the length of the recall interval. Although studies of other forms of psychopathology have examined possible mediators in samples of sexually abused children (Cohen & Mannarino, 1996; Mannarino & Cohen, 1996; Oates, O’Toole, Lynch, Stern, & Cooney, 1994), similar child-based studies have not examined eating disorder outcomes. Consequently, this study examines how childhood sexual abuse might be associated with disordered eating. Borrowing from previous eating disorder research and studies of general psychopathology in abused children, the following mediators of the childhood sexual abuse-eating disorder link were identified and tested in independent models: body image disturbance, mood disturbance, impulsivity, drug and alcohol use, self-concept, and perfectionism (Figure 1).
METHOD

Participants

Two groups of girls who were 10–15 years old participated in the study. The sexually abused girls (n = 20) were identified by therapists in a local specialized treatment center for abused children. The definition of sexual abuse for inclusion in the study included either (1) intrafamilial sexual activity that was unwanted or that involved a family member 5 or more years older than the subject or (2) extrafamilial sexual activity that was unwanted or involved another person 5 or more years older than the subject. At the time of the study, all girls in the sexually abused group were receiving treatment.

The control group (n = 20) was matched to the abused girls on age and parent level of education and recruited through local school newsletters sent to parents. Matched control subjects were included in the study if they had not experienced any form of childhood abuse (e.g., sexual or physical abuse) via parent report.

Each 1-year age interval between 10 and 15 was characterized by equal numbers of control and abused subjects. Racial composition was 92.5% Caucasian, 5% African American, and 2.5% Asian. Control subjects had a higher annual household income than abused subjects (Wilcoxon Z = −2.90, p = .004), although the groups did not differ in parental education (Wilcoxon Z = −1.18, p = .24).

Thirty-five percent of the abused girls were sexually abused on only one occasion and 65% were abused on more than one occasion. Five percent were sexually abused under the age of 6, 65% were abused between the ages of 6–12, and 30% were abused between the ages of 13–15. Thirty percent of abuse incidents involved sexual penetration, 85% involved physical sexual contact without penetration, and 15% of cases involved some type of force or threat of force. Perpetrators were all male and most commonly a friend/acquaintance (25%), father (20%), or stepfather (20%) of the victim.

Measures

Childhood Trauma Questionnaire (CTQ)

The CTQ (Bernstein, Stein, et al., 1997) is a 28-item screening instrument that assesses self-reported experiences of abuse and neglect in childhood and adolescence. Respondents rate each item on a 5-point Likert scale with response options ranging from never.
true to very often true. The CTQ has been validated with both adult and adolescent populations and has demonstrated adequate convergent and discriminant validity (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997; Bernstein, Stein, et al., 1997).

**Children’s Attributions and Perception Scale (CAPS)**

The CAPS, developed by Mannarino, Cohen, and Berman (1994), was designed to assess perceptions and attributions believed to be relevant to sexually abused children. The CAPS consists of 18 items and four subscales. The subscales include feeling different from peers, personal attributions for negative events, perceived credibility, and interpersonal trust. This instrument has been shown to effectively predict the level of functioning at 6 and 12-month follow-up in sexual abuse victims and has adequate psychometric properties (Mannarino & Cohen, 1996; Mannarino et al., 1994).

**Children’s Depression Inventory (CDI)**

The CDI (Kovacs, 1985) is a 27-item self-rated symptom-oriented scale suitable for use with children and adolescents. It is largely based on the Beck Depression Inventory for Adults (Beck, 1967). The CDI has been found to be highly reliable and to have adequate convergent and discriminant validity (Kovacs, 1985).

**Piers-Harris Children’s Self-Concept Scale**

Piers and Harris (1964) developed this measure to assess a child’s perception of either a negative or positive self-concept. This measure contains 80 statements that are rated by the subject with either a yes or no response. Studies have demonstrated adequate internal consistency and test-retest reliabilities (Piers & Harris, 1964; Winne, Marx, & Taylor, 1977). The Piers-Harris has been found to correlate positively with other similar measures of self-concept (Parish & Taylor, 1978; Karnes & Wherry, 1982).

**Body Rating Scales for Adolescents (BRS)**

The BRS (Sherman, Iacono, & Donnelly, 1995) presents a series of figures of various body shapes and sizes to subjects and asks subjects to choose the one that best matches how they think they look and how they would like to look. In addition, subjects are asked to choose the figure that matches how they feel most of the time and what they think “guys” would find most attractive. The BRS has excellent psychometric properties and a high degree of face validity (Sherman et al., 1995).

**McKnight Risk Factor Survey (MRFS-IV)**

The MRFS-III (Shisslak et al., 1999) is a 103-item self-report instrument that has been used to identify risk and protective factors for the development of eating disturbances in preadolescent and adolescent girls. The MRFS-III has demonstrated adequate test-retest reliability, internal consistency, and convergent validity (Shisslak et al., 1999). An updated version consisting of minor changes of this measure, the MRFS-IV, was obtained from the authors and utilized in the present study.

**Kids Eating Disorders Survey (KEDS)**

The KEDS (Childress, Jarrell, & Brewerton, 1993) is a 14-item self-report questionnaire that is considered an appropriate screening instrument regarding identification and prevention of eating disorders. The KEDS assesses the presence of eating disorder symptomatology on two subscales: weight dissatisfaction and purging/restricting. It has shown good internal consistency and test-retest reliability (Childress et al., 1993).
Monitoring the Future Questionnaire (MTFQ)

The MTFQ (Bachman, Johnston, & O’Malley, 1987) is a 167-item self-report survey that has been used in a series of studies with high school seniors in the United States and in other countries. The survey asks subjects to rate “the way things are now and the way you think they ought to be in the future.” In the present study, six items commonly used to measure substance abuse patterns in teenagers were selected.

Impulsive Behavior Scale (IBS)

The IBS (Rossato, Yager, & Rorty, 1997) is a 25-item self-report measure that assesses the frequency of a variety of impulsive behaviors (shoplifting, suicidal thoughts, sexual promiscuity). Items judged to be inappropriate for young children were deleted (e.g., reckless driving), resulting in a shortened version (i.e., 19 items).

Procedure

At the time of the assessment, the study was explained to subjects and their parents in detail. Following consent of both parent and child, research staff explained to the subject in detail how to complete the child measures. All subjects completed the questionnaires in a room by themselves with research staff made available for questions. Completion of the questionnaires took approximately 1.5 hr, upon which subjects were paid $75.00 for their participation.

Statistical Analysis

Mediation analysis was performed using ordinary least squares regression (OLS) based on the methods described by Baron and Kenny (1986). The dependent variables in the analysis, representing eating-disordered behavior, included weight dissatisfaction and purging/restricting variables from the KEDS. The independent variable was a dummy-coded variable representing childhood sexual abuse. The mediating variables evaluated included measures of body image disturbance (the difference between “look now” and “like to look” ratings on the BRS), mood disturbance (CDI total score), impulsivity (IBS total score), drug use (composite measure of drug and alcohol use from the MTFQ), self-concept (Piers-Harris total score, CAPS total score), and perfectionism (MRFS-IV).

Establishing mediation involves demonstrating three relationships (Baron & Kenny, 1986): (1) the independent variable significantly predicts the dependent variable, (2) the independent variable significantly predicts the mediator variable, and (3) the mediating variable significantly predicts the dependent variable when both the mediating variable and the independent variable are used to predict the dependent variable. Given the above relationships, the effects of the independent variable are reduced from Step 1 to Step 3.1

RESULTS

Group Descriptives

Table 1 presents means and standard deviations by group (abused vs. nonabused) for dependent and mediator variables. The discrepancy score from the BRS represents dif-

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1Because the IBS included one item assessing impulsive eating disorder behaviors, the mediational analyses were run again after deleting that item. This secondary analysis corresponded very closely to the primary analysis. Consequently, the initial analysis will be presented.
ferences in ratings between “like to look” and “look now.” Negative numbers represent a desire to look thinner than subjects currently perceive themselves. The drug/alcohol index represents the sum of 7 points (0 = never, 1 = 1–2 times, 2 = 3–5 times, 3 = 6–9 times, 4 = 10–19 times, 5 = 20–39 times, 6 = 40+ times) for three questions from the MTFQ: (1) How many times have you drank alcohol-lifetime? (2) How many times have you been drunk-lifetime? (3) How many times have you used marijuana-lifetime? Correlations between items ranged from .668 to .971, with an overall alpha of .792.

**Mediation Analysis**

Step 1 regression analyses (regressing dependent variable on independent variable) revealed that abuse status (abused vs. nonabused) significantly predicted both weight dissatisfaction, $R^2 = .202$, $F(1, 38) = 9.6$, $p = .004$, and purging/restricting, $R^2 = .118$, $F(1, 38) = 5.1$, $p = .030$.

Step 2 regression analyses (regressing mediator variables on the independent variable) revealed that abuse status (abused vs. non-abused) significantly predicted impulsivity on the IBS, $R^2 = .149$, $F(1, 38) = 6.6$, $p = .014$; drug and alcohol use on the MTFQ, $R^2 = .107$, $F(1, 38) = 5.1$, $p = .030$; and perfectionism on the MRFS-IV, $R^2 = .112$, $F(1, 38) = 4.8$, $p = .034$. Abuse status did not significantly predict body discrepancy ratings on the BRS, $R^2 = .030$, $F(1, 38) = 1.2$, $p = .288$; total score on the CDI, $R^2 = .036$, $F(1, 38) = 1.4$, $p = .240$; or CAPS total score, $R^2 = .053$, $F(1, 38) = 2.1$, $p = .153$.

Step 3 analyses were performed only for those mediators significantly predicted by the independent variable in Step 2, namely impulsivity, drug and alcohol use, and perfectionism. Analyses were performed separately for each dependent variable.

**Weight Dissatisfaction**

Regression analyses were performed using both abuse status and mediator variables to predict weight dissatisfaction. IBS total score was a significant predictor of weight dissatisfaction ($\beta = .005$, $t = 3.1$, $p = .003$) when entered with abuse status. The regression coefficient for abuse status was reduced from 1.30 ($\beta = .450, 95\%$ confidence interval [CI] = 0.45–2.15, $t = 3.1$, $p = .004$) in Step 1 to .807 ($\beta = .279, 95\%$ CI = −0.02–1.63, $t = 1.97$, $p = .056$) in Step 3. These findings suggest that impulsivity should be considered as a partial rather than a full mediator in that the CIs for abuse status overlap from Step 1 and Step 3.

### Table 1. Means (± SD) of dependent and mediating variables by group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Nonabused</th>
<th>Abused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight dissatisfaction (KEDS)</td>
<td>2.3 ± 1.2</td>
<td>3.6 ± 1.4</td>
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<tr>
<td>Purging/restriction (KEDS)</td>
<td>0.3 ± 0.9</td>
<td>1.2 ± 1.5</td>
</tr>
<tr>
<td>Body discrepancy (BRS)</td>
<td>−1.2 ± 1.2</td>
<td>−1.6 ± 0.9</td>
</tr>
<tr>
<td>Depression (CDI)</td>
<td>48.0 ± 12.7</td>
<td>52.0 ± 11.0</td>
</tr>
<tr>
<td>Impulsivity (IBS)</td>
<td>24.4 ± 7.9</td>
<td>33.9 ± 14.5</td>
</tr>
<tr>
<td>Drug/alcohol use (MTFQ)</td>
<td>0.6 ± 1.6</td>
<td>2.8 ± 4.5</td>
</tr>
<tr>
<td>Self-concept (Piers-Harris)</td>
<td>55.6 ± 11.5</td>
<td>51.5 ± 10.5</td>
</tr>
<tr>
<td>Self-concept (CAPS)</td>
<td>43.3 ± 10.3</td>
<td>48.1 ± 10.8</td>
</tr>
<tr>
<td>Perfectionism (MRFS-IV)</td>
<td>2.8 ± 0.8</td>
<td>2.3 ± 0.8</td>
</tr>
</tbody>
</table>

Note: KEDS = Kids Eating Disorders Survey; BRS = Body Rating Scales for Adolescents; CDI = Children’s Depression Inventory; IBS = Impulsive Behavior Scale; MTFQ = Monitoring the Future Questionnaire; CAPS = Children’s Attributions and Perception Scale; MRFS-IV = McKnight Risk Factor Survey.
Neither the MTFQ alcohol and drug use index \( (\beta = 0.121, t = 1.95, p = 0.058) \) nor perfectionism \( (\beta = 0.239, t = 0.87, p = 0.389) \) accounted for a significant portion of the criterion variance when entered with abuse status.

**Purging/Restriction**

Analyses comparable to those described above were performed using the KEDS purging/restricting scale as the dependent variable. As before, the IBS total score accounted for a significant portion of the criterion variable \( (\beta = 0.005, t = 3.5, p = 0.001) \) when entered simultaneously with abuse status. The regression coefficient for abuse status was reduced from 0.90 \( (\beta = 0.344, 95\% \text{ CI} = 0.09–1.70, t = 2.3, p = 0.030) \) in Step 1 to 0.39 \( (\beta = 0.147, 95\% \text{ CI} = –0.38–1.15, t = 1.02, p = 0.316) \) in Step 3, again suggesting partial mediation.

Partial mediation was also suggested for the MTFQ alcohol and drug index. This index significantly predicted purging/restricting score \( (\beta = 0.127, t = 2.18, p = 0.036) \) when entered simultaneously with abuse status. The regression coefficient for abuse status was reduced from 0.90 \( (\beta = 0.344, 95\% \text{ CI} = 0.09–1.70, t = 2.3, p = 0.030) \) in Step 1 to 0.61 \( (\beta = 0.235, 95\% \text{ CI} = –0.20–1.43, t = 1.53, p = 0.135) \) in Step 3. Perfectionism \( (\beta = 0.328, t = 1.27, p = 0.211) \) did not significantly predict purging/restricting when entered with abuse status.

**DISCUSSION**

The major finding of the present study was that behavioral impulsivity provided the strongest mediation between a history of childhood sexual abuse and purging and restricting behavior, as well as weight dissatisfaction. The drug use index developed for this study provided a secondary mediator for purging and restricting behavior. Importantly, impulsivity and drug use mediated this relationship in the absence of mediational influence of other variables such as depression, self-concept, perfectionism, and self-perceptions. These findings suggest that eating disturbances in victims of childhood sexual abuse may follow a developmental pathway characterized by pervasive impulsivity and drug-using behavior, but not the more typical route that emphasizes self-esteem deficits, body image concerns, and perfectionistic dieting behavior (Agras, 1991; Fairburn, 1981). The idea that there may be at least two pathways into disordered eating has previously been discussed by several authors (Steinberg, Tobin, & Johnson, 1990; Vitousek & Manke, 1994).

These findings are relatively similar to other mediation analyses with adult sexual abuse victims, which revealed that borderline personality disorder significantly mediated the relationship between sexual abuse and eating disorder behaviors (Waller, 1992). These findings imply that certain abuse experiences, such as sexual abuse, elicit an impulsive flow of behaviors, including various eating disorder behaviors. Furthermore, the child abuse-impulsivity-eating disturbance link may be further mediated by complex conditioning (Charney, Deutch, Krystal, Southwick, & Davis, 1993; Post, Weiss, & Smith, 1994), pervasive psychobiological changes (Putnam & Trickett, 1997), and associated alterations in neurotransmitter functioning (Post et al., 1994; Putnam & Trickett, 1997). For example, eating disorder behavior (Brewerton, 1995; Jimerson, Lesam, Hegge, & Brewerton, 1990), aggressive behavior (Brown et al., 1982), and traumatic experience (vanderKolk, 1987) have each been empirically or theoretically linked to functioning of the serotonergic neurotransmitter system. To what extent such disturbances reflect the effect of an actual traumatic event versus a chronically disorganized and violent family environment remains a topic of considerable debate (Perkins & Luster, 1999). However, evidence con-
tinues to accumulate that suggests that traumatic experiences in childhood have a profound influence on the biology of children (Kaufman et al., 1997; Putnam & Trickett, 1997) and influence the etiology of disease well into adulthood (Felitti, Anda, Nordenberg, et al., 1998). Additionally, animal studies suggest that early traumatic experiences can have a pronounced and enduring psychobiological effect (Anisman, Zaharia, Meaney, & Merali, 1998; Suomi, 1997) and can also result in disturbances in eating behavior (Miller, Caul, & Mirsky, 1971).

The present study is limited by several methodological factors, including the absence of rigorous diagnostic assessments of eating disturbance. However, the self-report measures of eating disturbance have demonstrated adequate psychometric properties in standardization samples and there is no obvious reason to believe that they would prove less adequate among abused children. Another limitation is that all the abused children were currently receiving treatment. Although the assessment of abused children who are not receiving treatment would remove potential effects of clinical intervention, it is both difficult and possibly unethical to recruit untreated child victims for study and not offer treatment. Finally, we cannot definitively disentangle the effect of the everyday and ongoing home environment from the effects of the sexual abuse in terms of the impact on eating behavior. This issue has been addressed in the general child trauma literature (Briere & Elliott, 1993). Recent evidence with adolescents suggests that even after controlling for family functioning variables, childhood sexual abuse displays a significant association to disturbances in eating (Thompson, Wonderlich, Crosby, & Mitchell, in press).

Several conceptual caveats should also be sounded regarding the present study. First, the data do not support a simple assumption that childhood sexual abuse causes eating disorders, as evidenced by the considerable variability among the abused children on the eating disorder outcome measure. However, the data do suggest that individuals who display impulsive behavior following the abuse may be more likely to show disordered eating. As with all risk factors, whether genetic, experiential, or developmental, childhood sexual abuse will be best understood in the context of a larger causal model of eating disorders that carefully considers the mechanisms by which its effect is transmitted and the conditions under which it is most influential. Future studies, utilizing longitudinal designs, could clarify the course of eating disturbances in abused children along with possible mediational mechanisms of such change or chronicity. Finally, little is known about the impact of a history of childhood trauma on response to traditional eating disorder treatments, a void that could be addressed through moderator analyses of existing treatment studies that include data on history of childhood trauma.

REFERENCES

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