Child and adolescent predictors for eating disorders in a community population of young adult women

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Child and Adolescent Predictors for Eating Disorders in a Community Population of Young Adult Women

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Accepted 5 August 2002

Abstract: Objective: This study investigated early predictors for developing eating disorders by young adulthood in a community sample of women participating in a 22-year longitudinal study. Method: Twenty-one women were identified at age 27 with lifetime full or partial eating disorders. These women were compared with 47 women with no history of eating disorders on predictive factors from three broad domains. Results: The women with eating disorders had more serious health problems before age 5 and mother-reported anxiety-depression at age 9. At 15, mothers described them as having more behavior problems. Before age 15, families of the eating disorder group had more histories of depression, eating problems and changes in family financial circumstances. Discussion: This study identifies early predictors distinguishing girls who develop eating disorders. Findings point to the need for continued research in the area of early health to comprehensively examine the biologic, behavioral, and environmental risks for eating disorders. © 2002 by Wiley Periodicals, Inc. Int J Eat Disord 33: 1–9, 2003.

Key words: adolescent predictors; eating disorders; health problems; environmental risks

INTRODUCTION

An extensive theoretical literature has described etiologic models for eating disorders and several recent reviews have summarized the state of risk factor research (for reviews, see Crago, Shisslak, & Ruble, 2001; Stice, 2001; Striegel-Moore & Cachelin, 2001). Longitudinal studies of community samples covering the period from childhood to adulthood offer the most promising means of identifying the salient predictors for eating disorders. Such studies can fill important gaps in existing research that has tended to survey limited
samples (Attie & Brooks-Gunn, 1989; Vohs, Heatherton, & Herrin, 2001), cover relatively short time spans (Rosen, Compas, & Tacy, 1993), or focus on a limited number of hypothesized predictors (Button, Sonuga-Barke, Davies, & Thompson, 1996; Killen et al., 1996). The current study was designed to address some of these identified research needs.

Research has shown that the etiology is multifactorial, including genetic, personal vulnerability, familial, social, and cultural factors (Striegel-Moore & Cachelin, 2001). Family and twin studies have shown that eating disorders aggregate in families (for review, see Klump, Kaye, & Strober, 2001). Previously identified familial risk factors include parental psychopathology and childhood physical or sexual abuse (Fairburn, Welch, Doll, Davies, & O’Connor, 1997; Lilenfeld et al., 1998).

Studies of personal vulnerability factors have evaluated low self-esteem (Button et al., 1996; Fairburn et al., 1997; Fisher, Schneider, Pegler, & Napolitano, 1991), impulsive behaviors (Fisher et al., 1991; Pine, Cohen, Brook, & Coplan, 1997; Wiederman & Pryor, 1996), and anxiety and depression (Fisher et al., 1991; Rierdan & Koff, 1997; Zaider, Johnson, & Cockell, 2000). Most studies of this area, however, have employed cross-sectional designs, which are not as helpful in identifying predictors of a disorder (Kraemer et al., 1997).

Several prospective studies have focused on health and development. Some studies (Attie & Brooks-Gunn, 1989; Graber, Brooks-Gunn, Paikoff, & Warren, 1994) have suggested that girls who mature early and are physically larger than their peers are more predisposed to developing problems with eating. Another study also found that higher body mass index and earlier pubertal development predicted disordered eating in a community study of adolescent girls (Keel, Fulkerson, & Leon, 1997). Cnattingius, Hultman, Dahl, and Sparen (1999) found that very preterm birth and birth trauma were predictive of the development of anorexia nervosa in a prospective study of females in Sweden. Allen, Lewinsohn, and Seeley (1998) have shown that prenatal and perinatal health is related to later psychopathology.

The current study took advantage of the availability of data that are unique in three ways. First, the data were collected from a large community sample over a 22-year period. Few studies have the capacity to look at data collected over that span of time, beginning in the early childhood of the participants and continuing into their adulthood. By examining data collected prospectively from a community population, the current study provides a description of the childhood and adolescent experiences of participants at several time points considered critical in the development of eating disorders. Second, the data were collected from two informants: mothers and respondents. These separate perspectives offer the opportunity to trace the development of eating disorders over time, beginning before the age of 5 and including mothers’ reports of prenatal complications and early childhood health. The third strength of this study is the broad range of available data from multiple risk domains. The current study takes a multidimensional perspective of risk over a length of time that is seldom found in the literature.

**METHODS**

**Participants**

The study population was drawn from the female participants of the Simmons Longitudinal Study. As described in detail elsewhere (Reinherz, Giaconia, Carmola Hauf, Wasserman, & Silverman, 1999), the original sample included all youth entering kindergarten in 1977 in one public school district participating in state-mandated testing of
health, developmental, academic, and behavioral factors ($N = 763$). The school district was located in a predominantly White, working-class and lower middle-class (Hollingshead, 1971) community in the northeastern United States. Data were collected from multiple sources at seven time points between ages 5 (1977) and 26 (1998). Between 1977 and 1998, attrition occurred primarily in the early grades when students transferred from public schools to parochial and private schools. Because data collection occurred in school, youths transferring out of public school before the third grade were excluded from follow-up. Overall attrition for the 22-year period was 28% of youths remaining in the public school system through third grade. During the most recent round of data collection, conducted at age 26 (1998), 376 respondents (approximately one half of the total sample is female) participated in a structured diagnostic interview. A comparison of the participants who remained in the study at age 26 and those lost to follow-up revealed no significant differences on key demographic and clinical variables originally characterizing the cohort.

For the current study, a subset of female participants was selected from the total sample based on their scores on the Drive for Thinness subscale of the Eating Disorders Inventory (EDI; Garner, 1991), which had been administered to all participants at age 21 (1993). All women ($n = 31$) with scores of 12 or higher on the EDI Drive for Thinness subscale and a sample ($n = 40$) of women with Drive for Thinness scores below 10 were contacted to participate in the current study. These respondents were contacted and interviewed at age 27, approximately 1 year after the previous round of data collection with the entire sample. Of the 71 women selected for this study, 68 women (30 with higher EDI scores and 38 with lower scores) agreed to participate and 3 could not be contacted.

### Instruments and Procedure

#### Diagnostic Assessment of Full and Partial-Syndrome Eating Disorders

At age 27, trained interviewers completed telephone interviews with all women in the subsample. The interview included the Eating Disorders Module of the Diagnostic Interview Schedule IV (DIS-IV; Robins, Cottler, Bucholz, & Compton, 1995) to assess lifetime and current disorders based on criteria in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). Respondents were identified as meeting either lifetime full-syndrome anorexia nervosa or bulimia nervosa, lifetime partial-syndrome eating disorder, or as having no history of an eating disorder. We defined partial-syndrome anorexia nervosa as the presence of at least two of the four criteria for anorexia nervosa, in addition to having a high (12 or greater) Drive for Thinness score at age 21 or some functional impairment from anorexia symptoms as assessed with the DIS-IV at age 27. Partial-syndrome bulimia nervosa was defined as meeting at least Criteria A, B, and D (recurrent episodes of binge eating, recurrent purging, and self-evaluation unduly influenced by body shape and weight, respectively) for bulimia nervosa. These definitions of partial-syndrome anorexia and bulimia nervosa are similar to others used in a recent epidemiologic study of eating disorders (Lewinsohn, Striegel-Moore, & Seeley, 2000).

#### Childhood and Adolescent Predictors

Health-related predictors included interviews with mothers when respondents were 5 years old. Mothers provided information about pregnancy complications and the early health problems of the respondent. Adolescent self-reports at age 15 assessed height and weight and age of menarche.
Regarding behavioral-emotional predictors, measures of behavioral-emotional functioning were gathered from self-reports and from reports from mothers at ages 9 and 15. Mother-rated behaviors at age 9 were obtained using the Simmons Behavior Checklist (Reinherz & Gracey, 1983), an instrument developed to assess emotional and behavioral functioning in youth. Two subscales were examined for this study: anxious-depressed behavior ($\alpha = .82$) and peer relations ($\alpha = .76$). Self-report behavior ratings at that age were assessed with the Piers-Harris Children’s Self-Concept Scale (Piers, 1984). This 80-item self-report instrument measures child self-concept in five separate cluster areas. The two subscales examined for this study were anxious-depressed ($\alpha = .74$) and popularity ($\alpha = .68$).

At age 15, the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) and the Youth Self-Report (YSR; Achenbach & Edelbrock, 1987) were used to measure mother and subject ratings of internalizing and externalizing behavior problems, somatic complaints (“I feel dizzy,” “I repeat certain acts over and over,” “I have thoughts that other people would think are strange”). These subscales showed good reliability: internalizing (CBCL: $\alpha = .89$; YSR: $\alpha = .88$); externalizing (CBCL: $\alpha = .89$; YSR: $\alpha = .86$); somatic complaints (CBCL: $\alpha = .72$; YSR: $\alpha = .76$); thought problems (CBCL: $\alpha = .75$; YSR: $\alpha = .72$).

Regarding familial predictors, family history of eating problems before the age of 15 was determined through the combined reports of mothers and respondents and with the Family History of Eating Problems scale (FHEP). The FHEP is a 10-item scale developed by the authors specifically to assess the presence of eating problems among first-degree relatives. It identifies family members with symptoms of eating disorders or binge eating and determines the onset of those problems for each family member. We considered a history of family eating problems with onset before the respondent was 15 as a potential predictor for eating disorders in our sample. Family history of depression and substance disorders in first-degree relatives that occurred before the respondent was 15 was determined from combined mother and young adult reports at age 26 on the Family History Assessment Module (Janca, Bucholz, & Janca, 1992). Family life events were assessed at age 15 by self-reports of the occurrence of specific events. These included reports of social and economic changes in the family.

**RESULTS**

**Sample Description**

Twenty-one women were identified through the DIS-IV Eating Disorders Module as having a lifetime history of full or partial-syndrome eating disorders. Of these, 9 women met lifetime criteria for anorexia or bulimia nervosa and 12 met lifetime criteria for partial-syndrome disorders. The average age of onset reported was 16.48 years ($SD = 4.5$ years). Of the 21 women with full or partial-syndrome eating disorders, 7 reported an age of onset of 14 years or younger. Analyses comparing the full and partial-syndrome cases revealed no statistical differences on key demographic variables or psychosocial functioning in young adulthood. Therefore, the full and partial-syndrome eating disorder cases were combined into the eating disorder (ED) group for the current study. Forty-seven women had no history of an eating disorder and comprised the non-eating disordered (noED) comparison group.

As shown in Table 1, the ED and noED groups were quite similar in terms of demographic characteristics at age 26. The two groups did not differ in ethnicity, educational level, and marital, parental, or current employment status. However, the two groups did
differ significantly in income level. The noED women were more likely to earn at least $30,000 annually.

**Childhood and Adolescent Predictors for Eating Disorders**

**Health-Related Predictors**  
As shown in Table 2, the two groups differed significantly in early health indicators. Mothers of the ED group were twice as likely to report having had complications with the pregnancy with their daughters than mothers whose daughters did not develop an eating disorder. Mothers of girls who later developed eating disorders also were significantly more likely to report that their daughters had health problems as infants and toddlers than were mothers of daughters without eating disorders. No group differences were found at age 15 on measures of age of menarche and body mass index (based on self-reports of height and weight).

**Emotional-Behavioral Predictors**  
In the domain of emotional and behavioral predictors, we found group differences in the mother reports, but not in the self-reports, of behavior at ages 9 and 15 (Table 3). At age 9, mother ratings indicated that the ED group was experiencing more problems with anxiety-depression than their non-eating-disordered peers. Age 9 self-reports, however, revealed no group differences on measures of anxiety-depression or peer relations. At age 15, no group differences were found on measures of age of menarche and body mass index (based on self-reports of height and weight).

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### Table 1. Demographic characteristics at age 26

<table>
<thead>
<tr>
<th></th>
<th>Eating Disorder (n = 21)</th>
<th>No Eating Disorder (n = 47)</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>White</td>
<td>21</td>
<td>100.0</td>
<td>46</td>
</tr>
<tr>
<td>Married</td>
<td>6</td>
<td>28.6</td>
<td>11</td>
</tr>
<tr>
<td>Has children</td>
<td>3</td>
<td>14.3</td>
<td>7</td>
</tr>
<tr>
<td>Completed high school</td>
<td>21</td>
<td>100.0</td>
<td>46</td>
</tr>
<tr>
<td>Completed college</td>
<td>9</td>
<td>42.9</td>
<td>18</td>
</tr>
<tr>
<td>Currently employed</td>
<td>20</td>
<td>95.2</td>
<td>39</td>
</tr>
<tr>
<td>Salary more than $30,000 annually</td>
<td>2</td>
<td>10.0</td>
<td>22</td>
</tr>
</tbody>
</table>

***p < .001.

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### Table 2. Relationship between health-related risks and eating disorders by age 27

<table>
<thead>
<tr>
<th>Health and Developmental Risk</th>
<th>Eating Disorder (n = 21)</th>
<th>No Eating Disorder (n = 47)</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 5: mother reports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complications with pregnancy</td>
<td>20.0</td>
<td>9.2</td>
<td>4.3</td>
</tr>
<tr>
<td>Health problems, age 7–18 months</td>
<td>30.0</td>
<td>10.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Age 15: self-reports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body mass index</td>
<td>20.23</td>
<td>2.73</td>
<td>21.24</td>
</tr>
<tr>
<td>Age of menarche</td>
<td>12.53</td>
<td>.77</td>
<td>12.51</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.
15, girls’ self-reports again showed no significant differences in any behavioral problems. Mothers of the respondents, however, identified the girls in the ED groups as having more internalizing behavior problems, somatic complaints, and thought problems than the girls in the noED group.

**Familial Predictors**

The ED women and their mothers were significantly more likely to describe either a sibling or parent as having an eating problem that began before the respondent was 15 (Table 4). The parents of the ED women, compared with the noED women, were also significantly more likely to have a history of depression and drug problems with onset before the respondent was age 15.

There were also clear group differences in family life events and circumstances. At age 15, girls who developed eating disorders were significantly more likely than their peers to identify stressful family events that related to family financial status or parental employment changes. These included a change in parent financial status, a job change requiring father’s absence from home, and the loss of job by a parent. These changes appear to be unrelated to family socioeconomic status, which was not significantly different for the two groups at either age 9 or age 15.

**DISCUSSION**

Few studies have followed a population of young women through important stages of their early development to young adulthood. The findings of this 22-year longitudinal study point to a number of factors across three major domains that predict the development of full or partial-syndrome eating disorders in a population of young women. First, our findings suggest that early health problems are important predictors of the development of eating disorders. Specifically, compared with mothers whose daughters
did not develop an eating disorder, mothers of girls with a history of an eating disorder were twice as likely to report pregnancy complications and to have girls who had more health problems as infants and toddlers. These results are consistent with a study in Sweden that found a significant relationship between perinatal factors and the later development of anorexia nervosa (Cnattingius et al., 1999). These findings suggest biologic contributions to eating disorders and highlight the need for more research to examine more fully the integration of biologic factors with behavioral and cultural factors (Striegel-Moore & Cachelin, 2001). Alternatively, it is possible that health problems during pregnancy and early childhood contribute to increased anxiety and perhaps even overprotectiveness on the part of mothers. Early childhood health problems also may promote sensitivity to physical and health issues on the part of the child that, in turn, might explain the high levels of somatic complaints noted by mothers at age 15.

In parallel with findings from other studies (Fisher et al., 1991; Rierdan & Koff, 1997; Zaider et al., 2000), we found that anxious-depressed behavior was significantly related to full or partial-syndrome eating disorders by young adulthood. Specifically, mothers of the ED group rated their daughters as exhibiting more anxious-depressed symptoms and behaviors at age 9 than girls in the noED group. It is noteworthy that the anxiety and depression reported by the mothers at age 9 preceded the development of the eating disorder. Therefore, mothers of the ED group were able to distinguish this behavioral-emotional difference at age 9, before the onset of the disorder. At age 15, mothers reported that the girls who developed eating disorders had more behavior problems. Because one third of the ED group reported onset of eating disorders before age 15, we cannot identify a temporal relationship between behavioral-emotional behaviors at age 15 and the development of eating disorders. These findings are best conceptualized as correlates of the disorders.

Table 4. Relationship between familial risks and eating disorders by age 27

<table>
<thead>
<tr>
<th>Familial Risk</th>
<th>Eating Disorder</th>
<th>No Eating Disorder</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familial history of eating Problems by 15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent or sibling with eating problems</td>
<td>57.1</td>
<td>31.9</td>
<td>3.86*</td>
</tr>
<tr>
<td>Parental history of disorder by 15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent depression</td>
<td>33.3</td>
<td>8.5</td>
<td>6.60**</td>
</tr>
<tr>
<td>Parent alcohol</td>
<td>47.6</td>
<td>27.7</td>
<td>2.58</td>
</tr>
<tr>
<td>Parent drug</td>
<td>19.0</td>
<td>2.1</td>
<td>6.10*</td>
</tr>
<tr>
<td>Familial financial change</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in parent financial status</td>
<td>57.1</td>
<td>18.2</td>
<td>10.13***</td>
</tr>
<tr>
<td>Change in father’s job requiring absence from home</td>
<td>19.0</td>
<td>2.2</td>
<td>5.94*</td>
</tr>
<tr>
<td>Low family socioeconomic status at age 9</td>
<td>28.6</td>
<td>6.5</td>
<td>6.03*</td>
</tr>
<tr>
<td>Low family socioeconomic status at age 15</td>
<td>50.0</td>
<td>41.5</td>
<td>.54</td>
</tr>
<tr>
<td></td>
<td>33.3</td>
<td>45.7</td>
<td>.90</td>
</tr>
</tbody>
</table>

\*p < .05. \**p < .01. \***p < .001.

In contrast to the finding that at ages 9 and 15, mothers’ reports of behavioral-emotional symptoms were significantly different between the ED and noED groups, there were no self-reported behavioral-emotional differences between the groups. One explanation for this finding is that it is indicative of the lack of interoceptive awareness, or the
ability to recognize and accurately identify emotions or visceral sensations. This construct was first described by Bruch (1973) as being characteristic of anorexia nervosa and was later included as a subscale on the EDI (Garner, 1991). Keel, Klump, Leon, and Fulkerson (1998) found a lack of interoceptive awareness to be associated with eating pathology in a population of adolescent boys. In the current study, at both ages 9 and 15, the girls who developed eating disorders reported few, if any, problems whereas their mothers identified a number of difficulties, particularly in the internalizing realm. This discrepancy between mothers and daughters may well be a product of that lack of interospective awareness. In other words, the mothers could see that their daughters were troubled but the girls did not recognize or were unable to identify the feelings.

We found that family events also differentiated the two groups. At the age 15 assessment, significantly more girls from the ED group identified family events, occurring by age 15, that reflected change in their family's financial status. This is apparently unrelated to socioeconomic status. Our study found no association between socioeconomic characteristics and eating disorders. It would be useful for future studies to explore the mechanisms underlying the relationship between economic stressors (such as a parent losing his/her job) and a child's risk for an eating disorder. It is possible that financial changes within the family are experienced as a threat to an adolescent's sense of stability and self-esteem and may become a source of anxiety and stress.

The current study is limited by the small homogeneous (mostly White and working and lower middle-class) sample, which restricts the generalizability of the results and limits the statistical power of the analysis so that only fairly large differences are significant. Because eating disorders are relatively rare (Fairburn & Beglin, 1990; Garfinkel et al., 1995), very large samples are needed to identify an adequate number of cases within a community population.

However, these limitations are offset by several strengths. The most important aspect of this study is the span of time over which each respondent was interviewed. The early data, collected at ages 5 and 9, give a perspective that not only makes a significant contribution to the current knowledge base, but points to new directions for future research. Additional research should continue to investigate the findings of our study: pregnancy complications and early health problems, mother reports of behavioral and emotional difficulties, and changes in family finances in adolescence as predictors of eating disorders.

REFERENCES


