Psychosocial adjustment in young women who had experienced an eating disorder during adolescence

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A growing body of literature documents the adverse impact of adolescent psychiatric disorders on health and psychosocial adjustment in adulthood (Giaconia et al., 2001; Kessler et al., 1998; Lewinsohn et al., 2000a). Studies of the course and outcome of anorexia nervosa (AN) or bulimia nervosa (BN) typically have focused on diagnostic status (recovery versus chronicity), comorbidity, and impairments in physical health (e.g., low weight, menstrual dysfunction, and infertility) at follow-up (Bulik et al., 1999; Franko et al., 2001; Herzog et al., 1991; Sullivan et al., 1998a). These studies have been conducted with patient samples and have reported that for a majority of cases the eating disorder (ED) takes a chronic course and is associated with adverse long-term physical and mental health effects.

Relatively less is known about the impact of adolescent EDs on major areas of psychosocial adjustment in adulthood including educational attainment, employment status and income, marital and parenting status, social support, and life satisfaction. Experts have noted that because adolescence is an important period for the development of vocational and interpersonal skills and social relationships, the adjustment deficits observed during the acute phase of the ED may persist even among those individuals who eventually recover (Joiner, 2000; Reinherz et al., 1999). However, few studies have examined the long-term impact of an ED on psychosocial adjustment and these studies have included only patients, focused on a limited number of indicators of psychosocial adjustment, or offered little information regarding the specific evidence used to support reports of poor psychosocial adjustment in young adulthood among individuals with a history of adolescent ED. For example, Rastam and colleagues (1996) described continued poor social functioning at the 10-year follow-up of their AN sample, composed of patient and community cases. Deter and Herzog (1994) reported that about one third of patients with AN still exhibited social dysfunction after an average follow-up of 12 years. Similarly, in a 5-year
The present report seeks to advance knowledge of the impact of having experienced an ED during adolescence on a broad set of indicators of health and psychosocial functioning in young adulthood, using data collected from a community-based sample of women who were first studied during adolescence. This study takes advantage of a data set based on a large sample of randomly selected high school students who participated in an epidemiological study, the Oregon Adolescent Depression Project (OADP), and who were reexamined a year later (Lewinsohn et al., 1993) and during their 24th year (Lewinsohn et al., 1999).

On each of these occasions, extensive diagnostic information was collected about current and past episodes of mental disorders, which included aspects of problematic eating behaviors. In a previous publication (Lewinsohn et al., 1993) we provided information about the point and lifetime prevalence of AN and BN in male and female adolescents. The lifetime prevalence rate of ED for female adolescents was 23 per 1,000 compared with 1.4 per 1,000 for male adolescents. Given the low base rate of ED among males, the present report focuses on the female sample. In a subsequent article, based on the female sample, we reported that women with full-syndrome (FS) ED and partial-syndrome (PS) ED did not differ significantly on demographic characteristics, comorbidity, current self-reported physical symptoms or depression, history of attempted suicide, and mental health treatment utilization (Lewinsohn et al., 2000b). Therefore, for the present report, FS-ED and PS-ED women were grouped into one ED group. An important question is whether there are areas of impaired adjustment that are unique to women with an ED or associated more generally with history of adolescent psychopathology. Therefore, in the present study, women with adolescent ED also will be compared with three non-ED groups: (1) participants without a history of adolescent psychiatric disorder (no disorder, ND); (2) participants with a lifetime history of non-comorbid major depressive disorder (MDD); and (3) participants with a lifetime history of a non-mood disorder without ED or MDD (NMD).

**METHOD**

**Participants and Procedures**

OADP participants were randomly selected from nine senior high schools in western Oregon. A total of 1,709 adolescents (aged 14–18 years) completed the initial (T1) assessments (interview and questionnaires) between 1987 and 1989, with an overall participation rate of 61%. At the second assessment (T2), 1,507 participants (88%) returned for a readministration of the interview and questionnaire (mean T1–T2 interval = 13.8 months, SD = 2.3). Differences between the sample and the larger population from which it was selected, and between participants and those who declined to participate or dropped out of the study, were small (additional details regarding the T1 and T2 assessments are provided by Lewinsohn et al., 1993).

After individuals reached their 24th birthday, all participants with a history of MDD and other psychopathology at T1 were invited to complete a questionnaire by mail and to participate in a T3 telephone interview (Rohde et al., 1997), as were an approximately equal number of randomly selected control participants with no history of mental disorder at T2. After a thorough description of the study, written informed consent was obtained from OADP probands (and their guardians, if applicable).

Of the 1,101 individuals selected for T3 interview, 941 young adults (85.5%) participated: 539 (57.3%) women and 402 (42.7%) men. Average age at T3 was 24.2 years (SD = 0.6). Most participants were white (89.0%), with 1.1% African American, 3.0% Hispanic, 2.6% American Indian, 2.6% Asian, and 1.8% “other.” The majority (61.4%) were single, with 34.1% married, 1.6% separated, and 2.8% divorced. Almost all (96.8%) had graduated from high school or received their general equivalency diploma, and 31.4% had received a bachelor’s degree or higher. The mean time between the T2 and T3 assessments was 6.8 years (SD = 1.4). Although women were more likely than men to complete the T3 assessments (88.9% versus 81.0%; χ²[1, n = 1,101] = 13.55, p < .001), T3 participation differences as a function of other demographic variables or T2 diagnostic status were non-significant. Furthermore, PS-ED and FS-ED were not significantly associated with attrition from T1 to T2 or from T2 to T3. The mean time interval between the mailer questionnaire assessment and the T3 interview was 6.4 months (SD = 8.8).

The reference sample for the present study was restricted to female participants at T1 (n = 539). Given our focus on functioning near the time of the 24th birthday, participants who had not completed a mailer questionnaire during the 23- to 25-year age interval (n = 4) were excluded from the analyses.

**Diagnostic Interviews**

Participants were interviewed at T1 with a version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS), which combined features of the Epidemiologic version (Orvaschel et al., 1982) and the Present Episode version and included additional items to derive DSM-III-R diagnoses (American Psychiatric Association, 1987). At T2 and T3, participants were interviewed with the Longitudinal Interval Follow-up Evaluation (Keller et al., 1987), which elicited detailed information about the course of psychiatric symptoms and disorders since the previous interview. T3 diagnoses were made using DSM-IV (American Psychiatric Association, 1994).
Psychosocial Functioning During Early Adulthood

RESULTS

Young Adult Psychosocial Functioning

Young adult psychosocial functioning was assessed with both dichotomous and continuous measures. Dichotomous measures included the following: attainment of a bachelor's degree; unemployment of 1 week or more during the past year; annual household income less than $10,000; annual personal income less than $10,000; marital status (currently married: yes/no); parenting (whether participant had ever been a parent: yes/no); and mental health utilization (whether participant had seen a mental health professional in the past 12 months: yes/no). Continuous measures consisted of level of perceived social support from family members and social support from friends (10 items each; Procidano and Heller, 1983); social network size and frequency of social contact (3 items; Berkman and Syme, 1979); daily hassles during the preceding 4 weeks (20 items; Unpleasant Events Schedule; Lewinsohn et al., 1985); major life events in previous 12 months (33 events occurring to the participant, based on the Social Readjustment Rating Scale; Holmes and Rahe, 1967; and the Psychiatric Epidemiology Research Inventory; Dohrenwend et al., 1986); low self-esteem (10 items; Self-Esteem Scale; Rosenberg, 1965); depression symptoms (20-item Center for Epidemiologic Studies Depression Scale; Radloff, 1977); life satisfaction (15 items chosen from Andrews and Withey, 1976; Campbell et al., 1976); physical health (4 items assessing self-rated health, number of times received treatment in past year, treatment for illness or injury in past year, chronic medical problems or distress); and current daily smoking (K-SADS item). Scores on the continuous variables were converted to standard scores (z-scores) and were scored such that high values reflect more problematic functioning.

Adolescent Psychosocial Functioning

An aggregate measure of psychosocial functioning was constructed at T1, based on a standardized composite (α = .83) of 14 scales including major events, daily hassles, internalizing problem behaviors, externalizing problem behaviors, low self-esteem, low social support from friends, low social support from family, conflict with parents, emotional reliance on others, depressory attributional style, negative cognitions, low self-perceived social competence, poor coping skills, and poor physical health.

Diagnostic Groups

The T1 participants who completed a mailed questionnaire between the ages of 23 and 25 (n = 535) were divided into four groups based on the diagnoses they received before age 19: (1) participants with a lifetime history of FS-ED or PS-ED (n = 36); (2) participants with a lifetime history of non-comorbid MDD (n = 95); (3) participants with a lifetime history of an NMD without a history of ED or MDD (NMD; n = 64); and (4) participants with no history of disorder by age 18 (ND; n = 138).

RESULTS

Psychosocial Functioning During Early Adulthood

Adolescent diagnostic group differences on the measures of young adult functioning assessed at 24 years of age were examined with a multivariate approach. To determine whether the groups might differ along specific dimensions, discriminant function analysis using the direct entry method was performed. With four diagnostic groups, three discriminant functions can be calculated based on linear combinations of the young adult functioning variables. The first function had the largest ratio of between-groups to within-groups sums of squares; the subsequent orthogonal functions had successively lower ratios. For each function, the significance of the relationship between the diagnostic groups and predictors was evaluated with the χ² statistic. The eigenvalues associated with discriminant functions indicate the proportion of the between-group variability accounted for by each function.

An evaluation of the assumptions of linearity, normality, multicollinearity or singularity, and homogeneity of variance-covariance matrices revealed no major threats to multivariate analysis. From the 17 young adult functioning variables, three discriminant functions were calculated for the four diagnostic groups, yielding a combined χ² (51, N = 333) = 87.07, p < .001. After removal of the first function, which accounted for 57% of the between-group variability, the association between the four groups and the functioning variables was not significant, χ² (32, N = 333) = 38.68, p = .19. Thus only one significant discriminant function was obtained.

The discriminant loadings (i.e., correlation coefficients) between the 17 functioning variables and the significant canonical discriminant function are presented in the last column of Table 1. Variables with correlations of 0.32 or greater were considered to have an acceptable loading (i.e., accounting for 10% or more of the discriminant function variance) and were used for subsequent interpretation of the function. As can be seen, measures that loaded on the function were low self-esteem (0.57), poor physical health (0.47), low social support from family (0.47), depressive symptoms (0.46), recent unemployment (0.45), low social network size (0.44), major life events (0.42), mental health treatment (0.40), life satisfaction (0.39), and not attaining a bachelor's degree (0.35). Measures that did not load on the discriminant function include personal income, household income, marital status, parenthood, social support from friends, daily hassles, and daily smoking.

The between-group post hoc comparisons for the discriminant function score and each of the variables loading on the function are presented in the first four columns
of Table 1. The discriminant score accounted for 14% of the between-group variability; the ED group differed significantly from the other three groups, and the two psychiatric comparison groups differed from the ND group but did not differ from each other. Figure 1 depicts the magnitude of the diagnostic group differences using an error bar chart of the discriminant function group means with 95% confidence intervals; in terms of effect sizes, differences between the ED group and the other three groups ranged from moderately large to large (Cohen $d = 0.70$ to $1.27$). With respect to group differences on the specific functioning measures, although the three disordered groups did not significantly differ from each other on any of the measures, the ED group had the most elevated scores on all measures with the single exception of low life satisfaction (second highest score).

Impact of Comorbidity

Because 32 (89%) of the 36 ED cases had a lifetime history of non-ED mental disorder (Lewinsohn et al., 2000b), a direct comparison between comorbid ED and non-comorbid ED cases was not possible. To examine whether comorbidity could have impacted the preceding results, a subsequent discriminant function analysis was performed comparing the 32 comorbid ED cases with the comorbid MDD cases ($n = 85$) on the functioning measures. Unlike the previous analyses in which the ED group was elevated on the first discriminant function compared with the non-comorbid MDD group, the comorbid ED group did not differ from the comorbid MDD group in this subsequent analysis, $\chi^2 (17, N = 117) = 16.89, p = .46$. Thus the high degree of comorbidity in the ED group may have resulted in the higher level of psychosocial dysfunction found in the preceding analyses.

Psychosocial Functioning During Adolescence

The elevated level of psychosocial dysfunction found in young adulthood among the adolescent ED cases also

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**TABLE 1**

Here is the table converted into a natural text format:

<table>
<thead>
<tr>
<th>Variable</th>
<th>ED</th>
<th>MDD</th>
<th>NMD</th>
<th>ND</th>
<th>Discriminant Loading</th>
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</thead>
<tbody>
<tr>
<td>Discriminant score</td>
<td>0.87&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.14&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-0.40&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Low self-esteem</td>
<td>0.39&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.16&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.04&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.23&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.57</td>
</tr>
<tr>
<td>Poor health</td>
<td>0.31&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.01&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.24&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.20&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.47</td>
</tr>
<tr>
<td>Low family support</td>
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<td>0.06&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>-0.08&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>-0.12&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.47</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>0.37&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.16&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.02&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>-0.20&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.46</td>
</tr>
<tr>
<td>Unemployment</td>
<td>0.59&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.50&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.47&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.45</td>
</tr>
<tr>
<td>Low social network</td>
<td>0.27</td>
<td>0.05</td>
<td>0.09</td>
<td>-0.15</td>
<td>0.44</td>
</tr>
<tr>
<td>Major life events</td>
<td>0.24&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.02&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>-0.19&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.42</td>
</tr>
<tr>
<td>Treatment utilization</td>
<td>0.35</td>
<td>0.17</td>
<td>0.26</td>
<td>0.16</td>
<td>0.40</td>
</tr>
<tr>
<td>Low life satisfaction</td>
<td>0.16&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>0.29&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.07&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>-0.22&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.39</td>
</tr>
<tr>
<td>No bachelor’s degree</td>
<td>0.74</td>
<td>0.70</td>
<td>0.65</td>
<td>0.55</td>
<td>0.35</td>
</tr>
</tbody>
</table>

*Note: Means with different superscripts differ significantly at $p < .05$. ED = eating disorder; MDD = major depressive disorder; NMD = non-mood disorder; ND = no disorder.*

Fig. 1 Young adult psychosocial impairment (age 24): adolescent diagnostic group means for the discriminant function score. ED = eating disorder; MDD = major depressive disorder; NMD = non-mood disorder; ND = no disorder.
may have been present during adolescence. Thus the elevated psychosocial dysfunction may be associated with the stability in psychosocial functioning from adolescence to early adulthood rather than a consequence of experiencing ED during adolescence per se. To address this possible explanation, an ancillary analysis was conducted in which the adolescent diagnostic groups were contrasted on an aggregate measure of psychosocial functioning assessed at T1, using analysis of variance with Scheffé post hoc comparisons. The group means (SD) were –0.42 (0.80), 0.08 (0.92), 0.26 (0.91), and 0.73 (1.34) for the ND, NMD, MDD, and ED diagnostic groups, respectively. The omnibus test was significant, $F_{3,392} = 23.02$, $p < .001$; the ND group differed from the other three groups and the ED group differed from the NMD group, but the ED group did not differ from the MDD group. Thus an elevated level of psychosocial dysfunction already was evident in the ED group during adolescence.

**DISCUSSION**

The overall aim of this report was to examine whether experiencing an ED during adolescence was associated with persisting problems in health and psychosocial adjustment in young adulthood. We examined this question in a community sample in order to avoid the biases inherent in studies of patients (Berkson, 1946; Kessler et al., 1999; Willfrey et al., 2001) and with a comprehensive set of measures to capture a broad range of indicators of psychosocial adjustment. We identified 10 indicators that contributed to a significant canonical discriminant function differentiating the four groups of interest and thus were included in the composite measure of psychosocial adjustment. These indicators included low educational achievement (not attaining a bachelor’s degree), recent unemployment, poor physical health, low self-esteem, depressive symptoms, low social network size, low social support from one’s family, low life satisfaction, and having experienced major life events in the past 12 months. Therefore, psychosocial problems associated with adolescent EDs span a considerable range of domains of psychosocial adjustment and are observable even in a nonclinical population recruited in the community. This suggests that previous reports of the impaired physical health and psychosocial functioning observed in individuals with a history of an ED are not simply an artifact of recruiting patient samples.

Women who had experienced an ED before age 19 scored significantly higher on the composite measure of psychosocial impairment than women with no history of adolescent mental illness, women with adolescent non-comorbid mood disorder, or women with adolescent NMDs. Hence women with an adolescent ED evidenced the greatest degree of overall impairment, thus underscoring the clinical significance of ED pathology. This overall finding needs to be considered, however, in the context of several additional analyses that were performed to further understand the impact of an adolescent ED on young adult adjustment.

Planned post hoc comparisons found that compared with women with no history of an adolescent mental disorder, the women with EDs reported significantly lower self-esteem, more depression, less family support, and poorer health in young adulthood. These results do not simply reflect the effect of experiencing an ED at the time of assessment: none of the women still met criteria for an ED in young adulthood. It is further noteworthy that the ED group was composed both of women who in adolescence met FS criteria and women who met only PS criteria for AN or BN. Experts have emphasized that the diagnostic criteria for AN and BN are defined too narrowly and have called for a systematic investigation of PS cases to determine more appropriate diagnostic thresholds (Sullivan et al., 1998b).

Consistent with the high rates of psychiatric comorbidity observed in other community samples of women with an ED (Garfinkel et al., 1995; Kendler et al., 1991; Walters and Kendler, 1995), most of the ED cases in our sample had at least one comorbid psychiatric disorder. A comparison of the ED group and women with adolescent comorbid MDD found that the two groups did not differ significantly on the composite measure of psychosocial adjustment. Hence the lower levels of young adult functioning in women with an ED may derive in part from the fact that the ED group experienced multiple disorders. Nevertheless, while the specific mechanisms underlying the association between adolescent ED diagnosis and young adult psychosocial impairment are not yet established, this finding suggests that an ED diagnosis during adolescence may be a marker for current and future psychosocial impairment.

Finally, our findings point to continuity of psychosocial impairment from adolescence to young adulthood in ED. Research is needed to determine whether early intervention among individuals with an adolescent ED is effective in enhancing psychosocial adjustment in young adulthood. Moreover, the adverse outcomes observed in
this study call for the development of effective primary prevention strategies to reduce the incidence of ED.

Clinical Implications

Prior studies in primary care settings have shown that EDs are among the most commonly undetected mental health problems (e.g., Spitzer et al., 1999). Our findings suggest that health care providers working with adolescents need to screen for EDs, especially among those patients who evidence psychiatric symptoms. Furthermore, studies have found that few individuals with EDs receive treatment specifically for the ED pathology (Garvin and Striegel-Moore, 2001), even though effective psychological and pharmacological treatments have been developed (Wilson and Fairburn, 2002; Zhu and Walsh, 2002). Therefore, health care providers need to initiate appropriate referrals for mental health care that targets the ED symptoms.

Limitations

Our sample included only 36 women with PS- or FS-ED. Although this number is consistent with the prevalence rates observed in comparable community-based studies (Garfinkel et al., 1995; Kendler et al., 1991; Walters and Kendler, 1995), the ED group was too small to examine outcomes separately for FS and PS cases. Comorbidity rates in ED are very high (Kendler et al., 1991; Walters and Kendler, 1995), and our sample is no exception: four in five women with an ED met criteria for at least one additional psychiatric disorder. Consequently, teasing apart the role of severity (in terms of comorbidity) or of mental disorders other than an ED (e.g., adolescent mood or anxiety disorder) and the role of adolescent ED as possible determinants of young adult psychosocial functioning was not possible with the present data. Finally, there were not enough men with an ED to permit an exploration of the impact of an adolescent ED on psychosocial functioning in young adulthood. We recently reported that ED symptomatology was significantly correlated with lifetime history of mood and anxiety disorders in both men and women (Lewinsohn et al., 2002). The relatively lower prevalence rates of EDs among males poses a challenge for any epidemiological study due to the costs involved in establishing a large enough sample to permit identification of an adequate number of cases. These limitations are offset by several strengths, including the inclusion of a community-based sample, state-of-the-art diagnostic assessment, high retention rate, and comprehensive measurement of psychosocial adjustment. The apparent reduced psychosocial functioning of those participants with an adolescent ED point to the need for interventions designed to reduce the incidence and prevalence of ED.

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