

Psychosocial Correlates, Outcome, and Stability of Abnormal Adolescent Eating Behavior in Community Samples of Young People

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ABSTRACT

Objective: The current study investigated psychosocial correlates of abnormal adolescent eating behavior at three times during adolescence and young adulthood and its association with psychiatric diagnosis in young adulthood in a community sample.

Method: Sixty-four (10.5%) high-risk subjects (mean age 15 years) with abnormal eating behavior were identified at Time 1, another 252 (16.9%) were identified at Time 2 (mean age 16.2 years), and 164 (16.9%) were identified at Time 3 (mean age 19.7 years) and compared with three control groups matched for age and gender. Dependent measures included emotional and behavioral problems, life events, coping capacities, self-related cognition, social network, and family functions. Outcome was measured additionally by structured psychiatric interviews, and stability of abnormal eating behavior was studied in a longitudinal sample of 330 subjects.

Results: Few subjects showed more than one of five criteria of abnormal eating behavior. High-risk subjects shared a very similar pattern at all three times. They were characterized by

higher scores for emotional and behavioral problems, more life events including more negative impact, less active coping, lower self-esteem, and less family cohesion. Among 10 major psychiatric disorders, only clinical eating disorders at Time 3 shared a significant association with abnormal eating disorder at the same time whereas high-risk status at Times 1 and 2 did not predict any psychiatric disorder at Time 3. Stability of abnormal eating behavior across time was very low. Stability of abnormal eating behavior across time was very low.

Discussion: Abnormal eating behavior in adolescence and young adulthood is clearly associated with various indicators of psychosocial maladaptation. In adolescence, it does not significantly predict any psychiatric disorder including eating disorder in young adulthood and it is predominantly a transient feature. © 2005 by Wiley Periodicals, Inc.

Keywords: abnormal adolescent eating; emotional problems; behavioral problems

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Introduction

Various community surveys suggest that approximately 0.5% of the adolescent population suffer from anorexia nervosa, 1% suffer from bulimia nervosa, and 3–5% suffer from subclinical syndromes at any one point in time (Johnson-Sabine, Wood, Patton, Mann, & Wakeling, 1988; Råstam, Gillberg, & Garton, 1989; Steinhausen, Winkler, & Meier,

1997). The study of the natural course of these patients in the community has been complicated by the comparative rarity of these disorders. Thus, most of the outcome studies have primarily comprised patients treated at tertiary or even specialist service centers, and it is unclear to which extent this selection might have contributed to the relatively poor outcome (Steinhausen, 2002). One option to solve this problem has been to study subclinical eating disorders or abnormal eating behavior in the community due to its more frequent manifestation, and to link it with later outcome. Several recent studies have taken this approach. Kotler, Cohen, Davies, Pine, and Walsh (2001) found a strong association between childhood abnormal eating and bulimia syndromes in young adults. In their large epidemiologic study, Lewinsohn, Striegel-Moore, and Seeley (2002)

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relied on retrospective ascertainment of partial syndromes of adolescent eating disorders. They found that approximately one third of subjects with adolescent eating disorders had persisting disorders in young adulthood, whereas the eating disorder was limited to adolescence for the majority of subjects. Eating disorders in adolescence were also associated with a higher risk for other psychiatric disorders, particularly depression, in young adulthood. The stability of clinical eating disorders was tested in a large and representative community study by Patton, Coffey, and Sawyer (2003) who found 11% of those with eating disorders in adolescence had persisting disorders at the age of 20 years, whereas approximately 50% had high levels of depression and anxiety.

Epidemiologic studies of adolescent eating behavior not only offer opportunities to study the development of disorders but also the association with various other indicators of psychosocial maladaptation. Given the still limited etiologic understanding of the eating disorders with models favoring the multifactorial origin of these disorders, community studies also allow investigators to assess, either cross-sectionally or even longitudinally, the association of the various risk factors with abnormal eating behavior. A recent example of this kind of approach with both a cross-sectional and a longitudinal analysis found, for instance, strong cross-sectional relations among stress, coping, and symptoms of disordered eating whereas there were only tenuous longitudinal associations (Ball & Lee, 2002). In terms of life events, stress has been identified as a factor strongly associated with disordered eating (Greenberg, 1986; Horesh et al., 1995; Lacey, Coker, & Birtchnell, 1986) as have been maladaptive coping strategies (Shatford & Evans, 1986; Soukup, Beller, & Terrell, 1990; Troop, Holbrey, Trowler, & Treasure, 1994). In another study, strenuous and emotion-focused coping were found to be associated with low self-esteem, which in turn was strongly associated with disturbed eating attitudes (Fryer, Waller, & Stenfert Kroese, 1997). Furthermore, negative family concomitants of risk groups for the later development of an eating disorder have been identified (Leon, Fulkerson, Perry, & Dube, 1994; Polivy & Herman, 2002).

The current study is embedded into these two briefly described lines of research pursuing the aim of studying, first, abnormal eating behavior and its correlates at three times in adolescence and young adulthood. Second, in a longitudinal fashion, the association of abnormal eating behavior in adolescence and young adulthood with psychiatric diagnosis at outcome in young adulthood was examined.

Third, the stability of disturbed eating behavior across time was assessed.

Methods

Subjects

The original sample of the Zurich Epidemiological Study of Child and Adolescent Psychopathology (ZES-CAP) comprised 1,964 subjects aged 6–17 years who, in 1994 (Time [T] 1), were living in the Canton of Zurich, Switzerland. The sampling procedures have been described in detail in a previous publication (Steinhausen, Winkler Metzke, Meier, & Kennenberg, 1998). A subsample of adolescents was repeatedly assessed in 1997 (T2) and 2000 (T3) and formed the cohort of the Zurich Adolescent Psychology and Psychopathology Study (ZAPPS). To compensate for attrition, additional subjects were recruited at T2. The basic samples for the current study were 607 subjects aged 13–17 at T1, 1,493 subjects aged 13–20 at T2, and 968 subjects aged 16–23 at T3.

From these samples, high-risk subjects according to a screen composed of five criteria of disturbed eating behavior were identified at T1, T2, and T3 and compared with three control groups without indication of disturbed eating behavior (i.e., they did not fulfill a single criterion of the screen) and matched for age and gender. Sample characteristics of these six cross-sectional subsamples are shown in Table 1. There were 64 (10.5%) high-risk subjects at T1, 252 (16.9%) high-risk subjects at T2, and 164 (16.9%) high-risk subjects at T3. Matching for age and gender resulted in a perfect fit of high-risk groups and controls. In addition to the cross-sectional sample, a longitudinal sample of 330 subjects participated at all three times of the study and was used to study the continuity of abnormal eating behavior. There were 181 (55%) females and 149 (45%) males in the longitudinal sample.

Informed consent was obtained from the parents after receipt of the invitational letter at T1 and informed

TABLE 1. Sample characteristics

	1994 Sample	1997 Sample	2000 Sample
High-risk group			
<i>N</i>	64	252	164
Females	49	204	141
Males	15	48	23
Age (<i>M</i> ± <i>SD</i>)	15.0 ± 0.99	16.2 ± 1.47	19.7 ± 1.6
Controls			
<i>N</i>	64	252	164
Females	49	204	141
Males	15	48	23
Age (<i>M</i> ± <i>SD</i>)	14.8 ± 1.03	16.0 ± 1.5	19.6 ± 1.6

consent was obtained from the adolescents and young adults at T2 and T3.

Procedure

A screen modeled on selected items of the Eating Disorders Examination-Screening Version (EDE-S; Beglin & Fairburn, 1992) was based on the five criteria. A body mass index (BMI) ≤ 17.5 was the first criterion. The second criterion was a score of 3 (often), 4 (very often), or 5 (every day) in response to the following item: In the past 4 weeks, did you have binge attacks with the feeling that you could neither prevent nor stop these attacks when they had started? The third criterion was a positive response to the question: In the past 4 weeks, did you induce vomiting to control your body size and weight? The fourth criterion was a positive response to the question: In the past 4 weeks, did you use laxatives to control your body size and weight? The final criterion was the 90th percentile of the total score of the following four items dealing with distorted cognitions and attitudes with response scales ranging from 0 (never) to 5 (every day): (1) Have you been trying to restrict the amount of food or certain dishes or have you been counting calories to influence shape and weight? (2) Have you been fearful that you might gain weight or become fat? (3) Has thinking about food and calories interfered with your ability to concentrate on other things like reading, watching TV, or conversation? (4) How often have you been ashamed because of your shape and weight? (Do not count binge attacks).

In addition to the screening questionnaire, a series of other questionnaires were selected according to the major aims of the ZAPPS. A broadband questionnaire was chosen to obtain information on relevant behavioral and emotional problems of adolescents. To analyze potential risk, compensatory, vulnerability, and protective factors (Steinhausen & Winkler Metzke, 2001), life events were hypothetically seen as stressors, and various psychosocial variables including coping, self-related cognition, and features of the social network were regarded as moderating factors with regard to behavioral and emotional problems.

Questionnaires were completed confidentially by the adolescents during school hours in 1994. In 1997 and 2001, completed questionnaires were mailed. All questionnaires reflect raw scores and are positively keyed, that is, high scores represent high expression of the content of the scale. All scales showed good to excellent reliability. A list of alpha coefficients may be obtained from the authors.

Youth Self-Report (YSR). The problem behavior section of the YSR (Achenbach, 1991) and its Swiss adaptation (Steinhausen & Winkler Metzke, 1998) consists of the following primary subscales: socially withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behavior, and

aggressive behavior. Two second-order scales reflecting internalizing and externalizing were calculated. The YSR was administered in 1994 and 1997 (T1 and T2).

Young Adult Self-Report (YASR). With the exception of the YSR subscale measuring social problems and the inclusion of the subscale measuring intrusiveness, the YASR (Achenbach, 1997) consists of the same primary and secondary externalizing dimensions like the YSR. The YASR was administered in 2000 (T3).

Life Events Scale (LES). Thirty-six items were chosen from a preexisting questionnaire on life events (Goodyer, 1990). The time frame was defined as the 12 months before completion of the questionnaire. Besides frequencies of life events, a total impact score was calculated. This was based on a scale attached to each item ranging from -2 to $+2$ and indicating the unpleasantness or pleasantness of the respective event.

Coping Capacities (CC). Our modified version of the German Coping Across Situation Questionnaire (Seiffge-Krenke, 1989) addresses coping in four problem areas with school, parents, peers, and the opposite gender. Factor analysis resulted in two scales measuring active coping and avoidant behavior.

Self-Related Cognition (SRC). The 10-item scale for the measurement of self-esteem by Rosenberg (1965) and items from a German questionnaire assessing self-awareness (Filipp & Freudenberg, 1989) were further included in the questionnaire.

Social Network (SN). These newly developed scales cover six situations in which emotional or instrumental support is required. For each situation, the questionnaire asks whether or not nine close individuals (family members, relatives, friends, and teachers) provide support. In addition, the efficiency of each of these individuals is also rated. Factor analyses across situations revealed two stable dimensions, namely, size and efficiency of the social network.

Composite International Diagnostic Interview (CIDI).

Psychiatric assessments at T3 in young adulthood were based on the computer-assisted personal interview (CAPI) version of the Munich-Composite International Diagnostic Interview (M-CIDI; Wittchen & Pfister, 1997) covering criteria in the 4th ed. of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) and in the International Classification of Diseases (ICD-10; World Health Organization, 1992). Diagnostic findings reported in the current study are based on the CIDI/DSM-IV without using the DSM-IV hierarchy rules.

Statistical Analysis

Multivariate analyses (MANOVA) followed by univariate analyses of variance (ANOVA) were performed to test for

differences between high-risk groups and controls across the various dependent measures. In the case of nonhomogenous variances, nonparametric Kruskal-Wallis (chi-square) tests were computed. Furthermore, the relative risk (RR) and odds ratio (OR) were computed to test for associations of risk status at either T1, T2, or T3 with psychiatric diagnoses at T3 in young adulthood. Stability of risk items was tested by using the McNemar test.

Results

Frequencies of the various risk items in the three risk groups are shown in Table 2. The largest

contribution to risk group status came from the composite item of distorted cognitions and attitudes followed by binge attacks, low BMI, and vomiting whereas laxative abuse was a relatively rare event. More than three fourths of the three samples fulfilled only one of the five defining criteria.

In the first analytic step, emotional and behavioral problems and all other psychosocial variables were compared across the two groups at all three times. Findings for T1 are shown in Table 3 and indicate that high-risk subjects had significantly more emotional and behavioral problems, lower self-esteem and greater self-awareness, a smaller social network, and less family cohesion

TABLE 2. Abnormal eating behavior in risk groups at three times

	1994 Sample (N = 64)		1994 Sample (N = 252)		1994 Sample (N = 164)	
	N	%	N	%	N	%
BMI < 17.5	10	15.6	59	23.4	36	22.0
Binge attacks	10	15.6	62	24.6	55	33.5
Vomiting	15	23.4	38	15.1	18	11.0
Laxative abuse	5	7.8	6	2.4	8	4.9
Distorted cognitions and attitudes	40	62.5	160	63.5	103	62.8
One of these items	51	79.6	196	77.8	23	75.0
Two of these items	11	17.2	40	15.8	28	17.1
Three of these items	1	1.6	15	6.0	11	6.7
Four of these items	1	1.6	1	0.4	2	1.2

Note: BMI = body mass index.

TABLE 3. Comparisons of high-risk individuals and controls for dependent psychosocial variables in 1994 (Time 1)

	High-Risk Subjects (N = 64)		Controls (N = 64)		Wilks Lambda (df = 2)	F (df = 1)	χ^2 (df = 1)
	M	SD	M	SD			
Emotional/behavioral problems							
Total score	49.95	19.20	30.58	19.94		17.86***	
Life events							
Total score	4.88	3.71	3.86	3.09		2.99	
Impact score	-5.87	5.97	-4.38	3.91		3.54	
Coping capacities							
Active	4.45	2.83	4.76	2.35		0.26	
Avoidant	2.53	2.52	2.84	2.19		0.09	
Self-related cognition					12.14***		
Self-esteem	20.62	5.84	26.19	6.31		21.03***	
Self-awareness	23.00	6.06	19.39	6.56		9.31**	
Social network							
Size	18.80	5.59	21.62	6.01		4.50**	
Efficiency	23.20	3.07	22.60	3.74		0.48	
Family functions							
Cohesion	22.09	7.80	24.42	7.28			10.40***
Adaptability	18.42	6.11	19.69	5.49			3.68

** $p < .01$. *** $p < .001$.

compared with controls. This pattern was partly replicated but also extended at T2, with high-risk subjects having more emotional and behavioral problems, a higher total score and more negative impact score for life events, less active coping capacities, lower self-esteem, and less family cohesion compared with controls (Table 4). At T3, the pattern of differences at T2 was fully replicated (Table 5). Again, high-risk subjects had more emotional and behavioral problems, a higher total score and a more negative impact score for life events, less active coping, lower self-esteem, and less family cohesion compared with controls.

To pursue the second objective, psychiatric diagnoses at outcome (T3) were compared for the three pairs of samples that were identified at T1, T2, and T3. Across the 10 outcome disorders, substance abuse disorder, affective disorder, anxiety disorder, obsessive-compulsive disorder, posttraumatic stress disorder, somatoform disorders, and eating disorders, there was only a single significant association of high-risk status at T3 with an increased rate of clinical eating disorders at outcome (T3; RR = 16.24, OR = 20.19, $\chi^2 = 15.61$, $p < .0001$). In fact, the prevalence rate was 20.6% in the high-risk group in contrast to 1.2% in the control group for a clinical eating disorder. However, frequencies were too low for statistical tests of other associations in many instances.

Finally, the continuity of abnormal eating behavior was tested in the longitudinal cohort of 330 subjects, which provided data at all three

times of assessment. As Table 6 shows, only a few subjects had one or more risks without any significant association across time.

Discussion

Before addressing the main findings, some methodologic issues need to be discussed. They pertain to the samples and the screen for eating disorders. The original 1994 ZESCAP sample was a representative community sample that reflected the census data for the distribution of gender, urban versus rural composition, and variations in the school system. This sample was reduced in 1997 due to following up only adolescents and omitting children, and due to attrition. With additional recruitment, the sample was expanded to have sufficient sample sizes to meet the major objectives of the ZAPPS. The same procedure was also applied in 2000. Thus, the three samples have a shared nucleus for longitudinal analyses and wider and different sample margins for the cross-sectional analyses. At T2 and T3, there were slightly more females (47% at T1, 52% at T2, and 56% at T3), which was accepted due to the expected higher vulnerability of females for adolescent psychiatric disorders.

The screen developed for abnormal eating behavior in the current study was composed of five criteria, one of which was the 90th percentile of

TABLE 4. Comparisons of high-risk individuals and controls for dependent psychosocial variables in 1997 (Time 2)

	High-Risk Subjects (N = 252)		Controls (N = 252)		Wilks Lambda (df = 2)	F (df = 1)	χ^2 (df = 1)
	M	SD	M	SD			
Emotional/behavioral problems							
Total score	45.63	21.61	33.39	17.74		48.15**	
Life events							
Total score	7.09	4.05	5.85	3.45			11.52***
Impact score	-9.23	6.49	-6.73	4.78			18.05***
Coping capacities					3.11*		
Active	4.72	1.26	5.00	1.25		5.64*	
Avoidant	2.96	1.35	2.75	1.33		0.98	
Self-related cognition							
Self-esteem	22.85	7.31	27.40	5.88			55.79***
Self-awareness	22.12	5.31	20.60	5.48		11.79**	
Social network							
Size	20.94	5.45	22.57	7.13			3.66
Efficiency	11.21	4.12	11.64	4.34		0.48	
Family functions							
Cohesion	22.09	7.80	24.42	7.28			10.40***
Adaptability	18.42	6.11	19.69	5.49			3.68

* $p < .05$. ** $p < .01$. *** $p < .001$.

TABLE 5. Comparisons of high-risk individuals and controls for dependent psychosocial variables in 2000

	High-Risk Subjects (N = 164)		Controls (N = 164)		Wilks Lambda (df = 2)	F (df = 1)	χ^2 (df = 1)
	M	SD	M	SD			
Emotional/behavioral problems							
Total score	42.34	22.55	29.66	17.19		31.70***	
Life events							
Total score	6.67	3.72	4.92	3.32		4.05*	
Impact score	-8.57	6.29	-5.93	4.66			15.82***
Coping capacities							
Active	5.28	1.06	5.65	0.91			9.90**
Avoidant	2.67	1.09	2.62	1.11			0.43
Self-related cognition							
Self-esteem	22.42	6.60	26.50	4.62			34.52***
Self-awareness	20.25	5.03	19.73	4.64			0.53
Social network					0.63		
Size	25.51	7.88	26.26	7.50		0.32	
Efficiency	13.11	4.94	13.69	5.31		0.53	
Family functions							
Cohesion	22.19	7.40	24.85	7.58			12.16***
Adaptability	19.65	5.43	20.74	5.06			3.79

* $p < .05$. ** $p < .01$. *** $p < .001$.**TABLE 6. Stability of abnormal eating behavior across time (N = 330)**

	Time 2 Assessment				Time 3 Assessment				McNemar p		
	No Risk		≥ 1 Risk		No Risk		≥ 1 Risk		T1/T2	T1/T3	T2/T3
	N	%	N	%	N	%	N	%			
Time 1 assessment									.09	n.s.	n.s.
No risk	246	74.5	37	11.2	252	76.4	31	9.4			
≥ 1 risk	23	7.0	24	7.3	29	8.8	18	5.5			
Time 2 assessment											
No risk					248	75.2	21	6.4			
≥ 1 risk					33	10.0	28	8.5			

Note: T = time; n.s. = not significant.

responses to four questionnaire items reflecting the core cognitive and attitudinal symptoms of clinical eating disorders. The distribution of the five criteria in the high-risk groups was extremely asymmetric, with the majority of subjects showing only one abnormal item. Among the five criteria, the highest proportion of subjects were selected from those who fulfilled the criterion that comprised four questionnaire items dealing with disturbed cognitions and attitudes. The second largest contribution came from the criterion of BMI ≤ 17.5 and the third largest came from bingeing. Few subjects fulfilled more than one criterion of abnormal eating behavior.

Although the resulting high-risk groups are remarkable in terms of their frequency (10.5% at T1 and 16.9% each at T2 and T3), it has to be stated that due to the predominance of subjects fulfilling

only one of five selection criteria, they reflect abnormal eating behavior in a predominantly sub-clinical range. In addition, it is noteworthy that there was an increase in high-risk subjects from T1 with a mean age of 15.0 years to T2 with a mean age of 16.2 years but no further increase at T3 with a mean age of 19.7 years. From these data, there is evidence that abnormal eating behavior reaches its peak only in middle and late adolescence and young adulthood. There was a clear predominance of females in all three high-risk groups (77% at T1, 81% at T2, and 86% at T3) that was controlled for in all analyses. The analyses revealed a large number of gender effects that are not presented here due to space restrictions and, more importantly, due to the fact that no interaction of gender and groups was detected that indicated specific findings for females with high-risk status.

A major finding of the current study was that the high-risk groups were not only abnormal with regard to eating behavior but also in terms of emotional and behavioral problems. With few exceptions, high-risk groups clearly scored higher on the YSR and the YASR compared with controls. Given the consistency of these differences across three samples that contain both repeated and single time-specific measurements, there is a very solid replication of the associations between abnormal eating behavior and emotional and behavioral problems. The general vulnerability for psychosocial maladaptation as expressed by these associations adds to the paucity of studies that are trying to identify the interaction of risk and protective factors for juvenile eating disorders (for a review, see Steiner et al., 2003).

Also, for the other set of psychosocial correlates, it became clear that abnormal eating behavior is associated with various indicators of stress and impaired psychosocial functioning. Again, the replication of associations from T2 to T3 strongly supports the generalization of our findings. High-risk subjects experienced more psychological stress than controls due to more frequent life events including more negative impact from these events and, at the same time, had fewer active coping capacities for these stress factors. These findings are fully in accordance with the recent Australian survey by Ball and Lee (2002) and previous studies dealing with the function of life events, stress, and coping (Greenberg, 1986; Horesh et al., 1995; Lacey et al., 1986; Shatford & Evans, 1986; Soukup et al., 1990; Troop et al., 1994). Furthermore, our findings on the, perhaps, very central role of lower self-esteem for various psychopathologic conditions (e.g., alcohol abuse [Steinhausen & Winkler Metzke, 2003]) as for abnormal eating behavior match the findings by Fryer et al. (1997). Finally, the lack of family cohesion as a concomitant of abnormal eating behavior points to another risk factor, not only for abnormal eating disorders as indicated in the study by Leon et al. (1994), but also for clinical eating disorders (for a critical review, see Polivy & Herman, 2002).

When pursuing the second aim of the study (e.g., determining the predictive power of abnormal eating behavior for any mental disorder including eating disorders in young adulthood), a noteworthy finding was made. Actually, there was no association of risk status at any of the three times with other than eating disorders and only a single association of comittant abnormal eating disorder and a clinical diagnosis of an eating disorder at T3. The latter association clearly speaks against the insufficient sensitivity of the

screen. Thus, the lack of predictive power of abnormal eating behavior at T1 and T2 needs a different explanation. At T1, it was clearly the small number of subjects. None of the subjects showed an association with an eating disorder at T3, whereas at T2, both the RR (1.54) and the OR (1.66) were not significant. Taken together with the findings on stability of abnormal eating behavior in the longitudinal sample of 330 subjects, there is evidence that many of these subjects showed only transient abnormal eating behavior.

These findings strongly suggest that in the community, subclinical manifestations of abnormal eating behavior are not very stable across time and do not necessarily develop into a clinical eating disorder. Our findings of low stability on the subclinical level matches the findings of Lewinsohn et al. (2002) who showed that partial syndromes of eating disorders are limited to adolescence in the majority of cases. Conversely, it has to be taken into consideration that clinical eating disorders show a greater continuity across adolescence and young adolescence as shown in a few epidemiologic studies (Kotler et al., 2001; Patton et al., 2003). In contrast to the studies by Lewinsohn et al. (2002) and Patton et al. (2003), we found no association with other mental disorders at outcome, but this was due to the small number of cases that prevented any statistical tests. Given the comparative rarity of eating disorders, more extended sample sizes than those presented in the current study are clearly needed to sufficiently test for these associations.

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