

## Suicide attempts and suicidal ideation: links with psychiatric comorbidity in eating disorder subjects

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### Abstract

Additional psychiatric disorders in eating disorders patients may contribute to the risk of suicide and suicide attempts. The aim of this study was to examine associations between Axes I and II comorbidity and suicidality in a large sample of women currently suffering from an eating disorder (ED). In a sample of 288 women (87 anorexia nervosa, 158 bulimia nervosa, 43 eating disorders not otherwise specified) psychiatric comorbidity of Axes I and II was determined using the Structured Clinical Interview for DSM-IV. Histories of attempted suicide were explored in a structured interview. Suicidal ideation was determined by means of the SCL-90. Past suicide attempts were reported by 26%. Subjects with a purging type ED more frequently had a history of attempted suicide than subjects with a nonpurging type ED. A history of suicide attempts was associated with higher levels of Axes I and II comorbidity, in particular with affective disorders and Cluster B personality disorders. Current suicidal ideation was generally linked with higher levels of all types of Axes I and II comorbidity. Eating disorders are serious psychiatric disorders associated with high levels of comorbidity and suicidality. Incorporating a comprehensive psychiatric evaluation into the clinical assessment of ED patients is important for the assessment of suicidality and for the provision of adequate treatments. © 2004 Elsevier Inc. All rights reserved.

*Keywords:* Eating disorders; Comorbidity; Suicidality; Attempted suicide; Suicide ideation

### 1. Introduction

Suicide attempts and suicidal ideation are risk factors for suicide [1,2] and are thus indicators of suicidality, i.e., a person's propensity to commit suicide or suicide attempts. The WHO/EURO multicenter study [3] defines suicide attempt as "an act with nonfatal outcome, in which an individual deliberately initiates a nonhabitual behavior that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which the subject desired via the actual or expressed physical consequences." The term suicidal ideation refers to the occurrence of any thoughts about self-destructive behavior, whether or not death is intended. Such thoughts may range from vague ideas about the possibility of ending one's life at some point in the future to very concrete plans of committing suicide [4].

Suicide attempt and completed suicide share common

features, and the relative risk for suicide in a population of suicide attempters is about 40 times higher than expected in the general population and remains elevated even in the long term [5,6]. Almost all mental disorders are associated with increased suicide attempt and suicide risk [5,7–9]. In women with eating disorders (ED) the prevalence of suicide attempts is markedly increased compared with noneating disordered women from community samples [10,11]. The clinical significance of suicide in eating disorders is indicated by studies showing that in patients with anorexia nervosa, suicide is an important contributor to high mortality [12–14]. Eating disorders have a suicide risk comparable with that of other severe mental disorders [5], for example major depression [15]. Bulik et al. found no significant difference in the reported history of suicide attempts between anorexia nervosa, bulimia nervosa, and major depression. On the other hand, Favaro and Santonastaso [11] reported significant differences between ED diagnostic groups.

Psychiatric comorbidity of Axes I and II is often high in subjects with eating disorders [16,17]. The presence of additional psychiatric disorders may contribute, together

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with the severity and characteristics of ED, to the risk of suicide and attempted suicide in eating disordered patients. It is therefore necessary to accurately assess Axes I and II disorders when examining suicidality [18]. Yet only one study on suicidality in ED patients has incorporated an assessment of Axis I comorbidity [19]. Recent studies have examined the relationship between suicidality and ED diagnosis, severity of ED, and other specific clinical characteristics, i.e., history of suicide attempts and self-injurious behavior [10,11]. However, there are no studies examining complete Axes I and II comorbidity according to modern DSM-IV criteria and suicidality in a sample of persons with eating disorders as the main diagnosis.

The main aim of this study was to examine associations between suicidality (history of suicide attempts, current suicidal ideation) and comorbidity of Axes I and II in a large sample of subjects currently suffering from an ED. The goal was furthermore to determine whether suicidality was linked with ED diagnosis and subtype (anorexia nervosa restrictive, anorexia nervosa binge purge, bulimia nervosa purge, bulimia nervosa non purge, and eating disorders not otherwise specified). In addition, associations between severity and characteristics of the eating disorders (BMI, fixation on underweight, fear of weight-gain, frequency of eating attacks, frequency of binge-purge episodes, etc.) and suicidality were examined. We expected that prevalence of suicidality would differ between ED subgroups, and that subjects with a history of attempted suicide would be more likely to engage in suicide ideation than those without a history of suicide attempts.

## 2. Materials and Methods

### 2.1. Participants

The participants were enrolled during a period of 24 months (March 1997 until March 1999). Criteria for inclusion in the study were: current DSM-IV diagnosis of eating disorder; minimum age of 17 years; and ability to speak German with adequate fluency. All participants received detailed information about the procedures and aims of the study and gave written informed consent. In total, 300 eating-disordered persons were evaluated. Sixty-seven participants were consecutively recruited from the ED Inpatient Unit of the University Hospital Zurich (33 anorexia nervosa (AN), 33 bulimia nervosa (BN), 1 eating disorder not otherwise specified (EDNOS)), 66 participants were consecutively recruited as outpatients of the Psychiatric Outpatient Department of the University Hospital Zurich (23 AN, 38 BN, 5 EDNOS), and 31 participants were recruited via contacts with ED self-help groups in the Zurich area (4 AN, 22 BN, 5 EDNOS). An additional group of 136 participants with a clinical diagnosis of ED were enrolled via advertisements in local newspapers (30 AN, 70 BN, 36 EDNOS), to which a total of 280 persons responded.

Male participants ( $N = 12$ ) were excluded in order to permit comparisons with the ED and suicide literature. The sample investigated in this study comprised 288 participants, specifically 87 (30%) AN participants (mean Body Mass Index (BMI) 15.2, SD 1.6), 158 (55%) BN participants (mean BMI = 21.7, SD = 3.9), and 43 (15%) EDNOS participants (mean BMI = 22.1, SD = 5.6). Thirty-eight (44%) AN cases were of the restrictive type (AN-r), 49 (56%) were of the binge-purging type (AN-bp). Of the BN cases 144 (91%) were of the binge-purging type (BN-p) and 14 (9%) of the nonpurging type (BN-np). AN-r subjects had a significantly lower BMI (BMI 14.7, SD 1.7) than AN-bp subjects (BMI 15.6, SD 1.4) ( $z = 2.3$ ,  $P = 0.019$ ). BN-p subjects had a significantly lower BMI (BMI 21.4, SD 3.7) than BN-np (BMI 25.1, SD 4.0) ( $z = 3.8$ ,  $P < 0.001$ ).

The mean age at time of interview was 29.0 years (SD 9.6), with AN participants being younger (mean 26.8 SD 8.9) than BN (mean 29.5, SD 9.8) ( $z = 2.4$ ,  $P = 0.017$ ) and EDNOS participants (mean 31.7, SD 6.9) ( $z = 3.1$ ,  $P = .002$ ). The average age of ED onset (as reported by participants) was 17.5 years (SD 4.4) and did not vary significantly between ED diagnoses groups. Thus, the average ED duration of AN (mean 8.9, SD 8.8) was shorter than of BN (mean 12.1, SD 9.8), and of EDNOS (mean 13.9, SD 10.3).

### 2.2. Measures and procedure

This study is part of a prospective survey on the course of eating disorders. The data presented here were collected during the baseline phase of this survey and are partly retrospective in nature. ED and psychiatric comorbidity were diagnosed by means of the German version of the Structured Clinical Interview for Axes I and II of the DSM-IV [20], conducted by four psychologists (inter-rater reliability  $\kappa = 0.8$ ) who never met with the participants outside the interviews for the study. All diagnoses were discussed and finalized with the first author (GM). In addition, the COST B6 (European Cooperation in the Field of Scientific and Technical Research) structured interview [21] was conducted to explore participants' ED symptoms and ED history. The COST Action B6 is a research project, funded by the European Commission, on the outcome of eating disorders, in which 19 European countries participated. In this interview, lifetime history of suicide attempts was explored in detail. The interviewer rated the severity of the following symptoms during the preceding three months on five-point scales. Fixation on underweight and fear of weight gain (0 = none, 1 = low, 2 = marked, 3 = strong, 4 = extreme); intensity of preoccupation with appearance and weight (0 = never, 1 = less than half of the time, 2 = about half of the time, 3 = more than half of the time, 4 = always); frequency of binge eating attacks, vomiting, use of laxatives, dieting, and excessive physical activity (0 = never, 1 = once a week or fewer, 2 = two to three times a week, 3 = four times a week to daily, 4 = several times a day).

Table 1  
History of attempted suicide, repeaters and current suicide ideation for the total sample and ED subtypes

	Sub-Sample		History of attempted suicide		History of repeated suicide attempts		Sub-Sample		Current suicide ideation <sup>a</sup>	
	N	% of sample	N	% of sample	N	% of sample	N	% of sample	N	% of sample
AN restrictive	38	10.5	4	–	–	–	37	24.3	9	24.3
AN binge-purge	49	34.7	17	8.2	4	8.2	44	43.2	19	43.2
BN purge	144	29.9	43	13.2	19	13.2	138	23.2	32	23.2
BN non-purge	14	14.3	2	–	–	–	13	15.4	2	15.4
EDNOS	43	20.9	9	4.7	2	4.7	38	21.1	8	21.1
Total Sample	288	26.0	75	8.7	25	8.7	270	25.9	70	25.9

<sup>a</sup> Based on participants who completed SCL-90 items 15 and 59 ( $N = 270$ , 94%)

The Symptom Checklist (SCL-90) [22] was administered to all subjects, and completed by 270 patients. Like other studies [11,23] we assessed current suicidal ideation using the two items of the SCL-90 pertaining to suicide and death: item 15 “In the last 2 weeks, how much have you suffered from . . . thoughts of ending your life” and item 59: “. . . thoughts of death or dying”. A 5-point Likert scale was used for the responses (0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a lot and 4 = extremely often). The two items correlated at 0.76 (Spearman’s rho). Suicidal ideation was considered to be present if there was a score of 4 or more on the two items together. The study was approved by the Research Ethics Commission of the Psychiatric Hospital of Zurich.

### 2.3. Statistical analysis

Group differences were determined by means of  $\chi^2$  and Fisher’s exact tests for nominal variables. Group differences in non-normally distributed variables (e.g., age of ED onset) and in Likert scale variables were examined using Mann–Whitney- $U$  tests. All tests were two-tailed and alpha levels set at 5%.

## 3. Results

Seventy-five women (26%) reported that they had committed at least one suicide attempt in the past. Of these, one third, representing 8.5% of the total sample, had made more than one attempt. Fifty-five percent of the participants with a history of suicide attempts had used drugs, 30% self-injury, and 15% both drugs and self-injury in their attempts. Current ideation of suicide was reported by 25.9% ( $N = 70$ ).

Table 1 shows the distribution of history of attempted suicide (HAS), repeaters, and current suicide ideation (SI) for the total sample and the ED subtypes. EDNOS participants did not differ from the other ED diagnostic groups (AN or BN) regarding the proportion of HAS, repeaters, or SI. The AN-bp group had a significantly higher proportion of women with HAS ( $\chi^2 = 6.8$ ,  $df = 1$ ,  $P = .009$ ) than the

AN-r group. AN-bp participants also reported more frequently SI than AN-r, but this difference was not significant. Repeated suicide attempts were reported by 8.2% of AN-bp and by none of the AN-r participants (expected counts were too low in some subgroups to test for significance). A similar pattern emerged for BN participants. The BN-p group had a higher proportion of women with HAS, a history of repeated suicide attempts, and with SI than the BN-np group. However, none of these differences were significant (expected counts for suicide attempt repetition were too low in some subgroups to test for significance).

Comparisons of the ED diagnostic groups AN (AN-r and AN-bp combined) and BN (BN-p and BN-np combined) showed no significant differences regarding the proportion of HAS and repeaters. AN participants reported more frequently SI (34.6%,  $N = 28$ ) than BN (22.5%,  $N = 34$ ) ( $\chi^2 = 3.9$ ,  $df = 1$ ,  $P = .048$ ). Participants with a purging type disorder (AN-bp and BN-p combined) had a significantly higher rate of women with HAS (31%,  $N = 60$ ) than the nonpurging group (AN-r and BN-np combined) (12%,  $N = 6$ ) ( $\chi^2 = 8.0$ ,  $df = 1$ ,  $P = .005$ ). Repeated suicide attempts were reported by 12% ( $N = 23$ ) in the purging group and by none of the nonpurging participants (expected counts in some subgroups were too low to test for significance). There was no difference between participants with a purging type disorder and those with a nonpurging disorder regarding SI.

HAS participants were significantly more likely to engage in SI (45%,  $N = 31$ ) than those without HAS (19%,  $N = 39$ ) ( $\chi^2 = 17.4$ ,  $df = 1$ ,  $P < 0.001$ ). This association was significant in the AN group ( $\chi^2 = 10.5$ ,  $df = 1$ ,  $P < 0.001$ ) and the BN group ( $\chi^2 = 7.4$ ,  $df = 1$ ,  $P = 0.006$ ) but not for EDNOS participants.

Table 2 shows age and ED-related characteristics of the total sample and for participants with and without HAS and SI, respectively. Participants with HAS reported significantly more frequent binge eating attacks than participants without HAS. Frequency of purging behavior such as vomiting and use of laxatives was also significantly higher in the HAS group. Participants with SI had a significantly lower age of ED onset, higher levels of fixation on underweight, fear of weight gain, and higher levels of preoccupation with

Table 2  
Characteristics in total sample and split by history of attempted suicide and by current suicide ideation

	Total sample		History of attempted suicide				<i>P</i> <sup>a</sup>	Current suicide ideation <sup>b</sup>				<i>P</i> <sup>a</sup>
	<i>N</i> = 288		<i>N</i> = 213		<i>N</i> = 75			<i>N</i> = 200		<i>N</i> = 70		
	M	SD	M	SD	M	SD		M	SD	M	SD	
Age, y	29.0	9.6	28.5	9.5	30.4	9.8	.097	29.9	10.0	27.4	8.2	.091
Age of ED onset, y	17.5	4.4	17.7	4.4	16.9	4.5	.125	17.7	4.3	16.7	4.9	.012
ED duration, y	11.5	9.8	10.8	9.5	13.4	10.4	.059	12.1	10.3	10.6	8.4	.480
BMI, kg/m <sup>2</sup>	19.8	4.8	19.7	4.8	20.0	4.7	.484	20.1	4.8	19.2	5.1	.075
Fixation on underweight <sup>c</sup>	2.8	1.3	2.8	1.3	2.8	1.3	.632	2.7	1.3	3.2	1.1	.001
Fear of weight gain <sup>c</sup>	3.2	0.9	3.2	0.9	3.3	0.9	.335	3.1	0.9	3.4	0.8	.005
Preoccupation w. appearance and weight <sup>d</sup>	2.9	1.2	2.9	1.2	3.0	1.2	.483	2.8	1.2	3.2	1.1	.003
Binge eating attacks <sup>e</sup>	2.4	1.5	2.3	1.5	2.8	1.4	.014	2.4	1.5	2.5	1.6	.221
Vomiting <sup>e</sup>	2.1	1.7	1.9	1.7	2.7	1.6	.001	2.0	1.7	2.5	1.7	.021
Laxatives <sup>e</sup>	0.8	1.4	0.7	1.3	1.2	1.6	.022	0.7	1.3	1.1	1.6	.156
Dieting/low cal food <sup>e</sup>	2.7	1.4	2.7	1.4	2.6	1.5	.773	2.6	1.4	3.0	1.4	.004
Excessive physical activity <sup>e</sup>	1.6	1.5	1.5	1.5	1.6	1.5	.794	1.6	1.5	1.7	1.6	.425

Data are presented as M (SD)

<sup>a</sup> *P* values are based on Mann-Whitney-U tests

<sup>b</sup> Based on participants who completed SCL-90 items 15 and 59 (*N* = 270, 94%)

<sup>c</sup> 5-point Likert scales (0 = none, 1 = low, 2 = marked, 3 = strong, 4 = extreme)

<sup>d</sup> 5-point Likert scale (0 = never, 1 = less than half the time, 2 = about half the time, 3 = more than half the time, 4 = always)

<sup>e</sup> 5-point Likert scales (0 = never, 1 = once a week or fewer, 2 = two to three times a week, 3 = four times a week to daily, 4 = several times a day)

appearance and weight than participants without SI. Participants with SI also reported significantly more frequent vomiting and dieting behavior. The use of laxatives or binge-eating attacks was not predictive of SI.

Psychiatric comorbidity of Axes I and II was examined in the total sample and in the groups with and without HAS and SI respectively (see Table 3). In the total sample, the proportion of cases with any Axis I disorder was high

(72.9%). The most common Axis I disorders, present in more than half of the sample, were anxiety and affective disorders, followed by substance-related disorders (abuse and dependency). Other Axis I disorders were rare (<3%). Forty-seven percent of the sample had more than one Axis I disorder in addition to the ED. The rate of personality disorders was also high (68.1%). Cluster C disorders (anxious-fearful) were observed in more than half of the partic-

Table 3  
Axis I (lifetime) and Axis II disorders in total sample and split by history of attempted suicide and by current suicide ideation

	Total sample		History of attempted suicide				<i>P</i> <sup>a</sup>	Current suicide ideation <sup>b</sup>				<i>P</i> <sup>a</sup>
	<i>N</i> = 288		<i>N</i> = 213		<i>N</i> = 75			<i>N</i> = 200		<i>N</i> = 70		
	%	N	%	N	%	N		%	N	%	N	
<b>Axis I lifetime</b>												
Any Axis I	72.9	210	68.1	145	86.7	65	.002	67.0	134	92.9	65	<.001
Two or more Axis I disorders <sup>c</sup>	46.9	135	43.7	93	56.0	42	.947	40.0	80	65.7	46	.129
Affective disorders	51.0	147	45.5	97	66.7	50	.002	45.0	90	72.9	51	<.001
Substance-related disorders	25.3	73	21.6	46	36.0	27	.014	21.5	43	34.3	24	.033
Anxiety disorders	53.1	153	49.8	106	62.7	47	.054	47.5	95	70.0	49	.001
<b>Axis II</b>												
Any Axis II	68.1	196	62.9	134	82.7	62	.002	60.5	121	91.4	64	<.001
Disorders in more than one cluster <sup>c</sup>	31.3	90	27.7	59	41.3	31	.435	23.5	47	55.7	39	.004
Cluster A (odd-eccentric)	8.7	25	7.0	15	13.3	10	.096	6.5	13	14.3	10	.045
Cluster B (dramatic-emotional-erratic)	21.9	63	16.9	36	36.0	27	.001	16.5	33	37.1	26	<.001
Cluster C (anxious-fearful)	51.7	149	49.8	106	57.3	43	.259	45.5	91	71.4	50	<.001
Depressive/negativistic PD	27.1	78	24.9	53	33.3	25	.157	20.5	41	50.0	35	<.001

PD, Personality disorder,

<sup>a</sup> *P* values are based on  $\chi^2$  tests with *df* = 1

<sup>b</sup> Based on participants who completed SCL-90 items 15 and 59 (*N* = 270, 94%)

<sup>c</sup>  $\chi^2$  compares frequencies among participants with one disorder (disorders in one cluster) with frequencies among participants with several disorders (disorders in more than one cluster)

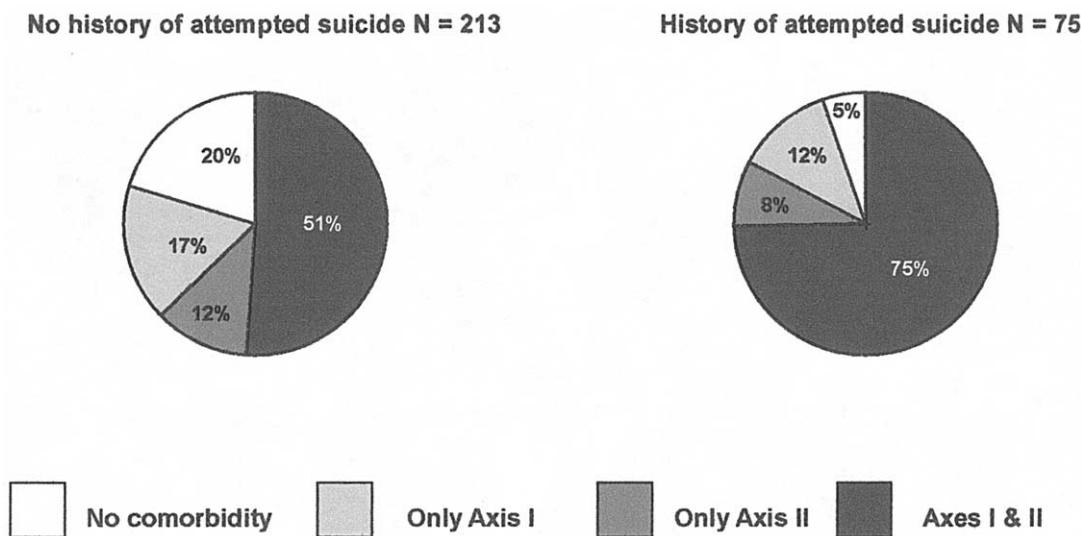


Fig. 1. Comorbidity distribution by history of attempted suicide.

ipants. The second and third most common types of disorders were depressive or negativistic disorders (DSM-IV Appendix B disorders for further study) and Cluster B disorders (dramatic-emotional-erratic). Cluster A disorders (odd-eccentric) were diagnosed in 8.7%. Thirty-one percent of the sample had personality disorders in more than one cluster.

Participants with HAS had significantly more often Axis I comorbidity and Axis II comorbidity than participants without HAS. When examining specific types of Axis I disorders, affective disorders differentiated the strongest between participants with and without HAS. Regarding specific Axis II clusters, only Cluster B disorders differentiated significantly between participants with and without HAS. Comorbidity comparisons of participants with and without SI produced an equivalent pattern of results with effects generally being more pronounced than for the HAS comparisons. Regarding Axis I, affective and anxiety disorders both were strongly associated with SI. On Axis II, Clusters B and C, and depressive or negativistic disorders showed strong links with SI. Results indicated that a cumulation of disorders in several clusters significantly increased the probability of SI.

When considering the distribution of disorders in both axes combined, 83.7% ( $N = 241$ ) of the total sample had some form of psychiatric comorbidity and 57.3% ( $N = 165$ ) had multiple comorbidity, that is both Axis I and Axis II comorbidity. Fig. 1 illustrates that the proportion of cases with pure ED was considerably lower and the level of multiple comorbidity higher for participants with HAS than participants without HAS ( $\chi^2 = 14.4$ ,  $df = 3$ ,  $P = 0.002$ ). The distribution of combined Axes I and II comorbidity in participants with and without SI was equivalent ( $\chi^2 = 29.6$ ,  $df = 3$ ,  $P < 0.001$ ).

#### 4. Discussion

This is the first study to employ a comprehensive assessment of Axes I and II (according to DSM-IV), history of attempted suicide (HAS) and current suicidal ideation (SI) in a large sample of women suffering from eating disorders (ED). We found a lifetime prevalence of suicide attempts of 26%. This rate is four times higher than the lifetime prevalence found in general female populations in Western countries (ca. 6%) [24,25] and is comparable to rates previously reported for ED samples [10,15,19].

The prevalence of HAS did not differ between the ED diagnostic groups AN, BN, and EDNOS. However, HAS was significantly more frequent in participants with a purging type disorder (AN-bp or BN-p) than in participants with a nonpurging type disorder (AN-r or BN-np). Similarly, participants with a history of repeated suicide attempts were only found in the group with purging ED. This association between HAS and purging type ED is consistent with findings by others [11]. Our analyses showed that this link was detectable when comparing the individual diagnostic subgroups AN-bp with AN-r, but it was not significant when comparing BN-p with BN-np. However, BN-np represents the least frequent of the DSM-IV ED subgroups and in our study, too, analyses involving this subgroup were somewhat limited by the small sample size. Overall, our results indicate that the main ED diagnosis (AN, BN, or EDNOS) is less prognostic of past suicide attempts than the subtype of the disorder (purging vs. nonpurging). The relatively high percentage of EDNOS cases with HAS (higher than in the AN-r and the BN-np group) was surprising and indicates that this heterogeneous diagnostic subgroup includes severely disordered individuals.

Our results furthermore showed that AN participants were more likely to engage in suicidal ideation than BN

participants. AN patients' starvation is a form of chronic self-harming behavior and continuously maintaining underweight generates considerable distress which might contribute to higher levels of suicidal ideation in this group. There was no difference between persons with and without purging type disorders regarding suicide ideation. As expected, participants with HAS were significantly more likely to engage in SI than those without HAS.

An association between suicide attempts and purging behavior was further reinforced by our analyses of ED-related characteristics and behaviors. Participants with history of attempted suicide engaged more frequently in binge-eating, vomiting and laxative abuse than participants without HAS. These findings confirm the view that these types of behavior are associated with disturbed impulse control [26,27] and that impulsivity is an important precursor of suicide attempts [7]. HAS was not associated with mental preoccupation with issues surrounding weight loss and appearance (fixation on underweight, fear of weight gain, and preoccupation with appearance and weight). Suicidal ideation, on the other hand, was not linked to any of the types of behavior associated with impulse control. Participants with SI showed significantly higher levels of preoccupation with issues surrounding weight loss and appearance. Such preoccupation can thus be seen as a warning sign for current suicide ideation in eating disordered subjects.

One of the central features of the present study was the examination of associations between suicidality and psychiatric comorbidity. Psychiatric comorbidity of Axes I and II was very high in the study sample. Only 16% of participants had neither Axis I nor Axis II comorbidity. Participants with HAS were significantly more frequently diagnosed with any-Axis I disorder (in addition to the ED) and with any-Axis II disorder than participants without HAS. Regarding specific types of Axis I comorbidity, affective disorders showed the strongest link with HAS. An association between suicide attempts and affective disorders such as depression is not surprising and confirms existing research findings in ED samples [19]. Regarding Axis II disorders, we found that Cluster B disorders (dramatic-emotional-erratic) showed a strong association with HAS. None of the other clusters, nor depressive or negativistic personality disorders, were linked with HAS. As Cluster B disorders are characterized by impulse control problems, this finding, too, supports the notion of a link between impulse control disturbances and suicide attempts. Indeed, an association between borderline personality disorders, which belong into Cluster B, and suicide gestures in ED patients has been reported by Wonderlich & Swift [28]. Mann et al. [7] also emphasized the role of borderline personality disorder as a predictor of impulsivity and suicide attempts.

Participants with SI were significantly more often diagnosed with any Axis I disorder and any Axis II disorder than participants without SI. When examining specific types of disorders and clusters, we found that SI was associated with elevated rates of all specific Axis I disorder types and of all

personality disorder clusters. Therefore, our results indicate that while affective disorders and Cluster B personality disorders are associated with an elevated suicide risk in ED participants, all forms of comorbidity appear to be linked with an elevated risk for suicide ideation.

Several limitations of the study ought to be considered. As in most ED research, our sample, too, is biased through the use of different recruitment sources so that it does not represent a random sample of all women with ED. As a consequence, although the sample reflects the distribution of main ED types generally encountered in clinical practice, the results of this study do not provide an estimation of prevalence rates. Furthermore, the use of two self-rating items to gauge suicide ideation does not permit a detailed examination of suicide-related thoughts and therefore precludes an assessment of severity of suicide ideation. History of suicide attempts was assessed retrospectively. Although it can be assumed that life events such as a suicide attempt would be fairly accurately recalled by the participants, exaggerations, minimizations or omissions may have biased our assessments. The severity of past suicide attempts was not assessed because this parameter would not be accurately reliable in a retrospective design. Future research ought to replicate the findings using prospective designs. The diagnostic subgroups (AN-r, AN-bp, BN-p, BN-np, EDNOS) varied in size; particularly the group of patients with the diagnosis BN-np was noticeably smaller than the other subgroups, reflecting the low prevalence of this ED subgroup in clinical samples. In addition, participants' current treatment (e.g., counseling, pharmacological treatment, etc.), which could possibly influence levels of suicidality, could not be considered in the analyses.

In conclusion, eating disorders are serious disorders associated with high levels of suicidality and psychiatric comorbidity. The study showed that not the main ED diagnosis (AN, BN, EDNOS) but the present behavior indicating problems of impulse control, such as binge eating attacks and vomiting, was linked with a history of suicide attempts. While suicide attempters were characterized predominantly by problems of impulse control, suicide ideators were characterized by higher levels of psychopathology in general, an association with AN, and higher levels of distress associated with issues surrounding weight and appearance. In clinical practice a comprehensive assessment of psychopathology (Axes I and II), and of medical history could help achieve an individual and specific case management and thus aid in reducing suicide risk.

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