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Binge Eating and Weight Concerns among Young Adults
Results from the Zurich Cohort Study

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In the longitudinal cohort study of young adults from the Canton of Zurich in Switzerland, two groups of eating problems were defined: binge eating and weight concerns. Subjects with these conditions were interviewed at the ages of 27–28 and 29–30 years. The binge eaters, mostly women, differed both from subjects with weight concerns and from controls. They had more severe eating problems and more anxiety and depression. Follow-up as well as retrospective data suggest that eating problems are persistent for the binge eaters, and, to a lesser extent, also for subjects with weight concerns. Even so, professional treatment is rarely sought by subjects with eating problems. These findings encourage long-term studies on eating problems in community samples.

In the last decade there has been increasing interest in eating disorders. Bulimia nervosa and binge eating have been studied most extensively. Bulimia nervosa, first described by Russel (1979), is characterised by attacks of overeating (binge eating), attempts to control weight gain with fasting, vomiting, laxative abuse, or excessive training, and extreme concerns about body shape and weight. Binge eating, a partial syndrome of bulimia nervosa, was common among college girls.

Many epidemiological studies have been conducted on bulimia nervosa and bulimic behaviours. Extensive reviews have been published by Connors & Johnson (1987) and Fairburn & Beglin (1990). However, most studies have investigated populations (e.g. schoolgirls and college students) who are particularly at risk (Mann *et al*, 1983; Wardle & Beales, 1986; Thelen *et al*, 1987; Johnson-Sabine *et al*, 1988; Patton, 1988). Studies of adults are often based on samples recruited in a health-care setting (Cooper & Fairburn, 1983; Cooper *et al*, 1987; King, 1989).

Studies investigating the relationship between bulimia nervosa and other psychiatric problems, especially depression, have mostly recruited from patient samples and may therefore select those with a severe disorder (Lee *et al*, 1985; Cooper & Fairburn, 1986; Swift *et al*, 1986). There have, to our knowledge, been no studies investigating the association of depression with milder eating problems in the general population. Also, longitudinal epidemiological studies are rare. Drewnowski *et al* (1988) followed up college students, King (1989) general practice patients, and Yager *et al* (1987) patients with eating disorders. All three studies report that symptoms tended to disappear within 12–24 months.

To our knowledge the present study is the first interview study on eating disorders, milder eating problems, and their association with other psychiatric syndromes to be conducted in a representative community sample of young adults. Moreover, this sample was followed up and re-interviewed after two years. Three issues are addressed:

(a) the occurrence of eating disorders and eating problems among young adults aged 27–28 and 29–30
(b) the overlap of eating problems with depressive and anxiety disorders
(c) the outcome of eating problems after two years.

Method

The Zurich cohort study was started in 1978 with a psychiatric screening of a representative sample of young adults aged 19–20 years ($n = 4567$), from the Canton of Zurich in Switzerland. All subjects completed the Symptom Checklist-90 (SCL-90R) (Derogatis, 1977). Based on these scores, 292 men and 299 women were selected for a longitudinal study. Two thirds of the sample served as a group with a higher risk of psychiatric disorders. They were randomly selected from those with SCL-90R scores above the 85th percentile. The other third were randomly selected from those who scored below the 85th percentile.

Subjects were interviewed four times over nine years (at ages 20–21, 22–23, 27–28, and 29–30 years) with a semistructured interview, the Structured Psychopathological Interview and Rating of the Social Consequences for Epidemiology (SPIKE). This instrument collects information on 25 neurotic and psychosomatic syndromes, and on consumption of various substances. Symptoms, length and frequency of complaints, subjective suffering, and impairment in social roles are assessed for each syndrome (for further details see Angst *et al*, 1984). The number of participants was 591 at the first interview in 1979, 456 at the second interview in 1981, 457 at the third interview in 1986, and 415 at the fourth interview in 1988. The third

and fourth interviews were conducted by trained psychiatric residents and clinical psychologists. Earlier interviews were conducted by trained psychology students.

Questions about eating problems were included for the first time in the third interview and also in the fourth interview. Subjects were asked about concern with being too fat or too thin, dieting, purging (e.g. vomiting), and use of laxatives and appetite suppressants. Current weight and changes in weight over the last year were assessed. Frequency of 'eating attacks' was rated over the last year, as once a year, more than monthly, to daily. Interviewers were instructed about the definition of a binge and excluded cases of simple overeating. Age of onset of eating problems was recorded, but without specification of the symptoms.

For all diagnostic classifications, computerised algorithms were applied to the data and no information from earlier interviews was taken into account. For the assignment of diagnoses of depressive disorders and anxiety disorders, DSM-III definitions were applied (American Psychiatric Association, 1980). An additional diagnosis of recurrent brief depression (RBD) was also examined (Angst *et al*, 1990*a*). It requires a monthly recurrence of depressive episodes over a year, together with subjective impairment at work.

None of our subjects met the DSM-III-R criteria for anorexia nervosa (American Psychiatric Association, 1987), that is a body weight 15% below normal. As the operationalisation of the DSM-III-R criteria for bulimia nervosa could not be reproduced exactly with our interview, we required all the DSM-III-R symptoms plus weekly binges over the last year for the diagnosis. At age 27–28, only four subjects met criteria for the diagnosis, while at age 29–30, there were five. For an epidemiological study, this is too few for separate analysis.

Thirty-two subjects reported binge eating and other bulimic symptoms at age 27–28. This group, which includes the four cases of bulimia nervosa, was subdivided: six subjects who reported bingeing only 1–3 times a year were excluded; six subjects binged 4–7 times a year; two did so 8–11 times a year; nine binged once or twice each month, two did so weekly and six binged daily. Given the low prevalence of binge eating in our sample, the cut-off point of four times a year was considered reasonable. For the definition of a group practising binge eating, either weight-reducing attempts (dieting, purging) or concerns with eating and weight were required in addition. Binge eaters at age 29–30 ($n = 22$) were defined accordingly.

In addition to those with a binge-eating problem, many subjects answered positively to the initial probe question, which inquired about problems with eating or weight, or feeling too thin or too fat during the last 12 months. Among them, we defined a subgroup of subjects who expressed problems with actual or potential overweight. They reported at least one of the following symptoms: feeling too fat or overweight, feeling afraid of gaining weight, feeling afraid of gaining weight in spite of low current weight, engaging in low-calorie diets or constant dieting, occasional binges (less than 4 per year) and attempts to reduce weight through use of laxatives, appetite suppressants, or excessive body training. The common problem of this group was a concern with keeping the right weight or reducing overweight. Many of these subjects, however, were of normal weight. Therefore, the problems in this group were labelled 'weight concerns'. Concerns about weight are an important feature in all eating disorders. However, the symptoms in this group are mild compared with those of binge eaters or subjects with eating disorders. Subjects who were overweight according to the body mass index (BMI, in kg/m^2; Keys *et al*, 1972), but who did not affirm subjective problems, were excluded. The group with weight concerns comprised 95 subjects at age 27–28 and 100 subjects at age 29–30.

Results

The symptoms of the two subgroups with eating problems are given in Table 1. For controls, the only information available was weight, height, and weight changes across the last year. For binge eaters the symptoms of both sexes were similar, except for use of appetite suppressants and depressed feelings after a binge. Female binge eaters suffered more than women with weight concerns, and were more often overweight than either women with weight concerns or female controls. Among subjects with weight concerns, men were more often overweight than women and had greater weight change; compared with controls, both sexes in this group were overweight.

The sex ratio (women : men) among the binge eaters was 19 : 7 at age 27–28 and 17 : 5 at age 29–30. No significant sex difference was found for the occurrence of weight concerns, although there was a slight excess of women at both interviews (57 : 38 and 57 : 43).

For the calculation of prevalence rates, data had to be weighted back to the population. The weighting factor was derived from the original sampling procedure based on the proportion of high and low scores of the SCL-90R at intake. Because of the increase of distortion with decrease of group size, no prevalence rates could be calculated for subjects with bulimia nervosa, nor for male binge eaters. Prevalence rates are given for binge eaters and subjects with weight concerns both at age 27–28 and age 29–30 in Table 2.

The cross-sectional association of binge eating and weight concerns with depression and anxiety disorders was examined at both interviews (Table 3). Binge eaters as well as subjects with weight concerns had received a diagnosis of depression (major depressive episode (MDE) or RBD) significantly more often than controls at age 27–28.

Panic disorder and sporadic panic occurred more often among binge eaters compared with controls. This association remained significant when depression (overlapping with binge eating and with panic) was controlled in a separate multivariate analysis. Phobias (agoraphobia, simple phobia, social phobia) were significantly associated both with binge eating and weight concerns. The patterns of association of subgroups of eating problems with anxiety disorders were consistent across the two interviews.

Depressive symptoms below the diagnostic threshold were common among subjects with eating problems. Therefore, the eight typical symptoms of depression (DSM-III) were

Table 1
Numbers of subjects with eating symptoms by subgroups of eating problems and sex, at 27–28 years

	Binge eating		Weight concerns		Controls	
	Women (n = 19)	Men (n = 7)	Women (n = 57)	Men (n = 38)	Women (n = 156)	Men (n = 180)
Binges	19	7	6	0	–	–
Vomiting	2	1	0	1	–	–
Use of laxatives	2	1	2	1	–	–
Use of appetite suppressants	7[1,2]	0	4	0	–	–
Strict dieting	7	4	28	11	–	–
Feeling depressed after binge	11[1]	0	–	–	–	–
Feeling overweight	17	6	54	38	–	–
Overweight (by BMI)	8[2,3]	3[3]	10[1,3]	16[3]	8[1]	25
Underweight (by BMI)	0	1	3	1	27[1]	5
Mean rating of subjective suffering	42.1[2]	32.3	28.1	21.4	–	–
Mean absolute weight change: kg	6.3[2,3]	5.4	3.6[1,3]	7.2[3]	1.7	2.4

χ^2 test was used for categorical data; Wilcoxon test for continuous data.
1. Within-group sex difference, $P<0.05$.
2. Same-sex comparison with weight concerns, $P<0.05$.
3. Same-sex comparison with controls, $P<0.05$.

Table 2
One-year prevalence rates for eating problems by sex and age

	Women		Men		Total	
	27–28 years (n = 963)[1]	29–30 years (n = 887)[1]	27–28 years (n = 967)[1]	29–30 years (n = 887)[1]	27–28 years (n = 1930)[1]	29–30 years (n = 1774)[1]
Binge eating: %	7.3	6.6	–	–	4.0	3.5
(95% confidence limits)	(5.6–9.4)	(5.0–8.2)	–	–	(3.9–4.1)	(3.4–3.6)
Weight concerns: %	19.8	23.8	17.8	21.1	18.8	22.5
(95% confidence limits)	(18.5–21.1)	(21.7–25.9)	(15.3–20.2)	(18.4–23.8)	(17.1–20.5)	(20.6–24.4)

1. n values are weighted back to the normal population.

Table 3
Association of eating problems with depression and anxiety

	Binge eating		Weight concerns		Controls	
	27–28 years (n = 26)	29–30 years (n = 22)	27–28 years (n = 95)	29–30 years (n = 100)	27–28 years (n = 336)	29–30 years (n = 293)
MDE or RBD[1]						
age 27–28	10[2]	–	35[2]	–	60	–
age 29–30	–	6	–	16	–	50
Panic disorder						
age 27–28	5[2]	–	7[2]	–	10	–
age 29–30	–	5[2]	–	4[2]	–	12
Generalised anxiety						
age 27–28	0	–	2	–	13	–
age 29–30	–	1	–	2	–	9
Phobias						
age 27–28	4	–	17	–	23	–
age 29–30	–	7[2]	–	16[2]	–	32

1. MDE = major depressive episode; RBD = recurrent brief depression.
2. χ^2 test, 1 d.f., P = 0.05, compared with controls.

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Table 4
Percentages with depressive symptoms by subgroups at 29–30 years

DSM-III depressive symptoms	Binge eaters ($n=22$)	Weight concerns ($n=100$)	Depressives[1] ($n=49$)	Controls ($n=244$)
Appetite	68[2,3]	30[2,4]	57	14
Sleep	50[2]	34[2]	73	18
Psychomotor	45[2]	33[2]	61	16
Loss of interest	68[2,3,4]	42[2,4]	98	22
Lack of energy	64[2,4]	47[2]	98	27
Feeling inferior	64[2,3]	35[2,4]	84	18
Concentration	59[2,4]	41[2]	96	19
Thoughts of death, suicide	36[2,3]	11[4]	39	6

1. Subjects with MDE or RBD.
2. Compared to controls, χ^2 test, $P<0.05$.
3. Compared to weight concerns, χ^2 test, $P<0.05$.
4. Compared to depressives, χ^2 test, $P<0.05$.

more closely examined. Binge eaters and subjects with weight concerns were compared with subjects with depressive disorders (MDE or RBD) without eating problems. Results are presented for age 29–30, where there were more clear-cut differences (Table 4). The control group contains subjects with depressive symptoms which do not reach a diagnostic threshold. Compared with controls, both binge eaters and subjects with weight concerns suffer more often from most depressive symptoms. There is one notable exception: suicidal thoughts are prevalent among binge eaters, but rare among subjects with weight concerns. Four depressive symptoms differentiated binge eaters from subjects with weight concerns: appetite problems, loss of interest, feeling inferior and thoughts of suicide (all more frequent among binge eaters).

The outcome of eating problems two years after the first assessment is shown in Table 5. Of the 22 binge eaters who could be followed up, only five (23%) were free from eating problems two years later. Subjects with weight concerns had better chances for remission than binge eaters. Even so, their risk to continue with eating problems is higher than that of controls. Among controls, a fifth had developed eating problems by 29–30 years.

The mean age of onset for eating problems (without specification of kind or severity) was 13.8 years for binge eaters and 17.6 years for subjects with weight concerns. Depression reportedly began at a mean age of 17.2 for binge eaters, and 17.8 for subjects with weight concerns.

The weight status at age 20–21 of subjects with eating problems seven years later was compared with that of controls. The mean BMI of those with eating problems was significantly higher at age 20–21 than that of controls (binge eaters BMI = 22.6, weight concerns BMI = 22.2, controls BMI = 20.7). This can therefore be considered as an objective indicator for persistent eating problems.

Only one of 26 binge eaters, and five of the 95 subjects with weight concerns, had sought professional treatment in the year before the third interview. At the same time, five of the binge eaters and nine of those with weight concerns had sought treatment for depression. This leaves four of the binge eaters, for instance, who did not talk to their doctor about their eating problems on the occasion of a consultation for depression.

Discussion

To our knowledge, the present study is the first to assess and follow up eating problems by means of a personal interview in a representative cohort of adults at the end of their 20s. Our cohort of 457 young adults from the Canton of Zurich in Switzerland was interviewed twice about eating problems, at 27–28 and 29–30 years. As could be expected on the basis of a 0.1% lifetime prevalence for anorexia (Robins *et al*, 1984), no cases of

Table 5
Two-year follow-up of binge eating and other eating problems

Age 29–30 years	Age 27–28 years: Binge eating ($n=22$)		Weight concerns ($n=88$)		Controls ($n=300$)	
	n	(%)	n	(%)	n	(%)
Binge eating	6	(27)[1,2]	6	(7)[2]	9	(3)
Weight concerns	11	(50)	44	(50)	45	(15)
No eating problems	5	(23)[3]	38	(43)[3]	246	(82)

1. Compared with weight concerns, χ^2 test, $P=0.01$.
2. Compared with controls, χ^2 test, $P=0.001$.
3. Compared with binge eaters, one-tailed χ^2 test, $P=0.05$.

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anorexia nervosa could be diagnosed in our sample. With four cases of bulimia nervosa, we were in the range of prevalence (1%) reported by other studies (Fairburn & Beglin, 1990). Two groups with milder eating problems were delineated. Binge eaters were characterised by recurrent eating attacks, dieting, and the use of appetite suppressants and other weight-reducing techniques. Concerns about weight, regardless of weight status, was the key symptom of the other, relatively large group with eating problems. Half the women in this group were on a diet, but less than a fifth were actually overweight. Men were more often overweight and had greater weight change.

Binge eaters and subjects with weight concerns did resemble each other in some respects. In both groups, overweight subjects were over-represented, and weight changes during the last year were higher than for controls. However, binge eaters, especially women, did have more severe symptoms than subjects with weight concerns. In addition to the binges, they frequently used appetite suppressants, expressed more subjective suffering, were more often over-weight, and underwent more weight change during a year.

Prevalence rates of binge eating, of around 4% at both interviews, are lower than the 5–32% of weekly binge eating among women reported by Connors & Johnson (1987). There are three explanations for this. Firstly, our sample is a community sample, while most other studies investigated special groups, such as schoolgirls and college students (Mann *et al*, 1983; Wardle & Beales, 1986; Thelen *et al*, 1987; Johnson-Sabine *et al*, 1988; Patton, 1988), or patients (Cooper & Fairburn, 1983, Cooper *et al*, 1987; King, 1989). Secondly, most previous studies used self-report questionnaires, while we used interviews. Perhaps it is difficult to admit binge eating in a face-to-face interview. The fact that few binge eaters confided themselves to a doctor, even when in treatment for depression, may support this interpretation. Finally, the higher age of our sample may also explain lower prevalence rates. Cooper & Fairburn (1983) found a sharp decrease in the prevalence of bulimia after age 29. As to the prevalence of weight concerns (around 22% for both sexes), no comparison with other studies is possible. However, most of these normal young adults did not express weight concerns. This is contrary to the widespread opinion that weight concerns and dieting are normal in modern society (Polivy & Hermann, 1987).

Binge eaters had more comorbid depression than controls. Subjects with weight concerns also had a greater risk of concurrent depression. We do not know of any other studies that investigated binge eating and depression. However, a number of clinical and family studies have shown a close association between bulimia and depression (Hudson *et al*, 1983; Lee *et al*, 1985; Piran *et al*, 1985, Laessle *et al*, 1987; Johnson-Sabine *et al*, 1988; Logue *et al*, 1989). Binge eaters suffered more often from loss of interest, feelings of inferiority, and thoughts of suicide than subjects with weight concerns and controls. Compared with depressives, however, they had fewer depressive symptoms. In addition, binge eaters were also at risk of concurrent panic syndrome and phobias. A higher rate of phobias among patients with bulimia was also reported by Laessle *et al* (1987). Beumont (1988) stressed the phobic aspect of fear of gaining weight. When both depression and anxiety disorders are considered, subjects with a syndrome of binge eating seem more severely affected.

The history of eating problems and depression, assessed retrospectively, suggests a different pattern for binge eaters and subjects with weight concerns. While subjects with weight concerns reported onset for both eating problems and depression at an average age of 18, binge eaters first experienced eating problems at 14 years and the depression started only three years later. Although these findings must be interpreted with caution, because they were assessed retrospectively and no diagnostic criteria were applied, they match findings from other studies; depression is secondary to bulimia (Johnson-Sabine *et al*, 1984; Cooper & Fairburn, 1986).

The two-year follow-up of binge eating and weight concerns showed that binge eating tended to persist or to become lesser weight concerns. This differs from the findings of the prospective studies on schoolgirls (Patton, 1988) or female college students (Drewnowski *et al*, 1988), which found little persistence. Again, the older age of our sample might account for this. Those detected as binge eaters at 27–28 years might have had more severe eating problems earlier and represent refractory cases.

Taken together, our findings suggest that among the milder eating problems in the community, binge eating is of special relevance and should be studied more extensively. Firstly, we believe that eating problems assessed in adolescent samples should be followed up over a long time, because it is likely that a part of the morbidity turns into mild but persistent disturbances of ordinary eating. Secondly, the association with depression in a community sample underlines the importance of studying eating problems and depression jointly. As longitudinal analyses of the course of anxiety disorders in the Zurich study have shown (Vollrath & Angst, 1989; Angst *et al*, 1990*b*), comorbidity with depression tends to be an important prognostic factor. The same might be true in the case of eating problems and eating disorders.

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