

# Depressive Symptoms and Substance Use among Adolescent Binge Eaters and Purgers: A Defined Population Study

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**Abstract:** We surveyed 646 tenth grade females in Northern California to assess the prevalence of binge eating and purging behaviors. Of these, 10.3 per cent met study criteria for bulimia and an additional 10.4 per cent reported purging behaviors for weight control. Bulimics and purgers were heavier, had greater triceps and subscapular skinfold thicknesses, and reported higher rates of drunkenness, marijuana use, cigarette use, and greater levels of depressive symptomatology. (*Am J Public Health* 1987; 77:1539-1541.)

## Introduction

Bulimia has become an important public health concern and may be increasing in prevalence.<sup>1,2</sup> The essential features of this disorder include recurrent episodes of binge eating, perceived loss of control during the eating binge, fasting or excessive caloric restriction or vigorous exercise or purging behavior to prevent weight gain, and persistent overconcern with body shape and weight.<sup>3</sup> Prevalence estimates, based largely on research with samples of college-age females, range from 3 per cent to 19 per cent depending on the choice of diagnostic criteria.<sup>2,4</sup> In addition to the potentially serious physical complications associated with the disorder,<sup>5-7</sup> clinical studies report high rates of chemical dependency<sup>8,9</sup> and clinical depression<sup>10,11</sup> among adult bulimics. While a few studies have reported prevalence estimates for binge eating, purging and bulimia in younger adolescents,<sup>12-14</sup> data on physiologic, behavioral, and psychological variables which may influence the pathogenesis of bulimia are largely lacking.

In previous work, we found that 10.6 per cent of female teenagers reported self-induced vomiting for weight control while 13 per cent of the sample reported some form of purging behavior.<sup>15</sup> Female purgers also reported higher rates of drunkenness and greater levels of psychological distress than non-purging female peers.<sup>16</sup> We now report prevalence estimates for bulimia in a new sample of tenth grade females using criteria operationalized by Halmi<sup>17</sup> to reflect the major symptoms of the disorder. We also report on a separate group of adolescents, not meeting study criteria for bulimia, who practice purging behaviors for weight control. We report linkages with body mass index, skinfold thicknesses, cigarette/alcohol/marijuana use, and depressive symptomatology.

## Methods

### Subjects

All tenth grade females (N = 646) enrolled in four northern California high schools were asked to complete a self-report instrument designed to detect the presence of physical characteristics and behaviors related to coronary

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heart disease risk. Average age of the students was 15. Ethnic distribution: White, 69.0 per cent, Black, 2.0 per cent, Asian, 13.1 per cent, Latino, 6.4 per cent, Native American, 0.3 per cent, Pacific Islander, 0.4 per cent, Other, 8.9 per cent. Fifty per cent of the students' fathers had completed four or more years of college.

### Measures

Assessments were carried out over two days in each of the four schools by trained staff. Students were surveyed in groups of 40-50 in two large classrooms during each class period. They completed a 14-item self-report instrument, modified from previous work,<sup>17</sup> designed to detect the presence of binge eating and purging behaviors in a normal population. Height and weight were measured on a standard balance beam scale with participants wearing lightweight gym clothing and no shoes. Triceps and subscapular subcutaneous skinfold thicknesses were measured with a Harpenden caliper according to established guidelines.<sup>18</sup> Body Mass Index (BMI) was computed from the formula (Wt/Ht<sup>2</sup>).

Students answered "yes" or "no" to the following question adapted for self-reporting from the DSM-III<sup>3</sup> structured clinical interview<sup>19</sup>: "Have you ever felt very depressed or lost interest in almost all activities every day for at least 2 weeks?" Students also completed a 13-item checklist composed of items associated with DSM-III depressive symptomatology. A total depressive symptoms score was computed for each student by summing across the checked items in the list.

Students were asked how often they got drunk on alcohol and smoked cigarettes and marijuana.

### Classification Criteria

Females were classified as bulimic only if they responded affirmatively to *all* of the following questions: "Have you ever had an episode of eating an enormous amount of food in a short space of time (an eating binge)?" "Do you feel miserable or annoyed with yourself after an eating binge?" "Do you consider yourself a binge eater?" "Are there times when you are afraid that you cannot voluntarily stop eating?"

Students were classified as purgers if they responded affirmatively to at least one of the three questions assessing frequency of purging behavior for weight control (self-induced vomiting, laxatives, diuretics) and they failed to meet the above criteria for bulimia. Purgers who also met criteria for bulimia were treated as bulimics rather than as purgers in all analyses.

## Results

Of 646 females surveyed, 565 (87 per cent) answered questions on binge eating and purging behaviors. Fifty-eight (10.4 per cent) were classified as bulimic. Among bulimics, 20.7 per cent (n = 12) reported self-induced vomiting, and 5.2 per cent (n = 3) reported using laxatives and/or diuretics to control weight. Fifty-nine (10.4 per cent) were classified as purgers. Among purgers, 78 per cent (n = 46) reported vomiting, 17 per cent (n = 10) reported laxative use, and 24

TABLE 1—Means of Anthropometric Measures of Bulimics, Purgers, and Normals

Measures	Bulimics Purgers Normals			Difference in Means	
	(A)	(B)	(C)	(95% CIs)	
	(N:58)	(N:59)	(N:444)	A-C	B-C
BMI (Wt/Ht <sup>2</sup> )	22.9 (3.3)	23.7 (5.6)	21.6 (3.4)	1.3 (.07, 2.5)	2.1 (.92, 3.4)
Subscapular Skinfold Thickness (mm)	14.9 (5.6)	15.6 (6.9)	12.7 (5.3)	2.2 (.30, 3.9)	2.9 (.99, 4.6)
Triceps Skinfold Thickness (mm)	22.4 (5.1)	21.4 (6.2)	19.4 (6.0)	3.0 (1.0, 5.0)	2.0 (.07, 4.0)

TABLE 2—Cigarette and Marijuana Smoking among Bulimics, Purgers, and Normals

	Cigarettes			Marijuana		
	Bulimics (N=57)	Purgers (N=56)	Normals (N=441)	Bulimics (N=56)	Purgers (N=56)	Normals (N=444)
Never smoked	33.3	23.2	46.5	41.0	46.4	66.0
Smoked at least once	29.8	30.4	27.2	28.6	32.2	17.6
Smoke monthly	8.8	14.3	7.9	16.1	8.9	10.1
Smoke weekly or more	28.1	32.1	18.4	14.3	12.5	6.3

Difference in proportions between bulimics and purgers combined and normals:  
Cigarette use (weekly or more): 11.7% (95% CI: 7.2, 16)  
Marijuana use (weekly or more): 7.1% (95% CI: 4.6, 8.8)

per cent (n = 14) reported using diuretics for weight control. Most reported only occasional purging although 20 per cent (n = 12) reported vomiting once per week or more. Eighty per cent of bulimics and 70 per cent of purgers were White.

There were no differences among bulimics, purgers, and normals for either fathers' level of education or students' college enrollment plans.

Both bulimics and purgers had greater triceps and subscapular skinfold thicknesses and BMIs than normals (Table 1) but did not differ from each other.

Students judged their current weight, relative to a self-defined standard of normality, on a five-point scale ranging from "Very Underweight" to "Very Overweight". Since bulimics and purgers were, on average, heavier than normals, only the responses of students with BMIs less than 25 were examined (n = 464): 65 per cent of bulimics (n = 43), 45 per cent of purgers (n = 40), and 33 per cent of normals (n = 381) judged themselves to be overweight. Difference between bulimics and normals: 32 per cent with 95 per cent CIs 17.5, 46.5.

In response to the question: "Have you ever felt very depressed or lost interest in almost all activities every day for at least two weeks?" 41.2 per cent of bulimics, 44.6 per cent of purgers, and 28.8 per cent of normals answered "yes". Difference between bulimics/purgers combined and normals: 14.1 per cent with 95 per cent CI = 4.7, 23.5.

On the checklist, the mean number of depressive symptoms reported by bulimics was 6.7 (sd = 3.6), by purgers: 6.1 (sd = 3.5), and by normals: 5.1 (sd = 3.3). Difference between bulimics and normals: 1.0, 95 per cent CI = .38, 2.64.

Bulimics and purgers reported higher usage rates than normals for cigarettes and marijuana (Table 2) and more frequent bouts of drunkenness (Table 3).

Depression may be associated with adolescent drug use.<sup>20</sup> When only "nondepressed" bulimics (n = 30), purgers

TABLE 3—Self-reported Frequency of Drunkenness among Bulimics, Purgers, and Normals

	Bulimics (N=57)	Purgers (N=59)	Normals (N=444)
Don't drink	26.7	26.7	46.8
Don't get drunk	37.6	28.7	28.0
Get drunk once/month	25.0	21.4	17.5
Get drunk several times per month or more	10.7	23.2	7.7

Difference in proportion between bulimics and purgers combined and normals:  
Drunkenness (monthly or more): 14.95 (95% CIs: 14.9, 23.6)

(n = 31), and normals (n = 300) were examined, marijuana and drunkenness rates remained higher among bulimics and purgers. Differences between bulimics/purgers combined and normals: (a) marijuana smoking at least once: 25 per cent, 95 per cent CI: 9, 41; (b) drunkenness at least monthly: 13 per cent, 95 per cent CI: 1, 25. There were no substantial differences among the three groups in cigarette use.

### Discussion

Our bulimia prevalence data are similar to other research based on self-report questionnaires.<sup>17,21</sup> However, since 13 per cent failed to complete questions on binge eating and purging, our findings with respect to prevalence are potentially biased. We did not include all DSM-III criteria for bulimia in the assessment. Studies using all DSM-III criteria including purging behavior to define bulimia report prevalence estimates ranging from 3 per cent to 5 per cent.<sup>4,22</sup> If purging is added to the study criteria for bulimia, the prevalence falls to 3 per cent in our population.

Several studies suggest that bulimia occurs predominantly among thin or anorexic individuals.<sup>23,24</sup> However, two

recent large-scale investigations suggest that bulimics are somewhat overweight for their respective heights.<sup>17,25</sup> Young female bulimics in this study were heavier than normals and had greater skinfold thicknesses. In contrast with our earlier work, female purgers in this study were also heavier, with more of their weight as adipose tissue, than normal peers.

Bulimics typically report feeling fat when they are not overweight by objective standards.<sup>25</sup> Although bulimics and purgers in this study were, on average, somewhat heavier than normals, most would not be characterized as having achieved particularly unhealthy levels of weight or body fatness. Nevertheless, when we controlled for BMI, 65 per cent of bulimics stated they were overweight compared to 33 per cent of normals.

Depression is common among bulimics.<sup>11\*</sup> Over 40 per cent of adolescent bulimics and purgers in this study reported intensity and frequency of depressive symptomatology compatible with a DSM-III major depressive disorder. However, many studies show that psychosocial development interacts with self-report so that adult diagnostic systems become unreliable when applied to adolescents.<sup>26</sup> Recent efforts to establish prevalence estimates in nonclinical samples of adolescents have reported rates ranging from 8.6 per cent to 18 per cent.<sup>27\*\*</sup> A clinical interview is needed to establish a firm diagnosis.

Controlled and uncontrolled studies with clinic<sup>9</sup> and community<sup>8,28</sup> populations indicate that a subset of bulimics abuse drugs and alcohol. Chemical dependence may provide relief from depression, anxiety, and other psychosocial problems to which bulimics appear susceptible.<sup>29,30</sup> In this study, young adolescent bulimics and purgers reported substantially higher levels of substance use than normals.

In summary, the results show that many young girls in our study population engage in unhealthy methods of weight regulation. By age 15, binge eating and purging are associated with other potentially harmful behaviors. Methods for the prevention of unhealthy weight regulation need to be identified.

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