The Prevalence of Bulimia Nervosa in the US College Student Population

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Abstract: A phone survey to determine the prevalence of bulimia nervosa was conducted with a national probability sample of 1,007 male and female students from a stratified sample of 53 universities and colleges in the continental United States. Using the revised (DSM IIIR) diagnostic criteria, 1 per cent of the women and 0.2 per cent of the men were classified as bulimic. Bulimia was most prevalent (2.2 per cent prevalence rate) among undergraduate women living in group housing on campus. (*Am J Public Health* 1988, 78:1322–1325.)

Introduction

Bulimia nervosa is an eating disorder characterized by recurrent episodes of binge eating that may be followed by purging or self-induced vomiting to lose weight.[1,2] Bulimic patients, predominantly college-educated young women in their early to mid-twenties, are said to be obsessed with body image and body weight, alternating between eating binges and periods of fasting or rigorous dieting.[1–3]

The prevalence of bulimia among female college students has received much research attention.[4–10] The disorder is thought to have reached alarming proportions on campuses across the United States,[11] becoming increasingly prevalent with each new freshman class.[9] Early survey studies of college students estimated the prevalence of bulimia at between 8 and 19 per cent of college women and up to 5 per cent of college men.[4,11] According to assertions in the popular press,[12] at least one-half of women on campus suffer from some sort of eating disorder. However, these high prevalence estimates have not been reflected in clinical practice: the number of bulimic women seeking treatment in university health clinics has been reported as low.[6]

Only a small minority of college bulimics may seek professional treatment for this disorder. Bulimic women often conceal their condition with the typical patient reporting symptoms of bulimia for up to five years before seeking treatment for the first time.[3]

It is also possible that some past surveys have seriously overestimated the prevalence of bulimia on the college campus. Most survey studies of bulimia among college students have been based on respondents from a single institution.[4–10] Respondent samples from private colleges and research-oriented universities with high scholastic admission standards have been overrepresented.[4,7,10,11] Considerable selection or response bias within schools may also have been present. Typically, studies were conducted with undergraduates (most often freshman students) living in dormitories or attending introductory classes in psychology or English.[5,6] In some cases, respondents were recruited by advertising for students to complete surveys on eating attitudes or eating behaviors.[7]

The stringency of the criteria used for the probable diagnosis of bulimia is another important issue. The DSM III criteria[1] upon which many early studies were based are now regarded as overinclusive.[13] The minimum frequency of binging was unspecified, and fasting, purging or vomiting were not positively required for the probable diagnosis of bulimia. As noted in a recent study,[14] inflated prevalence estimates for bulimia may have been based on loosely defined bulimic behaviors rather than on the clinically significant syndrome of bulimia nervosa.

The revised (DSM IIIR) diagnostic criteria for bulimia nervosa recently published by the American Psychiatric Association are considerably more stringent.[2] As summarized in Appendix A, they specify a minimum binge frequency and regular use of fasting, purging or vomiting to counteract the effects of a binge. A recent survey based on these criteria[14] has provided sharply reduced prevalence estimates of bulimia nervosa among undergraduate and graduate students at the University of Pennsylvania. After correcting for false positive responses, only 1.3 per cent of the female and 0.1 per cent of the male respondents met the DSM IIIR diagnostic criteria for bulimia nervosa.

The present report is based on interviews obtained from a national probability sample of male and female college students. The prevalence of bulimia nervosa was estimated on the basis of the revised (DSM IIIR) diagnostic criteria. The proportion of respondents who had sought professional treatment for an eating disorder was also ascertained.

Method

The survey was conducted by phone in April 1987, using a national probability sample of 1,007 college students. The sample was selected using a two-stage cluster design to provide a student population representative of the 7.6 million students in the US who are enrolled in four-year colleges or graduate schools.

In the first stage, a sample of 53 colleges and universities was selected from the population of 1,952 such institutions in the US. This sampling frame included the total enrollment of 7.7 million students—a figure nearly identical to the most recent estimate of 7.6 million students obtained from the Bureau of the Census. The sampling frame was stratified into sets of schools defined by geographical region (an eight-category variable distinguishing the north and south regions within each of the four time zones), academic standards of admission (as indicated by test score requirements), the total number of enrolled students, and the percentage of students living in campus housing. A sample of 53 schools was selected by stratified probability procedures, where the probability of selection was proportional to the size of the

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student body. Junior colleges and two-year community colleges were excluded from the frame.

In the second stage of sampling, 36 student telephone directories were obtained and used to select a predesignated student sample. In the 17 cases where student directories did not exist or were not available, the schools were replaced with others in the same sampling strata to reconstruct a balanced sample of 53 schools that were representative of the four-year colleges and universities in the entire country. An equal number of students was then selected from each of the 53 institutions.

In the present two-stage design, each student had an equal probability of selection into the final sample regardless of the size of the school. Selection probabilities in the first stage were proportional to school size, so that large schools were more likely to be selected than small schools. In the second stage, the use of equal within-school samples ensured that students in large schools had a lower conditional probability of selection relative to students in small schools. For example, if School A is twice as large as School B, it is twice as likely to be selected into the first stage of the sample. However, once the schools have been selected, the conditional probability of a student in School A being selected into the sample is only half that of a student in School B. Unequal probabilities of selection were thus reciprocals that canceled out to yield an equal-probability sample of individuals.[15]

It is important to note that this procedure allows our results to be generalized only to the subpopulation of college students with listed telephone numbers: students with unlisted telephone numbers or no phones at all were by necessity excluded from the sample. A comparison of the number of students whose phones were listed with total enrollment figures provided by the 53 colleges indicated that approximately 70 per cent of all students were listed in the directories.

Interviewing was done by phone over 10 days. Up to three callbacks were attempted to make initial contact with predesignated students. Calls were also made across different times of day and days of week to ensure making contact. Appointments were made with roommates or family members when someone other than the respondent was reached. We also traced the student to new living quarters when we found that he or she had moved. Respondents were eliminated from the sample if they were no longer registered students.

This follow-up procedure yielded a sample with 63.5 per cent contact rate. Of the 726 students in the sample we were unable to contact, 533 were not reached after the maximum three callbacks. The remainder had either moved (n=92), had a nonworking telephone number (n=27), incorrect listing (n=13), or could not be reached for other reasons (e.g., a roommate informed us that they were hospitalized at the time of contact). The completion rate for the interview (i.e., the per cent of contacted respondents we were able to interview) was 95.1 per cent. The overall response rate, defined as the per cent of students in the sample we were able to contact and interview, was 56.4 per cent.

The interview completion rate (95.1 per cent) compares very favorably with other studies on eating disorders in which questionnaires were administered in a classroom setting[14] or by mail surveys.[10] However, our ability to make initial contact (63.5 per cent) was much lower than it might have been in a typical survey of the general population. This can be attributed to the fact that college students are away from their rooms much of the day and often return late at night and leave early in the morning. Our sampling scheme called for phoning no earlier than 9:00 am and no later than 10:00 pm, unless we had an appointment to call earlier or later. It is unclear whether or how our results would have been affected by revising this rule. We do know that the central study variables were unrelated to the number of calls required to complete the contact, arguing against a systematic bias of our results by the low contact rate.

TABLE 1—Summary of Subject Characteristics in Bulimia Survey of College Students

Characteristics	Females (n = 507)		Males (n = 500)	
	Undergraduate n = 442	Graduate n = 65	Undergraduate n = 394	Graduate n = 106
Age (years)	21.5	29.8	21.2	28.2
Height (cm)	165.0	165.0	181.0	179.0
Weight (kg)	58.1	57.9	77.1	74.6
BMI (kg/m^2)	21.2	21.3	23.6	23.2
Desired weight (kg)	54.5	54.4	77.2	74.3
Desired weight loss (kg)	3.6	3.5	−0.1	0.3

Instrument

Interviews averaged 15 minutes in length. Questions addressing eating disorders occurred last in each interview. Additional information was obtained about age, college year, and housing arrangements. Further questions addressed height and weight, desired body weight, and current dieting practices. Questions dealing with bulimia were based on the DSM IIIR diagnostic criteria published in the Diagnostic and Statistical Manual of Mental Disorders, Revised Edition (see Appendix A). An eating binge was defined as "an enormous amount of food eaten in a short space of time." The questions were adapted from a previously tested and validated instrument that had been used with a large population of college students.* To guard against false positive responses, an additional criterion required either dieting at the time of the survey or desire for weight loss as measured by a difference between current and desired body weight.

In estimating confidence intervals for the prevalence of bulimia, the Taylor series expansion method was used to compute estimates and sampling errors in stratified sample designs. The PSALMS program in the OSIRIS IV software package was used for these calculations.[16]

Results

Body Weight and Dieting

Characteristics of subjects are summarized in Table 1. Mean heights and weights were 5'5" (165cm) and 128 lbs (58.1kg) for women and 5'11" (180cm) and 168.9 lbs (76.6kg) for men. These values are in close agreement with median weights for 18–24 year old women (130 lb or 59.0kg) and men (170 lbs or 77.0kg) of comparable stature, as based on the National Health and Nutrition Examination Survey (NHANES) data, published by the National Center for Health Statistics.[17]

Overall, 21.1 per cent of college women reported being on a diet at the time of the study (95 per cent CI: 17.6, 24.6). The prevalence of dieting was highest among freshman

*Drewnowski A, Yee D, Krahn DD: Bulimia on campus: incidence and recovery, rates. Presented at the American Psychiatric Association Annual Meeting in Chicago, 1987.

women (25.0 per cent), next highest among sophomores (23.6 per cent), then juniors (22.2 per cent), seniors (18.9 per cent), and graduate students (13.8 per cent). In contrast, only 8.0 per cent of male students reported being on a diet (95 per cent CI: 5.0, 11.0), with freshman males dieting the least (3.9 per cent). These data are consistent with the common observation that young women typically express a desire to be thinner, while young men on the average do not.[18]

Binge Eating, Purging, and Vomiting

Thirty-one women (6.1 per cent) and 50 men (10.0 per cent) reported at least two eating binges per week on the average during the preceding three months (95 per cent CI: 3.8, 8.4 for women and 7.6, 12.4 for men). The prevalence of extreme dieting behaviors was then examined further among this subgroup.

Seven women (22.6 per cent) and three men (6.0 per cent) reported fasting following an eating binge. Four women (12.9 per cent) and one man (2.0 per cent) reported using laxatives, while three women (9.7 per cent) and no men reported self-inducing vomiting to counteract the effects of a binge.

DSM IIIR Bulimia Nervosa

According to the present definition, five women (1.0 per cent) and one man (0.2 per cent) gave responses consistent with a probable diagnosis of bulimia nervosa (95 per cent CI: 0.2, 1.8 for women and 0.0, 0.6 for men). Mean body weight of women classified as bulimic was 133.2 lbs (60.4kg) and their desired weight was 117.0 lbs (53.1kg). Bulimic women were thus heavier than the population mean and wished to be thinner than the group ideal. Their mean desired weight loss was 16.2 lbs (7.3kg)—almost twice that observed for the female population sample. Four of the five bulimic women reported being on a diet at the time of the study. Only two out of five reported having sought professional help for this disorder.

The prevalence of bulimic behaviors (potentially diagnosable as an atypical eating disorder) as opposed to bulimia nervosa was somewhat higher. An additional four women, but no men, met the criteria of binging twice a week or more often, and reported following eating binges with fasting, purging or vomiting. However, since these women denied losing control during a binge, they did not satisfy the strict DSM IIIR criteria for bulimia nervosa. Their inclusion raised the point prevalence rate for bulimic behaviors as distinct from bulimia nervosa to 1.8 per cent of college women (95 per cent CI: 0.3, 3.3).

Two other patterns in the data are noteworthy. First, all bulimics were undergraduates, as compared to 84 per cent of the total sample. Second, all of them lived in campus group housing (dormitories, residence halls, fraternities, or sororities), compared to only 45 per cent of the total sample. The prevalence of bulimia among undergraduate women living in group housing on campus was thus estimated at 2.2 per cent (95 per cent CI: 0.5, 3.9). The prevalence of bulimia among undergraduate men with the same housing arrangement was estimated at 0.5 per cent (95 per cent CI: 0.0, 1.5). The concentration of bulimics among undergraduate females in campus housing may help explain why previous surveys, most often based on this subpopulation, have produced prevalence estimates far in excess of those reported here.

Discussion

The present study estimated the probable prevalence of bulimia nervosa among US college students nationwide at approximately 1.0 per cent for women and 0.2 per cent for men. These figures are much lower—sometimes by an order of magnitude—than the prevalence rates for bulimia reported in previous surveys on eating disorders. The present study employed stringent DSM IIIR diagnostic criteria and a nationally representative sample of college students. The discrepancy between current estimates and some previous findings underscores the importance of using rigorous research design and modern sampling techniques in studying the psychiatric epidemiology of eating disorders.[19]

The present data also show that only two of the five bulimics interviewed have sought professional treatment. If this pattern is typical of college bulimics, it might help explain why reports of high prevalence of bulimia on campus are not matched by an equally high number of referrals for treatment. Another possibility is that bulimia nervosa is not necessarily a chronic condition, and that at least partial remission may occur even in the absence of professional help. Longitudinal studies are needed to document the progress of the disease and examine factors linked to disease promotion or recovery.

APPENDIX A
DSM IIIR Criteria For Bulimia Nervosa

A. Recurrent episodes of binge-eating (rapid consumption of a large amount of food in a discrete period of time, usually less than two hours).
B. During the eating binges there is fear of not being able to stop eating.
C. The individual regularly engages in either self-induced vomiting, use of laxatives, or rigorous dieting or fasting in order to counteract the effects of binge eating.
D. A minimum average of two binge-eating episodes per week for at least three months.

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Status of Women in 99 Countries: Population Crisis Committee Briefing Paper

The Washington-based Population Crisis Committee has recently issued a new Population Briefing Paper, entitled "Country Rankings of the Status of Women: Poor, Powerless and Pregnant." In this study of 99 countries, representing 2.3 billion women (92 per cent of the world's female population), 20 indicators were used to measure women's well-being in five sectors: health, marriage and children, education, employment, and social equality.

A maximum total score of 100 was possible. Possible scores were divided into seven overall rankings, ranging from Excellent to Extremely Poor. Some countries received Excellent scores in one or another sector, but no total country fell in the Excellent category (scores 90 to 100). Only seven of the 99 countries had total scores of 80 or above (a rank of Very Good). Sweden scored highest with 87; Bangladesh scored lowest with 21.5. North America and Northern Europe dominated the top-ranked countries; Africa, the Middle East and South Asia the bottom ranks. Switzerland ranked 24th with a score of 73. The high income oil-exporting countries of the Gulf ranked Very Poor or Extremely Poor, with scores below 50. Some upper middle income South American countries also ranked relatively low. In contrast, a few low income countries scored fairly well, with Sri Lanka and China having scores of 60 and 58.5, respectively.

The study indicates that over 60 per cent of all women and girls in the world live under conditions which threaten their health, deny them choice about childbearing, limit educational attainment, restrict economic participation, and fail to guarantee them equal rights and freedoms with men.

The study also confirms the important links between the status of women in the five sectors. The briefing paper points out, "Educational attainment, for example, is related not only to employment, but to health, family size and equality in marriage. Patterns of marriage and childbearing have a similarly powerful effect on social and economic conditions for women and are in turn influenced by them. Women with greater educational and economic opportunities marry later and have closer to the number of children they want. . . .

"If women are to become full partners with men in the social, economic and political development of their countries, they will need to change the age-old patterns of discrimination—present to some degree in almost every country—which have kept them second-class citizens. They will also need to gain control over that part of their lives which everywhere distinguishes most women's lives from men's lives. They must be able to decide whether and when to bear a child, and they must enlist husbands, employers and governments in meeting child care responsibilities. With the possible exception of a few industrialized countries, women in most parts of the world are getting little such help. And for half the world's women real choices about childbearing do not exist."

Copies of the 10-page Population Briefing Paper, and an accompanying 26″ × 31″ four-color wall chart illustrating the 20-scaled indicators for all 99 countries, are available in limited quantities from: Population Crisis Committee, 1120 19th Street, NW, Washington, DC 20036. Specify ISSN 0197-2235 BP-20 when requesting the paper and chart.