

Evidence for an Alcohol–Stress Link among Normal Weight Adolescents Reporting Purging Behavior

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A survey of 1728 tenth grade students was conducted to assess the prevalence of purging behavior, alcohol and drug use, and reported physical and psychological distress. Thirteen percent reported purging behavior. Female purgers outnumbered males 2 to 1. Male purgers were significantly heavier than male nonpurgers. The prevalence of drunkenness and daytime drinking among female purgers was significantly higher than for female nonpurgers. Female purgers were more likely to report using alcohol to reduce stress than nonpurging female peers. Female purgers reported a higher level of psychological distress when perceived situational control is low than female nonpurgers. Significant differences were not found between male purgers and male nonpurgers on variables assessing alcohol use and psychological distress. Educational programs aimed at prevention of eating disorders may need to be developed.

Many adults with bulimia abuse drugs and alcohol (Mitchell, Hatsukami, Eckert, & Pyle, 1985; Pyle, Mitchell, & Eckert, 1981). This relationship may be mediated by dysphoric and fluctuating mood states to which bulimics appear vulnerable (Johnson & Larson, 1982; Strober, 1981). Drug use may, in part, represent the bulimic's attempt to relieve psychological disturbances such as anxiety, depression, guilt, and shame that typically accompany the disorder.

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Bulimics have been shown to be more susceptible than controls to anxiety and affective disorders in a variety of studies. The evidence is diverse, ranging from higher scores on all symptom dimensions of the SCL-90 (Weiss & Ebert, 1983), to elevations on depression and anxiety scales of the MMPI (Hatsukami, Own, Pyle, & Mitchell, 1982), to a higher prevalence of negative mood states assessed via self-report diaries (Johnson & Larson, 1982).

The relationship between drug use and bulimia has been reported in both clinic (Mitchell, Hatsukami, Eckert, & Pyle, 1985; Pyle, Mitchell, & Eckert, 1981) and community-based investigations (Weiss & Ebert, 1983; Pyle, Mitchell, Eckert, Halvorsen, Neuman, & Goff, 1983). For instance, 34% of a sample of 275 bulimics attending an eating disorders clinic reported a history of alcohol and drug problems (Mitchell, Hatsukami, Eckert, & Pyle, 1985). One study of college freshmen found that normal weight bulimic female students reported a significantly higher treatment rate for alcohol and drug abuse than nonbulimic students (Pyle, Mitchell, Eckert, Halvorsen, Neuman, & Goff, 1983).

Eating disorder research with normal weight younger age groups is limited. Estimates of the prevalence of binge eating and purging among younger normal weight adolescents have been reported only recently (Crowther, Post, & Zaynor, 1985; Kagan & Squires, 1984; Killen, Taylor, Telch, Saylor, Maron, & Robinson, 1986; Pope, Hudson, Yurgelun-Todd, & Hudson, 1984). Although the frequency of these behaviors in younger age groups tends to be low, their occurrence in conjunction with dysfunctional attitudes about eating and weight may place many young people at risk for developing an eating disorder.

This paper examines relationships among purging behavior, alcohol and drug use, and psychological distress and physical discomfort in a sample of normal weight tenth grade high school students. In previous research with this sample, teenage purgers compared with nonpurgers were found to exhibit a heightened concern with weight and eating. Purgers dieted more, counted calories more often, felt greater guilt following excessive eating, and engaged in more 24-hour fasts (Killen, Taylor, Telch, Saylor, Maron, & Robinson, 1986). In this study we hypothesized that adolescent purgers would report more psychological distress and physical discomfort when faced with situations they deemed beyond their control. Consistent with this hypothesis we predicted that purgers would also report more alcohol and drug use than their nonpurging counterparts.

METHOD

Subjects

During January of 1985, 1728 tenth grade students enrolled in four northern California high schools completed a survey designed to detect the presence of behaviors related to coronary heart disease risk. Of those studied, 52.4% were males and 47.6% were females. Ethnic breakdown of the students was as follows: White, 71.1%; Black, 2%; Asian, 14.1%; Latino, 4.8%; American Indian,

1.2%; Pacific Islander, 1.5%; other, 5.3%; and 65% of the students' fathers and 58% of their mothers received at least some college-level education.

Measures

Assessments were carried out over a 5 day period in each of the high schools by trained staff led by the project directors. Students were surveyed in four school classrooms during each class period. Class sizes ranged from 20 to 30 students. Males and females were separated.

Health Survey

A self-administered questionnaire assessed behaviors, knowledge, attitudes, and intentions in each of the following areas: physical activity, nutrition/diet, substance use, and stress. Questions concerning alcohol and drug use, purging behaviors, physical and psychological manifestations of stress, and stress management behaviors were presented to students in Likert-type scale formats.

1. **Purging Behaviors:** Students reported on the frequency of their practice of the following forms of purging behavior: self-induced vomiting following eating, laxative use, and diuretic use.
2. **Drug Use:** Students reported frequencies of drunkenness, drinking before or during school, cigarette and marijuana smoking, cocaine and heroin use.
3. **Manifestations of Stress:** Physical and psychological manifestations of stress were measured by presenting students with a list of 24 physical, cognitive, and affective reactions (e.g., embarrassment, anger, fear, inability to think clearly, pounding heart, sweaty palms, etc.) that people commonly experience when perceived situational control is low. Students were asked the question: When you get in a situation that you don't think you can handle, what happens? They were asked to rate the intensity of their reactions when perceived situational control is low. A stress score was computed for each student by summing across the 24 items.
4. **Affective Distress Index:** An 8-item affective distress index derived from the 24-item stress manifestations scale was computed to measure affective distress in response to uncontrollable situations. The index assessed intensity of anger with self and others, nervousness, anxiety, embarrassment, fear, and panic.
5. **Coping Behaviors in Response to Stress:** Coping in response to stress was measured by presenting students with a list of 25 behaviors typically used in attempts to counteract perceived stress (i.e., drinking, smoking, and exercising). Students indicated with a simple yes or no whether they engaged in the behaviors in order to cope with stress.

Height/Weight

Height and weight were measured on a standard balance beam scale. Participants wore lightweight gym clothing and removed shoes and jackets before they were measured. Height was rounded down to the nearest inch. Weight was rounded down to the nearest pound.

Table 1. Frequency (%) of purging behaviors among 15 year olds.

	Laxatives		Diuretics		Vomiting	
	M	F	M	F	M	F
Never	94.3	93.2	97.6	96.3	95.0	89.4
Monthly or less	4.1	6.1	1.0	3.1	3.2	8.6
Weekly	0.6	0.5	0.6	0.1	0.8	1.1
Several times a week or more	1.1	0.2	0.8	0.4	1.0	0.9
Total yes responses (males vs. females)	5.8	6.8	2.4	3.6 ^a	5.0	10.6 ^b

Note: M = male, F = female.

^a $\chi^2 = 13.5, p < .02.$

^b $\chi^2 = 29.3, p < .0005.$

RESULTS

Classification of Purgers

Subjects were classified as purgers if they responded "yes" to at least one of the three questions assessing purging behavior. About 13% of the adolescents reported some form of purging behavior (Table 1). Female purgers outnumbered males 2 to 1. Most purgers engaged in purging about once per month. Few purged as frequently as once a week. Male purgers were significantly heavier than male nonpurgers (68.4 versus 63.8 kg; $t = 2.94, p < .003$) and had significantly higher Quetelet ratio's (23 versus 21; $t = 3.35, p < .001$). Females did not differ significantly in bodyweight (56.3 versus 56.0 kg) or Quetelet ratios (22 versus 22, $t = 0.68, NS$).

Self-reported Drunkenness: Purgers versus Nonpurgers

A chi-square test of independence was computed to compare reported drinking among purgers and nonpurgers (Table 2). Differences between groups in prevalence and patterns of cigarette, marijuana, and cocaine use were not sig-

Table 2. Percent reporting drunkenness: purgers versus nonpurgers.

	Males		Females	
	P	NP ^a	P	NP ^b
Do not drink	42.2	35.0	31.3	32.7
Never get drunk	30.4	34.6	28.7	39.5
Once a month	14.5	19.3	20.9	19.5
Several times a month or more	12.9	11.1	19.1	8.3

Note: P = purger, NP = nonpurger.

^a $\chi^2 = 7.77, NS.$

^b $\chi^2 = 19.96, p < .002.$

Table 3. Percent reporting drinking before/during school: purgers versus nonpurgers.

	Males		Females	
	P (n = 38)	NP ^a (n = 317)	P (n = 68)	NP ^a (n = 258)
Never	68.4	78.2	64.7	81.4
Rarely	13.2	14.5	13.2	12.8
Sometimes	13.2	6.0	17.6	5.4
Often	5.2	1.3	4.5	0.4

Note: Analysis based only on students reporting *drinking once a month or more* during the day or evening. P = purger, NP = nonpurger.

^a $\chi^2 = 7.3, p < .13$.

^b $\chi^2 = 19.1, p < .0003$.

nificant and will not be reported. Students were asked the question: How often do you get drunk on alcohol? Female purgers reported a higher incidence of drunkenness than female nonpurgers ($p < .002$). In contrast, male purgers and male nonpurgers did not differ ($p < .17$).

Daytime Alcohol Consumption: Purgers versus Nonpurgers

A chi-square test of independence was computed to examine drinking behavior before or during school hours (Table 3). The analysis was restricted to those students reporting drinking at least once a month. Students were asked the question: Do you drink alcohol before or during school? Female purgers reported drinking during the day more often than nonpurging females ($p < .0003$). Male purgers and nonpurgers did not differ significantly ($p < .13$).

Manifestations of Stress: Purgers versus Nonpurgers

Students were asked to rate the intensity of their reactions when feeling out of control. A two-way analysis of variance (purge \times sex) revealed main effects for purging status ($F = 7.3; p < .007$) and sex ($F = 64.1; p < .0001$). Purgers and nonpurgers were then compared within each gender group. Female purgers reported reactions of a higher intensity than those of female nonpurgers ($t = 2.21, p < .03$). Male purgers and male nonpurgers did not differ ($t = 1.50, p < .13$). Males reported significantly lower levels of discomfort than females.

Affective Distress: Purgers versus Nonpurgers

Scores derived from the subscale of eight items measuring affective distress were analyzed by a two-way analysis of variance. Main effects for purging status ($F = 6.3, p < .02$) and sex were obtained ($F = 66.7, p < .0001$). Female purgers reported higher levels of affective distress than female nonpurgers ($t = 2.39, p < .02$). Male purgers and nonpurgers were not significantly different in this regard ($t = .99, p < .33$). Males reported significantly lower levels of affective distress than females.

Coping with Stress: Purgers versus Nonpurgers

An index of maladaptive coping behaviors composed of items measuring substance use (cigarettes, alcohol, marijuana, and cocaine) in response to stress was computed for each subject. Purgers were more likely to report using drugs in efforts to combat stress than nonpurgers ($t = 3.28, p < .001$). A higher percentage of female purgers reported using drugs for stress control than their nonpurging female counterparts ($t = 2.19, p < .03$). Male purgers reported more drug use than male nonpurgers, but the difference between the two groups was not statistically significant ($t = 1.59, p < .12$).

Chi-square tests of independence were then computed to examine each of the drug variables separately. The proportions of purgers and nonpurgers reporting reliance on cigarettes, marijuana, and cocaine did not differ significantly. However the groups did differ in reported alcohol use. The analysis for drinking was based on the responses of all subjects reporting drinking alcohol at least once a month or more. Thirty-six percent of female purgers and 46% of male purgers reported using alcohol as a coping strategy. In contrast, only 20% of female nonpurgers and 31% of male nonpurgers coped with stress by drinking. The prevalence of alcohol use in this context was significantly higher among female purgers ($\chi^2 = 6.3; p < .02$). Male purgers and male nonpurgers did not differ significantly ($\chi^2 = 2.6 p < .11$).

DISCUSSION

This investigation suggests that normal weight female adolescents who report purging behaviors for purposes of weight control differ in other important respects from their nonpurging peers. Differences in alcohol consumption and physical and affective reactions to uncontrollable situations were particularly striking between female purgers and female nonpurgers. Differences between male groups were much less striking and consistent.

The results invite comparison with studies of adult female bulimics. Male bulimics have yet to be studied extensively and frequently do not appear in either clinic-based or community investigations (Schlesier-Stropp, 1984). With regard to chemical dependency, several uncontrolled studies indicate that a subset of bulimics abuse drugs and alcohol (Mitchell, Hatsukami, Eckert, & Pyle, 1985; Pyle, Mitchell, Eckert, 1981). At least one controlled study has shown that bulimics report more substance use difficulties than nonbulimics (Pyle, Mitchell, Eckert, Halvorsen, Neuman, & Goff, 1983). Bulimics reporting substance use problems have been identified in both clinic-based and community investigations.

In this study a higher proportion of adolescent female purgers reported frequent bouts of drunkenness than female nonpurgers. Of perhaps equal importance are the findings on daytime alcohol consumption. Since drinking during school hours is usually associated with substantial penalties, our observation of a higher prevalence of daytime drinking among female purgers may say even more about the susceptibility of this group to substance use problems.

In addition to substance abuse, bulimics appear beset by a host of psychosocial problems including depression (Herzog, 1982; Pyle, Mitchell, & Eckert,

1981; Russell, 1979), anxiety (Fairburn & Cooper, 1982; Mitchell, Hatsukami, Eckert, & Pyle, 1985; Pyle, Mitchell, & Eckert, 1981), low perceived personal control (Weiss & Ebert, 1983), and social isolation (Johnson & Larson, 1982; Weiss & Ebert, 1983). Although some portion of these disturbances may arise from specific reactions to binge eating and purging, another portion may result from the dysfunctional thinking styles manifested by many bulimics. For example, persons with eating disorders tend to be overly perfectionistic and equate any weight gain as evidence of loss of personal control (Garner & Bemis, 1982). Researchers have argued that such faulty thinking styles may function as precursors of eating disorders (Garner & Bemis, 1982).

Psychological dysfunctions of this nature could not be assessed in this research. However, the measure of stress manifestations serves as an index of potentially maladaptive physical discomfort and psychological distress stemming from perceived loss of control. On the full 24-item scale, female purgers reported significantly higher physical discomfort and psychological distress than female nonpurgers. Males did not differ and reported less distress than females. On the affective distress subscale, female purgers reported more severe affective reactions to uncontrollable situations than female nonpurgers. Again, differences among males were not significant.

The need for symptom relief may at least partly explain the observed relationship between bulimia and drug use. An increased susceptibility to psychological disturbance may lead to the development of binge eating and other consummatory behaviors such as drinking (Johnson & Larson, 1982; Strober, 1981). In this study adolescents were asked about their use of alcohol and drugs to control stress. Adolescent purgers of both sexes were more likely to rely on alcohol for stress management than their nonpurging peers. However, only among females did the purger–nonpurger comparison reach statistical significance.

An estimate of the proportion of actual bulimics in this study cannot be given since binge eating and other essential diagnostic criteria were not assessed. However, since most bulimics also purge rather frequently, it seems unlikely that many in this study would receive the diagnosis. Although purging is not considered an essential feature of bulimia by DSM-III standards, it is, nonetheless, an important component. Mitchell et al. (1985) presented data indicating that 72% of a group of 275 bulimics vomited once a day or more. In a group of 499 women fulfilling diagnostic criteria for bulimia, the frequency of vomiting exceeded that of binge eating: 56% reported vomiting at least once a day, and 17.5% vomited more than once a week (Fairburn & Cooper, 1982). In contrast, less than 1% of females in this study purged more than once a week.

The findings suggest that a number of young people in this study, and particularly the females, may be at risk for developing eating disorders. Work designed to improve our understanding of the risk factors that may influence adoption of binge eating and purging behaviors in both males and females is clearly needed (Striegel-Moore, Silberstein, & Rodin, 1986). Prevention research also deserves a priority focus. Scant attention has been paid to education for the primary prevention of eating disorders. Instructional programs aimed at prevention of eating disorders and adoption of healthful weight control strategies may need to be developed. Theoretical models from which treat-

ment programs could be developed presently exist. Adolescent smoking prevention programs based on social influence-resistance models have provided encouraging results (Killen, 1985). Educational programs that unveil the social influence mechanisms promoting unrealistic and unhealthy attitudes about body weight and impart accurate knowledge and effective influence-resistance techniques offer one potentially promising approach.

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