Substance Use Among Women with Eating Disorders

Michael W. Wiederman
Tamara Pryor

(Accepted 10 June 1995)

Objective: *The results of past research suggest that bulimics are more likely than anorexics to engage in substance use, and that binge eating and/or purging may be an indicator of increased likelihood of substance use. We further investigated substance use among women with eating disorders.* **Method:** *We compared women with anorexia nervosa (n = 134) to women with bulimia nervosa (n = 320) with regard to history of substance use and investigated potential relationships between eating disorder symptom presentation and substance use.* **Results:** *Even after controlling for age and eating disorder symptom severity, women with bulimia nervosa were more likely than those with anorexia nervosa to have used alcohol, amphetamines, barbituates, marijuana, tranquilizers, and cocaine. Independent of diagnostic category, severity of caloric restriction was predictive of amphetamine use, severity of binge eating was predictive of tranquilizer use, and severity of purging was predictive of alcohol, cocaine, and cigarette use.* **Discussion:** *Results are discussed in relation to the results of past research and with an emphasis on the importance of considering eating disorder symptom presentation in addition to formal eating disorder diagnosis.* © *1996 by John Wiley & Sons, Inc.*

Several studies have highlighted the comorbidity of substance use and eating disorders. Holderness, Brooks-Gunn, and Warren (1994) reviewed the relevant research and arrived at several conclusions. In general, individuals with bulimia nervosa appear to be more likely to use alcohol and other drugs when compared with individuals with anorexia nervosa. Also, binge eating/purging anorexics appear to be more likely than restricting anorexics to indulge in substance use. Impulsive eating and purgation behaviors may be indicators of likelihood to use substances.

Past research on the relationship between eating disorders and substance use has not been definitive, however, as Holderness et al. (1994) noted a number of problematic issues that have characterized past research on the topic. For example, past researchers have

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Michael W. Wiederman, Ph.D., is Assistant Professor, Department of Psychological Science, Ball State University. **Tamara Pryor, Ph.D.,** is Associate Professor and Director of the Eating Disorders Program, University of Kansas School of Medicine-Wichita. *Address correspondence to Tamara Pryor, Ph.D., Department of Psychiatry and Behavioral Sciences, University of Kansas School of Medicine-Wichita, 1010 N. Kansas, Wichita, KS, 67214.*

International Journal of Eating Disorders, Vol. 20, No. 2, 163–168 (1996)

CCC 0276-3478/96/020163-06

not always used well-defined clinical samples. Also, many past researchers have asked respondents about substance use in general rather than querying about use of specific drugs. Also, with the diagnostic subtyping inherent in the 4th ed. of the *Diagnostic and statistical manual of mental disorders* (DSM-IV; American Psychiatric Association, 1994), the issue of symptom presentation is salient. That is, after reviewing past research we are left with the question of whether diagnostic category (anorexia nervosa vs. bulimia nervosa) or symptom severity (caloric restriction, binge eating, purging) is most predictive.

The objectives of the current study were to investigate the incidence of different types of substance use in a clinical sample of women diagnosed with either anorexia nervosa or bulimia nervosa. We also explored the potential relationship between eating disorder symptom presentation and substance use.

METHOD

Subjects

Participants were 454 female outpatients (Mean age = 24.15 years; $SD = 7.69$) who met diagnostic criteria (DSM-III-R; American Psychiatric Association, 1987) for anorexia nervosa ($n = 134$) or bulimia nervosa ($n = 320$). In line with current diagnostic practices (American Psychiatric Association, 1994), those who met criteria for both anorexia nervosa and bulimia nervosa were diagnosed with anorexia nervosa.

Measures

Substance Use

Participants completed the Diagnostic Survey for Eating Disorders-Revised (DSED-R; Johnson, 1985), a 24-page instrument that included information on substance usage. Each respondent was asked to indicate how frequently she had used each of eight substances: alcohol, amphetamines, barbituates, hallucinogens, marijuana, tranquilizers, cocaine, and cigarettes.

Symptom Severity

Several self-report indicators of symptom severity from the DSED-R were used in the current study. Specifically, participants reported the age of onset for caloric restriction (dieting), binge eating, self-induced vomiting, and use of laxatives for weight loss. They also reported lifetime duration (in months) of binge eating, self-induced vomiting, and laxative abuse. Lastly, participants indicated the current frequency of fasting, use of diet pills, binge eating, self-induced vomiting, abuse of laxatives, and abuse of enemas.

To streamline use of these variables, they were standardized and combined into respective indices of restricting, binge eating, and purging. First, values on each of the variables were standardized (each was converted into a Z score based on where the individual's response fell in the sample distribution). Before standardizing the age of onset variables, however, we had to correct for the fact that individuals who had not engaged in a particular symptom behavior (e.g., binge eating) would have a raw score of 0 on the corresponding age-of-onset variable, whereas those who had a late onset of the symptom would have a greater score than those with an earlier onset. For each of the age-of-onset variables, we assigned a value of 0 to those individuals who had never engaged in the behavior and subtracted the age of onset from 50 for those who had. In this way, greater

scores were indicative of earlier onset. After standardizing each individual variable, indices were created by taking the mean of the Z scores for the items comprising the particular index. Severity of caloric restriction consisted of age of onset of dieting, and current frequency of fasting and diet pill use. Severity of binge eating consisted of age of onset, lifetime duration, and current frequency of binge eating. Severity of purging consisted of age of onset, lifetime duration, and current frequency of self-induced vomiting, age of onset, lifetime duration, and current frequency of laxative abuse, and current frequency of enema abuse.

Procedure

Upon presentation at our outpatient eating disorders clinic, 2-hr diagnostic assessments were conducted by clinicians experienced in the evaluation and treatment of eating disorders, including separate semistructured interviews conducted by a psychologist and a psychiatrist. Eating disorder diagnoses were based on the 2-hr diagnostic evaluation. Finally, participants completed the paper-and-pencil measures.

RESULTS

Rather than investigate the issue of frequency of substance use (figures that may not have been very accurate as many of our patients indicated that their substance usage had changed over time), we condensed the women's responses into dichotomous variables regarding whether they reported ever having used each particular substance. The percentage of respondents who had used each of the substances is reported in Table 1 by diagnosis. In all instances, individuals with bulimia nervosa were more likely than women with anorexia nervosa to have used the particular substance.

To address the question of whether diagnostic category or symptom severity is the best predictor of substance use among eating-disordered women, a series of eight logistic regression analyses (Norusis, 1990) were performed. In each separate analysis, age (control variable), diagnosis (1 = anorexia nervosa, 2 = bulimia nervosa), the three symptom indices (restricting, binge eating, and purging), and the relevant interaction terms (Diagnosis × Restricting, Diagnosis × Binging, Diagnosis × Purging) were regressed onto the

Table 1. Incidence of substance usage for women with anorexia nervosa (n = 134) versus women with bulimia nervosa (n = 320)

Substance (Ever Used)	Anorexia Nervosa	Bulimia Nervosa	Chi-Square (df = 1)*	$p <$
Alcohol	29.6%	73.4%	45.00	.00001
At least weekly	11.9%	34.8%	23.31	.00001
Amphetamines	3.0%	17.8%	16.60	.00006
Barbituates	2.2%	10.0%	6.94	.009
Hallucinogens	0.7%	7.8%	7.48	.007
Marijuana	5.2%	24.7%	22.05	.00001
Tranquilizers	2.2%	13.8%	12.27	.0005
Cocaine	1.5%	12.5%	12.35	.0005
Cigarettes	22.2%	32.1%	3.99	.05

*Corrected for continuity.

substance use variable in a stepwise fashion. The results of these logistic regression analyses are reported in Table 2.

Inspection of Table 2 reveals that diagnostic category (anorexia nervosa vs. bulimia nervosa) was predictive of alcohol, amphetamine, barbituate, marijuana, tranquilizer, and cocaine use. Severity of caloric restriction was positively related to amphetamine use,

Table 2. Stepwise logistic regression analyses using symptom indices and diagnosis to predict substance use among women with anorexia nervosa (n = 134) or bulimia nervosa (n = 320)

Variable	B	SE	Wald	df	$p <$	R
Alcohol						
Diagnois	1.08	.24	19.86	1	.0001	.17
Severity of purging	0.83	.25	10.65	1	.001	.12
(Constant)	−1.22	.42	8.33	1	.004	
Model χ^2 (df = 2) = 57.32, $p < .0001$, goodness-of-fit χ^2 (df = 450) = 465.34, $p < .30$, cases correctly classified: 70.86%						
Amphetamines						
Diagnosis	1.44	.56	6.68	1	.01	.11
Severity of caloric restriction	0.47	.23	4.15	1	.05	.08
Diagnosis × Binging interaction	0.37	.12	9.17	1	.003	.14
(Constant)	−4.70	1.06	19.80	1	.0001	
Model χ^2 (df = 3) = 37.02, $p < .0001$, goodness-of-fit χ^2 (df = 450) = 438.29, $p < .65$, cases correctly classified: 86.12%						
Barbituates						
Age	0.04	.02	3.79	1	.05	.09
Diagnosis	1.54	.61	6.27	1	.01	.13
(Constant)	−6.37	1.32	23.24	1	.0001	
Model χ^2 (df = 2) = 13.45, $p < .001$, goodness-of-fit χ^2 (df = 451) = 434.34, $p < .71$, cases correctly classified: 92.29%						
Hallucinogens						
Diagnosis × Binging interaction	0.45	.14	9.68	1	.002	.20
(Constant)	−3.01	.23	167.34	1	.0001	
Model χ^2 (df = 1) = 8.77, $p < .003$, goodness-of-fit χ^2 (df = 452) = 420.73, $p < .86$, cases correctly classified: 94.27%						
Marijuana						
(Diagnosis)	1.78	.41	18.97	1	.0001	.20
(Constant)	−4.68	.79	35.36	1	.0001	
Model χ^2 (df = 1) = 28.10, $p < .0001$, goodness-of-fit χ^2 (df = 452) = 453.85, $p < .47$, cases correctly classified: 81.06%						
Tranquilizers						
Age	0.09	.02	19.42	1	.0001	.24
Diagnosis	1.38	.67	4.28	1	.04	.09
Severity of binge eating	0.63	.25	6.31	1	.01	.12
(Constant)	−7.29	1.47	24.53	1	.0001	
Model χ^2 (df = 3) = 49.22, $p < .0001$, goodness-of-fit χ^2 (df = 450) = 377.33, $p < .99$, cases correctly classified: 89.87%						
Cocaine						
Diagnosis	1.85	.74	6.15	1	.01	.12
Severity of purging	0.90	.31	8.34	1	.004	.15
(Constant)	−5.83	1.45	16.20	1	.0001	
Model χ^2 (df = 2) = 25.87, $p < .0001$, goodness-of-fit χ^2 (df = 451) = 455.74, $p < .43$, cases correctly classified: 90.75%						
Cigarettes						
Age	0.04	.01	6.92	1	.009	.09
Severity of purging	0.54	.20	6.98	1	.009	.10
(Constant)	−1.77	.35	25.26	1	.0001	
Model χ^2 (df = 2) = 15.06, $p < .0005$, goodness-of-fit χ^2 (df = 450) = 448.38, $p < .52$, cases correctly classified: 71.08%						

Note. SE = standard error of B, diagnosis: anorexia nervosa = 1, bulimia nervosa = 2.

severity of binge eating was positively related to tranquilizer use, and severity of purging was predictive of having used alcohol, cocaine, and cigarettes. Significant diagnosis by symptom severity interactions was infrequent but included women with bulimia nervosa and the most severe binge eating patterns demonstrating greater likelihood of having used hallucinogens and amphetamines. Last, we performed a stepwise multiple regression analysis to predict the total number of different substances the respondent had used. The regression equation [$R = .32$, $R^2 = .10$, $F(2,446) = 24.96$, $p < .0001$] consisted of diagnosis (beta = .23) and severity of purging (beta = .14).

DISCUSSION

Similar to past research, we found that patients with bulimia nervosa were more likely than those with anorexia nervosa to have used a variety of drugs. Unlike past research, however, we controlled for age of respondents and explored the relationship between eating disorder symptom severity and history of substance use. Even after controlling for age and symptom presentation, women with bulimia nervosa were still more likely than women with anorexia nervosa to have used alcohol, amphetamines, barbituates, marijuana, tranquilizers, and cocaine. General personality differences between individuals with anorexia nervosa versus bulimia nervosa have been found, the latter group being characterized as more impulsive (see Vitousek & Manke, 1994, for review). It may be the less inhibited, more impulsive, personality style of the individual with bulimia nervosa that leads to the relatively greater incidence of substance use.

Independent of diagnosis, symptom severity was predictive of substance use. Severity of caloric restriction was related to amphetamine use. This finding makes sense, as those individuals with the greatest drive for thinness could be expected to most severely restrict their intake of food, and amphetamines, which suppress appetite and increase metabolism (Sansone & Sansone, 1994), could be considered one more method such individuals may employ in an attempt to lose weight. Binge eating was predictive of tranquilizer use. Similarly, others have characterized the functions of binge eating to include tension relief and regulation of intense affect (Johnson & Connors, 1987). Purging was predictive of having used drugs which are often experienced in social settings such as night clubs and parties (alcohol, cocaine, and cigarettes).

We found that eating disorder symptoms are differentially related to usage of different types of drugs, and as such, one cannot make blanket statements regarding a relationship between a particular symptom and substance usage in general. It does seem, however, that severity or purging is the symptom related to usage of a greater number of different substances. To explain why some eating-disordered individuals enage in substance use whereas others do not, further research is needed to determine the personality and environmental correlates of substance usage in this group.

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