Psujek, J., Martz, D., Curtin, L., **Michael, K.**, & Aeschleman, S. (2004). Gender Differences in the Association among Nicotine Dependence, Body Image, Depression, and Anxiety within a College Population. ***Addictive Behaviors**, 29:2,* 375-380. Elsevier (ISSN: 0306-4603) doi:10.1016/j.addbeh.2003.08.031

Keywords: Nicotine dependence | Fagerstrom test for nicotine dependence | Body image | Anxiety | Depression | Weight concerns | Smoking

Gender Differences in the Association among Nicotine Dependence, Body Image, Depression, and Anxiety within a College Population

Jessica K. Psujek, Denise M. Martz, Lisa Curtin, Kurt D. Michael and Stanley R. Aeschleman

ABSTRACT

Previous research has linked female weight concerns and smoking. This study examined whether poor body image and other eating disorder variables, after controlling for symptoms of anxiety and depression, were predictive of smoking severity in a sample of 478 college students (n=215 males, n=246 females). Contrary to our hypotheses and recent research, the predictors were not associated with nicotine dependence for females (R2=.00), and only dieting was negatively associated with nicotine dependence for males. These findings might be attributable to differences in how nicotine dependence is operationalized, the use of point prevalence symptom data versus lifetime prevalence of psychopathology, the severity of psychopathology in the present sample, or the use of a cross-sectional as opposed to a longitudinal design.

ARTICLE

1. Introduction

Although cigarette smoking has been in a gradual decline, this reduction has been sharper among men than women [U.S. Department of Health and Human Services, 1990. U.S. Department of Health and Human Services, Public Health Service (1990). Healthy People 2000: National Health Promotion and Disease Prevention Objectives: DHHS: Pub. No. (PH5) 91-50213. Washington, DC: U.S. Government Printing Office.U.S. Department of Health and Human Services, 1990]. Many believe cigarette smoking suppresses body weight and that cessation

produces weight gain [French & Jeffery, 1995 and Klesges et al., 1989]; these beliefs appear particularly influential for younger women [French & Perry, 1996].

Previous research has linked smoking with depressive symptoms and "negative affect" [Glassman, 1993]. Research has found that smoking precedes depression [Goodman & Capitman, 2000] and that anxiety and depression predict smoking initiation [Patton et al., 1996], dependence [Breslau et al., 1998], smoking persistence [Patton et al., 1998], and problems with withdrawal [Breslau et al., 1992]. The purpose of this study was to test if poor body image and other eating disorder constructs add to the prediction of smoking severity after controlling for symptoms of anxiety and depression.

2. Method

2.1. Participants and procedure

A sample of 461 smoking and non-smoking participants (i.e., 215 males and 246 females; 93% Caucasian) was obtained from a mid-sized southeastern university. Males' average age was 19.2 (S.D.=2.8) with a body mass index (BMI) of 24.3 (S.D.=4.4). Mean age for females was 18.5 (S.D.=0.9) and their mean BMI was 22.4 (S.D.=3.5). Forty-five percent of the selectively recruited males and 43% of females were smokers. Participants completed a consent form and all questionnaires during a 1-h testing session for extra credit.

2.2. Materials

Assessments included a self-created Demographic Questionnaire that inquired about height, weight, gender, age, school year, economic status, and two people who could verify participant smoking as a bogus pipeline to enhance accuracy of self-reported smoking [Roese & Jamieson, 1993]. Participants were also given the Cognitive Behavioral Dieting Scale (CBDS; [Martz et al., 1996]) that assessed current dieting, the Body Esteem Scale (BES; [Franzoi & Shields, 1984]) that measures satisfaction with 35 aspects of perceived physical appearance, the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ; [Heinberg et al., 1995]) that assesses individuals' recognition and acceptance of socially sanctioned standards of appearance, the Eating Disorder Inventory-2 (EDI-2; [Garner, 1991]), a self-report measure of symptoms associated with anorexia nervosa and bulimia nervosa, the Symptom Checklist-90-R (SCL-90; [Derogatis, 1994]) that is a 90-item self-report measure of current, point-in-time, psychopathology symptom status, and the The Fagerstrom Test for Nicotine Dependence (FTND; [Heatherton et al., 1991]) that measures typical smoking behaviors indicative of ncotine dependence.

3. Results

A one-way ANOVA was used to calculate gender differences on the predictor variables (see Table 1). Existing norms for these scales are presented in Table 1 for relative comparisons with our sample. Relative to males, females reported greater general psychopathology, anxiety, depression, eating disorder pathology, dieting, and internalization of societal standards of appearance when compared to males (see Table 2). Given these gender differences, two hierarchical regression analyses, using stepwise entry for multiple variables, were used to analyze the data. Separately for males and females, Step 1 of this analysis consisted of the FTND scores regressed onto the SCL-90 MDE and anxiety subscales, while Step 2 regressed the FTND scores on the EDI-2, CBDS, SATAQ, and the BES. Based on previous literature, we predicted that symptoms of anxiety and depression would account for a significant amount of nicotine dependence variance. Furthermore, we hypothesized that the EDI-2, CBDS, SATAQ, and the BES would account for additional unique variance in nicotine dependence in Step 2, and that the body image variables would account for more variance for females as compared to males. Contrary to these hypotheses, the hierarchical regression equation for female participants was not significant in Steps 1 or 2 (see Table 3). Similarly, for males, anxiety and depression failed to predict nicotine dependence, but there was a slight negative relationship between dieting and nicotine dependence.

Table 1. Means and standard deviations for SCL-90 variables and their psychiatric inpatient and nonpatient normative comparisons [Derogatis, 1994].

Variable	Males, n=215	Normative comparison	Females, n=246	Normative comparison
SCL-90 (GSI)	0.663 (0.515)	0.25 for nonpatients 1.06 for psychiatric inpatients	0.893 (0.584)	0.36 for nonpatients 1.44 for psychiatric inpatients
SCL-90 Anxiety	0.542 (0.777)	0.22 for nonpatients 1.22 for psychiatric inpatients	1.268 (1.132)	0.37 for nonpatients 1.64 for psychiatric inpatients
SCL-90 Depression	0.738 (0.692)	0.28 for nonpatients 1.41 for psychiatric inpatients	0.923 (0.731)	0.46 for nonpatients 1.92 for psychiatric inpatients

Values in parentheses represent standard deviations.

Table 2. Summary of gender comparisons for predictor variables

Predictors	Males (n=215)	Females (n=246)
SCL-90 (Global Severity Index)		
M	0.663 * *	0.893 * *
S.D.	0.515	0.584
SCL0-90 (anxiety)		
M	0.542 * *	1.268 * *
S.D.	0.777	1.132
SCL-90 (depression)		
M	0.960*	1.200*
S.D.	0.900	0.950
EDI-2		
M	31.475 * *	44.223 * *
S.D.	24.826	28.904
CBDS		
M	24.674 * *	38.592 * *
S.D.	10.898	13.018
SATAQ (internalization)		
M	19.749 * *	25.329 * *
S.D.	5.515	7.870
BES		
M	127.432 * *	115.541 * *
S.D.	21.820	20.592

Table 3. Summary of hierarchical regression analysis for variables predicting nicotine dependence according to gender (n=461)

Variable	Males (n=215)			Females (n=246)		
	B	S.E. *B*	β	*B*	S.E. *B*	β
Step 1						
SCL-90 (anxiety)	–	–	.022	–	–	–
SCL-90 (depression)	–	–	.110	–	–	–
	R^2=.00			R^2=.00		
Step 2						
EDI-2	–	–	.015	–	–	–
CBDS	−.025	.009	−.186*	–	–	–
SATAQ (internalization)	–	–	−.068	–	–	–
BES	–	–	−.117	–	–	–
	ΔR^2=.00			ΔR^2=.00		
Total R^2	.035			.00		

4. Discussion

The failure to find a relationship between psychopathology and nicotine dependence may be explained by the selected assessments. Previous studies finding psychopathology predictive of nicotine dependence employed clinical interviews to assess general mental health status [Patton et al., 1998] and lifetime prevalence of psychiatric disorders [Breslau et al., 1991], rather than assessment of point prevalence symptom endorsement captured by the depression and anxiety subscales of the SCL-90-R.

Likewise, differences exist in how nicotine dependence has been operationalized. This study used the FTND, a self-report measure assessing typical smoking symptoms indicative of nicotine dependence. However, [Breslau & Johnson, 2000] found that FTND classification of smokers as nicotine dependent versus nondependent was not associated with depression, whereas DSM-III-R-classified nicotine-dependent smokers showed a threefold increase in lifetime prevalence of depression. Perhaps the behavioral symptoms (i.e., smoking more than intended and unsuccessful quit attempts) as specified in the DSM versus the potentially more physiological FTND items (i.e., length of time to first cigarette and amount smoked per day) might indicate more severe dependence. The behavioral dimension of nicotine dependence consistent with the DSM criteria may be the link between nicotine dependence to depression.

Finally, the anxiety and depression scores of the SCL-90-R for this sample fell between the norms for nonpatients and inpatients. Higher levels of depression and anxiety, more consistent with the inpatient norms, may be required before the association among depression, anxiety, and nicotine dependence becomes apparent.

Despite the fact that hypotheses were not supported, there were several strengths of this investigation. First, the gender differences (e.g., prevalence of depression and anxiety) were consistent with previous studies and suggest that the instruments used adequately assessed the constructs of interest. Furthermore, the sample size was large enough to detect an association, if it existed, between the variables examined. In contrast, several limitations to this study should be noted. Smoking behavior was assessed with a self-report questionnaire. Though self-report data are used in the smoking literature, biological measures are useful in corroborating self-reports. Additionally, lifetime prevalence of nicotine dependence (DSM criteria), depression, anxiety disorders, and body image/dieting was not assessed in this study. This study examined static smoking behaviors rather than smoking behaviors over time, which may explain the absence of a relationship between these variables. Perhaps examining body image/dieting in relation to participant's previous and current quit attempts would prove more productive. Moreover, this

study was conducted on a college population consisting primarily of white middle-class individuals. Though white, middle-class females are found to be at increased risk for eating disorder pathology; sampling solely from this socioeconomic group limits the generalizability of findings. Finally, the cross-sectional design does not allow for evaluation of potential associations between depression, anxiety, eating disorder constructs, and smoking behaviors across time.

Acknowledgements

We wish to thank Kim Sorrell, Sharon Hecker, Misty Goodman, Courtney Williams, and John Tedder for their assistance in data collection and entry.

References

Breslau, N., & Johnson, E. O. (2000). Predicting smoking cessation and major depression in nicotine-dependent smokers. American Journal of Public Health, 90, 1122–1127.

Breslau, N., Kilbey, M. M., & Andreski, P. (1991). Nicotine dependence, major depression, and anxiety in young adults. Archives of General Psychiatry, 48, 1069–1074.

Breslau, N., Kilbey, M. M., & Andreski, P. (1992). Nicotine withdrawal symptoms and psychiatric disorders: Findings from an epidemiologic study of young adults. American Journal of Psychiatry, 149, 464–469.

Breslau, N., Peterson, E. L., Schultz, L. R., Chilcoat, H. D., & Andreski, P. (1998). Major depression and stages of smoking. Archives of General Psychiatry, 55, 161–166.

Derogatis, L. R. (1994). Symptom Checklist-90-R: Administration, scoring, and procedures manual (3rd ed.). Minneapolis, MN: National Computer Systems.

Franzoi, S. L., & Shields, S. A. (1984). The Body Esteem Scale: Multidimensional structure and sex differences in a college population. Journal of Personality Assessment, 48, 173–178.

French, S. A., & Jeffery, R. W. (1995). Weight concerns and smoking: A literature review. Annals of Behavioral Medicine, 17, 234–244.

French, S. A., & Perry, C. L. (1996). Smoking among adolescent girls: Prevalence and etiology. Journal of American Women's Association, 51, 25–28.

Garner, D. M. (1991). Eating Disorder Inventory-2: Professional Manual. Odessa, FL: Psychological Assessment Resources.

Glassman, A. H. (1993). Cigarette smoking: Implications for psychiatric illness. American Journal of Psychiatry, 150, 546–553.

Goodman, E., & Capitman, J. (2000). Depressive symptoms and cigarette smoking among teens. Pediatrics, 106(4), 748–755.

Heatherton, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerstrom, K. O. (1991). The Fagerstrom Test for Nicotine Dependence: A revision of the Fagerstrom tolerance questionnaire. British Journal of Addiction, 86, 1119–1127.

Heinberg, L. J., Thompson, J. K., & Stormer, S. (1995). Development and validation of the Sociocultural Attitudes Towards Appearance Questionnaire. International Journal of Eating Disorders, 17, 81–89.

Klesges, R. C., Meyers, A. W., Klesges, L. M., & LaVasque, M. E. (1989). Smoking, body weight, and their effects on smoking behavior: A comprehensive review of the literature. Psychological Bulletin, 106, 204–230.

Martz, D. M., Sturgis, E. T., & Gustafson, S. B. (1996). Development and preliminary validation of the Cognitive Behavioral Dieting Scale. International Journal of Eating Disorders, 19, 297–309.

Patton, G. C., Carlin, J. B., Coffey, C., Wolfe, R., Hibbert, M., & Bowes, G. (1998). Depression, anxiety, and smoking initiation: A prospective study over 3 years. American Journal of Public Health, 88, 1518–1522.

Patton, G. C., Hibbert, M., Rosier, M. J., Carlin, J. B., Caust, J., & Bowes, G. (1996). Is smoking associated with depression and anxiety in teenagers. American Journal of Public Health, 86, 225–230.

Roese, N. J., & Jamieson, D. W. (1993). Twenty years of bogus pipeline research: A critical review and metaanalysis. Psychological Bulletin, 114, 363–375.

U.S. Department of Health and Human Services, Public Health Service (1990). Healthy People 2000: National Health Promotion and Disease Prevention Objectives: DHHS: Pub. No. (PH5) 91-50213. Washington, DC: U.S. Government Printing Office.