Brief research report

Body image and tobacco cessation: Relationships with weight concerns and intention to resume tobacco use

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Abstract

Concern about weight gain after tobacco cessation is a potential barrier to quitting tobacco. Few studies, however, have examined the role of body image in cessation-related weight concerns and anticipated relapse. This study investigated relationships between current body image dissatisfaction, anticipated body image dissatisfaction (discrepancy between anticipated post-cessation body shape and desired body shape), cessation-related weight concerns, and intention to resume tobacco with weight gain. Body image dissatisfaction was significantly related to cessation-related weight concerns. Participants who reported current dissatisfaction with their body image were 2.6 times more likely to intend to resume tobacco use with cessation-related weight gain than those with no body image dissatisfaction. Individuals with anticipated body image dissatisfaction were 3.4 times more likely to intend to resume tobacco compared to individuals with no anticipated body image dissatisfaction. Women and normal weight individuals with anticipated body image dissatisfaction appear to be at particularly high risk for intending to relapse. Results suggest that tobacco cessation interventions may need to target concerns about body image as well as weight gain.

Keywords: Smoking cessation; Weight concern; Body image; Relapse prevention; Gender differences; Military

Introduction

Tobacco use is the leading cause of preventable illness and death in the United States (Centers for Disease Control and Prevention, 1997; Mokdad, Marks, Stroup, & Gerberding, 2004), accounting for 400,000 deaths annually. Although approximately 46% of smokers try to quit in any given year, only 7% remain tobacco-free 1 year later (Centers for Disease Control and Prevention, 1993). One factor that has emerged as a potential obstacle to cessation is concern
about cessation-related weight gain (Russ, Fonseca, Peterson, Blackman, & Robbins, 2001).

Most women and men gain weight with tobacco cessation (United States Department of Health and Human Services, 1990). The majority will gain less than 10 lb (Peterson & Helton, 2000); however, a subgroup (up to 10%) may gain up to 30 lb (Klesges et al., 1997; Williamson et al., 1991). A growing literature has found high prevalence of concern about cessation-related weight gain in both male and female tobacco users, with higher levels of concern in females (Jeffery, Hennrikus, Lando, Murray, & Liu, 2000; Meyers et al., 1997; Russ et al., 2001). Research on the relationship between weight concerns and quitting self-efficacy found that individuals with higher weight concerns were less confident in their ability to quit tobacco (Bowen, McTiernan, Powers, & Feng, 2000). Others have studied the amount of weight gain female smokers would be willing to tolerate for smoking cessation. Although one study found that the majority predicted they would not resume smoking, even with a 20-lb weight gain (Meyers et al., 1997); others found high percentages (75%) would not be willing to gain more than 5 lb (Pomerleau & Kurth, 1996) in a cessation attempt.

Studies evaluating whether high levels of weight concerns decrease cessation attempts or increase the likelihood of relapse have yielded mixed results, with some investigations finding positive relationships between weight concerns and less successful quitting (Jeffery et al., 2000; Klesges et al., 1988; Meyers et al., 1997), and others finding no relationship (French, Jeffery, Klesges, & Forster, 1995; McBride, French, Pirie, & Jeffery, 1996). These mixed results are likely related to differences in measurement approaches and participant samples.

Clearly, the relationship between weight concerns and smoking cessation and relapse is complicated and deserves further examination. Most studies investigating these relationships have overlooked the potential impact of body image, a related but theoretically distinct concept. Body image involves not just concerns about weight, but also perceptual components (e.g., estimation of body size) and subjective evaluations of one’s appearance (e.g., body shape and size). One study found that cessation-related weight gain negatively impacts body image (Stepnowski, 2003). King, Matacin, Marcus, Bock, and Tripolone (2000) found that female smokers had higher body dissatisfaction than normative female samples and speculated that concerns about body image might negatively impact quit attempts. However, no published studies have investigated the role that pre-cessation body image dissatisfaction may have in cessation attempts and relapse risk. The current study examined the relationships between body image, concern over anticipated cessation-related weight gain, and intention to resume tobacco use with cessation-related weight gain. The primary hypotheses guiding the study included: (1) current body image dissatisfaction would be significantly related to higher concern with post-cessation weight gain, and (2) individuals with higher levels of body image dissatisfaction would be more likely to intend to resume tobacco use with cessation-related weight gain.

Method

Participants were 124 tobacco users enrolled in a tobacco cessation program in a military medical center. The program consisted of 8 weekly group sessions co-led by a clinical health psychologist (A.P.) or post-doctoral fellow (C.R.) and a pharmacist. Participation in the treatment program and the current, IRB-approved study was voluntary and was open to all military medical beneficiaries (e.g., active duty members, military retirees, and family members).

During the second week of treatment (1 week prior to their “quit date”) participants completed questionnaires assessing demographics, concern about cessation-related weight gain, body image, and intention to resume tobacco use with weight gain. Participants reported their height, and they were weighed on a calibrated beam hospital scale. Weight issues were discussed during the treatment, but not until the sixth week, after the study data had been collected.

Concern with cessation-related weight gain was assessed with the following items, which participants rated on a 0–10 Likert scale (0 = “not at all concerned”; 10 = “very concerned”): (a) “How concerned are you about the possibility of gaining weight when you quit smoking?” (b) “How concerned would you be if you quit smoking and gained 5 pounds?” and (c) “How concerned would you be if you quit smoking and gained 10 pounds?” These three items were averaged together...
to yield an overall measure of cessation-related weight concerns, ranging from 0 to 10.

Anticipated tobacco relapse with weight gain was assessed with six items measuring intention to resume smoking if varying amounts of weight (1–5, 5–10, 10–15, 15–20, 20–25, and 25–30 lb) were gained after cessation. The questions were worded as follows: “If after quitting smoking you gained xx pounds, would you start smoking again?” Responses were coded into one dichotomous “yes/no” variable for anticipated relapse with weight gain. Item content and wording, however, were informed by the literature, and have been used in other published reports (Russ et al., 2001).

The Figure Rating Scale (FRS; Stunkard, Sorensen, & Schulsinger, 1983) was used to assess body image dissatisfaction. This scale consists of nine male and nine female contour drawings ranging in size from thin to heavy, with each drawing assigned an integer number, ranging from 1 to 9, respectively. Prior researchers have used the FRS to assess current body size, ideal body size, and perceptions of preferences of the opposite gender (e.g., Altabe & Thompson, 1992; Fallon & Rozin, 1985; Rozin & Fallon, 1988). Subjects are asked to answer the following questions: “Which drawing looks most like you?” and “Which drawing would you like to look like?” Psychometric research on the FRS indicates good test-retest reliability and adequate validity (Thompson & Altabe, 1991). For the current study, a tobacco-specific question was added: “Which drawing would you look like if you quit smoking?” Although adapted from the literature, the psychometric properties of this item are unknown.

In the present analyses, the variable “current body image dissatisfaction” (CBID) was defined as the discrepancy between the figure chosen for current body shape and the figure chosen for ideal body shape. “Anticipated body image dissatisfaction” (ABID) was defined as the discrepancy between anticipated post-cessation body shape and ideal body shape. Risk ratios, derived from chi-square analyses, were calculated to determine whether individuals with body image dissatisfaction (current or anticipated) were more likely to report an intention to resume tobacco use compared to individuals with no body image dissatisfaction. This question was examined for the overall sample, as well as by gender and weight category.

Table 1 contains demographic and weight information for the participants, who ranged in age from 20 to 76 years (M = 42, SD = 15.9). Mean body mass index (BMI) for the sample was 26.4 (SD = 4.0; overweight), with no significant gender differences. For the overall sample, concern with cessation-related weight gain was 5.64 (SD = 3.18) on a 0–10 Likert scale. Females reported significantly higher weight concerns (M = 6.89, SD = 2.90) than did males (M = 4.68, SD = 3.07, t(122) = 4.06, p < .001). Normal weight subjects reported significantly lower weight concerns (M = 4.70, SD = 3.55) than did overweight and obese subjects (M = 6.19, SD = 2.76, t (117) = −2.57, p < .05).

The majority (67%; n = 83) reported some degree of current body image dissatisfaction (i.e., CBID > 0). This percentage was higher for women (80%; n = 43) than for men (57%; n = 40), and for overweight and obese (84%; n = 61) than normal weight (39%; n = 18) subjects. Similar results were found for anticipated body image dissatisfaction, with 83% of women and 60% of men (70% of total sample) anticipating that their post-cessation body shape would be heavier/larger than their ideal. Seventy-eight percent of overweight and obese participants reported some
degree of anticipated body dissatisfaction, compared to 56% of normal weight participants. In the overall sample, anticipated body dissatisfaction ($M = 1.23$, $SD = 1.31$) was higher than current body dissatisfaction ($M = .81$, $SD = 1.33$, $t(121) = -4.54$, $p < .001$). Means of current and anticipated body dissatisfaction for females were 1.22 ($SD = 1.12$) and 1.70 ($SD = 1.22$), and for males were .52 ($SD = 1.41$) and .87 ($SD = 1.27$), respectively.

Pearson correlation coefficients revealed that current body image dissatisfaction was significantly related to concern with post-cessation weight gain ($r = .56$, $p < .001$). This relationship was stronger for normal weight ($r = .72$, $p < .001$) than overweight or obese ($r = .36$, $p < .001$) individuals, and for males ($r = .60$, $p < .001$) than females ($r = .40$, $p < .001$).

Few subjects (6%) reported an intention to resume tobacco with small weight gains (in the 1–5 or 5–10 lb ranges). However, 31% intended to resume tobacco if they gained 10–20 lb, and 12% reported they would resume if they gained 20–30 lb. Half (50%) reported that they would not return to tobacco use with any amount of cessation-related weight gain. There were no significant differences by gender or weight category.

Intention to resume tobacco use with weight gain was analyzed by level of current and anticipated body image dissatisfaction (Fig. 1). Participants were classified as having either current body image dissatisfaction (i.e., $CBID > 0$) or no current body image dissatisfaction (i.e., $CBID = 0$; figure chosen for current body shape matched the figure chosen for ideal shape). Similar dichotomous classification was done for anticipated body image.

Chi-square analysis revealed that individuals who were dissatisfied with their current body image were significantly more likely to report an intention to resume tobacco use with cessation-related weight gain than individuals who were not dissatisfied with their current body shape (58% versus 34%, respectively), $\chi^2 (1, N = 124) = 6.16$, $p < .05$. Similarly, participants who anticipated feeling dissatisfied with their body image after cessation were more likely to intend to resume tobacco use if they gained weight ($\chi^2 (1, N = 122) = 8.73$, $p < .01$). Specifically, 59% of individuals with anticipated body image dissatisfaction (versus only 30% of those who anticipated no dissatisfaction with their body image) reported an intention to resume tobacco use with weight gain. Risk ratio calculations revealed that participants who reported current dissatisfaction with their body image were 2.6 times more likely to resume tobacco use with cessation-related weight gain than those with no body image dissatisfaction. Analysis by gender revealed that females who were dissatisfied with current body image were 1.8 times more likely, and males with current body image dissatisfaction were 2.9 times more likely, to intend to resume tobacco use compared to those with no body image dissatisfaction. Risk ratios for normal weight and overweight/obese individuals were 3.1 and 1.9, respectively.

For the overall sample, individuals with anticipated body image dissatisfaction were 3.4 times more likely to intend to resume tobacco compared to individuals with no anticipated body image dissatisfaction. This was quite pronounced for females and normal weight individuals. Females with anticipated body dissatisfac-

![Figure 1](image-url)
tion were 6.5 times more likely to intend to resume tobacco than females with no anticipated body dissatisfaction. Normal weight individuals with anticipated body image dissatisfaction were also at higher risk, being 8.5 times more likely than normal weight individuals without anticipated body dissatisfaction to intend to relapse. The ratios for males (2.3 risk ratio) and overweight and obese individuals (1.7 risk ratio) with anticipated body dissatisfaction were much lower.

Discussion

This study investigated relationships between cessation-related weight concerns, body image dissatisfaction, and intention to resume tobacco use in a population of treatment-seeking adults. Results indicated that the vast majority of participants (94%) predicted that, even with a 5–10 lb cessation-related weight gain, they would not resume tobacco use after cessation. These results are particularly encouraging since the average weight gain for men and women after cessation is less than 10 lb. Additionally, half the participants reported that they would not resume tobacco use regardless of the amount of weight gained after cessation. These results are notable in light of previous research that found much higher percentages of tobacco users reporting intention to return to smoking with relatively small amounts of weight gain (e.g., 5 lb; Pomerleau & Kurth, 1996). These differences could be related to sample characteristics (e.g., treatment seeking versus community sample, gender, age). Despite the large numbers of participants who predicted they would not resume tobacco use with small amounts of cessation-related weight gain, participants still reported concern with cessation-related weight gain, with females having significantly higher levels of concern than males.

The inclusion in the current study of measures of current and anticipated body image dissatisfaction represents a new addition to this body of literature. The moderate correlations found between measures of cessation-related weight concerns and body image dissatisfaction (coefficients ranging from .36 to .72) suggest that although the measures of body image dissatisfaction share some similarity to weight concerns, they also are measuring a somewhat distinct concept.

Notable differences in the strength of the relationships between cessation-related weight concerns and body image dissatisfaction were found between males and females, and between overweight and normal weight subjects. The reason for these differences is unclear at the present time and deserves further investigation. One possible explanation for the larger correlation between body image dissatisfaction and cessation-related weight concerns for males is the military weight standards. Previous research found that males in the military are significantly more concerned about post-cessation weight gain than their civilian counterparts and this effect was stronger among military members who were close to or over their maximum allowable weight (Russ et al., 2001). Similarly, previous research found that male military members enrolled in a mandatory weight management program were significantly more likely to engage in bulimic weight loss behaviors as compared to civilian males enrolled in a voluntary weight loss program (Peterson, Talcott, Kelleher, & Smith, 1995). However, in each of these studies female military members had more concern about post-cessation weight gain and engaged in more bulimic-weight loss strategies than male military members. Additional research is needed to further investigate factors related to body dissatisfaction in male military members.

The role that body image may have in tobacco cessation success and relapse was supported by results indicating that subjects who had current or anticipated body image dissatisfaction were 2.6 and 3.4 times, respectively, more likely to report an intention to resume tobacco use if they gained weight after quitting. Of particularly high risk were females who anticipated being dissatisfied with their bodies after they quit using tobacco (6.5 times more likely to intend to resume tobacco compared to females with no anticipated body dissatisfaction), and normal weight individuals with anticipated body dissatisfaction (8.5 times more likely to intend to relapse than those with no anticipated body dissatisfaction). Together, these results provide initial evidence that body image concerns may influence decisions about remaining tobacco-free, and that tobacco cessation interventions may need to target concerns about body image as well as weight gain to improve relapse prevention.

The results of the current study are limited by several factors. The small sample made it difficult to
analyze results in relevant subgroups (e.g., by age, by military status, etc.). The cross-sectional design of the study and lack of a control group make predictive or causal conclusions inappropriate. This study investigated the relationship between body image variables and intentions to quit, rather than actual behavioral cessation outcomes, and the relationship between intentions and behaviors in tobacco relapse has yet to be determined. Future research using longitudinal designs and behavioral outcomes (e.g., actual relapse, rather than an intention to relapse) would further clarify these relationships. Finally, future research might benefit from additional measures of body image dissatisfaction. Although the FRS provides a brief measure that is easily adapted to tobacco-specific questions, the modification used in this study has not been psychometrically validated. In future studies, multi-dimensional measures of body image may provide a more accurate and full assessment of this construct and assist in further understanding the relationship between body image, weight concerns, and tobacco cessation.

References


