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Race and Sex Associations to Weight Concerns among Urban African American and Caucasian Smokers

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Abstract

This study compared general weight concerns (Drive for Thinness, Body Dissatisfaction, and Cognitive Restraint) and smoking-specific weight concerns among adult African American and Caucasian women and men smokers enrolled in a smoking cessation clinical trial. Participants were 119 African Americans (73 female) and 182 Caucasians (90 female). Results revealed that general weight concerns were higher in Caucasians versus African Americans, and in women compared with men but there were no race by sex interactions. Drive for Thinness and Body Dissatisfaction were higher in women compared with men, and Cognitive Restraint was highest in Caucasian women. Finally, smoking-specific weight concerns were higher in Caucasian women than both Caucasian and African American men, with African American women intermediate. Results indicate that while Caucasian women preparing to quit smoking exhibited the highest levels of concern about weight, smoking-specific weight concerns, and certain sub-components of general weight concerns were also prevalent among African Americans and Caucasians. Future research is needed to elucidate how race and sex differences in weight concerns may impact smoking cessation.

Keywords

African Americans; Weight Concerns; Smoking

1. Introduction

Numerous studies have shown that weight concerns are related to both cigarette smoking initiation (French, Perry, Leon, & Fulkerson, 1994; Pomerleau, 1996) and maintenance (Klesges & Klesges, 1988), and may also be a barrier to cessation (Doherty, Militello, Kinnunen, & Garvey, 1996; Jeffery, Hennrikus, Lando, Murray, & Liu, 2000; Meyers et al.,

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1997). Although the majority of prior studies on weight concerns among smokers have been conducted among Caucasians, recently there has been an increased interest in examining these issues in African American smokers. This interest likely derives from African Americans' lower smoking cessation quit rates and higher levels of obesity and post-cessation weight gain compared with other racial/ethnic groups (for a review, see Sanchez-Johnsen, 2005). Characterizing the role of weight concerns among Caucasian and African American women and men smokers preparing to quit smoking may be important in terms of developing comprehensive interventions on smoking-related weight issues for all smokers, as well as potential targeted materials specifically designed for sex or race subgroups.

Due to cultural differences in weight and body image, weight control has been suggested to play a lesser role in motivation to smoke among African Americans than Caucasians (e.g., Jefferies et al., 2004). Specifically, African American smokers have been shown to be less concerned about weight (Pollack, Namenek, Brouwer, Lyna, Taiwo, & McBride, 2003), as well as less likely to exercise to control weight and more satisfied with their body shape than Caucasian women smokers (Pomerleau, Zucker, Namenek Brouwer, Pomerleau & Stewart, 2001). On the surface, studies such as this appear to suggest that the majority of African American smokers may not have a high level of concern for their weight. However, not all studies uniformly support this premise. For example, Caucasian and African American smokers have been shown to be similar on dissatisfaction with body shape and drive to be thin (Sanchez-Johnsen, Spring, Sommerfeld, & Fitzgibbon, 2005), and African American women smokers may be less tolerant of any weight gain when they quit smoking versus Caucasian women smokers (Pomerleau et al., 2001). Together, these findings suggest that at least among some African American women smokers, certain aspects of weight control that are typically associated with Caucasian women smokers, may also be prevalent among African Americans.

In addition to racial differences in weight concerns, there are also important sex differences or race by sex interactive effects in weight concerns. Although weight concerns have been studied extensively among women smokers, weight concerns are also important to study among men due to their high rates of being classified as overweight or obese based on BMI levels (73.9% and 72.9% in African American and Caucasian men, respectively) (ACS, 2009). In fact, in one of the few studies examining sex differences in weight concerns among African Americans (n= 367), Pollak and colleagues (2003) found that that African American men (19%) and women (25%) smokers were equally likely to be weight concerned. In contrast, in another study of African American light smokers, women reported greater weight control expectancies than men (Thomas et al., 2008). These mixed findings support the notion that additional research is needed on weight concerns among men and women smokers.

Overall, there is a relative dearth of research examining weight concerns in smokers across ethnic or racial groups, and only a handful of studies have examined weight concerns specifically among African Americans. Moreover, no study to our knowledge, has examined weight concerns using comprehensive measures of both general weight concerns and smoking-specific weight concerns in a large sample of African American and Caucasian women and men smokers. Such studies are important in order to further examine deeper constructs related to weight concerns and whether there are sex and race differences associated with weight concerns in African American and Caucasian women and men smokers. Therefore, the primary aim of this study was to compare general and smoking-specific weight concerns in African American and Caucasian women and men smokers enrolled in a smoking cessation clinical trial. It was hypothesized that Caucasians would report greater general and smoking-specific weight concerns than African Americans, and that women would report greater general and smoking-specific weight concerns than men.

2. Method

2.1 Procedures

Participants were 301 adult cigarette smokers (119 African Americans, 61% female and 182 Caucasians, 49% female) enrolled in a smoking cessation clinical trial examining a combined pharmacological and behavioral intervention [Chicago STOP Smoking Trial (C-STOP)]. The trial included 10 study visits over a 3-month treatment interval, as well as participation in follow-up interviews up to 52 weeks after the quit date. To be eligible for C-STOP, participants had to be within the ages of 18 to 65, smoke 12 to 40 cigarettes daily for two or more years, have a Body Mass Index between 18 and 38, and have no current major health or psychiatric problems. The latter were assessed by questionnaires, a diagnostic interview, and a medical exam, and standard cut-off thresholds were employed to rule-out those with significant major Axis I or II disorders or medical problems. Subjects included in this paper were those participants indicating non-Hispanic ethnicity and either African American/Black or Caucasian/White race, which was 90.4% (301/333) of the total enrolled CSTOP sample. This paper reports on data acquired during the first study visit, which was approximately two weeks prior to the quit date. Participants were recruited through newspaper, radio, internet and mass-transit advertisements, as well as flyers in the community, at clinics and through word-of-mouth referrals. For more information on recruitment and eligibility, see King et al., 2010 submitted.

2.2 Measures

Demographic information and self-report measures were obtained via paper and pencil or computerized questionnaires. *General Weight Concerns* were measured by the *Drive for Thinness subscale* of the Eating Disorders Inventory-2 (EDI-2; Garner, 1991), the *Body Dissatisfaction subscale* of the EDI-2, and the *Restraint factor* of the Three Factor Eating Questionnaire (Stunkard & Messick, 1988). The individual subscales were transformed into Z-scores and summated to create a *General Weight Concerns Index* ($\alpha=.73$). *Smoking-Specific Weight Concerns*, defined as the belief that smoking can be used as an appetite or weight control strategy and that smoking cessation leads to weight gain, was measured by the Smoking Situations Questionnaire (Weekley, Klesges, & Reylea, 1992). Socioeconomic status (SES) was assessed using the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975). Smoking measures included the average number of cigarettes smoked per day, assessed by a one-month modified Timeline Followback interview (Sobell, Maisto, Sobell, & Cooper, 1979; Sobell & Sobell, 1995), and physical tobacco dependence, measured by the Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991). Expired air carbon monoxide (CO; Micro Smokerlyzer; Bedfont, Medford, New Jersey) was measured at baseline to assess recent smoke exposure. Body Mass Index (BMI; weight [kg]/height [m]²; Garrow & Webster, 1985) was calculated using objectively measured weight and height during screening.

2.3 Statistical analysis

A series of 2-factor (race, sex) between-subjects analyses of variance were conducted in order to examine effects of race, sex, and their interaction on demographic characteristics, smoking background variables, and weight concerns factors. Significant main effects or interactions were followed with Tukey's post-hoc analysis, as appropriate. The following covariates were used in the analyses examining race and sex differences in general and smoking-specific weight concerns: age, SES, BMI, and cigarettes smoked per day. The decision to select certain covariates for use in these analyses was based on the following: 1) prior research indicating that these are potentially important predictors of weight concerns (e.g., BMI and number of cigarettes smoked per day) (Sanchez-Johnsen, et al., 2005); and 2) baseline differences in demographic variables observed between the race and sex subgroups

within the present sample, including age and SES, and intercorrelations between variables education and SES.

3. Results

3.1 Demographic and Smoking Characteristics

Table 1 depicts general characteristics and smoking background variables separately for African American and Caucasian men and women. African Americans (vs. Caucasians) were older [$F(1,297)=23.85$; $p<.001$], had fewer years of education [$F(1,297)=20.89$; $p<.001$], and were of lower socioeconomic status [$F(1,293)=21.29$; $p<.001$]. Men and women were similar on most characteristics except that women were older [$F(1,297)=11.31$; $p<.01$]. Finally, African American women had higher BMI than both Caucasian women and men, with African American men intermediate [race $\times$ sex: $F(1,291)=5.58$, $p<.05$; Tukey's $ps<.001$].

In terms of smoking variables, compared with Caucasians, African Americans had higher FTND scores, which suggests potentially greater physical dependence on nicotine [$F(1,297)=8.63$; $p<.01$], and they initiated smoking at a later age [$F(1,294)=5.87$; $p<.05$]. Women and men did not differ on most of the smoking background variables, except that Caucasian men smoked more cigarettes per day than Caucasian women as well as African American women and men [race $\times$ sex: $F(1,297)=6.59$, $p<.05$; Tukey's $ps<.05$].

For the overall sample, there were significant relationships observed between more years of education and higher SES ($r(df)=+0.51$, $p<.001$), and older age and number of cigarettes smoked per day ($r(df)=+0.118$, $p<.05$).

3.2 General and Smoking-Specific Weight Concerns

Table 2 depicts weight concerns variables separately for African American and Caucasian men and women. General Weight Concerns were higher in Caucasians versus African Americans [$F(1,254)=6.54$; $p<.05$] and also in women compared with men [$F(1,254)=31.13$; $p<.001$]. In terms of the specific subscales Drive for Thinness and Body Dissatisfaction, there were no differences between the race groups ($ps=NS$) but significant differences as a function of sex, with women reporting higher levels on both Body Dissatisfaction [$F(1,254)=36.29$; $p<.001$] and Drive for Thinness [$F(1,254)=12.82$; $p<.001$] scales compared with men. The final subscale, Cognitive Restraint, was significantly higher in Caucasian women than Caucasian men and African American women and men [race $\times$ sex: $F(1,254)=5.17$, $p<.05$; Tukey's $ps<.01$].

For Smoking-Specific Weight Concerns, Caucasian women reported higher levels of smoking for weight control than both Caucasian and African American men [race $\times$ sex: $F(1,254)=5.28$, $p<.05$; Tukey's $ps<.01$], with African American women intermediate.

4. Discussion

While conventional wisdom held that African Americans are satisfied with their bodies and less concerned about weight issues than Caucasians (Flynn & Fitzgibbon, 1998), results from this study do not unilaterally support this premise among smokers. While overall weight concerns were heightened in Caucasian versus African American smokers, these race groups did not differ on two specific sub-dimensions of weight concerns, including dissatisfaction with body shape and drive to be thin. Therefore, unlike prior assumptions, African American smokers do have some specific concerns about weight and body image similar to those in Caucasian smokers.

In addition to race differences we also examined sex differences in smokers' weight concerns. . Regardless of race, women reported higher levels of Body Dissatisfaction and Drive for Thinness than men. Additionally, significant sex and race interactions were observed in Cognitive Restraint, with Caucasian women reporting higher levels than Caucasian men and both African American women and men. Cognitive Restraint refers to the degree to which someone consciously monitors and controls their food intake, and unlike the other dimensions of weight concerns measured in this study, it may include both a cognitive and behavioral component. Our results may indicate that among smokers preparing to quit, Caucasian women are more likely to diet and engage in other behaviors to control their weight than Caucasian men or African Americans.

In terms of race and sex differences in smoking-specific weight concerns, results revealed that Caucasian women smokers reported higher levels of smoking-specific weight concerns than Caucasian men and African American men, but only marginally higher than observed in African American women. This finding offers further evidence for the suggestion that weight concerns specifically related to smoking may be equally important for both groups of women smokers.

There are several important inherent strengths to this study, including a large and diverse sample of smokers seeking treatment, the multidimensional assessment of weight concerns, and the direct examination of race and sex differences in weight concerns. However, there are several limitations that must be borne in mind when interpreting the findings. First, as mentioned, smokers in this study were enrolled in a smoking cessation trial and therefore the sample may be self-selected in terms of their motivation to quit. It is unknown whether weight concerns differ among African American and Caucasian women and men smokers not preparing to quit or seeking treatment. Second, this study included an urban sample of African American and Caucasian smokers of various socioeconomic status levels. As such, it is unknown whether African American and Caucasian smokers in rural areas have similar concerns about weight issues as those in urban areas. This may be an important area for future research since those in rural areas are disproportionately affected by tobacco use (Rayens, Hahn, & Hedgecock, 2008) and obesity (Patterson, Moore, Probst, & Shinogle, 2006). Third, this study included those who were preparing to quit smoking with a comprehensive combined behavioral and pharmacological intervention. In particular, it may be that the African American and Caucasian women in this study were attracted to this intervention trial due to potential effects of naltrexone on delaying or reducing cessation-related weight gain (King et al., 2006; O'Malley et al., 2006).

In conclusion, this was the first systematic study utilizing a comprehensive measure of weight concerns that included both general weight concerns and smoking-specific weight concerns in a large sample of African American and Caucasian women and men smokers preparing to quit smoking. Results revealed that smoking-specific weight concerns and certain aspects of general weight concerns (e.g., Drive for Thinness and Body Dissatisfaction) may be equally important among African Americans and Caucasians. Future studies examining other aspects of weight concerns such as body image and dieting are warranted to further explore various dimensions of weight concerns and to assess the relationship between weight concerns and smoking cessation in diverse samples of African American and Caucasian women and men smokers. Results from such studies may assist in the development of smoking cessation programs for African American and Caucasian women and men that address specific facets of weight concerns.

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Table 1

Background Characteristics and Smoking Behavior

	African American (n=119)		Caucasian (n=182)		Significance
	(a) Men (n=46)	(b) Women (n=73)	(c) Men (n=92)	(d) Women (n=90)	
General Characteristics:					
Age (yrs)	44.8 (9.9)	47.9 (9.0)	37.5(10.8)	42.9 (11.5)	a=b>c=d ^{***} ; b=d>a=c ^{**}
Education (yrs)	14.2 (2.1)	14.2 (2.3)	15.6 (2.2)	15.3 (2.2)	c=d>a=b ^{***}
Socioeconomic Status	39.1 (15.7)	40.8 (14.6)	47.7 (14.4)	48.0 (13.0)	c=d>a=b ^{***}
Body Mass Index (BMI)	27.5 (6.3)	29.4 (4.3)	26.6 (4.3)	25.8 (4.6)	b>c, d ^{***}
Typical Smoking Behavior					
Age of Smoking Onset (yrs)	16.2 (3.9)	17.3 (4.9)	15.8 (2.8)	15.7 (2.7)	a=b>c=d [*]
Nicotine Dependence ²	5.6 (2.0)	5.7 (1.8)	5.1 (2.1)	4.8 (1.8)	a=b>c=d ^{**}
Cigarettes smoked per day	15.4 (5.9)	16.4 (5.5)	19.3 (5.9)	16.9 (4.6)	c>a, b, d [*]
Expired CO Reading (ppm) ³	22.2 (9.2)	22.7 (9.9)	24.6 (15.0)	23.6 (11.7)	NS

Numbers reported are means (S.D.).

* $p < .05$,

** $p < .01$,

*** $p < .001$

¹ SES measured by the Hollingshead Four Factor Index of Social Status

² Nicotine Dependence = FTND Score

³ CO measured at first study visit

Table 2

Weight Concern Comparisons Among Race and Sex Smokers Subgroups

	African American (n=119)		Caucasian (n=182)		Significance
	(a) Men (n=46)	(b) Women (n=73)	(c) Men (n=92)	(d) Women (n=90)	
General Weight Concerns ¹	-0.9 (1.9)	0.5 (2.5)	-1.0 (1.6)	1.0 (2.6)	c=d>a=b [*] ; b=d>a=c ^{***}
Drive for Thinness ²	2.2 (3.9)	4.0 (4.8)	1.8 (2.8)	4.3 (4.8)	b=d>a=c ^{***}
Body Dissatisfaction ²	5.5 (4.5)	10.9 (6.5)	5.0 (4.7)	10.2 (8.1)	b=d>a=c ^{***}
Cognitive Restraint ²	5.4 (5.0)	6.7 (4.7)	5.6 (4.3)	9.5 (5.3)	d>a, b, c ^{**}
Smoking-Specific Weight Concerns ²	6.3 (2.3)	6.8 (2.4)	6.0 (1.7)	7.7 (2.5)	d>a,c ^{**}

Numbers reported are means (S.D.).

^{*} $p < .05$,

^{**} $p < .01$,

^{***} $p < .001$

These analyses controlled for Age, BMI, SES, and cigarettes smoked per day

¹ General Weight Concerns is the average of the Z-scores for Drive for Thinness, Body Dissatisfaction and Cognitive Restraint subscales

² Reported in raw scores