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Association of Perceived Racial Discrimination with Eating Behaviors and Obesity among Participants of the *SisterTalk* Study

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Abstract

The purpose of this study was to assess the association of perceived racial discrimination with emotional eating behaviors, weight status, and stress levels among obese African-American women, who volunteered to enter a weight control study (*SisterTalk*) in the New England region of the United States. The sample of women was taken from the baseline data of participants in *SisterTalk*, a randomized, controlled trial of a cable TV-delivered weight control program. Using the Krieger instrument, telephone and in-person surveys were used to assess perceived discrimination, emotional eating behaviors, and stress. Height and weight were measured to calculate BMI in order to assess weight status. ANOVA models were constructed to assess the association of discrimination with demographics. Correlations were calculated for discrimination, stress, emotional eating, and weight variables. ANOVA models were also constructed to assess discrimination with emotional eating, after adjusting for appropriate demographic variables. Perceived discrimination was associated with education and stress levels but was not associated with weight status (BMI). The frequency of eating when depressed or sad, and eating to manage stress, were both significantly higher among women who reported higher perceived discrimination and higher stress levels. Discrimination may contribute to stress that leads to eating for reasons other than hunger among African-American women, although the causal direction of associations cannot be determined with cross sectional data. Associations of discrimination with weight status were not found, although it is likely that emotional eating behaviors related to perceived discrimination are unhealthy. Future research should examine these relationships more closely in longitudinal studies.

Keywords

African-American women; obesity; perceived racial discrimination; stress

Introduction

Obesity continues to increase in the United States and prevalence is especially high among African-American women (Flegal, Carroll, Ogden, & Curtin, 2010). Risk of obesity-related illness, such as hypertension and diabetes, rise markedly as weight status increases (Gregg et al., 2005) and it is highest among Black women (35% and 13%, respectively) in comparison to age-adjusted prevalence of all Americans of both genders (24% and 9%, respectively) (CDC, 2009). According to *Healthy People 2020*, decreasing these chronic conditions associated with diet and weight is a priority goal, as is decreasing health disparities in obesity and associated co-morbidities among ethnic minority groups (Healthy People 2020).

Background and Significance

One factor that may contribute to differences in obesity-related health disparities across ethnic groups is racial discrimination. Krieger (2000) defined racial discrimination as being a socially structured and sanctioned phenomena that was justified by both ideology and expressed interactions. These occurred between individuals and institutions and were intended to maintain the privileges for members of the dominant groups at the cost and deprivation others. On-going discrimination against African-Americans has been documented in many segments of society. According to Clark, Anderson, Clark, and Williams (1999), perceived racism is the subjective and objective experience of prejudice or discrimination. Vines and colleagues (2006) showed that African-American survey respondents experienced frequent personal events in public places that were perceived as racism, such as interactions with police, getting a loan, seeking housing, and/or when needing medical care, and the researchers found that these experiences elicited both emotional and behavioral responses that could adversely affect the respondents' health. Williams (1999) further suggested that racism and socioeconomic status (SES) combined to affect health as individual and institutional discrimination and, along with the stigma of inferiority, restricted socioeconomic opportunities and mobility.

Discrimination and Obesity

Studies have shown mixed results in the relationships concerning discrimination and obesity (Gee, Ro, Gavin, & Takeuchi, 2008; Hunte & Williams, 2009; Shelton et al., 2009), weight gain (Cozier, Wise, Palmer, & Rosenberg, 2009; Hunte, 2011), and waist circumference (Vines et al., 2007).

Purpose of the Study

At present, there have been no known studies that examined the association of perceived discrimination with stress and emotional eating behaviors among those at risk for obesity. Therefore, the purpose of this study was to examine the relationship between these variables in a sample of African-American women. It was hypothesized that there was a relationship between obesity and perceived racial discrimination and that poor eating habits in relation to the stress caused by racial discrimination may mediate this relationship. To that end, the following questions were explored:

1. Is there a relationship between perceived racial discrimination and obesity?

2. Is there a difference in eating when depressed or stressed, based on perceived racial discrimination?

Methodology

Design, Sample and Setting

The research design was descriptive and was based on cross sectional data that served as the baseline data for a randomized, controlled trial studying a weight control intervention known as “*SisterTalk*.” This was a cable television weight loss intervention study designed for low-income African-American women conducted by Brown University in Boston, MA (Gans et al., 2003).

Sample

The participants were a sample of women recruited from public sites throughout Boston. Women could participate if they self-identified as an African-American or Black, were female, were from 18 to 70 years of age, resided in the Boston Cablevision catchment area and planned to stay in the area for at least one year, had a BMI not less than 22, were not pregnant or were more than four months postpartum, had no physical problems that would prevent mild physical activity, had no previous history of treatment for eating disorders, were able to speak and read English, had no participation in any other weight-control research project, and had access to a working telephone, television and VCR, as well as the availability to watch the *SisterTalk* cable TV program at its weekly airtime.

Institutional Review Board Approval

Approval was sought and obtained by the Institutional Review Board at Teachers College, Columbia University and the Institutional Review Board at Memorial Hospital of Rhode Island.

Procedures

Eligible participants completed a baseline telephone survey and were then scheduled to attend an in-person screening to obtain additional data. Physical measurements were performed including height, weight, and waist circumference. Height and weight was used to determine body mass index (BMI), which is weight in kilograms divided by the square of height in meters (kg/m^2). The BMI categories were classified according to the weight class categories established by the U.S. Department of Health and Human Services, National Heart Lung and Blood Institute (National Institutes of Health, 1998) and were as follows: Normal Weight (BMI 18.5–24.9 kg/m^2), Overweight (BMI 25–29.9 kg/m^2), Class I and II Obese (BMI 30.0 kg/m^2), Class III Obese (BMI 40).

Instrumentation

The Demographic Questionnaire—This questionnaire was researcher developed specifically for the purposes of this study. It measured the demographic characteristics of the study sample such as age, origin of birth, ethnicity, level of education, household composition, employment status, and income.

The Perceived Discrimination Questionnaire (Krieger, 1990) consisted of six questions: Have you ever experienced discrimination, been prevented from doing something, or been hassled or made to feel inferior in any of the following six situations because of your race or color? (1) At school, (2) getting a job, (3) at work, (4) getting housing, (5) getting medical care, (6) from the police or in the courts?(Krieger, 1990). The choices for each response were: (1) yes; or, (2) no. The discrimination score was calculated as the sum of the six

responses (1 or 2 excluding the missing items or responses of don't know or refusals), with the possible range of total scores being from 6 to 12.

The Stress Measure Question—This measure consisted of a single question concerning overall general stress: On a scale from 1 to 10, how stressful is your life? Number 1 meaning your life is not stressful to number 10 meaning your life is extremely stressful. For analysis of this question the numbers were placed into 3 categories as follows: 1–3 (low stress level), 4–6 (medium stress level), and 7–10 (high stress level). To assess emotional eating behavior, the following questions were asked such as, How often do you eat when you are feeling depressed or sad?, and How often do you eat as a way to manage stress? Responses to both questions were: (1) never; (2) rarely; (3) sometimes; (4) often; (5) almost always; (6) don't know; and, (7) refused to answer question.

This question was researcher developed as a simple measure with strong face validity. It as not been validated, although it is now being validated in a later study.

Data Analysis

Statistical Methods

ANOVA models were constructed to assess the association of the discrimination score with demographic variables including age, birthplace, ethnicity, education level, household composition, employment status, and household income. The least squared means were used as discrimination scores for each level of each demographic factor. Pearson correlation was calculated to examine the relationship between the continuous variables: the emotional eating behavior questions, BMI, waist circumference, stress, and the discrimination score. Next, for ease in interpretation, univariate ANOVA models were created to assess the association of the discrimination score with eating behaviors, weight status (BMI group), waist circumference, and stress, followed by multivariate models that included demographic variables that were significantly associated with discrimination. All statistical analyses were performed with SAS version 8.2 (SAS Institute, Cary NC, 2001).

Results

The African-American women in the sample ($N = 350$) ranged from 18 to 71 years of age. The majority (55.6%) was from 40 to 59 years of age and they were born in the United States (87.7%). Most identified themselves as African-American (77.7%), but other ethnic designations were also reported. Most of the participants (76%) had a college-level education and 75% were employed outside the home. Over half of the participants (64%) reported a family income of \$40,000 or less. The mean BMI was 34.8 and the mean waist circumference was 100.6 cm. The mean discrimination score was 8.2 and the mean stress level was 2.1.

Demographic characteristics separated many groups of women by reported level of discrimination. Discrimination was associated with age ($p = .0343$). Women with the highest perceived level of discrimination were in the middle-aged groups. Also, a positive association was found between education level and discrimination ($p < 0.0001$). Women with a higher level of education reported more racial discrimination. In addition, employment status was associated with discrimination, although not quite reaching the level of statistical significance, ($p = .0805$), with the highest level of perceived discrimination found among women who were employed full or part-time. Women who were born in the United States reported more discrimination than did women who were born out of the United States ($p = .0157$), but no differences were found among ethnic groups in reported

discrimination. There was no significant association found between discrimination and household composition (see Table 1).

The correlation matrix demonstrated colinearity among several variables. Discrimination and stress were correlated with each other ($r = 0.178, p < .0008$). The two emotional eating behavior questions were strongly correlated ($r = 0.685, p < .0001$). Both eating behavior questions were also significantly correlated with BMI, waist, stress, and the discrimination score. Also, BMI and waist circumference were strongly correlated with one another ($r = 0.884, p < .0001$), however, BMI and waist circumference were not correlated with either stress or discrimination (see Table 2).

In univariate models, there was a significant difference in mean discrimination scores based on responses to eating when sad/depressed ($p = 0.0021$), and when eating to manage stress ($p = .0024$). For each of these, higher perceived discrimination was reported, along with higher frequency of the eating behavior. The multivariate models still showed that each of these eating behaviors was associated with discrimination, even after adjusting for demographic characteristics.

Discrimination was also associated with stress levels ($p = .0029$), such that higher discrimination groups reported higher levels of stress. After adjustment for demographics, the association between stress and discrimination was similar ($p = .0089$). Waist circumference groups were significantly associated with discrimination ($p = .0398$), but the association was not linear. Both the highest and lowest waist circumference groups reported higher perceived discrimination than the middle two groups. Waist circumference was not associated with discrimination after adjusting for demographic factors. There was no significant difference in discrimination scores between BMI weight status groups in either univariate or multivariate models (see Table 3).

Discussion

This study found an association between perceived racial discrimination with emotional eating behaviors and perceived stress levels among obese African-American women, as supported in other literature (Cozier et al., 2009; O'Connor, Jones, Conner, McMillan, & Ferguson, 2008; Vines et al., 2007). The study by O'Connor and colleagues (2008) of 428 obese women and men used diary reports of daily hassles/stressors along with dietary intake. Daily hassles/stressors were defined as ego threatening, interpersonal, or work related. These authors reported a positive association between daily hassles and unhealthy eating behaviors, with the participants consuming more high fat ($p < 0.001$) and sugar ($p < 0.001$) snacks.

The present study found no association between weight status (BMI group) and discrimination, which is similar to the findings of several other studies (Hunte & Williams, 2009; Shelton et al., 2009). Nevertheless, others have found associations with weight-related variables. Gee and colleagues (2008) found a positive association between BMI and discrimination among Asian Americans. Cozier and colleagues (2009), in the Black Women's Health Study, found that an increase in perceived discrimination at baseline was associated with higher weight gain at an 8-year follow-up.

The present study also found no association between waist circumference and discrimination. Other researchers found higher waist circumference, with higher discrimination, in a study of middle-aged (35 to 47 years of age), obese, premenopausal African-American or Black women (Vines, et al., 2007). Moreover, an increase in waist circumference was associated with high and persistent racism in a multicultural prospective study (Hunte, 2011). More specifically, Lewis, Kravitz, Janssen, and Powell (2011)

described an association of reported discrimination with higher visceral fat (in and around internal organs) but not higher subcutaneous fat (close to the surface of the skin).

The lack of association between weight status and perceived discrimination found in this paper might be due to certain design limitations. First, the range of weight status, while large, did not include many women with a BMI in the normal range, and no women in the underweight range, which limits the assessment of association of one variable with another. Also, the measure of perceived discrimination that was used in this study was very general, and only a single item was used to measure perceived stress. Wyatt et al. (2003) identified three ways that discrimination might increase risk of cardiovascular disease including: institutional racism, with associated decreased socioeconomic opportunity and poor living conditions; personally-mediated racism, which acts as a stressor; and, true internalized racism, which comes from internalization of negative stereotypes. The Kreiger measure used in the *SisterTalk* study encompasses only personally mediated racism. Future studies should examine relationships of physical outcomes, including BMI, with other types/measures of discrimination.

It was hypothesized that perceived discrimination could be induced by stress, and indeed it was related to stress in the current cross sectional analysis, but the causal pathway is not clear. Previous research by Walcott-McQuigg (1995) demonstrated a higher likelihood of being overweight and the use of fewer weight control behaviors with higher stress. Also, women who were obese were more likely to report “confrontive coping,” or directly confronting life problems, which might have included weight problems, compared with normal weight participants, but no association was found with weight and perceived stress, social support, or stressful life events (Strickland, Giger, Nelson, & Davis, 2007). The measurement of stress in more depth with attention to sources of stress and coping mechanisms is warranted in future research.

Even without a direct association with weight, the association of discrimination and stress with emotional eating is concerning. Others have explored the neurochemical effects of racism as a stressor, including the direct and indirect effects on blood pressure (Krieger, 2000; Wyatt et al., 2003). Stressors in general have been shown to be associated with increased food intake. In animal models, stress that causes activation of the hypothalamus pituitary adrenal (HPA), or chronic stress axis, is associated with increased food intake and increased preference for sweets. In humans, the effect of greater intake of snack food with daily stressors was found only among individuals with high reactions to stress in some research (Adam & Epel, 2007). Daily hassles have been associated with increased food intake, in contrast with physical threat stressors that were associated with lower food intake (O'Connor et al., 2008), demonstrating again the very different dietary responses to different stressors. However, the more direct effect of racism-associated stress on eating behaviors has not heretofore been identified. In this study, stress was associated with both discrimination and emotional eating, however, further longitudinal studies are needed to establish a causal relationship.

Limitations of the Study

There were a number of limitations encountered in the process of implementing this study, which should be considered when interpreting this data. As noted above, the discrimination and stress measures used in the current study were brief and only measured one type of racial discrimination. Overall, the telephone and the in-person surveys used in the *SisterTalk* weight control study were lengthy and took an extensive amount of time to complete, perhaps creating fatigue and a considerable burden for the subjects. This could help to explain some missing data and score patterns. In addition, results cannot be generalized to

the total population since random sampling was not used and the women in the study volunteered for a weight control study, which may have introduced selection bias, and fewer underweight and normal weight women were in the sample, so the range of BMI was skewed higher. This could explain the differing relationships with other variables than were found in other studies with broader weight range.

Conclusions

This study found a strong relationship between perceived racial discrimination with perceived stress, as well as eating when depressed or sad, and eating to manage stress. In response, an intervention might be designed that specifically teaches stress management techniques and coping skills that do not involve eating. Such interventions should be culturally tailored and appropriate to manage stress among African-American women, including coping with discrimination.

Further studies need to explore conditions of stress and perceived racial discrimination in African-American women and how they relate to obesity and dietary behaviors. These studies should include qualitative research to explore more fully the relationship of perceived racial discrimination, stress, emotional eating and other factors related to obesity, as well as longitudinal studies to explore the causal relationship between discrimination, stress, emotional eating, and other factors. These studies should include more complete measures of discrimination, stress, and diet, as well as physiological measures of stress. Such research should be conducted across wider geographical areas of the United States, comparing cohorts in the South, Midwest, West, and Northeast, as well as in population samples of African-American women.

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Table 1Demographic Characteristics of SisterTalk Participants (*N* = 350)

Variables	<i>N</i> (%)	Discrimination Score Mean	<i>SD</i>	<i>p</i> value
Age (yrs)				.0343
18–29	36 (10.1)	7.5	2.0	
30–39	102 (28.7)	8.2	2.1	
40–49	116 (32.6)	8.6	2.0	
50–59	82 (23.0)	8.0	2.0	
60 or greater	20 (5.6)	7.8	2.0	
Born in US				.0157
Yes	313 (87.7)	8.3	1.7	
No	44 (12.3)	7.5	2.1	
Race/Ethnicity				0.4092
Black African Descent	4(1.1)	7.3	1.3	
African-American	272 (77.7)	8.3	2.1	
Black Cape Verdean	8 (2.3)	8.1	2.5	
Caribbean or West Indian	31 (8.9)	8.0	1.9	
African-American/Native American	6 (1.7)	6.8	2.1	
Black/Black American	29 (8.3)	8.0	1.9	
Education Level				< .0001
Less than high school	23 (6.4)	6.7	1.3	
High school graduate	67 (18.8)	7.4	1.6	
Some college/technical school	126 (35.3)	8.2	2.0	
College graduate	94 (35.3)	8.7	2.0	
Graduate school	47 (13.2)	9.1	2.3	
Household Composition				.9525
Live alone	79 (22.13)	8.2	2.0	
Live with adults only	72 (20.2)	8.3	2.0	
Live with children only	140 (39.2)	8.2	2.1	
Live with children/adults	66(18.5)	8.1	2.1	
Employment Status				0.0805
Employed full or part time	267 (75%)	9.4	2.0	
Unemployed	45 (12.6)	8.3	1.9	
Homemaker / student	22 (6.2)	8.0	2.2	
Retired	14 (3.9)	8.2	1.5	
Other	8 (2.2)	7.0	2.2	
Household Income	4			.0027
20K or less	75 (23.5)	7.5	1.8	
20K to 40k	129 (40.4)	8.4	2.0	
40k to 60k	55 (17.2)	8.0	2.0	
60k or more	60 (18.8)	8.6	2.0	
Continuous Variables	Mean (Std)	Units		

Variables	N (%)	Discrimination Score Mean	SD	p value
Discrimination	8.2 (2.0)	Score		
BMI	34.8 (7.9)	Kg/m ²		
Waist circumference	100.6 (17.4)	cm		
Stress	2.1 (0.8)	Score		

Table 2

Correlation Between Continuous Independent and Dependent Variables.

	Eat to manage stress?	BMI	Waist	Stress	Discrimination
Eat when depressed	0.68523	0.20513	0.23352	0.23864	0.18516
	<.0001	0.0001	<.0001	<.0001	0.0005
	346	349	349	347	349
Eat to manage stress?		0.21360	0.23923	0.26591	0.18255
		<.0001	<.0001	<.0001	0.0006
		347	347	345	347
Body Mass Index			0.88409	0.06628	-0.01803
			<.0001	0.2175	0.7368
			350	348	350
Waist circumference				0.08363	0.00787
				0.1194	0.8834
				348	350
Stress					0.17835
					0.0008
					348

Table 3
 Analysis of Variance of Discrimination Score by Eating Behavior Styles, Weight Status, and Stress Level Score (N = 350)

Demographic Characteristics	N%	Discrimination Score Mean	SD	p value	Adjusted p value
Eating when depressed/sad				.0021	.0147
Rarely/never	140 (39.3)	7.8	1.8		
Sometimes	90 (25.3)	8.2	2.1		
Almost always /often	126 (35.4)	8.7	2.1		
Eating to manage stress				.0024	.0055
Rarely/never		180 (50.9)	7.9	1.9	
Sometimes		91 (25.7)	8.2	2.1	
Almost always/often		83 (23.5)	8.9	2.2	
BMI group				.2147	.2777
Normal		28 (7.8)	8.4	2.0	
Overweight		76 (21.3)	8.5	2.0	
Class I and II obese		187 (52.4)	8.0	2.0	
Class III obese		66 (18.5)	8.4	2.2	
Waist Circumference Group				.0398	.1131
Lowest		102 (28.6)	8.4	2.0	
Low		81 (25.5)	7.9	2.0	
Medium		81 (22.7)	8.0	1.8	
High		83 (23.3)	8.7	2.2	
Stress level				.0029	.0089
Low		88 (24.8)	7.8	2.0	
Medium		142 (40.0)	8.1	1.9	
High		125 (35.2)	8.7	2.1	

• Adjusted for age, born in the US, education, income