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Racial Differences in Perception of Healthy Body Weight in Mid-Life Women: Results from Do Stage Transitions Result in Detectable Effects (STRIDE) Study

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Abstract

Objectives—Perception of a healthy body weight may influence health behaviors including physical activity level, nutritional habits, and health outcomes, and these perceptions may vary importantly by race. Midlife is a critical period for women, which typically includes weight gain. We assessed the associations between perception of healthy body weight and body mass index (BMI) and whether they vary by race.

Methods—In the Do Stage Transitions Result in Detectable Effects (STRIDE) study, body mass index (BMI) and perception of body weight (healthy, underweight, or overweight) were measured at the baseline examination. Multinomial logistic regression models examined the associations, with race (White vs. Black) as a moderator variable.

Results—Of 729 women enrolled, 689 women (95%, N=145 Black, N=544 White) were included in these analyses. Even though the average BMI was higher for Black women compared to White women (33.1 vs. 29.2, respectively, $p < .0001$), Black women were less likely to report that they weighed too much (RRR (Relative Risk Ratio) [95% CI]: 0.4 [0.2, 0.9], p 0.022) and more likely to think that they did not weigh enough (RRR [95% CI]: 14.2 [1.8, 110], p 0.011).

Conclusion—Although Black women in general face a greater threat of morbidity from weight-related chronic diseases, they are more likely to be accepting of their weight at higher BMI's, relative to Whites. Weight-loss interventions and counseling about healthy body size may influence healthy behavior and reduce chronic disease risk.

Keywords

Midlife; Body Image; Weight-Perception; Race; Health; Behavior

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INTRODUCTION

Body image refers to an individual's opinion of their external appearance. Understanding body image is important because it potentially can influence an individual's behavior. Given that Blacks are more likely to suffer from obesity-related medical conditions such as hypertension and noninsulin-dependent diabetes, understanding ways to help curtail unhealthy behavior that leads to these conditions are essential.^{1,2} Body image has been studied extensively in relation to disordered eating (although typically a restrictive eating pattern) in teenage and young adult women.^{3, 4} Results from these studies show that Black women have a more positive body-image when compared to their white counterparts, that persists with weight loss and weight regain.⁵ In contrast, qualitative work suggests that premenopausal obese Black women are dissatisfied with their body size.⁶ This study used a more in-depth analysis of body image by conducting interviews that were often 40–60 minutes in length, and noted that for these participants, body image satisfaction often fluctuated depending on social factors such as community resources, opinion of loved ones, ability to find clothes that fit, etc.

Body image, or body weight perception, is important because of its relationship to weight change. For example, in younger women (aged 25–37 at baseline) women, Lynch and colleagues found that body size perception influenced weight change over 13 years—obese women who perceived themselves as obese lost weight while those who perceived themselves as over- or normal-weight gained weight over this period.⁷ Understanding body image and the potential impact it has on the behavior of adult women is especially important given that the peri- to postmenopausal period is a time when a woman is most likely to gain weight,⁸ experience a loss in fat-free body mass, and an increase in central adiposity.^{9, 10} These changes increase the risk for obesity-related diseases by increasing one's risk for insulin resistance, atherosclerosis and hypertension.¹¹ Although women gain weight during their mid-life period, personal choices such as regular physical activity and diet can prevent or decrease this change.^{12, 13} Body image may influence these choices.¹⁴

This study aims to expand the knowledge of body weight perception and its association with obesity in women, specifically in mid-life and beyond. We sought to understand the associations between actual body size (body mass index (BMI) calculated as weight (kg)/height (m²)) and weight perception among mid-life women. We additionally examine whether the relation between BMI and weight perception differs between Black and White women during the mid-life period. We hypothesized that at higher BMI's, mid-life Black women would be more likely to perceive their current weight as healthy when compared to White women.

METHODS

Data Source and Study Population

Do Stage Transitions Result in Detectable Effects (STRIDE) is an ongoing cohort study of 732 women ages 40 to 65 years enrolled between January and December 2005 from a single university-based general internal medicine practice. Briefly, all women ages 40–65 who presented to the practice were asked to participate in a study examining the impact of menopause on health-related quality of life. All women who were in this age range, spoke English, and consented to participate were enrolled in the study. Recruitment details have been described previously.¹⁵ This study was approved by the University Institutional Review Board and registered with clinicaltrials.gov (#NCT00097994). Of the 732 original STRIDE participants, 724 women, aged 40–65 years, had complete data.

Measures

Weight and Weight Perception—To calculate BMI, the participants' weight and height were abstracted from the office visit that coincided with STRIDE enrollment. Based on BMI, participants were classified as underweight (BMI < 18), normal (BMI = 18, and <25), overweight (BMI = 25, and < 30), or obese (BMI ≥ 30).¹⁶ Because of the small numbers, the four participants (out of 724) that were underweight were excluded from further analyses.

Weight perception was assessed using a single question, "Do you think that your current weight is healthy?". Response options included: "Yes"; "No, I think I weigh too much"; and "No, I don't think I weigh enough".

Race—Participants were asked to self-report race. They were able to choose more than one racial category and were able to report race as *other*. Of the 720 women with complete data and that were either normal weight, overweight or obese, 544 were White, and 145 were Black. These 689 women were included in these analyses. Of the 31 participants excluded, 7 identified as Native-Americans, 14 Asian, and 7 "Other;" 3 had missing race data.

Stage of Menopause—Participants' menopausal status was defined using self-reported bleeding patterns. Menopausal status was categorized based on a previously defined modification of the Stages of Reproductive Aging Workshop criteria.¹⁷ Participants with regular bleeding patterns considered premenopausal. Perimenopausal participants had irregular bleeding patterns but their last menstrual period (LMP) occurred <12 months ago. Postmenopausal participants had their LMP ≥ 12 months ago. Because of small numbers and the inability to identify menopausal status based on bleeding patterns, women taking oral contraceptive pills (OCs) were grouped with premenopausal women, while women with a hysterectomy were grouped with postmenopausal women.

Other Variables—Age was calculated as date of survey completion minus date of birth. Participants self-reported their marital status and educational attainment. They were asked to report the presence or absence of nine comorbid medical conditions including: heart disease, heart failure, depression, diabetes, emphysema or lung disease, stroke, arthritis, cancer (other than skin cancer), and high blood pressure. Women were placed into comorbidity categories of: "none," "1–2 conditions," or "≥ 3 conditions."

Social support was measured using the 12-item Interpersonal Support Evaluation List (ISEL).¹⁸ The emotional well-being scale of the RAND-36 was used as a proxy for depressive symptoms.

Analysis

Participant characteristics were summarized using frequencies and measures of central tendency. We used t-tests for continuous variables and chi-square tests for categorical variables to compare differences in study variables by race. We also used univariable-multinomial logistic regression models to examine the associations of race, BMI, and the other covariables (age, educational attainment, marital status, menopause status, emotional wellbeing and social support) with weight perception. We entered covariables into subsequent multivariable multinomial logistic models examining the primary outcome of weight perception (categorized as Healthy, Too Much or Not Enough). Secondary analysis included categorical weight (normal, overweight and obese) and tested the interactions between race and BMI (as a continuous and categorical variable). All analyses were conducted using STATA 10.0 (Stata Corp., College Station, TX, USA) and alpha was set to 0.05.

RESULTS

Sample Characteristics

A total of 689 of 732 (94%) STRIDE participants had complete data, were not underweight, and are either White or Black; 79% were White, while 21% were Black. The mean BMI of the participants was at the usual cutoff for obesity, i.e. 30.0.¹⁶ Table 1 shows the sociodemographic and health characteristics of the STRIDE study participants according to race.

Greater proportions of White as compared to Black participants were married, had a graduate education, were perimenopausal and had no medical comorbidities. Most of the Black participants were postmenopausal or had had a hysterectomy, had three or more comorbidities and had some college or a high school education. On average, Black participants had a higher BMI (33.1) than their White counterparts (29.2).

Models Examining Association of Sociodemographic Characteristics and Weight Perception

In univariable models, a higher BMI was associated with perceptions of weighing too much (Relative Risk Ratio (RRR) [95% confidence interval (CI)]: 1.5 [1.4, 1.6]) (Table 2). Compared to White women, Black women thought they did not weigh enough (RRR [95% CI]: 6.7 [2.2, 20.2]). Additionally, reporting ≥ 3 comorbidities was associated with being more likely to have an abnormal weight perception (too much or not enough): (RRR [95% CI]: 2.2 [1.3, 3.8], and (7.2 [1.7, 31.1]), respectively.

In models adjusted for BMI and covariates outlined in Table 1, compared to White women, Black women were less likely to report that they weighed too much, and more likely to report that they did not weigh enough (RRR [95% CI]: 0.4 [0.2, 0.9] and 14.2 [1.8, 110], respectively) (Table 3). In addition, higher BMI (continuous) and higher educational attainment remained associated with perceptions of weighing too much, and lower BMI and poor emotional well-being remained associated with perceptions of not weighing enough (Table 3). As expected, analyzing BMI as a categorical variable yielded a similar pattern of results, and was significant ($p=0.0001$).

The interaction between race and BMI (continuous) was significant (RRR [95% CI]: 0.8 [0.7, 0.9]), such that at higher BMIs, Black women were less likely to perceive themselves as weighing too much than were White women. Including the interaction, Black women with higher BMIs were not more likely to report that they did not weigh enough than were White women (RRR [95% CI]: 0.9 [0.5, 1.6]). With BMI as a categorical variable, the interaction model results were not significant.

DISCUSSION

This study examined the association between weight perception and actual body weight in mid-life women. Not surprisingly, a higher BMI was associated with reporting that one weighed too much, while lower BMI's were associated with reporting that one didn't weigh enough. However, we found differences between White and Black women, such that Black women were less likely to perceive their body weight as too great, irrespective of actual body size. This is consistent with the analysis by Wolfe, which examined the "cultural tolerance of fatness" in African-American women.¹⁹ Wolfe hypothesized that acceptance of heavier weights in African-American women could be secondary to decreased pre-occupation with thinness as an ideal body weight and the interaction of perceived ideal body weight by socioeconomic position. Others have postulated similar theories.^{20–22} Our study did not focus on how perceptions of body weight differed according to socioeconomic

position specifically. We did see significant gradients in body weight perceptions with educational attainment, one measure of socioeconomic position. However, our findings persisted controlling for educational attainment. It is important to note that there is some evidence that suggests that African-American women are dissatisfied at higher weights, which seems to be impacted by other factors such as social class.^{21, 23} The perception of a body weight that is ideal or healthy varies considerably by racial group.

According to the Center for Disease Control (CDC), during the past 20 years, there has been a dramatic increase in obesity in the United States. Even more troubling is that Blacks had 51 percent higher prevalence of obesity compared with Whites in the 2006–2008 Behavioral Risk Factor Surveillance System (BRFSS) data. The perception of not weighing enough despite having a mean BMI that was classified as obese in Black women may result in a lack of weight loss attempts.^{24–26} This may contribute to Black women's higher prevalence of obesity-related medical conditions including diabetes and cardiovascular disease.

This study has several limitations that deserve mention. It is a cross-sectional study of women, who are already participating in an ongoing research project, and as such causality cannot be inferred and the population may not generalize to other settings. Additionally, the cross-sectional design limits the temporality of the association studied. Due to missing data and small sample sizes, analysis of certain variables were limited. The sample sizes were small for women who perceived themselves as “not weighing enough,” resulting in large confidence intervals particularly around race. This should be reexamined in a larger study. Our classification of menopausal status is based on bleeding patterns. Because women taking OCPs and those who have had hysterectomies cannot be classified based on bleeding patterns, and the small numbers of women in these groups, we considered women on OCPs to be pre-menopausal and women with a hysterectomy to be post-menopausal. We only used a single question to assess weight perception, and, therefore, cannot comment in detail on the more general concept of body image. Finally, the single measure for adiposity (BMI) limits the analysis. Future work could include other measures, such as waist-to-hip ratio, which may be a better predictor of obesity and its associated health risks.

CONCLUSION

The results of this study have direct implications for clinical care. Any physician should have a discussion with their patients with a BMI greater than or equal to 26 (thus including overweight and obese patients) about how to lose weight, the psychosocial factors that fuel their weight gain, or lack of weight loss, and the health effects of this weight. Similar to the 5 A's approach established for smoking cessation (a behavior and counseling model used by healthcare providers to help patients quit smoking), we propose the creation and testing of a model for weight loss (in congruence with the United States Preventative Services Task Force (USPSTF) guidelines that advocate screening for and intervening on obesity) to be used by healthcare providers.^{27, 28} Instituting such interventions not only to emphasizes the importance of addressing obesity in clinical care, but also to raise awareness that a patient's perception of what constitutes overweight/obese may vary from established clinical categories, particularly among certain racial groups. They also allow us to place discussions of obesity in the appropriate clinical context, with attention to the psychosocial overlay.

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Table 1

Sociodemographic and Health Characteristics of Participants in the STRIDE Study (n (%))

	Race			
Characteristic	Overall (n= 689)	White (n= 544)	Black (n= 145)	p-value
Age (mean (sd))	50.9 (6.4)	50.8 (6.4)	51.5 (6.4)	0.220
BMI ^a (mean (sd))	30.0 (7.6)	29.2 (7.1)	33.1 (8.8)	< 0.0001
Social Support (Interpersonal Support Eval List) (mean (sd))	3.4 (0.6)	3.4 (0.6)	3.3 (0.6)	0.011
Emotional Well-Being (mean (sd))	45.5 (10.6)	46.0(10.6)	43.5(10.3)	0.009
Marital Status (Married)(n(%))	367 (53.3)	328 (60.3)	39 (26.9)	<0.0001
Education(n(%))				<0.0001
High school	108 (15.7)	52 (9.6)	56 (38.6)	
Some College	182 (26.4)	131 (24.1)	51 (35.2)	
Completed College	162 (23.5)	146 (26.8)	16 (11.0)	
Graduate Degree	237 (34.4)	215 (39.5)	22 (15.2)	
Weight Perception (n(%))				<0.0001
Healthy	181 (26.3)	148 (27.2)	33 (22.8)	
Too Much	493 (71.5)	390 (71.7)	103 (71.0)	
Not Enough	15 (2.2)	6 (1.1)	9 (6.2)	
Menopause Status(n(%))				<0.0001
OCP/Premenopause	186 (27)	158 (29.0)	28 (19.3)	
Perimenopause	145 (21.0)	125 (23.0)	20 (13.8)	
Postmenopause/Hysterectomy	358 (52)	261 (48.0)	97 (66.9)	
Comorbidities(n(%))				<0.0001
None	223 (32.4)	195 (35.8)	28 (19.3)	
1–2	352 (51.1)	284 (52.2)	68 (46.9)	
3	114 (16.5)	65 (11.9)	49 (33.8)	

^aBMI: Body Mass Index = Weight (kilograms)/height (meters²)

OCP: Oral Contraceptive

Table 2

Univariable Models examining association of sociodemographic characteristics and weight perception *

Characteristic	Weight Perception *, RRR (95% CI)		
	Healthy (N = 181)	Too Much (N = 493)	Not Enough (N= 15)
Black	ref	1.2 (0.8, 1.8)	6.7 (2.2, 20.2) ^c
Age (years)	ref	1.0 (.98, 1.0)	1.0 (0.9, 1.1)
BMI **	ref	1.5 (1.4, 1.6) ^c	0.7 (0.6, 0.9) ^b
Married	ref	1.1 (0.8, 1.5)	0.2 (0.06, 0.8) ^a
Social Support	ref	0.7 (0.5, 1.0) ^a	0.2 (0.1, 0.5) ^c
Emotional Well-Being	ref	1.0 (.97–1.0) ^b	0.9 (.86–.95) ^c
Education	ref		
High school			
Some College		1.8 (1.1, 3.2) ^a	0.4 (0.09, 1.6)
Completed College		1.5 (0.8, 2.6)	0.4 (0.08, 1.5)
Graduate Degree		.98 (0.6, 1.6)	0.1 (0.02, 0.6) ^b
Menopause Status	ref		
OCP/Premenopause			
Perimenopause		1.5 (0.9, 2.6)	2.7 (0.4, 16.9)
Postmenopause/Hysterectomy		1.4 (0.9, 2.0)	3.3 (0.7, 15.7)
Comorbidities	ref		
None			
1–2		2.2 (1.5, 3.2) ^c	2.2 (0.5, 9.2)
3		2.2 (1.3, 3.8) ^b	7.2 (1.7, 31.1) ^b

* Response to the question “Do you think your current weight is healthy?” yes (referent); no, I weigh too much; or no I don’t weigh enough.

** BMI: Body Mass Index = Weight (kilograms)/height (meters²)^a p 0.05,^b p 0.01,^c p 0.001

Table 3

Multivariable Models examining association of sociodemographic characteristics and weight perception *

Characteristic	Weight Perception, RRR (95% CI)		
	Healthy (N=181)	Too Much (N=493)	Not Enough (N=15)
Black	ref	0.4 (0.2, 0.9) ^a	14.2 (1.8, 110) ^b
Age (years)	ref	1.0 (0.9, 1.1)	1.1 (0.9, 1.3)
BMI **	ref	1.6 (1.4, 1.7) ^c	0.6 (0.4, 0.8) ^c
Married	ref	1.4 (0.9, 2.3)	0.7 (0.1, 4.4)
Social Support	ref	0.8 (0.5, 1.3)	0.4 (0.1, 1.5)
Emotional Well-Being	ref	1.0 (0.9, 1.0)	0.9 (0.8, 0.9) ^b
Education	ref		
High school			
Some College		2.2 (0.9, 5.1)	2.2 (0.3, 17.6)
Completed College		3.5 (1.5, 8.4) ^b	0.6 (0.05, 8.2)
Graduate Degree		2.6 (1.1, 5.8) ^a	0.3 (0.03, 4.0)
Menopause Status	ref		
OCP/Premenopause			
Perimenopause		1.3 (0.6, 2.6)	7.3 (0.5, 106)
Postmenopause/Hysterectomy		1.1 (0.5, 2.4)	1.4 (.08, 23.2)
Comorbidities	ref		
None			
1–2		1.5 (0.9, 2.4)	0.2 (0.2, 1.5)
3		0.4 (0.2, 1.1)	0.9 (0.08, 10.6)

* Response to the question “Do you think your current weight is healthy?” yes (referent); no, I weigh too much; or no I don’t weigh enough.

** BMI: Body Mass Index = Weight (kilograms)/height (meters²)

^a p 0.05,

^b p 0.01,

^c p 0.001