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# The Association Between Obesity and Weight Loss Intention Weaker Among Blacks and Men than Whites and Women

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**Abstract**
*Introduction* Although obesity is associated with weight loss intention, the magnitude of this association may differ across various populations. Using a nationally representative data of the USA, this study tested the variation of the association between obesity and weight loss intention based on race and gender.
*Methods* Data came from the National Survey of American Life (NSAL), 2001–2003, which enrolled 5810 nationally representative sample of adults (3516 African-Americans, 1415 Caribbean Blacks, and 879 non-Hispanic Whites). Socio-demographics, body mass index (BMI), and weight loss intention were measured. We fitted logistic regression models in the pooled sample with weight loss intention as the outcome, obesity (BMI>30) as the predictor, while the effect of covariates was controlled. To test our moderation hypotheses, we entered race×obesity and gender×obesity interactions to the model.
*Results* Although the association between obesity and weight loss intention was significant among both race and gender groups, the magnitude of the association between obesity and weight loss intention was larger for women than men and Whites than Blacks. This finding suggests that individuals with obesity have less intention for weight loss if they are Black or men.
*Conclusion* The link between obesity and weight loss intention depends on race and gender. Weight loss intention may not increase in response to obesity among Blacks and men, compared to Whites and women. Healthy weight programs in the USA may benefit from tailoring based on race and gender.

**Keywords** Obesity · Weight loss intention · Race · Ethnic groups · Gender

## Introduction

In a dose-dependent fashion, obesity increases the risk of cardiovascular disease and premature death [1]. Time lived with obesity increases the risk of cardiovascular mortality, independent of body mass index (BMI) [2]. Obesity increases risk of hypertension [3], diabetes [4], metabolic syndrome [5], and stroke [6]. Health care cost attributable to obesity has exceeded the expenditures attributed to smoking and problem drinking [7]. Compared to those with normal weight, individuals with obesity use more physician visits, spend more time in the hospital, use medications, and miss more work days [8, 9].

Obesity is a major contributor to racial health disparities in the USA [10]. Compared to non-Hispanic Whites, Blacks are 50 % more likely to be obese, while the additional risk is 80 % for Black women. This figure suggests that four out of five Black women are overweight or obese [11].

Although weight loss intention has a distribution in the general population [12], very few community-based studies have focused on determinants intention for weight loss at the population level [13]. Design and implementation of healthy weight programs, however, require knowledge about factors associated with intention for weight loss [14]. Community-based research on social, psychological, and biological correlates of weight loss intention will improve the efficacy of healthy weight programs among populations, including minority groups [15, 16]. Despite the literature suggesting that

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obesity [17], perceived obesity [15], race [18–21], and gender [22, 23] influence weight control intention [15], our knowledge is very limited on the contextual effects of race and gender on the association between weight and intention for weight loss.

In the United States, race, ethnicity, and gender shape correlates of obesity [30, 31]. Race and gender may also determine the links between weight, perceived weight, and intention to control weight. In that study, perceived weight seemed to mediate the association between actual weight and the intention to lose weight among White women and Black men, but not White men or Black women [24].

In response to the knowledge gap on the role of gender and race on the link between obesity and weight loss intention, the current study aimed to investigate if the link between obesity and weight loss intention is different across groups based on race and gender. To provide results generalizable to the USA, this study used data from the National Survey of American Life (NSAL), a nationally representative survey of Blacks in America [25].

## Methods

The National Survey of American Life (NSAL) was completed between February 2001 and June 2003. The study protocol was approved by the Institutional Review Board of the University of Michigan, Ann Arbor. All participants gave consent for participation.

### Participants

The NSAL included non-Hispanic Whites and Blacks. Our study included 5810 individuals including 3516 African-Americans, 1415 Caribbean Blacks, and 879 non-Hispanic Whites.

The NSAL sampling was a national household probability sample of individuals 18 years and older [25, 26]. African-Americans and Whites were residents of either large cities or other urban and rural areas; however, Caribbean Blacks were sampled from large cities only.

### Interview

Data was collected through face-to-face computer-assisted (86 %) or telephone (14 %) interview. Interviews lasted an average of 140 min. All interviews were performed in English. The final response rate was 72.3 % overall.

### Measures

Socio-demographics including age, race, gender, employment status, education level, and country region were measured.

**Obesity** BMI was calculated based on self-reported weight and height, which is shown to be highly correlated with BMI based on direct measures of height and weight [27]. This approach may result in some underestimation of weight and overestimation of height [28], leading to low estimates of overweight and obesity [29]. BMI was dichotomized to healthy weight (BMI between 18.5 and 24.9)/ overweight (BMI between 25.0 and 29.9), versus any level of obesity, composed of class I (BMI between 30.0 and 34.9), class II (BMI between 35.0 and 39.9), or class III (BMI greater than 40.0) of obesity [30, 31].

**Weight Loss Intention** The main outcome in this study was intention for weight loss, measured by the following single item measure: Are you currently trying to lose weight? Responses included yes, no, and don't know.

### Statistical Analysis

Stata 13.0 was used for data analysis. For univariate analysis, weight-adjusted survey proportions and their 95 % confidence intervals were reported. Subpopulation commands were used for data analysis. Multiple logistic regressions were used for multivariable analysis, by considering intention for weight loss as outcome, obesity (BMI>40) as predictor, and race and gender as moderators. Model I did not include any interaction term. Models II and III included interactions between obesity×gender and obesity×race, respectively. Model IV included both interactions simultaneously. Adjusted odds ratio (OR) and 95 % confidence interval (CI) were reported. *P* values less than .05 were considered statistically significant.

## Results

A total of 5810 adults (3516 African-Americans, 1415 Caribbean Blacks, and 879 non-Hispanic Whites) were entered into this study. Compared to men, women reported higher intention for weight loss. Compared to Blacks, Whites also reported higher intention to lose weight (Table 1).

### Model I

Based on model I, obesity, female gender, and high education were positively associated with intention to lose weight, while being Black was associated with lower weight loss intention (Table 2).

### Model II

Based on model II, obesity and high education were positively associated with intention to lose weight, while being Black was associated with lower intention to lose weight. This model suggested that the effect of obesity on intention to lose weight was higher among women than men; however, gender lost its main effect on the outcome (Table 3).

**Table 1** Body mass index and intention to lose weight among Caribbean Black, African-American, and White men and women

| | Caribbean Black | | | | African-Americans | | | | Non-Hispanic Whites | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Women | | Men | | Women | | Men | | Women | | Men | |
| | % | 95 % CI | % | 95 % CI | % | 95 % CI | % | 95 % CI | % | 95 % CI | % | 95 % CI |
| Obesity | | | | | | | | | | | | |
| Overweight | 36.4 | (32.9–39.9 | 40.6 | (35.6–45.6) | 27.8 | (26.0–29.6) | 29.7 | (26.5–32.9) | 46.0 | (38.9–53.1) | 37.1 | (29.7–44.6) |
| Obesity class I | 32.2 | (27.9–36.5) | 40.6 | (32.9–48.2) | 30.8 | (28.5–33.1) | 40.8 | (38–43.5) | 23.1 | (15.5–30.6) | 40.1 | (34.3–45.9) |
| Obesity class II | 16.2 | (12.7–19.7) | 12.8 | (5.7–19.8) | 22.5 | (20.4–24.6) | 18.9 | (16.6–21.1) | 17.5 | (14.0–21.0) | 17.5 | (12.1–22.8) |
| Obesity class III | 9.3 | (5.3–13.4) | 5.5 | (1.1–9.9) | 11.0 | (9.3–12.7) | 6.6 | (5.3–8) | 8.8 | (5.6–12.0) | 3.8 | (1.6–5.9) |
| Weight control intention | | | | | | | | | | | | |
| No | 47.1 | (40.1–54.1) | 73.3 | (61.4–85.2) | 48.7 | (45.5–51.9) | 67.8 | (64.9–70.7) | 47.0 | (42.052.1) | 62.6 | (58.9–66.3) |
| Yes | 52.9 | (45.9–59.9) | 26.7 | (14.8–38.6) | 51.3 | (48.1–54.5) | 32.2 | (29.3–35.1) | 53.0 | (47.958.0) | 37.4 | (33.7–41.1) |

### Model III

Based on model III, obesity, female gender, and high education were positively associated with intention to lose weight, while the effect of obesity on intention to lose weight was smaller for Blacks than Whites. Being Black lost its main effect on intention to lose weight in this model (Table 4).

### Model IV

Obesity and high education were associated with higher intention to control weight, while race and gender did not have main effects on intention to control weight. Region was also not linked to the outcome. Based on this model, the effect of obesity on intention to control weight was larger among women than men and smaller among Blacks than Whites (Table 5).

**Table 2** Summary of regression model I without any interaction terms on weight loss intention

| | Odds ratio | [95 % CI] | | *P* value |
|---|---|---|---|---|
| Obesity (BMI>30) | 4.740 | 3.816 | 5.888 | <0.001 |
| Blacks[a] | 0.831 | 0.698 | 0.990 | 0.038 |
| Female[b] | 1.768 | 1.505 | 2.077 | <0.001 |
| Age | 0.999 | 0.994 | 1.005 | 0.843 |
| Education[c] | | | | |
| 12 years | 1.421 | 1.130 | 1.788 | 0.003 |
| 13–15 years | 1.900 | 1.476 | 2.445 | <0.001 |
| 16 years or more | 2.425 | 1.809 | 3.251 | <0.001 |
| Region **** | | | | |
| Midwest | 1.144 | 0.914 | 1.431 | 0.235 |
| South | 1.106 | 0.926 | 1.321 | 0.261 |
| West | 1.035 | 0.656 | 1.634 | 0.881 |
| Intercept | 0.121 | 0.086 | 0.171 | <0.001 |

[a] Reference group; Whites

[b] Reference group; Whites

[c] Reference group; 11 years or less

[d] Reference group; northeast

## Discussion

Based on the current study, race and gender change the magnitude of the association between obesity and the weight loss intention in the USA. Obesity may result in lower levels of weight loss intention among Blacks and men.

Similar to the literature, women in this study were more likely to identify themselves as overweight and are more

**Table 3** Summary of regression model II with the interaction term between gender and obesity on weight loss intention

| | Odds ratio | [95 % CI] | | *P* value |
|---|---|---|---|---|
| Obesity | 6.986 | 4.956 | 9.847 | <0.001 |
| Blacks[a] | 0.830 | 0.695 | 0.992 | 0.041 |
| Female[b] | 1.138 | 0.862 | 1.503 | 0.358 |
| Age | 0.999 | 0.994 | 1.004 | 0.775 |
| Education[c] | | | | |
| 12 years | 1.426 | 1.132 | 1.795 | 0.003 |
| 13–15 years | 1.914 | 1.483 | 2.471 | <0.001 |
| 16 years or more | 2.400 | 1.773 | 3.249 | <0.001 |
| Region[d] | | | | |
| Midwest | 1.144 | 0.916 | 1.429 | 0.232 |
| South | 1.110 | 0.930 | 1.325 | 0.243 |
| West | 1.034 | 0.653 | 1.638 | 0.884 |
| Obesity# Female | | | | |
| 0#Female | 1.927 | 1.358 | 2.734 | <0.001 |
| Intercept | 0.168 | 0.122 | 0.231 | <0.001 |

[a] Reference group; Whites

[b] Reference group; Whites

[c] Reference group; 11 years or less

[d] Reference group; northeast

**Table 4** Summary of regression model III with the interaction term between race and obesity on weight loss intention

| | Odds ratio | [95 % CI] | | *P* value |
|---|---|---|---|---|
| Obesity (BMI>30) | 3.764 | 2.542 | 5.575 | <0.001 |
| Blacks[a] | 1.117 | 0.797 | 1.567 | 0.515 |
| Female[b] | 1.767 | 1.504 | 2.076 | <0.001 |
| Age | 0.999 | 0.994 | 1.005 | 0.835 |
| Education[c] | | | | |
| 12 years | 1.416 | 1.118 | 1.793 | 0.004 |
| 13–15 years | 1.908 | 1.482 | 2.455 | <0.001 |
| 16 years or more | 2.411 | 1.786 | 3.256 | <0.001 |
| Region[d] | | | | |
| Midwest | 1.133 | 0.911 | 1.410 | 0.256 |
| South | 1.109 | 0.931 | 1.320 | 0.242 |
| West | 1.039 | 0.654 | 1.651 | 0.870 |
| Obesity# Blacks | 0.642 | 0.421 | 0.979 | 0.040 |
| Intercept | 0.130 | 0.089 | 0.189 | <0.001 |

[a] Reference group; Whites

[b] Reference group; Whites

[c] Reference group; 11 years or less

[d] Reference group; northeast

likely to report intention to lose weight [32, 33]. Women report higher motivation to lose weight possibly due to their higher perceived societal pressure to be thin and general concerns with their appearance. This is in line with the literature that suggests that women are more health conscious than men [34].

**Table 5** Summary of regression model IV with two interaction terms between gender×obesity and race×obesity on weight loss intention

| | Odds ratio | [95 % CI] | | *P* value |
|---|---|---|---|---|
| Obesity (BMI>30) | 5.541 | 3.370 | 9.108 | <0.001 |
| Blacks[a] | 1.133 | 0.808 | 1.588 | 0.464 |
| Female[b] | 1.123 | 0.853 | 1.479 | 0.403 |
| Age | 0.999 | 0.994 | 1.004 | 0.761 |
| Education[c] | | | | |
| 12 years | 1.420 | 1.122 | 1.798 | 0.004 |
| 13–15 years | 1.926 | 1.492 | 2.485 | <0.001 |
| 16 years or more | 2.385 | 1.748 | 3.254 | <0.001 |
| Region[d] | | | | |
| Midwest | 1.132 | 0.913 | 1.404 | 0.253 |
| South | 1.113 | 0.936 | 1.323 | 0.221 |
| West | 1.039 | 0.650 | 1.661 | 0.871 |
| Obesity# Blacks | 0.625 | 0.411 | 0.949 | 0.028 |
| Obesity# Female | 1.967 | 1.401 | 2.761 | <0.001 |
| Intercept | 0.183 | 0.131 | 0.255 | <0.001 |

[a] Reference group; Whites

[b] Reference group; Whites

[c] Reference group; 11 years or less

[d] Reference group; northeast

Our results suggest that individuals with obesity have body dissatisfaction and want to engage in weight management behaviors that may lower their weight. Although not studied here, such behaviors include an increased intake of fruits and vegetables, or reduction in intake of high calorie foods, or an increase in exercise and physical activity [35, 36]. Future research should test if race and gender influence the behavioral translation of intention as well.

Culture may influence how life style factors such as unhealthy diet and physical inactivity contribute to excess weight [37]. Our information, however, is limited on how pathways with end results of obesity and metabolic syndromes among minority groups. Additionally, very few data exists on how Blacks and Whites differ in complex ways by which their attitude about self and weight perception inform weight-related behaviors [38]. Thomas posits that among ethnic minorities, historical, social, and cultural forces affect how attitudes and perceptions determine the lifestyle behaviors that translate to obesity [39].

This study adds to the existing knowledge on gender and race differences [40–53] particularly the effect of obesity on intention for weight loss [54–57]. Based on psychological theories such as reasoned action and planned behavior, however, intention is the strongest predictor of behaviors [58–60]. The associations between actual weight, weight perception, body dissatisfaction, weight loss intention, weight loss behaviors, and mental health are complex and may be under the influence of race, gender, ethnicity, and their intersections [61–65].

Our results may have important public implications for health promotion of over-weight and obese individuals [66]. Thus, universal healthy weight programs may have lower efficacy, unless the intervention program designs are informed by factors that explain predictors of weight specifically in each population.

Our findings suggest that healthy weight programs should be tailored based on race and gender of the target individual [67]. Future research should test if such tailoring increases the efficacy of healthy weight programs among minorities. This is critical as even modest weight loss may lower risk of coronary heart disease, hypertension, diabetes, hyperlipidemia, cardiorespiratory failure, and several other chronic diseases [68, 69].

Over 60 % of the US population is either overweight or obese [70–72]. Causing approximately 300,000 deaths each year, obesity is only second to cigarette smoking as the leading cause of death [73]. With the current trend for obesity [74], an increase in the obesity-related mortality and morbidity is expected in the near future [75]. These findings are particularly important because the existing trend in the epidemic of obesity has been attributed to the increase in unhealthy lifestyle rather than genetics [70, 71]. These concerns have

increased the attention of public health authorities to programs that promote weight loss intention among obese individuals [76].

Our findings may have important implications for healthy weight interventions and weight reduction programs among minority populations in the USA. While obesity increases mortality rates from all causes, and especially CVD by 50 to 100 % [77], even small weight loss reduces the risk of complications associated with obesity. Fortunately, even the beneficial effects of minimal weight loss will be significant [78].

Our study had a few limitations. A single item was used to measure intention for weight loss. Obesity was measured using self-reported data on weight and height. Although social norms and normative beliefs may predict intentions for weight control [80], we did not measure social norms related to thinness or obesity [79]. In addition, we used data from the National Survey of American Life, which was collected more than a decade ago, as obtaining more recent data was not possible. Finally, intention to lose weight but not the weight loss itself was the outcome [81]. Large sample size and nationally representative sample were two major strengths of this study.

In summary, gender and race change the link between obesity and intention to lose weight. The association between obesity and weight loss intention seems to be stronger among women and Whites than men and Blacks, respectively.

**Conflict of interest** Shervin Assari and Maryam Moghani Lankarani declare that they do not have any conflicts of interest.

Shervin Assari designed the work, analyzed the data, and drafted the manuscript. Maryam Moghani Lankarani contributed to the manuscript drafting and revision.

Publicly available data has been used. Informed consent was obtained from all individual participants included in the study. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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