Ethnic Differences in the Self-Recognition of Obesity and Obesity-Related Comorbidities: A Cross-Sectional Analysis

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BACKGROUND: Obesity and its related co-morbidities place a huge burden on the health care system. Patients who know they are obese may better control their weight or seek medical attention. Self-recognition may be affected by race/ethnicity, but little is known about racial/ethnic differences in knowledge of obesity's health risks.

OBJECTIVE: To examine awareness of obesity and attendant health risks among US whites, Hispanics and African-Americans.

DESIGN: Cross-sectional self-administered survey.

PARTICIPANTS: Adult patients at three general medical clinics and one cardiology clinic.

MAIN MEASURES: Thirty-one questions regarding demographics, height and weight, and perceptions and attitudes regarding obesity and associated health risks. Multiple logistic regression was used to quantify the association between ethnicity and obesity awareness, controlling for socio-demographic confounders.

KEY RESULTS: Of 1,090 patients who were offered the survey, 1,031 completed it (response rate 95%); a final sample size of 970 was obtained after exclusion for implausible BMI, mixed or Asian ethnicity. Mean age was 47 years; 64% were female, 39% were white, 39% Hispanic and 22% African-American; 48% were obese (BMI ≥ 30 kg/m²). Among obese subjects, whites were more likely to self-report obesity than minorities (adjusted proportions: 95% of whites vs. 84% of African-American and 86% of Hispanics, $P = 0.006$). Ethnic differences in obesity recognition disappeared when BMI was >35 kg/m². African-Americans were significantly less likely than whites or Hispanics to view obesity as a health problem (77% vs. 90% vs. 88%, $p < 0.001$); African-Americans and Hispanics were less likely than whites to recognize the link between obesity and hypertension, diabetes and heart disease. Of self-identified obese patients, 99% wanted to lose weight, but only 60%

received weight loss advice from their health care provider.

CONCLUSIONS: African-Americans and Hispanics are significantly less likely to self report obesity and associated health risks. Educational efforts may be necessary, especially for patients with BMIs between 30 and 35.

KEY WORD: obesity; ethnic difference; self recognition.

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BACKGROUND

Obesity is epidemic in the US and other Western countries. Currently nearly one-third of Americans are obese.¹ Data from the National Health and Nutrition Examination Survey (NHANES) show that the prevalence of obesity in US adults has increased dramatically since 1960, and now approaches 34%.^{1,2} Annual mortality attributable to obesity in US adults has been estimated at between 280,000 and 325,000.³

Although the disparity in obesity by socioeconomic status (SES) has decreased over the past 3 decades, ethnic and racial disparity persists.^{1,4} Obesity is more prevalent in non-Hispanic black adults (44%) than in Mexican-American (39%) or non-Hispanic white adults (32%).² The higher prevalence of obesity-related co-morbidities such as hypertension, diabetes mellitus and coronary heart disease among minority groups^{1,5} challenges health care providers to improve education and care provided to these groups. Racial/ethnic differences in weight misperception have also been reported; weight underestimation was more common in blacks and Mexican-Americans than in whites, and more common in men than women.⁶⁻⁸ However, previous studies have not evaluated recognition of obesity (as opposed to overweight), have not included non-Mexican Hispanics, and have not assessed ethnic differences in awareness of obesity-related comorbidities such as diabetes, cardiovascular disease and early mortality.

According to the Health-Belief model, perceived personal susceptibility increases prevention and treatment seeking behaviors.^{9,10} Thus, recognition of one's own obesity and its health risks is a prerequisite to seeking treatment. To

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examine self-recognition of obesity and awareness of associated health problems in a sample of US adult patients, we administered a survey to adult patients in four ambulatory clinics. Based on previous studies, we hypothesized African-American and Hispanic patients would be less likely than white patients to recognize themselves as obese, viewing their weight as normal. We further hypothesized that this lack of recognition would lead African-American and Hispanic patients to underestimate the health risks of obesity.

METHODS

We conducted a cross-sectional survey of adult patients visiting three general medicine clinics and one cardiology clinic associated with Baystate Health (BH) during March and April 2008. The sites were chosen because they serve a mixture of white, African-American and Hispanic patients, and are teaching sites affiliated with Baystate Health. Medical assistants distributed the survey to consecutive adult patients (aged ≥ 18 years) at check-in, during which the patient was weighed. Participants needed to be literate in either English or Spanish. Patients were informed that the survey was anonymous and voluntary, and completion implied consent. No incentive or assistance was provided, and no attempt was made to characterize patients who refused the survey or did not return it. Patients completed the questionnaires in the waiting area and returned them to the medical assistants. The study protocol was approved by Baystate Medical Center's Institutional Review Board.

Survey Design

The survey (see online appendix) was created primarily by the investigators with input from clinical staff and physician from the sites. An initial pilot study to assess the logistics of administering and collecting the survey forms was performed; no questions were modified as a result of the pilot study. The questionnaire consisted of 31 questions: 7 demographic questions, 1 direct question about racial/ethnic identity and 7 questions regarding beliefs about obesity. Demographic questions included age (in years); gender; primary language (English, Spanish and other); education level (categorized in four levels: high school, college, graduate school or other); current employment status (yes or no); income ($< \$10,000$, $\$10,000$ – $50,000$, $\$50,000$ – $100,000$ and $> \$100,000$) and marital status (single, married, divorced, partnered). For race/ethnicity, respondents were asked which best described their cultural background: African-American, Hispanic, white or Asian. Patients reported their current weight and height as measured on the day of clinic visit. Body mass index (BMI) was calculated in kg/m^2 ; we used a standard definition of BMI to classify individuals as normal ($\text{BMI} \leq 25$), overweight ($\text{BMI} 25.1$ to 29.9) or obese ($\text{BMI} \geq 30$). BMI is a widely used index for weight adjusted for height and has accurate correlation with adverse health effects, including mortality.^{11,12}

The two primary correlates of the study, self-perception of obesity and awareness of obesity's link to health problems, were assessed by the questions: "Do you think that you are obese?" and "Do you consider obesity to be a health problem?"

Knowledge of obesity's association with specific health outcomes (e.g., early mortality) was assessed using true/false questions (questions 14–18). All participants completed the demographic and knowledge components of the survey (questions 1–21). Participants who identified themselves as obese were also instructed to complete the second half of the questionnaire (questions 22–31). This consisted of questions regarding the effect of obesity on physical activity and quality of life, discussions with their physician about weight loss, patients' interest in weight loss and preferred weight loss treatments.

Statistical Analysis

Statistical analyses were performed using STATA version 10.1 (© 2009, StataCorp LP, College Station, TX). Data were analyzed with mean $\pm$ SD or proportions where appropriate. Differences in perception of obesity, awareness of related cardiovascular risks, effects of obesity on health and any discussion of the obesity issue with their physicians among three racial/ethnic groups were analyzed using χ^2 or Fisher's exact tests. Multivariate logistic regression was used to derive odds ratios and adjusted proportions (fitted values) to quantify ethnic differences in obesity perception, controlling for demographic and socioeconomic confounders. A two-sided alpha of 0.05 was specified for all tests of significance.

RESULTS

Of 1,090 patients approached, 33 patients refused to participate and 26 forms were returned without being completed, leaving a total 1,031 completed questionnaires (response rate 95%). Additional respondents were excluded for missing ($n=31$) or implausible ($n=4$) BMIs, or self-reported ethnicity that was either missing ($n=10$), Asian ($n=9$) or mixed ($n=7$), leaving a final sample size of 970.

Characteristics of the sample are summarized in Table 1. The mean age was 47.4 (SD 15.4) years, and 64% were female. The mean BMI was 30.7 (SD 7.2) kg/m^2 , with nearly half (49%, 95% CI 45% to 52%) of the sample meeting criteria for obesity. White subjects were older, had higher incomes and were less likely to be obese than non-white subjects. Twenty-two percent of the remaining subjects were missing at least one variable necessary for multivariate analysis (e.g., income, education, age, sex). Subjects with missing data were significantly older (7.43 years, 95% CI 5.20, 9.67), more likely to be non-white (OR 2.82, 95% CI 1.93, 4.12) and less likely to believe they were obese (OR 0.63, 95% CI 0.45, 0.87).

Overall, most respondents believed that obesity is a health problem, that it is treatable, and that it is associated with heart disease, high blood pressure diabetes and early death (Table 2). Significant differences in recognition existed along racial/ethnic lines even after adjustment for confounders: awareness for most associations was highest in white respondents, intermediate in Hispanic respondents and lowest in African-American respondents. Among subjects with $\text{BMI} \geq 30 \text{ kg}/\text{m}^2$, most (74%, 95% CI 70% to 78%) were aware of their own obesity. African-American and Hispanic patients were significantly less likely than white patients to recognize their

Table 1. Sample Characteristics By Race/Ethnicity

	White	Hispanic	African-American	P-value
n (Percent)*	383 (40%)	375 (39%)	212 (22%)	
Demographics				
Age/SD, in years	52.7/ 16.2	43.4/ 14.1	44.6/ 12.8	<0.001†
Female	246 (65%)	241 (65%)	130 (61%)	0.65††
Income ≥50K	98 (26%)	2 (1%)	7 (4%)	<0.001††
Employed	190 (56%)	129 (37%)	102 (53%)	<0.001††
Education				<0.001††
HS	146 (39%)	222 (68%)	127 (63%)	
College	171 (46%)	76 (23%)	65 (32%)	
Graduate school	54 (15%)	30 (9%)	10 (5%)	
Health				
Ever-smoker	219 (59%)	174 (49%)	109 (56%)	0.03††
History of heart disease	94 (25%)	59 (17%)	36 (16%)	0.007††
Hospitalized for heart disease	73 (19%)	49 (14%)	27 (13%)	0.05††
BMI category				
Normal (<25 kg/m ²)	108 (28%)	72 (19%)	29 (14%)	<0.001††
Overweight (25 kg/m ² to >30)	124 (32%)	105 (28%)	62 (29%)	
Obese (≥30 kg/m ²)	151 (40%)	198 (53%)	121 (57%)	

*Raw numbers may not correspond to percentages as denominators may differ due to missing data. †P-values derived from one-way ANOVA F-test for equality of means (continuous). P<0.05 suggests that at least one group's mean age differs significantly from the others. ††P-values derived from Fisher's exact test or Pearson's χ^2 (categorical). P<0.05 suggests that at least one group's proportion differs significantly from the others

Table 2. Knowledge of Obesity Health Risks in Overall Sample, Adjusted Proportions*

	White	Hispanic	African-American	Omnibus P-value
	n=383	n=383	n=383	
	% Report	% Report	% Report	
Obesity is a health problem†	90	88	77	0.001
Obesity is treatable‡	99	92	87	<0.001
Obesity is related to Heart disease‡	94	78	73	<0.001
High blood pressure‡	93	79	73	<0.001
Diabetes‡	93	81	82	0.001
Early death‡	97	79	73	<0.001
Self-report obesity (if obese)‡,§	95	86	84	0.006

*Adjusted for age, Ssex, income and education. †African-American significantly lower than Hispanic and white (P≤0.001 both). Hispanic vs. white NS (P=0.4). ‡Proportions for white subjects higher than Hispanic or African-American respondents (P≤0.005, all comparisons). African-American vs. Hispanic NS (P=0.7). §Additional adjustment for BMI

own obesity (Table 3). After multivariate adjustment, women and patients with higher incomes were more likely than others to report themselves as obese. Self-recognition of obesity was not associated with education level, age or employment status (Table 3). Even though 22% of patients were excluded from multivariate models for missing demographics, we found similar differences by race upon re-analysis in the full data set. Ethnically based discrepancies in obesity recognition were most pronounced in obese patients whose BMIs were borderline (i.e., ≤35 kg/m²), where 75% of white patients, but only 58% of Hispanic and 44% of African-American patients, reported themselves to be obese (Fig. 1). However, recognition levels were similar in those with BMI ≥35 kg/m² [98% of white patients versus 93% of Hispanic (P=0.21) and 99% of African-American patients (P=0.70)].

Attitudes towards obesity and its treatment are summarized in Table 4. Most (80%, 95% CI 79% to 82%) self-identified obese respondents said that their weight had affected their health and lives, with Hispanics being the most likely and African-Americans being the least likely to report this. Only about half of respondents (59%, 95% CI 57% to 61%) reported that health care providers had discussed obesity and weight management with them. Provider discussion did not vary significantly according to race/ethnicity. Almost all (93%, 95% CI 93% to 94.0%) respondents said they had tried to lose weight, regardless of race/ethnicity, and of those who have tried, 55% (95% CI 53% to 58%) reported success. However, success was not associated with race/ethnicity, knowledge of obesity as a health problem, ever being told *not* to lose weight or discussions with a health care provider. The majority of self-identified obese subjects (87%, 95% CI 86% to 89%) expressed interest in treatment for their obesity. Hispanics were more likely than whites or African-Americans (P=0.02 for both comparisons) to state they were interested in treatment. Diet was the most popular weight loss treatment choice for African-American and white subjects, whereas medication was the most popular treatment for Hispanic subjects. Hispanics were significantly less interested in exercise than whites (40% vs. 67%; P=0.001) or African-Americans (40% vs. 71%; P≤

Table 3. Predictors of Self-Awareness of Obesity in Respondents with BMI≥30 kg/m²

Predictor	Odds ratio	Odds ratio
	Unadjusted	Adjusted*
Race		
White	1.00 Referent	1.00 Referent
AA	0.20 (0.10, 0.42)	0.30 (0.13, 0.73)
Hispanic	0.21 (0.11, 0.42)	0.39 (0.16, 0.94)
Male	0.52 (0.32, 0.85)	0.41 (0.22, 0.78)
Age†	1.01 (0.99, 1.03)	1.01 (0.99, 1.04)
BMI†	1.41 (1.27, 1.56)	1.46 (1.30, 1.64)
Income‡	1.93 (1.31, 2.84)	1.68 (0.99, 2.83)
Education		
<HS	1.00 Referent	1.00 Referent
College	2.66 (1.50, 4.69)	1.54 (0.75, 3.17)
Graduate	2.25 (0.89, 5.68)	1.27 (0.40, 4.04)

*Adjusted for gender, age (continuous), BMI (continuous), income (ordinal) and education (categorical). †Represents the change in odds of recognition for every 1 unit increase of predictor. ‡Represents the change in odds of obesity recognition for every 1-category increase of predictor

Figure 1. Discrepancies between obesity and self-report, by race/ethnicity. *AA vs. white, $P=0.046$. †Hispanic vs. white, $P=0.001$.

Table 4. Knowledge and Attitudes in Obese Subjects Who Self-Report Obesity Adjusted Proportions*

	White	Hispanic	African-American	Omnibus P-value
	n=150	n=197	n=120	
	% Report	% Report	% Report	
Obesity is a public health problem	99	94	99	0.05
Obesity has affected my life	80	86	77	0.25
Obesity has limited my activities	73	79	59	0.02
I have asked my doctor about treatment	40	50	32	0.13
My doctor has talked to me about obesity	55	67	57	0.49
I have been told not to lose weight	8	8	5	0.52
I have attempted to lose weight	96	95	96	0.98
I succeeded in attempts to lose weight	63	51	53	0.49
I would like to lose weight	98	99	99	0.97
I would be interested in any treatment	84	96	85	0.02
...Interested in diet control	83	67	76	0.07
...Interested in exercise	67	40	71	<0.001
...Interested in medication	52	70	48	0.02
...Interested in surgery	33	31	30	0.86

*Adjusted for age, sex, income, education and degree of obesity (BMI)

0.001), and significantly more interested in medications than whites (70% vs. 52%; $P=0.03$) or African-Americans (70% vs. 48%; $P=0.008$).

DISCUSSION

Results of this survey suggest that race/ethnicity affects not only recognition of one's own obesity, but also awareness of obesity's link to morbidity and mortality, and preferences for obesity treatment. These disparities hold even after adjustment for socioeconomic confounders. Previous studies have also shown that obesity awareness is inversely related to the prevalence of obesity in one's own ethnic/gender group.⁶ When the prevalence of obesity is higher in an ethnic group, obesity appears normal, and people may be less likely to recognize their own obesity. The difference in self-recognition of obesity and associated risk in different ethnic groups may also be due to differences in socio-culture, contextual body image, dietary habits and other factors.^{13,14} The problem is compounded by the fact that African-Americans have a lower mortality rate compared to whites at the same BMI^{15,16} and are thus somewhat protected from the effects of obesity.

Several studies, using NHANES or other national surveys, have examined the discrepancies between self-reported weight categories and ethnicity; in these studies, obese African-Americans and Mexican-Americans were more likely than obese whites to perceive their weight as normal.^{7,8} Although these studies did not use the word "obese," rates of recognition were almost identical to those that we observed. Our study extends these findings to an additional ethnic group, Hispanics primarily of Puerto Rican descent, whose recognition rate was similar to that of Mexican-Americans. In addition, we found that ethnic differences also influence awareness of obesity's link to diabetes, cardiovascular disease and early mortality, which might directly inform practice priorities in adult primary care settings.

Nearly all the patients in our study who recognized themselves to be obese expressed a desire to lose weight, and most reported that their weight has adversely affected their health and lives, but only about half of the subjects reported receiving weight loss advice from their health care provider. These findings suggest that opportunities exist for providers to discuss the presence, sequelae and treatments of obesity with affected patients, and that the need for discussion is particularly high for African-American and Hispanic patients, especially those with a BMI between 30 and 35. We also found that preferences for type of treatment varied by ethnicity, with whites and African-Americans preferring exercise, while Hispanic patients preferred medications. The reason for this preference is not known; future studies might explore beliefs and experiences related to both medication and exercise.

Our study had a number of strengths. First, we included a large ethnically and socio-economically diverse sample, including the predominant racial/ethnic groups of the eastern US. Second, the study design resulted in a very high response rate, so response bias is unlikely. Finally, all patients had

their weight checked in the clinic on arrival, increasing the accuracy of reported weights.

Our study also had several limitations. First, we employed a convenience sample from three general medicine clinics and one cardiology clinic; cardiology patients might have a better understanding of cardiovascular risks associated with obesity. We did not identify which surveys came from the cardiology clinic. Patients with heart disease were more likely than those without heart disease to know they were obese, but this finding did not reach statistical significance, and it did not alter the association between race and obesity awareness. Second, not all patients may share the same understanding of the word "obese," and it might not be their preferred term.¹⁷ Differences in recognizing obesity may therefore have had to do with interpretation rather than self-recognition. However, our results were almost identical to those of previous studies that used the term overweight, and the ethnic differences in self recognition disappeared above BMI of 35, implying that the difference had to do with threshold rather than understanding. Third, the anonymous nature of the study did not allow us to confirm reported weights. Patients reported weights after they were weighed at check-in. Even so, some may have underestimated their weight, in which case the problem of under-recognition is even worse than we report. Finally, our Hispanic population is comprised almost exclusively of patients of Puerto Rican heritage. Findings from this population may not be applicable to patients from other Hispanic cultures such as Mexican or Central American.

CONCLUSION

Treating obesity and its sequelae remains a challenge for primary care physicians. Our study offers some important lessons for those who treat obesity in minority populations. Because most people who recognized their own obesity had tried to lose weight regardless of ethnicity, physicians should strive to improve awareness of ideal body weight and the dangers of obesity, especially among ethnic minorities. In particular, providers should be aware that African-Americans and Hispanics with BMI between 30 and 35 often do not realize that they are obese. Once aware of their obesity and its health consequences, such patients would likely be interested in counseling about treatment options. The providers should then be cognizant that treatment preferences also vary with ethnicity. Tailoring treatments according to patient preference might lead to higher success rates in the treatment of obesity.

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