Objectives: To determine: 1) the prevalence of obesity; 2) how persons perceive their body mass; 3) how they thought men perceived the body mass of women; 4) beliefs about the relationship of obesity with health, wealth, and diet; and 5) the amount and type of exercise done.

Design: All eligible patients and accompanying persons present on random clinic sessions over a seven-week period.

Setting: Two adjacent public primary care clinics in Barbados.

Participants: 600 persons (response rate 95%) age \geq 15 years.

Results: 39% (17% of males and 45% of females) were obese (body mass index [BMI] ≥30 kg/m²), and 30% (48% of males and 24% of females) were overweight (BMI 25–29.9 kg/m²). Satisfaction with body image declined with increasing BMI (P<.001), but 46% of obese persons were happy with how their body looked.

The median image women selected from a body figure rating scale to represent their current size was not significantly different from the image they thought men preferred (P=.19) but was significantly larger than that chosen for ideal size (P<.001). Men selected a slightly smaller image compared to women (P=.04) for "the female image preferred by Barbadian men." Multivariate logistic regression showed that the likelihood of thinking that "men prefer women a little fat" was significantly increased by female sex (odds ratio [OR] 2.45, 95% confidence interval [CI] 1.4-3.3), increasing age (OR 1.02, 95% CI 1.01-1.03), and increasing BMI (OR 1.04, 95% CI 1.01-1.07). Respondents thought obesity could be caused by overeating (74%), and by heredity (72%), and 3% associated it with wealth. Being fat and a little fat were thought to be a sign of health by 2% and 27% respectively. Only 55% of respondents exercised with walking being done by 34%.

Conclusions: Females have a very high prevalence of obesity. Perceptions may be a barrier to motivation and behavior change required for weight reduction. (*Ethn Dis.* 2006;16:384–390)

Key Words: Behavior Change, Body Image, Obesity, Primary Care

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INTRODUCTION

The prevalence of obesity is increasing in Barbados,¹⁻⁵ a small Caribbean island with a predominately (95%) Black African population, and the associated epidemic of diabetes mellitus, hypertension, and cardiovascular disease is a cause for concern.⁶⁻⁸ National nutrition surveys in Barbados between 1969 and 1981 showed that in persons \geq 15 years of age, overweight (defined as 20% heavier than ideal weight) increased from 7% to 16% in men and from 32% to 38% in women.^{2,3} A similar survey carried out in 2000⁵ found that 56% of men and 64% of women age ≥ 18 years were either overweight or obese. In the International Collaborative Study on Hypertension in Blacks (ICSHIB) conducted in 1993,⁴ 31% of Barbadian women and 10% of men aged 24 to 75 years were obese (body mass index [BMI] \geq 31.1 for men and 32.3 for women), while 28% of women and 18% of men were overweight $(BMI \ge 27.8-31 \text{ for men and } 27.3-32.2)$ for women). Figures from the Barbados eve study⁸ estimated the prevalence of diabetes mellitus to be 18% in persons \geq 40 years of age. The prevalence of hypertension (BP ≥160/95 mm Hg or on treatment) was estimated in 1993 to be 45% in persons age 40-79 years.⁶

Perceptions and attitudes with respect to obesity are also a cause for concern. The belief that Caribbean men A similar survey carried out in 2000⁵ found that [in Barbados] 56% of men and 64% of women age \geq 18 years were either overweight or obese.

"like their women fat" has been linked to the historical background of the traditional African culture and the slavery experience.1 Hoyos and Clarke9 found in a previous study of persons attending a family practice clinic in Barbados that 46% of women and 17% of men were obese (BMI $> 27.4 \text{ kg/m}^2$ for men and $>27.0 \text{ kg/m}^2$ for women). In that study, fewer than half of the obese subjects considered themselves fat, and 40.6% of respondents were of the view that men liked women fat. Only 42.8% of respondents associated obesity with overeating. In the United States, the prevalence of obesity in African American women is greater than that found in White women.¹⁰ The mean body image size that Black women chose as ideal was significantly greater than that chosen by White women.¹¹

The aims of this study were to determine the prevalence of obesity in persons attending two public primary care clinics, one of which was the same family practice clinic surveyed by Hoyos and Clarke⁹; to investigate how these persons perceived their body mass and how they thought men perceived the body mass of women; to determine their beliefs about the relationship of obesity with health, wealth, and eating certain foods; and to determine the

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Fig 1. Body figure rating scale^{11,16} (adapted and reproduced with the permission of Stunkard et al¹⁶)

amount and type of exercise done by the respondents.

METHODS

Ethical approval for this study was obtained from the Ministry of Health, Barbados. The study was conducted at the General Practice Unit, Wildey, St. Michael, Barbados (a teaching family medicine practice of the University of the West Indies with 4000 registered patients), and the Edgar Cochrane Polyclinic, which is located in the same building. The two clinics surveyed are primary care centers attended mainly by working-class persons living in the surrounding area. All services, including medication, are free. Patients are seen by appointment and as walk-ins. In keeping with the high prevalence of diabetes⁸ and hypertension,⁶ many of the patients attending have these conditions. Patients with a wide range of other conditions are seen, including pregnant and postnatal women (not eligible for this study) and pediatric patients. Services offered include immunizations, family planning, and Pap smears.

The study was done on random clinic sessions over a seven-week span starting on June 5, 2001, and ending July 17, 2001. All patients and accompanying persons who attended the clinics during data-collection periods were eligible, providing they were >14 years of age and not pregnant or within three months of delivery. Informed consent was obtained. While awaiting attention, consenting participants were weighed and had their heights measured, with shoes removed, with a portable Weylux stadiometer with a sliding head plate and a scale, respectively. The body mass index (BMI) for each patient was calculated in kg/m².

In this study, BMI was used to measure obesity according to World Health Organization¹² and National Institutes of Health¹³ definitions: underweight (BMI <18.5 kg/m²), healthy weight (BMI 18.5–24.9 kg/m²), overweight (BMI 25–29.9 kg/m²) and obese (BMI \geq 30 kg/m²). This definition of overweight and obese has been shown on a population basis to be both sensitive and specific in separating fat from lean people.^{14,15}

After measurements were taken, a questionnaire was administered by one of the authors (J. Lynch). It included a female body figure rating scale (Figure 1).^{11,16} This scale consisted of a series of nine female images ranging from very thin to very obese. Women were asked to select the images that they felt best represented: 1) their current body size; 2) their ideal body size; and 3) the body size they thought men in Barbados would prefer. Men were asked to select the female image that they thought Barbadian males preferred. The questionnaire asked both men and women if they thought that men preferred women fat or a little fat; if they were satisfied with their body; if they thought they were fat, overweight, a little fat, the right

size or thin; causes of being a little fat; their desire to lose weight; and the amount of exercise they did.

Data were entered into the statistical software SPSS Graduate Pack 10.0 (SPSS Inc, Chicago, Ill) for Windows for statistical analyses. Median and mean body image sizes were calculated. For normally distributed continuous variables differences in means were assessed by the Student t test, and for non-normally distributed continuous variables the Mann-Whitney U test was used. Distributions of categoric variables were tested for significance by chi-square test. Spearman coefficient was used to determine the significance of correlations between non-normally distributed variables. Multivariate forward stepwise logistic regression analysis was carried out on all univariate associations of P < 0.1 with the outcome variable, agreement with the statement "men prefer their women fat or a little fat." P<.05 was considered statistically significant.

RESULTS

Six hundred and thirty persons were eligible to participate in the study. Thirty persons declined to take part, giving a response rate of 95.2%. Of the 600 respondents 129 (21.5%) were male and 471 (78.5%) were female. The median age of the males was 55 (interquartile range [IQR] 32–68) years and of females 43 (IQR 29–61) years (P=.002).

BMI Distribution

The mean BMI of males was 26.4 kg/m² (95% confidence interval [CI] 25.7–27.1) compared to 29.3 kg/m² (95% CI 28.7–29.9) for females (P<.001). Thirty nine percent of all respondents were obese (17% of males and 45% of females), and 30% were overweight (48% of males and 24% of females) (P<.001 for the difference between rates in males and females).

| Table 1. BMI of respondents by age and s |
|--|
|--|

| Age Groups (years) | | | | | | | | | | |
|--------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--|--|
| | BMI(kg/m ²) | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | ≤65 | Total | | |
| Male | | | | | | | | | | |
| Number | <18.5 | 1 | 0 | 0 | 0 | 0 | 2 | 3 | | |
| % | | 4.8% | 0% | 0% | 0% | 0% | 5.0% | 2.3% | | |
| | 18.5–24.9 | 14 | 6 | 2 | 5 | 6 | 9 | 42 | | |
| | | 66.7% | 42.9% | 15.4% | 31.3% | 24.0% | 22.5% | 32.6% | | |
| | 25-29.9 | 3 | 7 | 7 | 7 | 14 | 24 | 62 | | |
| | | 14.3% | 50% | 53.8% | 43.8% | 56.0% | 60.0% | 48.1% | | |
| | ≥30 | 3 | 1 | 4 | 4 | 5 | 5 | 22 | | |
| | | 14.3% | 7.1% | 30.8% | 25.0% | 20.0% | 12.5% | 17.1% | | |
| | Total | 21 | 14 | 13 | 16 | 25 | 40 | 129 | | |
| | | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | |
| Female | | | | | | | | | | |
| Number | <18.5 | 12 | 3 | 1 | 0 | 0 | 2 | 18 | | |
| % | | 13.0% | 4.1% | 1.3% | 0% | 0% | 2.1% | 3.8% | | |
| | 18.5-24.9 | 50 | 21 | 15 | 13 | 7 | 21 | 127 | | |
| | | 54.3% | 28.8% | 18.8% | 17.1% | 12.5% | 22.3% | 27.0% | | |
| | 25-29.9 | 15 | 16 | 18 | 17 | 16 | 33 | 115 | | |
| | | 16.3% | 21.9% | 22.5% | 22.4% | 28.6% | 35.1% | 24.4% | | |
| | ≥30 | 15 | 33 | 46 | 46 | 33 | 38 | 211 | | |
| | | 16.3% | 45.2% | 57.5% | 60.5% | 58.9% | 40.4% | 44.8% | | |
| | Total | 92 | 73 | 80 | 76 | 56 | 94 | 471 | | |
| | | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | |

Table 1 shows the distribution of BMI by age and sex. After 24 years of age, obesity in females rapidly rises. Underweight was rare (2.3% of males and 3.8% of females).

Satisfaction with Body Image

Satisfaction with body image decreased significantly with increasing BMI (P<.001) (Figure 2). Only 47 (7.9%) of the 594 respondents considered themselves to be fat, and these had a mean BMI of 36.5 (95% CI 34.5-38.5) kg/m². Two hundred and fortynine persons (41.9%) with a mean BMI of 25.7 (95% CI 25.1-26.3) kg/m² thought that they were the right size (Figure 3). Of obese persons who responded, 18%, 32%, 31%, 18%, and 2% thought they were fat, overweight, a little fat, the right size, or thin, respectively. The corresponding responses for overweight persons were 2%, 10%, 28%, 53%, and 7%, and for healthy weight and underweight individuals combined, 2%, 2%, 8%, 61%, and 27% (P<.001). Responses did not significantly differ by sex for any of the weight categories. For healthy-weight individuals, 24% thought that they were thin.

Body Figure Rating Scale

Correlation was high between BMI and the size of image chosen by women for both their current body size (P < .001) and ideal body size (P < .001).



Fig 2. Satisfaction with body image by BMI category. Total of 630 respondents P<.001 by chi square



Fig 3. Perception of body mass by mean BMI of respondents. N=number, M=mean

Table 2. Logistic regression relationships between age, sex, BMI, and opinion on

whether men prefer women a little fat or fat

| Univariate-Men Prefer Women a Little Fat | | | | | | | | | |
|--|-------------------|--------------|------------|-----------|--|--|--|--|--|
| | Number | P value | Odds Ratio | 95% CI | | | | | |
| Increasing BMI | 559 | .000 | 1.44 | 1.19–1.74 | | | | | |
| Increasing Age | 559 | .000 | 1.02 | 1.01-1.03 | | | | | |
| Sex (female compared to male) | 559 | .001 | 1.98 | 1.33-2.97 | | | | | |
| Multiva | ariate-Men Prefe | er Women a L | ittle Fat | | | | | | |
| | Number | P value | Odds Ratio | 95% Cl | | | | | |
| Sex (female compared to male) | 559 | .000 | 2.45 | 1.40-3.30 | | | | | |
| Increasing Age | 559 | .000 | 1.02 | 1.01-1.03 | | | | | |
| Increasing BMI | 559 | .006 | 1.04 | 1.01-1.07 | | | | | |
| U | nivariate-Men P | refer Women | Fat | | | | | | |
| | Number | P value | Odds Ratio | 95% CI | | | | | |
| Increasing BMI | 568 | .307 | 1.02 | .98–1.05 | | | | | |
| Increasing Age | 568 | .000 | 1.03 | 1.02-1.05 | | | | | |
| Sex (female) | 568 | .106 | 1.63 | .90-2.94 | | | | | |
| Mu | Iltivariate-Men I | Prefer Women | Fat | | | | | | |
| | Number | P value | Odds Ratio | 95% CI | | | | | |
| Increasing Age | 568 | .000 | 1.04 | 1.02-1.05 | | | | | |
| Cov (formale) | 568 | .012 | 2.20 | 1.19-4.08 | | | | | |

The median image selected by women for current size was 4 (IQR 3-5). This was the same as the median of 4 (IQR 3-5) chosen by women for the "female image preferred by Barbadian men" (P=.19) but was significantly larger than the median of 3 (IQR 2-4) chosen for ideal size (P<.001). Most women (95%) selected images 2-5 as representing their ideal self. When asked to select "the female image preferred by Barbadian men," men selected a slightly smaller image (median 4, IQR 3-4), compared to women (P=.04).

Preference for Women Being a Little Fat or Fat

Responses overlapped on the preference of men for the body size of women; 83 persons answered yes to both options (fat and a little fat). These persons were included in the analysis of both categories of body size preference.

Of the 559 persons who answered the question, 311 (55.6%) thought that men preferred women a little fat. Respondents who answered yes were significantly heavier (mean BMI 29.7 vs 27.4, P<.001), and older (median age 49, IQR 36-65 vs median age 38, IQR 24-59, P<.001) than the 44.4% who answered no. Women (59.5%) were more likely than men (42.5%) to answer yes (P=.001). Multivariate logistic regression showed that the likelihood of agreeing with "men prefer women a little fat" was significantly increased by female sex, increasing age, and BMI (Table 2).

Only 94 (16.5%) of 568 persons thought that men preferred fat women. They were older (median age 54 years, IQR 44-68) compared to those who thought men did not prefer women fat (median age 42 years, IQR 27-60) (P < .001). No significant difference by sex or mean BMI was seen. However, multivariate logistic regression showed that the likelihood of agreeing with "men preferring women fat" was significantly increased by female sex and increasing age but not by BMI (Table 2).

| Table 3. | Desired | weight | loss I | bv BMI | of res | pondents |
|----------|---------|----------|--------|--------|--------|-----------|
| Tuble 5. | Desireu | mensile. | 1033 | | orics | ponucitis |

| | Desired Weight Loss | | | | | | | | |
|--------|---------------------|--------------|-------------|-------------|-------------|-------------|-------------|---------------|--|
| | BMI | None | 1–5 lbs | 6–10 lbs | 11-20 lbs | 21-30 lbs | >30 lbs | Total | |
| N % | <18.5 | 21 100.0% | | | | | | 21 100.0% | |
| | 18.5–24.9 | 134 79.3% | 13 7.7% | 15 8.9% | 4 2.4% | 2 1.2% | 1 .6% | 169 100.0% | |
| | 25.0–29.9 | 79 44.6% | 28 15.8% | 34 19.2% | 18 10.2% | 13 7.3% | 5 2.8% | 177 100.0% | |
| | ≥30 | 32 13.7% | 21 9.0% | 35 15.0% | 30 12.9% | 32 13.7% | 83 35.6% | 233 100.0% | |
| | Total | 266 44.3% | 62 10.3% | 84 14.0% | 52 8.7% | 47 7.8% | 89 14.8% | 600 100.0% | |

P<.001 by chi-square test.

lbs=pounds.

Causes of Being a Little Fat or Fat

Overeating, foods high in fat and sugar, and heredity were associated by 74%, 78%, and 72% of persons, respectively, with being a little fat or fat. Eighty one percent thought being fat would make diabetes mellitus, hypertension, and elevated cholesterol more difficult to treat. While 27% thought being a little fat was a sign of health, only 1.7% thought being fat was healthy. Only about 3% of persons thought that persons who were fat or a little fat were wealthier than those who were not.

Desire to Lose Weight

Eighty-six per cent of obese persons, 55.4% of overweight persons, 20.7% of normal-weight persons, and no underweight persons wanted to lose weight (P<.001) (Table 3). Of obese persons, 22.7% wanted to lose between zero and five pounds. No significant difference by sex was seen.

Exercise

Two hundred and seventy three (45.5%) persons said they never exercised, while 92 (15.3%), 96 (16%), and 139 (23.2%), respectively, said that they exercised one to two times per week, three times per week, and more than three times per week. No significant difference in responses by BMI was seen. Results differed significantly by sex; 34.1% of males and 48.6% of females never exercised (P=.014). Of the 327 persons who exercised, 62.7% said that they walked regularly, 8.0% jogged, 5.8% went to the gym, and 1.5% swam.

DISCUSSION

The results show a high prevalence of overweight in men and obesity in females in the sampled clinic population. The rapid rise in prevalence of obesity with age in females is particularly worrying. This finding indicates that young women need to be specifically assessed and targeted for behavior change. Previous national nutrition surveys in Barbados have shown that females have a greater prevalence of obesity than males;^{2,3,5} the 2000 survey showed that >50% of women 18-29 years of age are overweight or obese. Using a different definition of obesity, Hoyos⁹ found in his 1984 study that 17% of men and 46% of women attending a family practice clinic were obese. If the same definition were used in our study carried out 17 years later, 36% of men and 86% of women would be defined as obese.

The body figure rating scale used in this study was previously used in Black populations.^{11,17} Current and ideal body size were correlated with BMI, and the body size women thought men preferred was significantly larger than the size women thought was ideal.¹⁷ Since most persons chose figures 2–5, increasing the discriminating value of the scale by having a larger choice of figures in this region might be preferable.

Attempts at behavior change should be initiated in primary care, even though tackling the obesity problem effectively will require additional public health initiatives to be taken that are beyond the usual scope of the family physician. Behavior-change strategies for weight loss at the primary care level should include more than giving the patient an exercise and diet prescription and expecting compliance. According to the transtheoretical model of Prochaska et al,¹⁸ the strategy used for behavior change must be tailored to where the individual lies along the stages of change. Similarly, Rollnick¹⁹ points out that the individual's readiness for change must be assessed, and this depends on the perception of the importance of the problem and the confidence in the ability to implement change. Therefore, the findings that only 18% of obese persons considered themselves fat and 46% were happy with their appearance; that 60% of overweight persons thought they were the right size or thin and 45% did not want to lose any weight; that the body size women thought men preferred was not significantly different to their current body size; and that 60% of women thought men preferred women a little fat all have to be taken into account. Women on average were of the impression that men liked them heavier than was actually the case.

Some of the findings of this study were less worrying. Women did choose on average an ideal body size that was smaller than their current size, 62% of obese persons wanted to lose >10 pounds, and knowledge had changed somewhat compared to what was seen in previous studies.^{3,9} Unlike the previous study by Hoyos,⁹ in which only \ldots this study has shown that when compared to population prevalence estimates²⁻⁵ obese persons are overrepresented in the sampled clinic population.

42.8% associated obesity with overeating, in our study $\approx 74\%$ of persons associated overeating with being a little fat and fat. Also unlike the previous study in which 30% of persons associated obesity with wealth, only 3% in our study made this association. Similar to our study, 19% of obese persons thought that they were the right size in the Hoyos study. The two studies may not be directly comparable because in addition to using the same teaching family practice, we sampled persons from the adjacent polyclinic. However, persons attending both of these clinics live in the same area and are of the same socioeconomic status.

In 1981 a National Health and Nutrition survey³ showed that only 4% of women thought obesity was associated with hypertension and 2% thought it was associated with diabetes. Fortunately, in this study population perception is largely correct; 81% realized that obesity can make these conditions more difficult to treat. Even though persons attending the clinics we surveyed are mainly working class, by attending a clinic they may be better educated about the effects of obesity than the general population. The magnitude of the change over time, however, suggests a significant improvement in knowledge. Thus the association of malnutrition, underweight, poor health, and poverty may no longer hold sway in Barbados, where even the poor are now obese.

A Barbados risk factor survey in 1993²⁰ showed that 53% of adults did no exercise above their normal daily

routines. These results are in keeping with our study. Exercise is important for any weight loss program; studies indicate that people who maintain weight loss best tend to be those who exercise most.²¹

The finding that 78.5% of persons surveyed were female has face validity in the primary care setting in Barbados, where women far outnumber men in the waiting room. Reasons for this include the following: women with their higher levels of obesity are more prone to chronic diseases as compared to the less obese males; some services offered such as family planning and Pap smears are directed toward women; children are usually accompanied by their mother rather than father; and healthy young males rarely attend. The previous study by Hoyos⁹ used a similar sampling method. Of the persons surveyed, 82% were female.

In conclusion, this study has shown that when compared to population prevalence estimates²⁻⁵ obese persons are overrepresented in the sampled clinic population. This finding reflects the fact that obese persons place a disproportionate burden on the primary healthcare services. Compared to previous studies,^{3,9} persons seem better educated about the causes and effects of obesity even though obesity prevalence has increased dramatically over the last 30 years in Barbados. The study shows that some degree of excess fat seems to be acceptable. This finding could be partially responsible for the high prevalence of obesity. The range of a person's response to carrying excess fat in Barbados could be different than what is found in other populations. A greater degree of excess fat than expected by healthcare personnel may be required to elicit a negative perception in the individual. Although a clinic population cannot be assumed to be representative of, or directly comparable to, the entire population, the findings of this study are still of importance to primary healthcare workers, as clinic attendees are the persons they come in contact with and might influence. These workers must recognize the extent of the obesity problem, the burden it is placing on health and resources, and the need for taking perception into account when prescribing behavior change.

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OBESITY IN PRIMARY CARE - Adams et al

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Acquisition of data: Adams, Lynch-Prescod Data analysis interpretation: Adams, Carter

Manuscript draft: Adams, Carter

Statistical expertise: Adams, Lynch-Prescod, Carter

Administrative, technical, or material assistance: Adams, Lynch-Prescod