



Original article

Body image (dis)satisfaction among low-income adult women

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SUMMARY

Background & aims: A better understanding of the factors that affect self-perception of body characteristics may play an important role in weight control practices. The objective of this study was to analyze body weight perception and body image satisfaction in low-income adult women in Southern Brazil.

Methods: This was a cross-sectional survey study in a cohort of women recruited from areas of social vulnerability in the city of Porto Alegre, RS. A random sample ($n = 218$) of women was interviewed, and socioeconomic and lifestyle factors, body image perception using the Stunkard Scale, body weight estimation, weight concern and duplicate anthropometric measurements were obtained.

Results: The average age of the low-income women was 56.3 ± 9.5 years. The prevalences of overweight and obese individuals were 34.1% and 52.5%, respectively. Among all women, 83.0% were dissatisfied with their body image, and 68.9% of the women estimated their body weight correctly. In addition to BMI (body mass index), the proportions of women with a higher income ($p = 0.05$), smoking history ($p < 0.01$) and history of hypertension ($p = 0.04$) were significantly different between groups according to body image satisfaction. Multivariate analyses using Poisson regression showed that black/mixed race, higher income, and underweight and obese women were more likely to be dissatisfied with their body image.

Conclusions: The majority of women know their body weight and have body image dissatisfaction. Skin color, higher income and BMI were significantly associated with dissatisfaction. In addition, these women consider the “healthiest” body image to be thinner than the “ideal” body image, and the “ideal” image is one of normal weight and not too thin.

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1. Introduction

Body image refers to a subjective concept of one's physical appearance based on self-observation and the reactions of others [1]. An “Ideal” body image is used to refer to the body size determined by a cultural group to maximize beauty and/or success and the optimum physical state as defined by society [1]. The concept of an ideal body image directly affects an individual's body image satisfaction or dissatisfaction.

The prevalence and factors associated with weight perception and satisfaction in adulthood deserve to be investigated because of

the impact of weight perception on the rising incidence of overweight individuals, which is among the major public health challenges worldwide. In Brazil, the number of overweight women is higher than the number of obese women; however, both have increased between 2006 and 2016 from 38.5% to 50.5% and from 12.1% to 19.6%, respectively [2]. Moreover, the prevalence of individuals with excess weight increases with a decrease in educational level and socioeconomic status [3].

It is widely assumed that knowing one's weight is essential for weight control and good health. Studying self-perception of weight provides the opportunity to understand the interplay between its psychosocial and physical consequences. Only 3.6% of young adults who are clinically overweight perceive themselves to be smaller than desired, and 36.3% are satisfied with their body [4]. This incongruence between clinical weight category and self-

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perception, referred to as weight misperception, is often assumed to be detrimental to health maintenance [5].

A better understanding of the factors affecting self-perception of body characteristics may play an important role in weight control practices. The aim of this study was to assess body weight perception and body image satisfaction in low-income women in Southern Brazil.

2. Materials and methods

We conducted a cross-sectional study in a cohort of women followed in a breast cancer mammography screening program in South Brazil (Núcleo Mama Porto Alegre). The cohort includes 9167 women aged >15 years old recruited from areas of social vulnerability in the city of Porto Alegre. Núcleo Mama Porto Alegre has been described in detail elsewhere [6]. Briefly, women aged 40–69 years (approximately 4500 women) were invited to participate in an annual breast cancer clinical and mammography screening program. Women who participated in the screening between July and December of 2014 were randomly invited to participate in the current study. We excluded physical and/or mentally disabled women, women taking systemic corticosteroids, pregnant women and women who gave birth within 6 months prior to the interview. All participants signed an informed consent form at the start of the study. The project was approved by the Research Ethics Committee at the Hospital Moinhos de Vento (protocol no. 2004/13).

The sample size ($n = 218$) was calculated based on the average prevalence of body dissatisfaction of 64% and a relative precision of 10% [4]. Statistical significance was defined as $p < 0.05$.

3. Socio-economic and lifestyle factors

All participants answered a questionnaire that collected information about age, self-reported skin color, marital status (with/without a partner), number of children (0–1 child or more than 1 child), smoking history (never smoked or smoker), educational level (grouped according to years and type of education) [7] and household income in Brazilian currency (categorized as under US\$ 208; US\$ 208 - US\$ 416 or over US\$ 416 per month). The Brazilian minimum wage is US\$ 285 dollars per month.

Level of physical activity was evaluated according to guidelines for data processing and analysis of the short form of the *International Physical Activity Questionnaire* [8]. Information about diabetes and high blood pressure was self-reported (“Has a doctor ever informed you that you have high blood pressure?” and “Has a doctor ever informed you that you have diabetes mellitus?”).

4. Anthropometric measurements

Duplicate anthropometric measurements were obtained by trained interviewers. Weight (kg) was measured using an electronic scale (Urano, Brazil – 180 kg) with patients wearing light clothing and no shoes. Height (m) was measured in the Frankfurt position

using a wall-mounted stadiometer (1 mm precision; Sanny, Brazil). Weight and height measurements were used to calculate body mass index (BMI, kg/m^2), and weight status was classified according to the World Health Organization criteria (underweight $< 18.5 \text{ kg}/\text{m}^2$, normal-weight 18.5–24.9 kg/m^2 , overweight 25.0–29.9 kg/m^2 and obese $\geq 30 \text{ kg}/\text{m}^2$ [9]). Waist circumference (WC) was measured at the midpoint between the lower rib margin and the iliac crest using a flexible non-elastic measuring tape (Haeschmass, Alemanha).

5. Body image perception

The Stunkard Scale with nine figures was used to measure body image perception (Fig. 1) [10]. This is a rating scale made up of nine silhouettes of women ranging from extremely underweight (1) to very obese (9). The scale was shown with the following three questions: (a) ‘Which of these figures do you relate to the most with regard to your body?’ (current body size), (b) ‘Which of these figures looks like what you would like your body to look like?’ (ideal body size) and (c) ‘Which of these figures do you consider the healthiest?’ (healthiest body size). According to previous studies, these figures were classified into underweight (Figs. 1 and 2), normal-weight (Figs. 3 and 4), overweight (Figs. 5, 6 and 7) and obese (Figs. 8 and 9). All instruments were previously validated for use in the Brazilian population [11].

Body image dissatisfaction was obtained by subtracting the number corresponding to the ideal body image from the number corresponding to the current body image. When the difference was equal to zero, the individual was classified as “satisfied”, and if smaller than zero, she was classified as “dissatisfied due to slowness” [12]. When the results were higher than zero, the participants were classified as “dissatisfied due to being overweight”.

6. Body weight estimation

Body weight estimation was obtained using the difference between self-reported weight minus measured weight. Body weight estimation was defined as “correct” if the absolute difference between self-reported minus measured weight was less than 2.0 kg, as “underestimated” if the difference was less than -2.0 kg and as “overestimated” if the difference was greater than 2.0 kg [13].

7. Weight concern

Women were also asked about their desire to lose weight (“Would you like to lose weight?”) and how much weight they want to lose. They were also asked if they have already tried to lose weight.

8. Statistics

Categorical variables were summarized using absolute frequencies and percentages, while continuous variables were

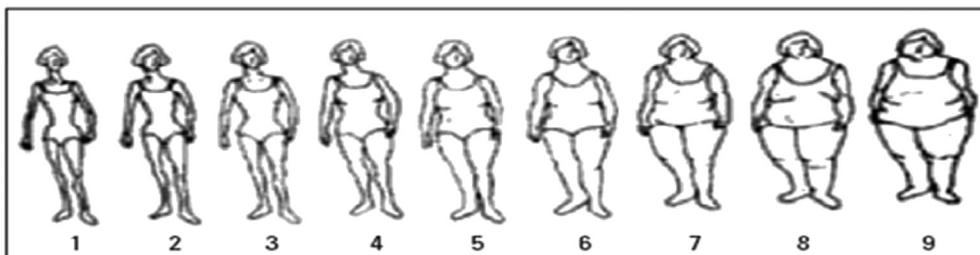


Fig. 1. Scale to measure perceived body image proposed by Stunkard et al. (1983) [10].

Table 1
Socioeconomic and lifestyle characteristics of women in Southern Brazil according to body image satisfaction.

Characteristics	Overall	Dissatisfied due to slimness	Satisfied	Dissatisfied due to overweight	<i>P</i> ^α
Age (years)	56.3 (9.5)	58.5 (8.0)	57.3 (10.7)	55.9 (9.3)	0.57 ^a
Skin color					
White	175 (81.1)	8 (88.9)	26 (96.3)	141 (78.3)	0.07 ^b
Non-white	41 (18.9)	1 (11.1)	1 (3.7)	39 (21.7)	
Educational level					
Illiterate	9 (4.3)	1 (11.1)	3 (11.1)	5 (2.9)	0.41 ^b
< 6 years	113 (54.0)	3 (33.3)	14 (51.8)	96 (55.2)	
6–12 years	53 (25.1)	3 (33.3)	6 (22.2)	44 (25.3)	
> 12 years	35 (16.6)	2 (22.3)	4 (14.9)	29 (16.6)	
Household income					
≤ US\$ 208	30 (14.2)	2 (22.2)	2 (7.4)	26 (14.9)	0.05 ^b
US\$ 208 - US\$ 416	108 (51.2)	6 (66.7)	20 (74.1)	82 (46.8)	
≥ US\$ 416	73 (34.6)	1 (11.1)	5 (18.5)	67 (38.3)	
Marital status					
With a partner	140 (64.5)	5 (55.6)	15 (55.6)	120 (66.3)	0.46 ^b
Without a partner	77 (35.5)	4 (44.4)	12 (44.4)	61 (33.7)	
Number of children					
0 or 1 child	41 (18.9)	1 (11.1)	5 (18.5)	35 (19.4)	0.82 ^b
> 1 child	176 (81.1)	8 (88.9)	22 (81.5)	146 (80.6)	
Smoker	40 (18.9)	4 (44.4)	10 (38.5)	26 (14.7)	<0.01 ^{b,α}
Hypertension	101 (47.6)	1 (11.1)	10 (38.5)	90 (50.8)	0.04 ^{b,α}
Type 2 diabetes mellitus	29 (13.7)	1 (11.1)	3 (11.5)	25 (14.1)	0.91 ^b
Physical activity					
Low	113 (53.1)	4 (44.5)	13 (50.0)	96 (53.9)	0.70 ^b
Moderate	65 (30.5)	2 (22.2)	9 (34.6)	54 (30.3)	
High	35 (16.4)	3 (33.3)	4 (15.4)	28 (15.8)	

α = 0.05. Data expressed as the mean (standard deviation) or n (prevalence).

^a Independent t-test.

^b Chi-squared test.

analyzed using means and standard deviations. To compare proportions, the chi-squared test and Fischer's exact test were used. Student's t-test or Mann–Whitney non-parametric test was used to compare continuous variables.

Multivariate analyses using Poisson regression with robust variance were performed to estimate the prevalence ratios and 95% confidence intervals to examine the possible associations between body image satisfaction and demographic, socioeconomic, environmental and health variables. The reference categories were white skin color, household income ≥ US\$ 416 per month, without a partner, 0 or 1 child, high physical activity, normal-weight, non-smoker and without hypertension.

In all analyses, a 5% significance level was used as the criterion to reject the null hypothesis. The analyses were carried out in SAS[®] version 9.4 (Cary, United State) [14].

9. Results

A total of 218 low-income women between the ages of 25 and 82 years (mean 56.3 ± 9.5 years) were included in the study with 44% of the women being greater than 50 years old. Socioeconomic and lifestyle characteristics of the study population are shown in Table 1. Household income levels (*p* = 0.05), smoking history (*p* < 0.01) and history of hypertension (*p* = 0.04) were significantly different between groups according to body image satisfaction. Nevertheless, the average body mass index of smoking women was lower than that of non-smoking women (28.8 ± 6.3 kg/m² vs. 30.3 ± 5.5 kg/m², *p* = 0.03 - data not shown).

The prevalences of overweight and obese individuals were 34.1% and 52.5%, respectively (Table 2). Only two women were classified as underweight. The majority of the women (83.0%) were

Table 2
Anthropometric measurements, weight concern and body weight estimation of women in Southern Brazil according to body image satisfaction.

Characteristics	Overall	Dissatisfied due to slimness	Satisfied	Dissatisfied due to overweight	<i>P</i> ^α
Waist circumference (cm)	97.7 (12.5)	76.9 (7.6)	87.7 (9.6)	100.2 (11.4)	<0.01 ^{a,α}
Weight (kg)	74.9 (15.0)	52.7 (9.2)	62.4 (10.2)	77.9 (13.9)	<0.01 ^{a,α}
Average BMI (kg/m ²)	30.5 (5.6)	21.3 (2.8)	25.3 (3.1)	31.8 (5.1)	<0.01 ^{a,α}
BMI groups (%)					
Underweight	2 (0.9)	2 (22.2)	–	–	<0.01 ^{b,α}
Normal weight	27 (12.5)	6 (66.7)	11 (40.7)	10 (5.5)	
Overweight	74 (34.1)	1 (11.1)	13 (48.2)	60 (33.2)	
Obese	114 (52.5)	–	3 (11.1)	111 (61.3)	
Would like to lose weight (%)	173 (79.8)	–	6 (22.2)	167 (92.3)	<0.01 ^{b,α}
How much weight (kg)	11.8 (10.1)	–	4.7 (4.6)	12.0 (10.2)	0.07 ^a
Tried to lose weight (%)	156 (72.7)	1 (12.5)	8 (29.6)	147 (81.7)	<0.01 ^{b,α}
Body weight estimation (%)					
Underestimated	48 (22.6)	2 (22.2)	4 (15.4)	42 (23.7)	0.89 ^b
Correct	146 (68.9)	6 (66.7)	20 (76.9)	120 (67.8)	
Overestimated	18 (8.5)	1 (11.1)	2 (7.7)	15 (8.5)	

Abbreviations: BMI, body mass index; Underweight: BMI < 18.5 kg/m², normal weight: 18.5–24.9 kg/m², overweight: 25.0–29.9 kg/m², obese: ≥30 kg/m².

α = 0.05. Data expressed as the mean (standard deviation) or n (prevalence).

^a Independent t-test.

^b Chi-squared test.

dissatisfied with their body image due to perceiving themselves as larger than the ideal, despite 5.5% of them being normal weight. Approximately 80.0% of the women indicated that they would like to lose weight, ranging from 0.9 g to 60 kg, and practically all have already tried to lose weight. Regarding to weight estimation, the majority of women estimated their weight correctly (68.9%), but 22.6% of women underestimated and 8.5% overestimated it.

When comparing the variables by body weight estimation, the only significant difference was in skin color: non-white women were more likely to overestimate their weight than white race women ($p = 0.01$ – Table 3). The mean body weight between the groups was also different (73.5 ± 14.3 kg for white women vs. 80.9 ± 16.6 kg for black/mixed race women ($p < 0.01$ – data not shown).

Among women who were satisfied with their body image, 59.3% were overweight or obese according to their BMI. On the other hand, it is important to highlight the body image dissatisfaction in 6 normal-weight individuals (66.7%) due to perceiving themselves as smaller than the ideal (Fig. 2).

In the majority of women, the body image chosen as “ideal” was larger than that of the “healthiest” (Fig. 3). When a subgroup analysis was performed by age, women under 50 years old considered themselves as heavier than those over 50 years old

(data not shown) despite having similar BMIs (31.3 ± 6.5 kg/m² vs. 30.3 ± 5.4 kg/m², $p = 0.25$ data not shown).

Skin color and BMI were independently associated with body image dissatisfaction (Table 4). The results of the multivariate analysis showed that non-white women were more likely to be dissatisfied than white women. When BMI was added to the model, household income was no longer associated with dissatisfaction (Model 3), and being underweight or obese was associated with dissatisfaction. Age, marital status, number of children, physical activity, history of smoking and presence of hypertension were not associated with body image satisfaction.

10. Discussion

Self-perception is an important factor in weight control practices [15–17]. Many studies have shown that body weight misperception is common, but the self-recognition of weight is the premise of weight control [16,17]. This study assessed body weight perception and body image satisfaction among low-income adult women in the city of Porto Alegre, RS. The study found that the great majority of the women know their body weight and are dissatisfied with their body image. Furthermore, they consider the “healthiest” image to be thinner than the “ideal” image, and the “ideal” image is one of normal weight but not too thin.

Most women were able to estimate their body weight accurately. When analyzing associations between body weight estimation and individual characteristics, the only association found was to skin color; non-white women were more likely to overestimate their weight compared to white ones. This may be related to body figures conveyed as ideal by white women compared to black/mixed race women. In the 1980s, in Brazil, Gilberto Freyre

Table 3
Body weight estimation according to skin color.

Characteristics	Underestimated	Correct	Overestimated	P ^a
Skin color (%)				0.01
White	38 (22.2)	123 (71.9)	10 (5.9)	
Non-white	10 (24.4)	23 (56.1)	8 (19.5)	

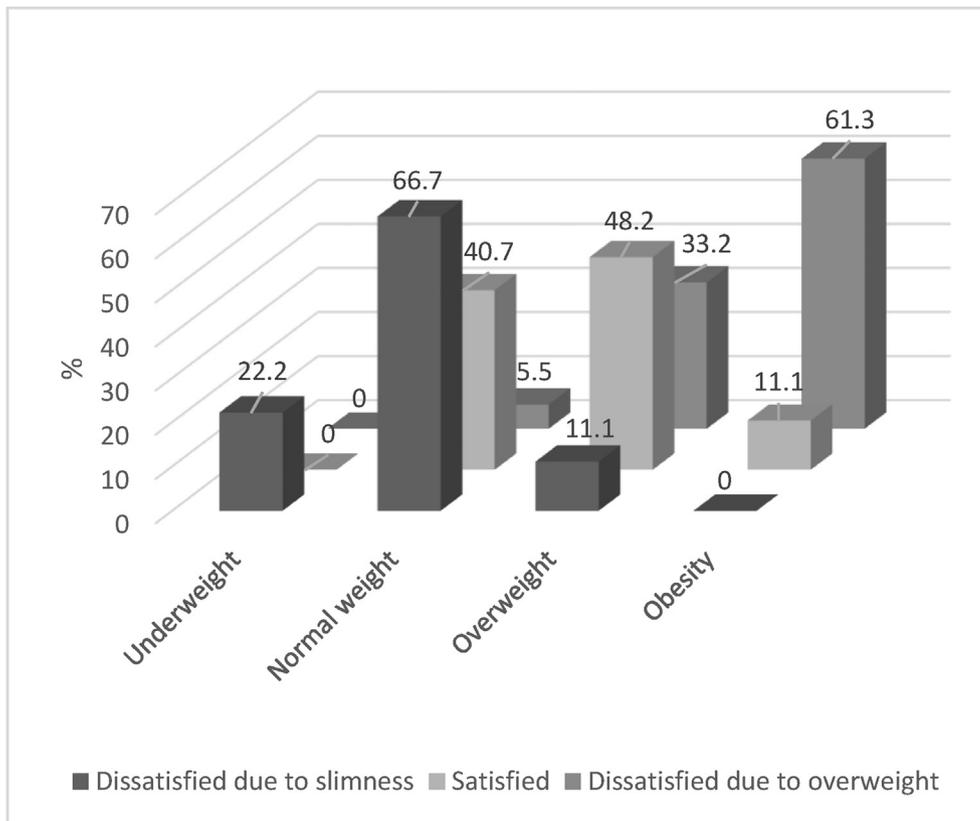


Fig. 2. Prevalence of body image perception according to nutritional status.

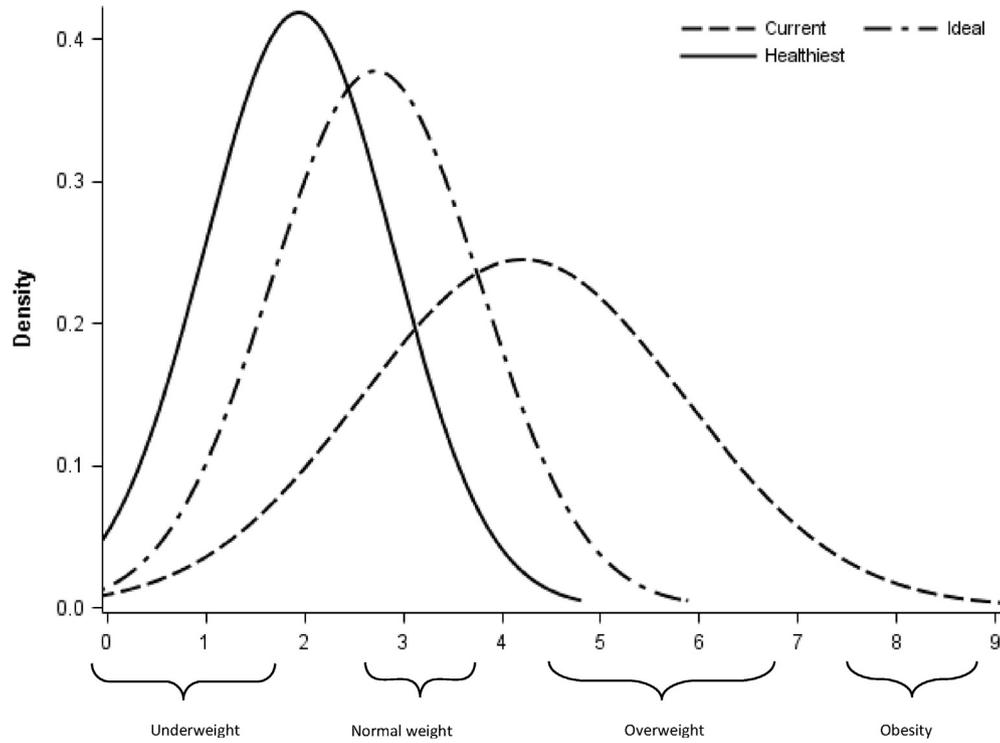


Fig. 3. The distributions of “current” and “healthiest” images compared to the “ideal” image as determined by women using the Stunkard Scale [10]. Legend: Underweight BMI <18.5 kg/m², normal weight 18.5–24.9 kg/m², overweight 25.0–29.9 kg/m², obese ≥30 kg/m².

Table 4

Multivariate analyses of body image dissatisfaction according to demographic, socioeconomic, environmental and health variables for women in Southern Brazil.

Variables	Model 1	Model 2	Model 3	Model 4
Age (years)	0.99 (0.94; 1.06)	0.99 (0.93; 1.06)	0.98 (0.93; 1.04)	0.98 (0.92; 1.04)
Skin color				
Non-white	1.15 (1.05; 1.25)	1.15 (1.05; 1.25)	1.10 (1.01; 1.19)	1.13 (1.02; 1.25)
White	1	1	1	1
Household income				
≤ US\$ 208	0.99 (0.89; 1.11)	1.01 (0.89; 1.14)	0.98 (0.86; 1.11)	0.97 (0.84; 1.11)
US\$ 208 - US\$ 416	0.87 (0.78; 0.97)	0.88 (0.79; 0.98)	0.88 (0.79; 0.97)	0.88 (0.79; 0.97)
≥ US\$ 416	1	1	1	1
Marital status				
With a partner		0.94 (0.84; 1.06)	0.97 (0.86; 1.09)	0.98 (0.87; 1.10)
Without a partner		1	1	1
Number of children				
0 or 1 child		1	1	1
> 1 child		0.99 (0.89; 1.11)	0.99 (0.90; 1.10)	1.01 (0.90; 1.13)
Physical activity				
Low		0.95 (0.81; 1.12)	0.95 (0.82; 1.09)	0.94 (0.81; 1.09)
Moderate		0.99 (0.86; 1.15)	0.98 (0.86; 1.12)	0.98 (0.86; 1.11)
High		1	1	1
BMI groups				
Underweight			1.60 (1.16; 2.23)	1.66 (1.17; 2.36)
Normal-weight			1	1
Overweight			1.36 (0.98; 1.89)	1.32 (0.95; 1.84)
Obese			1.60 (1.17; 2.19)	1.55 (1.13; 2.11)
Smoker				0.85 (0.71; 1.01)
Non-smoker				1
Hypertension				1.00 (0.90; 1.10)

Abbreviations: BMI, body mass index; Logistic regression shown as prevalence ratios and 95% confidence intervals. Model 1: Adjusted for age (continuous), skin color (white or non-white) and household income (≤US\$ 208, US\$ 208 - US\$ 416 or ≥ US\$ 416 per month). Model 2: Model 1 + marital status (with or without a partner), number of children (0 or 1 child or > 1 child) and physical activity (low, moderate or high). Model 3: Model 2 + BMI groups. Model 4: Model 3 + smoker (smoker or non-smoker) and hypertension (yes or no).

(1986) drew attention to the change in the pattern of feminine beauty. According to Freyre, the pattern of feminine beauty has shifted from the brown-skinned, curvy woman with black and frizzy hair to a European pattern of tall and blonde with straight

and thin hair [18]. A current example is represented by the Brazilian model Gisele Bündchen [19].

In our culture, slim features are regarded as symbols of health and beauty, but for older people who are in a different stage of life,

the body figure appears to be less valued and they may not be consciously aware that they are gaining weight [20]. Our findings are consistent with the results of previous studies that showed that young people tend to perceive themselves as having higher body weight than older people. While the perception may vary according to age, we found that women younger than 50 years old have a similar BMI to women over 50 years old, and both groups considered the healthiest image to be leaner than the ideal image. However, the younger individuals perceived themselves to have greater body weight than older individuals.

As found in our study, there is overall great dissatisfaction with body image, and currently, many women desire the lean body as advocated by the media around the world. In addition, they consider underweight to be healthier. Beyond the influence of the media, the body is a highly valued element in Brazilian culture. In Brazil, similar to France but unlike other cultures, the body is displayed and not disguised with clothing [19]. This cultural aspect may explain why the body figure considered ideal is bigger than that considered the healthiest; the women want a leaner body but at the same time have some “volume” to be displayed [21].

The great majority of the women were dissatisfied with their body image due to perceiving themselves as larger than the ideal. A number of studies have reported findings on body dissatisfaction in samples of individuals with various weight statuses. The difference in body dissatisfaction between individuals with normal weight and obesity is commonly assumed [22]. Some subjects do not perceive themselves as overweight and obese, so they are satisfied with their body weight, which may hinder appropriate weight loss; on the other hand, some under- and normal-weight women perceive themselves as obese. Both situations should be carefully evaluated. It is also important to consider that body image relates to the ways in which an individual conceptualizes and experiences the body, constructed through socialization in certain social groups and cultures [23]. The fact that both obese women and women of normal weight have a desire for a different body figure may be related to bodily experiences throughout life and how they deal with the body, which is different in each stage of life, as suggested by the data of the present study.

Some authors claim that when people are dissatisfied with themselves, there is greater desire for weight loss. Weight reduction success depends on factors such as weight control practices and behaviors acquired by the individual. A meta-analysis has suggested that weight loss intervention programs may help improve body image among obese/overweight individuals [24]. This is of interest given that the body image can affect psychological well-being and weight loss or maintenance of weight loss [25]. Meanwhile, in the present study, the prevalence of overweight individuals and obesity were high; most women indicated that they would like to lose weight and practically all of them had already tried to lose weight.

There is evidence that the prevalence of body weight misperception declines with increasing educational level [20]. However, in this study, no significant difference was found among women of various educational levels possibly because the sample was homogeneous (most of the women were low-income and had a low level of education). At the same time, the prevalence of body image dissatisfaction was larger in higher-income women, independent of body weight. These findings support the results of previous studies [4,26] but contradict another Brazilian study, suggesting that in countries such as Brazil, body image dissatisfaction is independent of skin color, income and schooling [27].

The prevalence of obesity and BMI is observed to have an inverse relationship with socioeconomic status in Western societies, especially in women [28]. Those with a higher income may be thinner because they can afford a healthier lifestyle, but they may

also have more narrowly defined standards for acceptable body size and adjust their behaviors accordingly. These findings suggest that household income indeed bears a relationship to self-perceived weight status.

Skin color is undoubtedly a sociocultural factor in which some groups are more accepting of larger body sizes. It has been suggested that among some groups, higher weight may be culturally valued as a positive sign of health or that overeating is less disparaged in communities where there has been a history of scarcity [29]. However, there has been no consensus regarding the effect of skin color on body dissatisfaction. Caution should be taken when interpreting these results, taking into account the race/ethnicity of the participants [30]. However, the association between body dissatisfaction and skin color may represent not only discontent with body size but also an expression of a broader bodily experience in which skin color and body size lead to stigma and discrimination [31].

Some limitations of the present study should be noted. First, all our participants came from an underserved area with high rates of obesity. Furthermore, this study did not analyze data regarding personality traits or diet, which can influence body image. Evidence indicates that negative body image is associated with high levels of neuroticism, low levels of extraversion, and (potentially) low levels of conscientiousness [32]. The Stunkard Scale has limitations due to the rigidity and constant height across the figures. The scale may not be sensitive enough, and it has been found that participants do not use the full range of the scale; even participants with a very high BMI hardly ever select the largest figure on the scale. Another limitation is related to BMI, which is only a proxy for body fat content; it does not discriminate between the ratio of muscle to fat mass, which people are likely to take into consideration when evaluating their own body shape. This limitation may have caused misclassifications.

Considering that body dissatisfaction and body perception are associated with some unfavorable obesity-related behaviors such as excessive weight loss attempts, the development of prevention and interventional measures and understanding their implications in practice are essential. Clinical and public health professionals must implement interventions designed to correct weight misperceptions. In weight control practices, factors affecting body self-perception should be considered. An essential determinant of successful weight loss is awareness of having excessive weight status.

In summary, our study revealed that the majority of women know their body weight and have body image dissatisfaction. Skin color and BMI were significantly associated with body image dissatisfaction among women, and the likelihood of dissatisfaction was greater in higher-income women. In addition, these women consider the “healthiest” image to be thinner than the “ideal” image, and the “ideal” image is one of normal weight and not too thin. These results indicate that body image must be understood within the context in which it is produced and includes aspects that go beyond BMI such as the expression of bodily experiences and conceptions of health.

Statement of authorship

Authors KNL and WE designed the study and wrote the protocol. Author KNL and KDR conducted literature searches, provided summaries of previous research studies and conducted the study. BM conducted the statistical analysis. All authors contributed to and approved the final manuscript.

Conflict of interest statement and funding sources

The authors have no conflicts of interest to declare.

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