

Body image perception and associated anthropometric and body composition indicators in the elderly

Percepção da imagem corporal e indicadores antropométricos e de composição corporal associados em idosos

Iasmim Batista Correia¹
Nathalie de Almeida Silva²
Paulo Granges e Silva²
Tarciana Nobre de Menezes²

Abstract – Aging leads to psychological losses and various physical changes that, associated with body-stereotyped patterns imposed by society, can cause disturbances in the body image perception (BIP) in the elderly. The aim of this study was to evaluate BIP in older adults living in the city of Campina Grande / PB and its relationship with different anthropometric and body composition indicators. This cross-sectional study was carried out with older adults of both sexes enrolled in the Family Health Strategy of Campina Grande, PB. BIP was considered as a dependent variable and body mass index (BMI), waist circumference (WC), triceps skinfold (TSF), and arm fat area (AFA) as independent variables. The association between BIP and anthropometric indicators was verified using the Pearson chi-square test (X^2), simple and multiple logistic regression, with significance level of $p < 0.05$. Overall, 420 older adults were interviewed (68.1% women), of whom 409 reported their actual body image perception. Regarding the perception of idealized body image, 11 individuals did not respond and 230 were satisfied, since 179 desired another silhouette. Individuals with BMI indicative of overweight / obesity were more likely of showing body image dissatisfaction compared to those with normal weight. Subjects with excessive TSF showed greater body image dissatisfaction in relation to those with normal weight. Women were more likely of showing body image dissatisfaction. Thus, it was observed that variables BMI, TSF and sex were independently associated with body image satisfaction.

Key words: Anthropometry; Body image; Health of the elderly.

Resumo – O envelhecimento acarreta perdas psicológicas e alterações físicas diversas que, associadas a padrões de corpo estereotipados pela sociedade, podem causar distúrbios na percepção da imagem corporal (PIC) dos idosos. O objetivo deste estudo foi avaliar a PIC de idosos residentes no município de Campina Grande/PB e sua relação com diferentes indicadores antropométricos e de composição corporal. Este estudo é domiciliar, transversal, realizado com idosos, de ambos os sexos, cadastrados na Estratégia Saúde da Família de Campina Grande, PB. A PIC foi considerada como variável dependente e o índice de massa corporal (IMC), a circunferência da cintura (CC), a dobra cutânea tricipital (DCT) e a área de gordura do braço (AGB) como variáveis independentes. A associação entre a PIC e os indicadores antropométricos foi verificada por meio do teste qui-quadrado de Pearson (X^2), regressão logística simples e múltipla, com nível de significância $p < 0,05$. Foram entrevistados 420 idosos (68,1% de mulheres), dos quais 409 informaram sobre a percepção da imagem corporal real. Quanto à percepção da imagem corporal idealizada, 11 idosos não responderam e 230 estavam satisfeitos, visto que 179 desejavam outra silhueta. Idosos com IMC indicativo de sobrepeso/obesidade apresentaram maior chance de insatisfação com a imagem corporal em relação àqueles eutróficos. Os idosos com DCT excessiva apresentaram maior insatisfação com a imagem corporal em relação àqueles eutróficos. As mulheres apresentaram maior chance de insatisfação com a imagem corporal. Com isso, observa-se que as variáveis IMC, DCT e sexo foram, independentemente, associadas à satisfação com a imagem corporal.

Palavras-chave: Antropometria; Imagem corporal; Saúde do idoso.

1 State University of Paraíba. Physical Therapy Course. Campina Grande, PB. Brazil.

2 State University of Paraíba. Department of Physical Therapy. Graduate Program in Public Health. Campina Grande, PB. Brazil.

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INTRODUCTION

The aging process leads to progressive changes in functional, motor, psychological and social aspects¹. The natural decline of the functions of all physiological systems, common in advanced age, may limit the coding capacity of stimuli coming from the sensory system (vision, touch, proprioception), interfering with the body's awareness and mental structuring of the individual over his own body - called body image².

Psychological and affective losses, as well as typical aging-related physical alterations, are also negatively affected by concepts and values of society full of stereotypes associated with certain body patterns. Body image can suffer serious distortions in these individuals subject to society pressures. There is also a constant influence of the media on body perception and satisfaction³.

Possible disturbances in body perception can be investigated based on the relationship of body image perception and anthropometric indicators and body composition⁴. Studies have shown that the real body classification is proportional to the body mass index value^{1,5}. In view of the complexity in the detection of these disorders, some results point to the need for further studies in this area in order to better understand the aging process and body self-perception^{3,6}.

Among the anthropometric and body composition variables, body mass index (BMI) has been used to describe changes in body image construction. BMI is a variable of easy calculation; however, in the elderly, its use presents difficulties in interpretation due to aging changes such as decreased height, adipose tissue accumulation, reduced lean body mass and decrease in the amount of water in the organism³. Thus, it is important to verify the association of body image with other anthropometric indicators, for example, waist circumference, triceps skinfold and arm fat area¹.

Thus, the importance of knowing the relationship that older adults have with their body is highlighted, especially the view of health professionals, who can act in a positive and more efficient way in their practices - evaluations and interventions - in all aspects that involve health, either physical, psychological, emotional and mental, aiming at understanding and holistically stimulating these individuals⁴. This study aimed to evaluate the body image perception of elderly residents in the city of Campina Grande/PB and its association with different anthropometric and body composition indicators.

METHODOLOGICAL PROCEDURES

This study is part of a broader study aimed at carrying out a multidimensional assessment of the health of older adults enrolled in the Family Health Strategy (EST) of Campina Grande/PB, and is characterized as being cross-sectional home-based with collection of primary data.

This study investigated individuals aged 60 years and over of both sexes.

Individuals with severe clinical impairments without therapeutic possibility, and those who were absent from their Basic Family Health Unit (UBSF) for longer than field research were excluded. Data collection was carried out from August 2009 to May 2010 by three pairs of interviewers, duly trained by the research coordinating professor and collaborating professors. During anthropometric training, the reliability of values obtained in the assessment of variables, both intra-rater and inter-rater, was assured considering the values proposed by Lohman et al.⁷. A pilot study was conducted with 42 older adults (10% of the total number of individuals to be interviewed), for possible methodological adjustments.

The sample was calculated by estimating prevalence of outcomes of at least 25%. The sample size was calculated using the following equation: $\{[E^2 \times p(1-p)] \times c\} / A^2$, where E is the confidence limit (1.96), c is the sample correlation coefficient (2.1), and A is the accepted precision for the estimated prevalence (A = 6%). The sample was proportional to each Health District, comprising 420 older adults.

Body image perception was verified through the nine-silhouette scale proposed by Stunkard et al.⁶, which represents images from thinness (Silhouette 1) to severe obesity (Silhouette 9). Initially, individuals were instructed to observe the scale and show which silhouette best represented their current physical appearance (Perception of Real Body Image - PICR). After the answer, individuals were asked if they would like to have the silhouette pointed out or to have another one (Perception of Idealized Body Image - PICI). Individuals were categorized as satisfied or dissatisfied with their body image, according to the result of the difference between PICR and PICI, ranging from -8 to +8. For result equal to zero, individuals were classified as satisfied with their body image and, for nonzero result, individuals were classified as dissatisfied.

Independent variables evaluated were: body mass index (BMI), waist circumference (WC) (cm), triceps skinfold thickness (TSF) (mm) and arm fat area (AFA) (cm²).

In order to calculate BMI (weight / height²), weight and height were measured according to techniques described in Lohman et al.⁷. To analyze BMI, individuals were classified as follows: low weight (BMI <23 kg / m²), normal weight (23 ≥ BMI <28 kg / m²), overweight (28 ≥ BMI <30 kg / m²) and obese (≥ 30 kg / m²)⁸.

WC and arm circumference (AC) (measured for AFA calculation) were measured using techniques described in Lohman et al.⁷. The following cutoff points were used for the WC classification and were considered not adequate (presence of metabolic risk): WC ≥ 102 cm for men and WC ≥ 88 cm for women⁹.

TSF and AC values were used to calculate the arm fat area (AFA). Triceps skinfold was measured using the Lange compass, according to techniques described in Lohman et al.⁷.

AFA was calculated according to equation proposed by Frisancho¹⁰:

$$[AGB (cm^2)] = \frac{[CB (cm)]^2}{4\pi} - \frac{[CB (cm) - (\pi \times DCT (cm))]^2}{4\pi}$$

TSF and AFA classification was performed based on values distributed in percentiles (P), according to sex, described by Menezes and Marucci¹¹. Thus, they were classified as follows: insufficiency (\leq P25), eutrophy ($>$ P25 and $<$ P75) and excess (\geq P75).

Control variables were: sex and age group (60-69 years, 70-79 years, 80 years or more).

Statistical procedures

Pearson's Chi-square test (X^2) was used to verify the association between body image perception and sex, age group, and anthropometric and body composition indicators. Simple logistic regression models were estimated to calculate the crude odds ratio (OR). For the multiple model, variables that presented $p < 0.20$ (Wald test) obtained in the simple analysis were considered. The stepwise forward input method was used to calculate the adjusted OR, with 95% confidence interval (95% CI). In the final model, the variables that remained in the model with $p < 0.05$ were considered significant. The evaluation of the logistic model adjustment was performed using the Hosmer-Lemeshow test. Data were analyzed using the SPSS 22.0 statistical package (IBM Corp., Armonk, United States).

Ethical Considerations

The major study, of which this is part, was submitted and approved by the Ethics Research Committee (CEP) of the State University of Paraíba (UEPB) (0228.0.133.000-08). Participants received explanations about the study and, when they agreed to participate, they signed the Informed Consent Form.

RESULTS

Overall, 420 individuals were interviewed (68.1% of women), with mean age of 71.6 years (SD = 9.19). Of the 420 elderly survey respondents, 409 reported on the PICR. Regarding PICI, 11 participants did not respond and 230 were satisfied, since 179 desired another silhouette.

Table 1 presents the bivariate analysis between body image perception and associated factors. In this table, it is possible to observe that the highest proportion of older adults dissatisfied with their body image were overweight / obese (63.9%), inadequate WC (61.0%), excess TSF (60.0%) and excess AFA (59.7%). There was a statistically significant association between body image perception and BMI ($p < 0.0001$), and WC ($p < 0.0001$), and TSF ($p < 0.0001$) and AFA ($p < 0.0001$).

Table 2 presents the multiple logistic regression results, showing the variables that remained in the final model and that are significantly associated to body image perception, regardless of other variables analyzed.

Table 1. Distribution of participants according to the association between body image perception and anthropometric and body composition indicators. Campina Grande / PB, Brazil.

Variables	Body Image Perception		p
	Satisfied (%)	Dissatisfied (%)	
BMI			<0.0001
Normal weight	68.9	31.1	
Low weight	70.5	29.5	
Overweight / Obesity	36.1	63.9	
WC			<0.0001
Adequate	67.6	32.4	
Inadequate	39.0	61.0	
TSF			<0.0001
Normal weight	60.6	39.4	
Insufficiency	69.6	30.4	
Excess	40.0	60.0	
AFA			<0.0001
Normal weight	62.0	38.0	
Insufficiency	68.0	32.0	
Excess	40.3	59.7	

Note. BMI: body mass index; WC: waist circumference; TSF: triceps skinfold; AFA: Arm fat area.

BMI, TSF and sex were independently associated with body image dissatisfaction, adjusted by WC and age group. Overweight / obese individuals (OR = 2.71, 95% CI: 1.44 - 5.10) were more likely of being dissatisfied with their body image in relation to those with normal weight. Individuals with excessive TSF (OR = 2.24, 95% CI: 1.29 - 3.90) were more likely of being dissatisfied with their body image in relation to those with normal weight. Women were more likely of being dissatisfied with their body image (OR = 2.07, 95% CI: 1.19 - 3.58).

Table 2. Logistic regression for BMI, TSF and sex in relation to body image dissatisfaction. Campina Grande / PB, Brazil.

Variables	Crude OR	Adjusted OR**	95% CI	p
BMI				
Normal weight				
Low weight	0.93	1.08	0.55 - 2.15	0.817
Overweight / Obesity	3.92	2.71	1.44 - 5.10	0.002*
TSF				
Normal weight				
Insufficiency	0.67	0.89	0.44 - 1.81	0.754
Excess	2.30	2.24	1.29 - 3.90	0.004*
Sex				
Male				
Female	2.02	2.07	1.19 - 3.58	0.010*

Note. BMI: body mass index; TSF: triceps skinfold; OR = odds ratio. * Statistically significant association. ** Obtained from model that includes WC and age group and the significant variables in the univariate analysis.

DISCUSSION

Body image perception, an important component of personal identity, is a multidimensional construction that represents how the person perceives his own body⁵.

In this study, it was observed that BMI, TSF and sex were variables independently associated with body image dissatisfaction. Recent national studies have shown that more than half of the adult population is overweight¹², and that there is greater occurrence of body weight dissatisfaction among women than among men¹³.

Regarding anthropometric variables, it was observed that overweight / obese individuals in this study were more likely of being dissatisfied with their body image compared to those with normal weight. This result is similar to that of other studies with older adults who found greater body image dissatisfaction among obese participants^{2,14,19}.

A study with 179 women with mean age of 45 years and BMI > 30 kg/m² found that women with BMI > 40 kg/m² expressed greater body image dissatisfaction and low self-esteem¹⁵. Although studies show association between body image satisfaction / dissatisfaction and nutritional status, a consensus on this association cannot yet be established due to personal factors that interfere in their self-assessment, from physiological and socioeconomic changes to changes in family structures and distribution of resources in society¹⁴.

The high body image dissatisfaction that affects overweight/obese older adults may be due to the non acceptance of body changes, characteristics of the aging process, considering that with the aging process, BMI tends to increase¹⁶. This body image dissatisfaction due to obesity can induce these individuals to adopt harmful strategies in order to achieve the desired weight, such as inappropriate use of medications and the adoption of radical diets, surgical and aesthetic procedures and physical activity beyond their capacity³. Thus, individuals compromise their quality of life and favor the adoption of self-depreciative measures with respect to their body, impairing their self-esteem, being a cause of suffering, depression and social isolation.

Another anthropometric variable that presented association with body image perception in this study was TSF, considering that individuals with excessive TSF were more likely of being dissatisfied with their body image in relation to those with normal weight. Studies that evaluated TSF as a risk factor for body image dissatisfaction were not found in literature. However, this information is relevant, given that excess body fat can lead to various diseases, among them the high disability and mortality rates due to chronic noncommunicable diseases, such as cardiovascular diseases¹⁷. Therefore, it is necessary to carry out studies that provide specific information about this association.

The high prevalence of excessive TSF in the elderly evidenced in this study differs from results obtained in other studies that verified high prevalence of insufficient TSF in the elderly^{5,18}. This divergence evidences the specificity of certain physical characteristics, whether by regional or local

issues; thus requiring individualized attention that aims to monitor the nutritional status of older adults enrolled in the Family Health Strategy of the city of Campina Grande/PB, since TSF is an evaluation variable that, when in excess, is a risk factor for cardiovascular and metabolic diseases.

Changes in body fat distribution and other age-related body changes are common: appearance of wrinkles and senile signs, as well as decreased physical fitness, with loss of muscle mass. These changes directly affect body satisfaction, especially among women¹⁹. Two studies conducted in Brazil, one conducted in Florianópolis/SC and the other in Pelotas/RS, found that sex is directly related to body image dissatisfaction. These studies showed that women presented 50% greater risk of being dissatisfied with body image, when compared to men^{16,20}, which corroborates result found in the present research.

International studies have found association between BMI and sex; however, they have shown higher prevalence of overweight/obesity in men, when compared to women^{14,21}. Data from the National Survey on Surveillance of Risk Factors and Protection for Chronic Diseases by Telephone Inquiry (VIGITEL) of 2014 indicated a similar result in Brazil, with greater prevalence of overweight among men¹². In addition to the presence of overweight / obesity, the influence of media and cultural aspects on today's society is considered as one of the possible reasons for greater probability that overweight women to be more dissatisfied with their body image than men²². There is a media appeal that the individual should be young, show no signs of aging and have perfect body measurements to fit society based on beauty and consumption industry¹⁴. The presence of unwanted aesthetic elements, as well as body limitations that make it difficult to perform several activities, are contributing factors for body image dissatisfaction²³. These aspects are worrisome, since studies have reported that women with inadequate nutritional status and dissatisfied with their own body are at greater risk for psychological diseases such as depression^{24,25}. Thus, older women construct their self-image based on a relationship between body, nutrition, health and happiness³.

As previously observed, variables related to excess body fat and weight reflected in body image dissatisfaction among participants in this study, suggesting that body image dissatisfaction may reflect knowledge about the inadequacy of their nutritional status. This is a relevant aspect, considering that this self-knowledge can have repercussions on changes in unsatisfactory living habits aiming at reversing this condition³. However, it should be considered that the feeling of not having a sufficiently beautiful body, within socially constructed standards - that is, thin, slender, shaped, young and muscular - can be a serious failure, leading to loss of self-esteem, insecurity and diseases²⁶. Thus, undesirable aesthetics and the difficulty in performing several activities brought about by the aging process negatively impact the individual's self-image, especially of women, and increase the possibility of psychological and social suffering linked to complications in the well-being and self-esteem of these individuals³.

Thus, in addition to the risk of developing obesity-related diseases, older adults may experience negative feelings of sadness, anger and depreciation with their bodies through body image dissatisfaction, which is accompanied by a relationship of not accepting the process of functional decline and the impossibility of reversing the aging process, as well as the social requirement by an established ideal physical shape²⁷. Thus, the high proportion of body image dissatisfaction in the elderly population is justified. These factors must be worked by family and health professionals, and can determine positive changes in the health status of this population.

The present study presents limitations typical of cross-sectional studies, because although associations between body image perception and BMI, TSF and sex have been observed, it is not possible to establish a causal relationship. Another aspect relates to silhouettes used to verify body image perception, since they are two-dimensional and may make it difficult for older adults to understand. It is suggested the creation of a mechanism that uses three-dimensional images facilitating the body perception and, consequently, increasing the reliability of the information collected.

One difficulty experienced during the conduction of this study was the lack of research that evaluated the association between body image and anthropometric and nutritional variables in the elderly. Thus, only few studies that could be compared with this study were found. Further studies aimed at analyzing body image dissatisfaction in the elderly and the factors that predispose to the risk of body image dissatisfaction are suggested. In addition, studies that assess psychological, social and cultural aspects and contribute to reduce body image dissatisfaction in the elderly are of extreme importance in the scientific field.

CONCLUSION

Therefore, it is necessary to recognize the importance of body image perception and its relationship with anthropometric and body composition indicators during the implementation of strategies to promote health among older adults, considering the need of weight control, mainly for those who exhibit distorted body image perception. Thus, it is necessary to motivate eutrophic and unsatisfied individuals to maintain their weight and satisfy themselves with their body image. As for overweight/obese or underweight individuals who are satisfied with their body image, it is important that they have the knowledge about their nutritional status so that they can seek the right weight. In this way, the chances that risk factors related to inadequate nutritional status affect the health of older adults are reduced.

COMPLIANCE WITH ETHICAL STANDARDS

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Ethical approval

Ethical approval was obtained from the local Human Research Ethics Committee – Paraíba State University, and the protocol was written in accordance with the standards set by the Declaration of Helsinki.

Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conceived and designed the experiments: TNM. Performed the experiments: IBC and PGS. Analyzed the data: NAS. Contributed reagents/materials/analysis tools: TNM. Wrote the paper: IBC.

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CORRESPONDING AUTHOR

Iasmim Batista Correia
Venâncio Neiva street, 273, Center,
Ingá, PB, Brazil.
E-mail: miimcorreia@gmail.com