original article

Body image perception in women: prevalence and association with anthropometric indicators

Percepção da imagem corporal em mulheres: prevalência e associação com indicadores antropométricos

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Abstract – The aim of this study was to investigate the prevalence of body image perception and its association with anthropometric indicators (body mass index, waist circumference, waist-height ratio, and conicity index) in women undergoing cervical cancer screening at an institution in Florianópolis, Santa Catarina. The study included 736 women (≥ 18 years). Anthropometric variables (weight, height, waist circumference) were collected for the determination of body mass index, waist-height ratio, and conicity index. Body image perception was evaluated using a nine-body silhouette scale. The prevalence of body image dissatisfaction was 73% (dissatisfaction due to excess weight = 67.4%; dissatisfaction due to thinness = 5.6%). Overweight women (PR=1.34; 95%CI=1.23-2.49, p<0.001) and women with an inadequate conicity index (PR=1.12; 95%CI =1.02-1.24, p=0.016) presented a higher prevalence of body image dissatisfaction. The prevalence of body image dissatisfaction is high and the proportion of inadequate anthropometric indicators requires attention. Moreover, body dissatisfaction was more prevalent among overweight women and women with an inadequate conicity index. These results indicate the need for interventions and for the implementation of programs designed to control body weight and to reduce cardiovascular risk factors and body image dissatisfaction in women attending primary health care centers, such as cancer screening services.

Key words: Anthropometry; Body image; Overweight; Self-esteem; Women.

Resumo – O objetivo do estudo foi investigar a prevalência da percepção da imagem corporal e a associação com indicadores antropométricos (IMC, perímetro da cintura, razão cintura/estatura e índice de conicidade) em mulheres que buscam por exame de rastreamento do câncer de colo uterino em Florianópolis, Santa Catarina. Avaliaram-se 736 mulheres (≥18 anos) que realizaram o exame de rastreamento de câncer de colo de útero em uma instituição de Florianópolis, SC. Medidas antropométricas (massa corporal, estatura, perímetro da cintura) para a determinação do índice de massa corporal, razão cintura/estatura e índice de Conicidade foram coletadas, além da percepção da imagem corporal (escala de nove silhuetas corporais). A prevalência de insatisfação com a imagem corporal foi de 73% (insatisfação pelo excesso = 67,4%; insatisfação pela magreza= 5,6%, p< 0,05). As mulheres com excesso de peso (RP=1,34; IC95%=1,23-2,49, p<0,001) e com índice de conicidade inadequado (RP=1,12; IC95%=1,02-1,24, p=0,016) apresentaram maior prevalência de insatisfação com a imagem corporal. A prevalência de insatisfação com a imagem corporal é elevada e as proporções de indicadores antropométricos inadequados requerem atenção. Ademais, aquelas com excesso de peso e com índice de conicidade inadequado apresentaram maior prevalência de insatisfação corporal. Neste sentido, verifica-se a necessidade de intervenções e implementações de programas voltados para o controle da massa corporal, redução dos fatores de risco para doenças cardiovasculares e da insatisfação com a imagem corporal em ambientes de atenção primária à saúde, como espaço dedicado a exames de rastreamento de câncer.

Palavras-chave: Autoestima; Antropometria; Imagem corporal; Mulheres; Sobrepeso.

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INTRODUCTION

In every period of history, society has adopted an ideal physical type. In the Renaissance painting of Mona Lisa by Leonardo da Vinci, the obese female figure was valued and represented the beauty standard of that time. By the 1960s, people started to search for a lean, athletic pattern with well-defined shapes. Today, the pursuit of beauty increasingly governs the life of people and there is growing concern about perfection of the body, represented by the relentless pursuit of a lanky body type in women and a muscular type in men[1]. Within this context, the pursuit of an ideal body may have negative repercussions on body image.

Body image can be defined as a multidimensional construct[2] that represents how individuals think, feel and behave about their physical attributes[3]. In this respect, body image can be seen as the relationship between a person's body and cognitive processes such as personal beliefs, values and attitudes.

Recent studies have shown a high prevalence of body image dissatisfaction among men and women of different ages[4-7]. The pursuit of the ideal body, which is often imposed by the media and by society, may lead to the adoption of inadequate eating behaviors that range from a rigorous diet to the use of diuretics and laxatives, combined with strenuous physical activities[8].

The interest of researchers in body image has increased in recent years and studies have focused on the relationship between body image and anthropometric indicators. Most of these studies investigated the relationship between body image and body mass index (BMI), and demonstrated that a higher BMI (overweight and obesity) is associated with greater body dissatisfaction[6,9,10]. Another indicator studied is body fat[10], or simply the sum of skinfolds[11]. In a literature search (Scielo, Pubmed and Scopus databases; keywords: body image, self-esteem, women), we found no studies associating waist circumference, waist-height ratio (WHtR) and conicity index in a sample of Brazilian women.

Within this context and considering the negative impact of body dissatisfaction on women's quality of life[8], spaces need to be created in women's health care services where these aspects can be investigated and minimized. Therefore, the objective of the present study was to evaluate the prevalence of body image perception and its association with anthropometric indicators (BMI, waist circumference, WHtR, and conicity index) in women undergoing cervical cancer screening at an institution in Florianópolis, Santa Catarina.

METHODOLOGICAL PROCEDURES

Participants

A cross-sectional, descriptive study was conducted on 736 women (≥ 16 years) who underwent screening for cervical cancer at a non-governmental

institution promoting the prevention of cervical and breast cancer (Rede Feminina de Combate ao Câncer de Florianópolis, SC). This institution provides medical care free of charge to 4,200 women per year. The sample of this study corresponds to approximately 18% of this population.

The women received detailed information about the objectives and methodology of the study and agreed to participate by signing the free informed consent form (> 18 years). In the case of girls younger than 18 years, the legal guardian signed the consent form. The study was approved by the Ethics Committee of UDESC (Protocol No.15/2011).

Procedures and instruments

Data were collected in the afternoon on Tuesdays, Thursdays and Fridays between September 2011 and June 2012. The women attended the visits spontaneously without an appointment. Exclusion criteria were pregnancy, physical incapacity (walking), and cognitive deficit (anamnesis/conversation with the patients).

Anthropometric measures (body weight, height, and waist circumference) and data regarding body image perception were collected. Body weight was measured with a Tanita digital scale to the nearest 0.1 kg. Height was measured with a wall-mounted stadiometer to the nearest 1 cm. The standardizations proposed by Alvarez and Pavan[12] were used for these measurements. Waist circumference was measured with a Sanny® inextensible measuring tape to the nearest 1 mm, at the narrowest point of the waist (without clothes)[13].

Body weight and height were used for the calculation of BMI (kg/m²) and nutritional status was classified according to World Health Organization criteria[14]: obesity (BMI ≥ 30 kg/m²), overweight (BMI 25.0 to 29.9 kg/m²), eutrophic (BMI < 25 kg/m²), and low weight (BMI < 18.5 kg/m²). Two categories were established because of the small number of women in the "low weight" and "overweight" categories: no excess weight (low weight + normal weight) and overweight (overweight + obesity). Abdominal obesity was classified based on waist circumference using cut-off values in relation to the risk of developing metabolic complications: inadequate (≥ 88 cm) and adequate (< 88 cm)[14]. WHtR was classified using the cut-off values suggested by Pitanga and Lessa[15], with values higher than 0.53 indicating an increased WHtR. The conicity index was determined based on body weight, height and waist circumference using the mathematical equation of Valdez[16]. The cut-off values adopted for the classification of an inadequate conicity index were 1.18 and 1.22 for women aged 49 years and ≥ 50 years, respectively[17].

The nine-body silhouette scale proposed by Stunkard et al.[18] and validated for Brazilian adults[19] was used for body image assessment. This scale consists of nine different silhouettes ranging from severely thin (silhouette 1) to severely obese (silhouette 9). The instrument was shown to the women who indicated which of the images corresponded to their current and ideal body image. When the difference between the true and ideal silhouette was

zero, the women were classified as satisfied; if it was different from zero, the women were classified as dissatisfied. If the difference was positive (true-ideal), dissatisfaction was due to excess weight (desire to reduce the body silhouette) and if it was negative, dissatisfaction was due to thinness (desire to increase the body silhouette).

Data analysis

The data were analyzed using the SPSS 20.0 program. Descriptive (mean, standard deviation, and distribution of frequencies) and inferential statistics (Poisson regression) were used. The association between body image perception and anthropometric indicators was evaluated using a Poisson regression model with robust variance estimation. Crude and age-adjusted analysis including all variables was used. The level of significance was set at $p<0.05$.

RESULTS

The general characteristics of the sample are shown in Table 1. The age of the participants ranged from 16 to 69 years, with a mean of 40.1 year (SD=13.4). Excess weight was observed in 48.5% of the women. Analysis of abdominal obesity showed that waist circumference was above the recommended values in 32.3% of the women. The WHtR and conicity index were inadequate in 38.3% and 40.5% of the participants, respectively.

Table 1. General characteristics of the sample studied (Florianópolis, SC).

Variable	Mean (SD)
Age (years)	40.1 (13.4)
Body weight (kg)	65.5 (12.4)
Height (m)	1.6 (0.1)
Body mass index (kg/m²)	25.8 (4.8)
Waist circumference (cm)	81.8 (12.0)
Conicity index	1.2 (0.1)
Waist-height ratio	0.51 (0.1)
	n (%)
Nutritional status	
Eutrophic	371 (51.5)
Overweight	350 (48.5)
Waist circumference	
Normal	491 (67.7)
Increased risk	234 (32.3)
Waist-height ratio	
Adequate	398 (61.7)
Inadequate	247 (38.3)
Conicity index	
Adequate	394 (59.5)
Inadequate	268 (40.5)

SD: standard deviation; n: absolute frequency; %: relative frequency.

Analysis of body image perception showed that 27% of the women were satisfied with their body image and 73% were dissatisfied (p<0.05). Among the latter women, 67.4% were dissatisfied due to excess weight and 5.6% were dissatisfied due to thinness (p<0.05). Figure 1 illustrates the distribution of women according to body image perception.
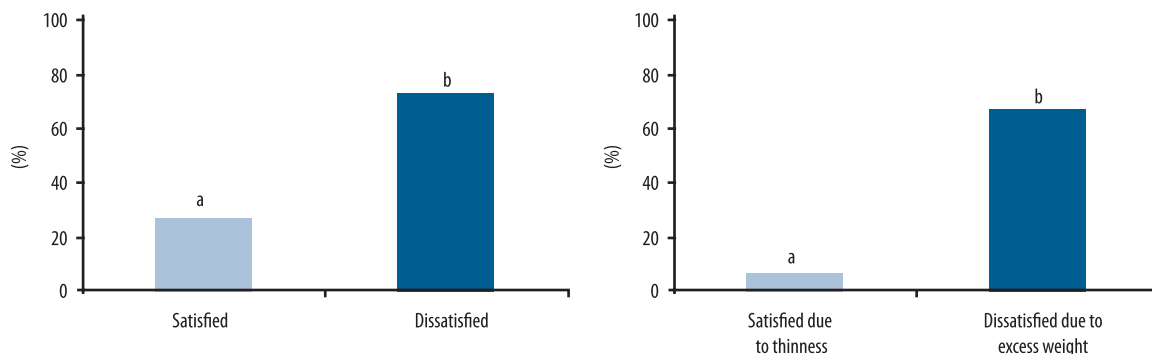
Figure 1. Distribution of women according to body image perception (Florianópolis, SC).
* p<0.05 (different letters indicate significant differences between proportions).

Crude analysis of body image perception (Table 2) showed that all anthropometric indicators were associated with the outcome variable (body image dissatisfaction). The age-adjusted prevalence ratios were 1.34 (95%CI: 1.23-1.47) for overweight and 1.12 (95%CI: 1.02-1.24) for inadequate conicity index when compared to peers with adequate BMI and conicity index, respectively.

Table 2. Prevalence and crude and adjusted analysis of body image satisfaction in women (Florianópolis, SC).

Variable	Satisfied	Dissatisfied				
	%	%	Crude PR (95%CI)	Wald	Adjusted PR* (95%CI)	Wald
BMI						
Eutrophic	41.1	58.9	1		1	
Overweight	11.6	88.4	1.34 (1.27-1.43)	91.763	1.34 (1.23-1.47)	35.844
Waist circumference						
No risk	32.8	67.2	1		1	
With risk	15.6	84.4	1.19 (1.12-1.26)	28.981	0.97 (0.85-1.10)	0.018
Waist-height ratio						
No risk	36.2	63.8	1		1	
With risk	12.7	87.3	1.27 (1.19-1.35)	53.540	1.05 (0.93-1.19)	0.002
Conicity index						
No risk	32.7	67.3	1		1	
With risk	17.6	82.4	1.16 (1.09-1.24)	20.700	1.12 (1.02-1.24)	3.096

BMI: body mass index; PR: prevalence ratio; 95%CI: 95% confidence interval. *Odds ratio adjusted for age.

DISCUSSION

The present study demonstrated a prevalence of excess weight of 48.5% in women undergoing preventive cervical cancer screening at a primary

health care service. This proportion is similar to those reported in a study conducted in 26 Brazilian state capitals and the Federal District (50.3%)[20]. In addition, 32.3% of the women studied here presented with abdominal obesity. A higher proportion was observed among women attending a Family Health Strategy Unit in São Paulo (57.4%)[21]. On the other hand, lower prevalence rates of abdominal obesity were reported for women from the State of Maranhão (15,5%)[22] and for women from southern Brazil (37.5%)[23]. In a study involving adults from the State of Pernambuco, 69.9% of the women presented with abdominal obesity[24]. A possible explanation for these differences in the prevalence of abdominal obesity is related to differences in the mean age of the participants of those studies; the results should therefore be analyzed with caution.

Inadequate WHtR and conicity index were observed in 38.3% and 40.5% of the women, respectively. In a study involving employees of a higher eduction institution, 29.1% and 32.3% of the sample had an inadequate WHtR and conicity index, respectively[25]. Obesity, especially central obesity, predisposes to a series of risk factors for the development of cardiovascular diseases[26]. In this respect, the high prevalence of women with abdominal obesity observed in the present study reflects the magnitude of the problem.

With respect to the prevalence of body image dissatisfaction (73%), 67.4% of the women were dissatisfied due to excess weight and 5.6% due to thinness. Similar rates of body dissatisfaction have been reported in other Brazilian studies[7,25]. International studies also show a high prevalence of body image dissatisfaction among women[28]. These high rates of body image dissatisfaction might be related to the influence of media and the society, which impose a current beauty standard that is not always achievable by the general population. In addition, females are generally more dissatisfied, a fact that might be explained by sociocultural, psychological and biological factors that subjectively determine the pursuit of the best physical appearance[29]. These comparisons should be analyzed with caution considering the differences in the samples between studies, especially in terms of age.

The greater dissatisfaction due to excess weight observed in the present study agrees with other studies conducted in different regions of Brazil[7,27]. Within this context, it has been observed that body image dissatisfaction is more prevalent among women with excess weight. Silva et al.[30] found an association between body image dissatisfaction and excess weight in men and women when compared to their normal-weight peers. However, divergent results were reported in a study involving active elderly women[27], in which excess weight was not associated with body image dissatisfaction. This divergence should be analyzed with caution due to the difference in the age of the participants between studies and since active elderly women were studied. With respect to the association between body image perception and conicity index, we found no study investigating this relationship in adults, a fact impairing discussion.

One of the limitations of the present study was its cross-sectional design, which did not permit to establish cause-effect relationships between

the dependent variable and the independent variables (anthropometric indicators). In addition, the instrument used to identify body image perception was a set of two-dimensional images (silhouettes), a fact impairing presentation of the individual as a whole. However, this scale is commonly used in studied assessing body image perception.

CONCLUSIONS

The present results indicate that the prevalence of body image dissatisfaction is high among women undergoing cervical cancer screening and the proportions of inadequate anthropometric indicators require attention. Body image dissatisfaction was more prevalent among women with excess weight and women with an inadequate conicity index. These results indicate the need for interventions and for the implementation of programs designed to control body weight and to reduce cardiovascular risk factors and, consequently, body image dissatisfaction, among women attending primary health care centers, such as cancer screening services.

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