Introduction

Body image is a complex phenomenon that is multi-dimensional in nature [1] and can involve perceptual, affective, cognitive or behavioral disturbances. Body dissatisfaction is highly prevalent during adolescence [2, 3]. A study carried out with schoolchildren (8 to 11 years) in Porto Alegre, Brazil, revealed that 82% of them were dissatisfied with their own body image [4]. Research indicates that girls tend to exhibit greater body dissatisfaction than boys [5–7].

While body dissatisfaction is related with the desire to be thinner among females [4], among male adolescents body dissatisfaction is associated with the desire to gain weight, to achieve an athletic build [2, 4, 8].

Body dissatisfaction has often been associated with discrepancies between real and ideal silhouettes [9, 10]. Although it is a complex subject for investigations, there is evidence that social and sociocultural aspects have an influence on distorting body image [11].

A series of nutritional status disorders can be observed in adolescents today, characterized both by nutritional excesses and deficits [12, 13]. During recent years, overweight and obesity have been observed to increase in all age groups [13], and as a result overweight adolescents suffer from problems related to acceptance of their self-image and valuation of their own bodies.

There has not been found any Brazilian research that would verify the association between nutritional status and body dissatisfaction in adolescents, thus the objective of this study was to analyze this association.

Material and methods

Participants

The association between body dissatisfaction and nutritional status in adolescents was investigated by means of a cross-sectional study “Levels of physical activity, physical fitness and health-related social behavior in schoolchildren from Florianópolis, SC”. This study was carried out during the second half of 2007 with a representative sample of adolescents from the public secondary education system of Florianópolis, SC, in the southern region of Brazil.
Sample selection

The sample selection was carried out in two stages: (1) stratification by geographic region and (2) school classes as clusters. Initially the municipality of Florianópolis was divided into five regions: Center, Continent, East, North and South. Next, the largest schools in each region were selected and from each school the number of classes necessary to achieve representativeness of its geographic area was determined. All adolescents who attended school classes on the day of data collection were invited to take part.

The sample size was determined using procedures suggested by Luiz and Magnanini [14] for a finite population, assuming a prevalence of 50% (body dissatisfaction), 95% confidence interval (95%CI), estimated error of 4 percentage points and an additional 15% for possible losses from the sample. Based on these parameters it appeared necessary to collect data from 659 adolescents. Considering the characteristics of the sampling process which involves all individuals belonging to each cluster, the final sample contained 892 adolescents.

Adolescents above 18 years of age were excluded (n = 33). Adolescents who did not complete their body image questionnaire were considered as lost to the sample (n = 182). The final sample comprised 676 adolescents (234 boys and 442 girls), aged 14 to 18 years (mean = 16.06 ± 1.01).

Procedures

This research was approved by the Research Ethics Committee at the Universidade Federal de Santa Catarina (Hearing number 372/2006).

In each case, school management was contacted in order to explain the research objectives and methods. Parental consent was obtained before initiating data collection. The adolescents were informed that participation was voluntary.

Measurements

Body image

Information related to body image was obtained using a scale of nine body silhouettes proposed by Stunkard, Sorenson and Schlusinger [15]. All of the silhouettes were shown to the adolescents and they replied to the following two questions: Which silhouette best represents your body’s current appearance (real)? Which body silhouette would you like to have (ideal)? Body image was evaluated by subtracting the real silhouette from the ideal silhouettes. When the difference was equal to zero, the adolescent was classified as satisfied and if different from zero as dissatisfied. If the difference was positive, dissatisfaction was due to a desire for a smaller silhouette and if the difference was negative the dissatisfaction was caused by a desire to increase in size.

Weight and height

Body weight and height were measured according to recognized procedures [16]. Body weight was measured using a digital balance, PLENNA® brand, with 150 kg capacity and 0.1 kg sensitivity and automatic shutdown. Height was measured using a flexible steel stadiometer fixed to the wall. Body mass index [body weight (kg) / height (m²)] was used as the indicator of nutritional status [17, 18]. Adolescents with BMI below 18.5 kg/m² [18] and above 25.0 kg/m² [17] were considered to have nutritional status disorders. The expression overweight was adopted to define both overweight and obesity. The international cut-off values used for the classification of nutritional status according to gender and age are shown in Tab. 1.

Data analysis

When comparing two proportions, the test of significance for differences between proportions was applied. Differences in frequency between variables were verified using the chi-square test. The association between body dissatisfaction and nutritional status was analyzed by means of logistic regression, with a 95% confidence interval. Data were analyzed using the statistical programs SPSS 13.0 and MedCalc 9.3.3.0.

Results

The distribution of the adolescents by gender and satisfaction with body image is illustrated in Fig. 1. It was observed that 65.5% of the adolescents were dissatisfied with their body image, being significantly higher among male adolescents (72.6%) than females (61.8%) (Fig. 1a). When the subset of dissatisfied adolescents was stratified by desire to change body silhouette (Fig. 1b), it was observed that females wished to reduce their silhouette (48.4%), while males wished to increase it (51.3%).

Figure 2 illustrates the degree of body dissatisfaction according to nutritional status. It was found that
A. Pelegrini, E.L. Petroski, Body dissatisfaction and nutritional status

Table 1. International cut off points for body mass index for thinness, overweight and obesity between 14 and 18 years of age

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77.0% of the adolescents with nutritional status disorders were dissatisfied with their body image (Fig. 2a), 46.7% wished to reduce and 30.3% to increase their silhouette (Fig. 2b). With relation to the adolescents classified as having healthy BMI, it was observed that 61.8% were dissatisfied (Fig. 2a), with 36.6% and 25.2% desiring smaller and larger silhouettes, respectively (Fig. 2b).
When body image perception was stratified by gender (Fig. 3), the results revealed that male adolescents with unhealthy nutritional status exhibited more dissatisfaction (84.4%) than females (74.2%) (Fig. 3a). While 42.2% of the male adolescents with unhealthy nutritional status wished to increase their body silhouette, just 25.8% of the females expressed this wish. The predominant desire among female adolescents was to reduce the size of their body silhouette (48.3%) (Fig. 3b).

Figure 4 illustrates the degree of body dissatisfaction according to underweight, normal weight and overweight. The results revealed that 61.0%, 61.8% and 90.9% of underweight, normal weight and overweight adolescents were dissatisfied. While the underweight adolescents (59.7%) wanted to increase their body silhouette, the obese ones wanted to reduce it (86.4%).

Table 2 shows the association between body dissatisfaction and nutritional status. It was found that un-
healthy nutritional status was only associated with body dissatisfaction among females (95%CI = 1.35–3.43). When BMI was stratified as normal weight (reference category), underweight and overweight, the association only appeared among the females, indicating that the chance of showing body dissatisfaction is 11 times greater in overweight female adolescents than in adolescents with normal weight.

**Discussion**

Analyzing perceived body image, it was observed that a large number of adolescents were dissatisfied with their body shapes and sizes. A study comprising schoolchildren of secondary education in greater Florianópolis, SC, revealed that 48.2% of these schoolchildren were dissatisfied with their body weight [19]. Body dissatisfaction is even observed among pre-adolescents in small towns (63.9%) [6]. Brazilian studies have found that body dissatisfaction varies from 64% to 82% in schoolchildren [4, 6]. In a population study carried out with Chinese children and adolescents (3 to 15 years), it was observed that approximately 60% were dissatisfied with their body image [3]. In Poland, the body dissatisfaction in adolescents (40.0%) tends to be smaller than found in Brazilian ones [20].

Body dissatisfaction has been observed in both gender [21], but greater proportions are found among female adolescents, as demonstrated by studies undertaken in Brazil [5, 6] and other countries [7, 20, 22]. In contrast to what can be found in the literature, the findings of this study revealed that male adolescents exhibited greater body dissatisfaction than female adolescents. This can be related the pressure exercised by the society, mainly the influence exerted by media [23], promoting muscle and athletic bodies in male adolescents. Results from another clinical study demonstrated that across all stages of development, girls were more likely to adopt strategies to lose weight, whereas boys were more likely to adopt strategies to increase muscle [24].

Excessive concern with the body and the disorders related with body image problems have until recently appeared to almost exclusively affect females, however, these problems have been reported in males with growing frequency [25, 26].

With relation to the type of body dissatisfaction, it was observed that the girls in general wished to reduce the size of their body silhouette, while the boys desired larger silhouettes. These results are similar to what was observed by Branco, Hilário and Cintra [5], demonstrating the same tendency in a sample of adolescent schoolchildren in the city of São Paulo, Brazil. In the same manner, the findings of this study confirm what was observed in Chinese children and adolescents, where the preference among females was for smaller body silhouettes and for larger silhouettes among males [3].

In contrast with females, who desire slimmer figures, male individuals are concerned with becoming stronger and more muscular. Very often, standards of beauty are influenced by media which create desires and reinforce images, standardizing bodies, so that those individuals who see themselves as outsized feel pressure and dissatisfaction.

It was observed that while the adolescents with underweight wanted to increase the body silhouette, the obese ones wanted to reduce. In parts, those results were also proven for the univariate analysis detecting an association between body dissatisfaction and nutritional status. However, this association was only present among females, in girls with nutritional status disorders having twice the chances of dissatisfaction with their own body image, in relation to normal weight adolescents. Another association detected was between body dissatisfaction and being overweight. Overweight adolescent girls were eleven times more likely to be dissatisfied when compared with normal weight female adolescents.

In São Paulo, Brazil, female adolescents exhibited a self-perception of their body image that was not compatible with their true nutritional status [5], whereas, in a study carried out in two cities in the state of Rio Grande do Sul, Brazil, it was found that nutritional status was the factor most strongly associated with body dissatisfaction, since children with obesity, risk of obesity and those below the 15th percentile, were dissatisfied [6]. In the same manner, in Santo André, Brazil, it was found that overweight adolescents were more dissatisfied with their body image [11]. In Norway, body dissatisfaction in adolescents (13–19 years) was observed to increase in line with increasing BMI [27]. In Poland, body dissatisfaction was more prevalent in obese adolescents (77.6%) than non-obese ones (36.2%) [20].

This study suffers from the limitations inherent to all cross-sectional studies, i.e., it estimates relationships between variables at a time and does not allow cause and effect relationships to be identified. The measure
used to assess body image provides very limited information and may not adequately assess boy’s body image given their concerns with muscles and an athletic body. Although the nine-silhouette scale was initially proposed for adults, it has been widely applied to adolescents [21, 28, 29]. One of the advantages of this study is the representative number of adolescents of both gender enrolled in secondary education in Florianópolis. Furthermore, this is the first Brazilian study carried out in adolescents of this age group with the objective to identify the association between body dissatisfaction and nutritional status.

Conclusions

Body dissatisfaction proved to be a highly frequent phenomenon in adolescents of both gender. Therefore, the data generated by this research should be sufficient to warn parents, educators and health professionals of the prevalence of body dissatisfaction in adolescents. Given that obesity is agreed as a global public health problem, finding that obese adolescents are dissatisfied with their body shape should signal that they are ready and motivated to act and try to lose body weight. This can lead, in part, to unhealthy behavior such as anorexia, bulimia, muscle dysmorphia and inappropriate dieting [24]. According to the analysis carried out, the findings suggest that nutritional status, primarily overweight, determines body dissatisfaction, particularly for female adolescents. In spite of the body dissatisfaction to be more prevalent in male adolescents, they tended to accept their body image more, even those with unhealthy nutritional status.

Therefore, it is suggested that studies of nutritional interventions and physical exercise be carried out in order to contribute to reducing the prevalence of overweight and obesity and, consequently, improving the self-esteem of these adolescents. Further cross-sectional investigations considering distinct social classes and different age groups are also needed to improve understanding of the relationship between body image and nutritional status.

References

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