Body dissatisfaction in adolescents: a longitudinal study

Insatisfação corporal em adolescentes: uma investigação longitudinal

Leonardo de Sousa Fortes[1], Maria Aparecida Conti[2], Sebastião Sousa Almeida[3], Maria Elisa Caputo Ferreira[1]

[1] *School of Physical Education and Sports of the Federal University of Juiz de Fora (UFJF).*
[2] *Institute of Psychiatry – Clinics Hospital of the University of São Paulo (USP).*
[3] *School of Philosophy, Sciences, and Letters of Ribeirão Preto (FFCLRP/USP).*

Laboratório de Estudos do Corpo (Labesc) – Faculdade de Educação Física e Desportos da Universidade Federal de Juiz de Fora.

Received: 1/3/2013 – **Accepted:** 7/19/2013

Abstract

Background: Evidence has shown that the prevalence of body dissatisfaction in youth has been increasing in recent years and it seems that adolescence is the main culprit. **Objective:** This study assessed body dissatisfaction in adolescents over one year. **Methods:** A total of 358 adolescents of both genders aged 11 to 14 years were investigated on three occasions (T1, T2, and T3). The investigation included collecting their height and weight for calculating body mass index (BMI) and administrating the Body Shape Questionnaire (BSQ). **Results:** The prevalences of body dissatisfaction in males and females differed significantly. Over time, dissatisfaction increased gradually in females and decreased in males ($p < 0.05$): females were more dissatisfied on T3 than on T1 and T2 ($F = 9.71$; $p = 0.001$) while males were more dissatisfied on T1 than in T2 and T3 ($F = 12.55$; $p = 0.001$). The scores between occasions T1, T2, and T3 also differed. **Discussion:** Over a period of one year, body dissatisfaction increased in females and decreased in males. Health-promoting programs for school children should be implemented during the school year.

Fortes LS, et al. / Rev Psiq Clín. 2013;40(5):167-71

Keywords: Body image, adolescents, body dissatisfaction.

Resumo

Contexto: Evidências demonstram que a prevalência de insatisfação corporal entre jovens tem aumentado nos últimos anos. Parece que o período da adolescência é o principal precursor para esse aumento. **Objetivo:** Avaliar a insatisfação corporal em adolescentes ao longo de um ano. **Métodos:** A investigação foi desenvolvida em três momentos (T1, T2 e T3). Participaram 358 adolescentes, de ambos os sexos, com idade entre 11 e 14 anos. Utilizou-se o *Body Shape Questionnaire* (BSQ) e peso e estatura foram mensurados para o cálculo do índice de massa corporal (IMC). **Resultados:** A prevalência de insatisfação corporal diferiu entre os sexos, com aumento gradativo em meninas e diminuição em meninos em função do tempo (T1, T2 e T3) ($p < 0,05$). Ademais, os escores diferiram segundo T1, T2 e T3. No sexo feminino, em T3, as meninas depreciaram o corpo quando comparadas a T1 e T2 ($F = 9,71$; $p = 0,001$), e de forma oposta entre os meninos evidenciou-se maior insatisfação em T1 em relação a T2 e T3 ($F = 12,55$; $p = 0,001$). **Conclusão:** Concluiu-se que a insatisfação corporal aumentou ao longo de um ano em meninas, enquanto em meninos houve diminuição. Sugere-se a implementação de programas de promoção da saúde para escolares durante o ano letivo.

Fortes LS, et al. / Rev Psiq Clín. 2013;40(5):167-71

Palavras-chave: Imagem corporal, adolescentes, insatisfação corporal.

Introduction

Body image is a multifaceted construct that involves biological, psychological, and social aspects[1]. According to Fitzsimmons-Craft *et al.*[2], thoughts, feelings, and behaviors towards the body encompass the body image phenomenon. Hence, body dissatisfaction is part of the attitude associated with body image and involves disdain for one's own weight and appearance[3,4]. There is evidence that females tend to be more dissatisfied with their bodies than males[5-7]. Additionally, studies show a high prevalence of body dissatisfaction among adolescents[3,4,8], which may be called "normative discontent" with one's own weight and body shape/appearance.

Adolescence is the period between ages 10 and 19 years[6,7]. It is one of the most critical development phases, characterized by physical[9], psychological, and social[10] instabilities. One of the main challenges individuals face during this period is self-acceptance, when they begin to take responsibility for their actions, make choices, make decisions, and assume responsibilities. Furthermore, the body undergoes many morphological changes regulated by the maturation process[11], namely: increase of the lean mass in boys, increase of the fat mass in girls, and accelerated growth in boys and girls[9,12]. These physical changes may directly influence the individual's mental image, which may have a positive or negative repercussion on body dissatisfaction, and possibly trigger aggravating factors at the end of this process.

Apparently the increase in body fat observed in girls during adolescence[9] goes against the sociocultural idealization of the body, which recommends thinness. On the other hand, the physical changes promoted by the maturation process in boys, such as the increase in lean mass and decrease in body fat, are in agreement with the idealized body type[13]. Nonetheless, regardless of body appearance, adolescents are prone to internalize the ideal body advertised by the contemporary culture[14,15]. Adolescents may therefore be more susceptible to the internalization of an ideal body, resulting in body dissatisfaction[3,16]. Yet, longitudinal studies are needed that focus on specific characteristics, such as disdain for weight and appearance.

Few studies with a longitudinal design have been carried out so far. Helfert and Warschburger[3] found that body dissatisfaction in adolescents increased over a period of one year but this finding was not corroborated by Gondoli *et al.*[4]. This last study included only

Address correspondence to: Leonardo de Sousa Fortes. Rua Guaçui, 525/202 – São Mateus – 36025-190 – Juiz de Fora, MG, Brasil. E-mail: leodesousafortes@hotmail.com

females. It seems that males have not been studied as often. The present study seems to be the first in Brazil that investigates body dissatisfaction over time in males and females. Thus, the objective of the present study was to compare body dissatisfaction in adolescents over a period of one year.

Methods

This school-based longitudinal study was done during 2011 in the city of Juiz de Fora/MG and included adolescents aged 11 to 14 years of both genders.

Sampling

According to information provided by the Department of Education of Juiz de Fora (www.pjf.mg.gov.br/se), the number of adolescents aged 11 to 14 years enrolled in the municipal schools of the abovementioned city in 2010 was approximately 30,000. Calculation of sample size considered the following criteria recommended by Alves *et al.*[17]: 25% prevalence of body dissatisfaction according to Miranda *et al.*[5], Mousa *et al.*[18], and Helfert and Warchsburger[3], 95% confidence, 5% sampling error, and 1.2 for the study design. Therefore, a representative sample of the target population should have at least 285 school children.

The proportional sample was stratified according to the geographic location of the schools in the municipality of Juiz de Fora (north, south, and center) and the type of administration (public or private), followed by distribution in the elementary school. The participants were selected by two-phase random sampling. First, schools were selected in each region, then students in each school. The schools were selected from a list provided by the statistics division of the Department of Education of the State of Minas Gerais. The final sample came from six different locations (schools) and consisted of adolescents who attended school on the sampling day.

Only adolescents enrolled in elementary schools of the city of Juiz de Fora/MG in 2011 and whose guardians signed a free and informed consent form were included in the study.

A total of 730 students were included in the study but later, 372 were excluded because they did not answer all the questions in the questionnaire, did not participate in the anthropometric assessment on all three study occasions, or were absent on any of the study occasions. On occasion 1 (T1), 330 boys and 400 girls were assessed. On occasion 2 (T2), 177 adolescents (105 girls and 72 boys) were lost. Finally, on occasion 3 (T3), 195 students were excluded, 113 girls and 82 boys.

Instruments

Body Shape Questionnaire (BSQ)

The BSQ is a self-administered questionnaire with 34 questions and Likert-type answers ranging from 1 (never) to 6 (always). It attempts to assess how often an adolescent is concerned and/or dissatisfied with his or her weight and body, that is, presenting body dissatisfaction. Higher scores indicate greater dissatisfaction. The total score is classified as follows: < 80 = free from body dissatisfaction; ≥ 80 and < 110 = mild dissatisfaction; ≥ 110 and < 140 = moderate dissatisfaction; and ≥ 140 = severe dissatisfaction. This questionnaire has been validated for Brazilian adolescents[19] and has good psychometric properties. The internal consistency for the present sample was determined by calculating the Cronbach's alpha, which ranged from 0.86 to 0.92 for both genders on all study occasions.

The BSQ was analyzed according to two criteria: normal (free from, mild, moderate, and severe body dissatisfaction) and grouped classifications (satisfied and dissatisfied). For the latter, the classifications mild, moderate, and severe body dissatisfaction were grouped as "dissatisfied" as done in other studies[10,20].

Eating Attitudes Test (EAT-26)

EAT-26 was used for assessing eating disorder symptoms. This is another self-administered questionnaire with 26 questions and Likert-type answers as follows: (0 = never, almost never, or occasionally; 1 = sometimes; 2 = often; 3 = always). The score for question 25 is inverted. These questions are distributed into three subscales, as follows: 1) diet – pathological rejection of high-calorie foods and concern with body appearance; 2) bulimia and concern with foods – involves binge eating followed by vomiting to lose or control body weight; and 3) self-control – can control food intake and assess environmental and social promoters of food intake. A score equal to or greater than 20 indicates a risky behavior that may trigger eating disorders. Considering that the participants with eating disorder symptoms could affect the present findings, the EAT-26 was included as a covariate in data analysis. The present study used the EAT-26 versions that had been validated for Brazilian adolescents. The version for females[20] was translated and back translated, obtaining a Cronbach's alpha of 0.82, so its use is recommended for studies with similar samples. The version for males[21] presented a Cronbach's alpha of 0.88 and was analyzed for construct validity and reproducibility, obtaining satisfactory results for factor analysis and test-retest. In order to verify if EAT-26 was appropriate for the present sample, its internal consistency was calculated, resulting in Cronbach's alphas of 0.89 for females and 0.86 for males.

Brazilian Economic Classification Criterion (BECC)

The socioeconomic level of the participants was determined by the BECC, developed by the Brazilian Association of Survey Companies (ABEP)[22]. The BECC estimates the purchasing power of individuals and families living in urban areas, not their social class. This instrument investigates the number of comfort items, such as car, refrigerator, bathroom, and television set, among others, in a household. Greater scores indicate greater purchasing power. Since some studies showed that socioeconomic level influences body image[23,24], the present study chose to include BECC scores as a covariate in the statistical analyses.

Anthropometric assessment

The anthropometric data was collected by a single, trained individual. Body weight was determined by a portable digital scale (Tanita) with a capacity of 200 kg and accuracy of 0.1 kg. Height was determined by a portable stadiometer (Welmy) with a length of 220 cm and accuracy of 0.1 cm as recommended by the International Society for the Advancement of Kinanthropometry[25]. Body mass index was determined by dividing body weight by the square of the height (BMI = kg/m^2). Due to reliability criteria, the BMI curve was calculated for age as done by other studies[5,7] to verify if the results would coincide. The results did not indicate statistical differences in any of the study stages.

Procedures

The principals of five private and five public schools, totaling ten schools, were invited to participate in the study after being informed of the study objectives and procedures. However, only six, three from private and three from public schools, agreed to participate. The students of these schools were then informed of the objectives and procedures of the study and those who agreed to participate were given one week to obtain written consent from their guardians, who then signed the free and informed consent form.

Each study occasion was further subdivided into another two occasions. On the first occasion, the students answered the BSQ and a qualitative questionnaire that collected their demographic data (age and gender). Groups of students were approached by a

single researcher who standardized the verbal explanations to avoid intra-researcher interferences.

Once the questionnaires were filled out, the students were taken to another room in their physical education uniforms and barefoot to collect anthropometric data. Only one student at a time could enter the assessment area. These procedures were repeated three times throughout 2011, at four-month intervals (February, T1; June, T2; October, T3).

This study was approved by the Human Research Ethics Committee from the Federal University of Juiz de Fora under protocol number 2282.022.2011 as determined by Law 196/96 issued by the National Health Council.

Statistical analysis

The study variables were described as central tendency (mean) and dispersion (standard deviation and frequency) measures. The Pearson's chi-square test for one variable was used for comparing the prevalences of body dissatisfaction over time (T1, T2, and T3). Two-way repeated--measures analysis of variance (sex x time) using age, EAT-26, BECC and BMI as covariates was used for comparing the BSQ scores; then age, EAT-26, and BECC were used for comparing BMI on all occasions (T1, T2, and T3) and sex. The Bonferroni correction was used for identifying the differences. The Student's t-test for independent samples was used for comparing, at T1, the main study variables (age, BSQ, and BMI) of adolescents who participated in all study occasions with those of adolescents excluded on T2 and T3. The data was treated by the software SPSS 17.0 with a significance level of 5%.

Results

A total of 358 adolescents, 186 females and 172 males, participated on all study occasions. Table 1 shows their mean age, weight, height, BMI, and percentage of body fat.

On T1, there were 400 females and 330 males stratified according to age as follows: 182 (100 females and 82 males) adolescents aged 13 years and 183 (100 females and 83 males) adolescents aged 14 years.

On T2, there was a sample loss of 177 adolescents (105 females and 72 males) aged as follows: 139 (74 females and 65 males) aged 11 years; 139 (79 females and 60 males) aged 12 years; 156 (82 females and 74 males) aged 13 years; and 119 (60 females and 59 males) aged 14 years.

Finally, on T3, there was another sample loss of 195 adolescents (113 females and 82 males). The age distribution was as follows: 101 (55 females and 46 males) aged 11 years; 90 (52 females and 38 males) aged 12 years; 102 (45 females and 47 males) aged 13 years; and 65 (34 females and 41 males) aged 14 years.

Because of the relatively large sample loss on T2 and T3, we chose to compare the T1 data of the adolescents who were excluded from the study with those of adolescents who participated on all three occasions. In this sense, the results for females did not differ significantly according to age ($F = 1.45$; $t = 0.36$; $p = 0.71$), BSQ score ($F = 0.83$; $t = 0.51$; $p = 0.52$), and BMI ($F = 1.09$; $t = 0.48$; $p = 0.40$). Likewise, the independent Student's t-test for males did not find significant differences for age ($F = 0.93$; $t = 0.21$; $p = 0.86$), BSQ score ($F = 1.17$; $t = 0.74$; $p = 0.38$), and BMI ($F = 0.88$; $t = 0.60$; $p = 0.54$).

Table 2 shows the minimum and maximum values of the anthropometric variables as a function of time. The dispersions of these variables changed on all occasions (T1, T2, and T3) for both sexes.

Table 3 shows BSQ classifications according to occasion (T1, T2, and T3) and sex. The BSQ classification "free from body dissatisfaction" ($X^2 = 7.39$; $p = 0.01$) in females differed significantly from the classifications "mild body dissatisfaction" ($X^2 = 4.47$; $p = 0.03$) and "severe body dissatisfaction" ($X^2 = 6.02$; $p = 0.01$) as a function of occasion. These findings indicated that the prevalence of individuals "free from body dissatisfaction" decreased over one year. On the other hand, the results indicate an increase in the prevalence of the other BSQ classifications, that is, mild, moderate, and severe. All male BSQ classifications differed significantly ("free from body dissatisfaction" – $X^2 = 25.96$; $p = 0.001$; "mild body dissatisfaction" – $X^2 = 15.61$; $p = 0.01$; "moderate body dissatisfaction" – $X^2 = 10.77$; $p = 0.001$; and "severe body dissatisfaction" – $X^2 = 8.13$; $p = 0.01$). Hence, contrary to females, the prevalence of males "free from body dissatisfaction" increased over the study one-year period, while the prevalences of the other classifications (mild, moderate, and severe body dissatisfaction) decreased.

Table 3 shows how body dissatisfaction varied over time. The frequency of females with body dissatisfaction increased over time ($X^2 = 13.13$; $p = 0.01$) but not in males, which decreased over time ($X^2 = 49.33$; $p = 0.001$).

Table 1. Sociodemographic and anthropometric data according to sex and occasion (T1, T2, and T3) – Juiz de Fora, 2011

Variable	Sex											
	Female						Male					
	T1		T2		T3		T1		T2		T3	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Age (years)	12.4	1.53	12.5	1.56	12.7	1.60	12.5	1.51	12.6	1.54	12.7	1.69
Weight (kg)	48.8	11.6	47.9	11.5	48.9	12.2	48.2	11.2	48.7	11.7	49.9	11.1
Height (m)	1.55	0.86	1.55	0.88	1.55	0.70	1.56	1.05	1.56	0.9	1.56	0.9
BMI (kg/m²)	20.0	3.76	19.8	3.67	20.1	4.15	19.6	3.48	20.0	3.92	20.2	3.80

T1: occasion 1; T2: occasion 2; T3: occasion 3; BMI: body mass index; M: mean; SD: standard deviation.

Table 2. Anthropometric minimums and maximums over time (T1, T2, and T3) according to sex – Juiz de Fora, 2011

Variable	Sex											
	Female						Male					
	T1		T2		T3		T1		T2		T3	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Weight (kg)	21.7	84.5	23.2	89.0	25.0	93.3	24.6	86.2	28.1	82.7	28.9	83.2
Height (m)	1.24	1.76	1.27	1.80	1.30	1.72	1.28	1.77	1.30	1.78	1.33	1.78
BMI (kg/m²)	12.8	31.8	13.2	32.5	13.1	34.1	13.3	32.8	14.6	32.9	14.2	32.9

T1: occasion 1; T2: occasion 2; T3: occasion 3; BMI: body mass index; Min: minimum; Max: maximum.

Table 3. Distribution of the prevalences (%) of Body Shape Questionnaire (BSQ) classifications and body dissatisfaction, and description of BSQ and BMI variables (mean and standard deviation) over time (T1, T2, and T3) according to sex – Juiz de Fora, 2011

Variable	Sex											
	Female						Male					
	T1		T2		T3		T1		T2		T3	
Prevalence (%) of the BSQ classifications												
Free	58.6[b]		43.3[c]		33.5[a]		76.1[b]		85.4[c]		96.3[a]	
Mild	21.2		27.7		33.5[a]		15.3		11.1[c]		2.6[a]	
Mod	12.3		15.2		17.3		6.1[b]		2.6[c]		1.1[a]	
Sev	7.9[b]		13.8		15.7[a]		2.4[b]		0.9[c]		0.0[a]	
Prevalence (%) of body dissatisfaction over time												
	T1[b]		T2[c]		T3[a]		T1[b]		T2[c]		T3[a]	
	S	D	S	D	S	D	S	D	S	D	S	D
GS	58.6	41.4	43.3	56.7	33.5	66.5	58.6	41.4	43.3	56.7	33.5	66.5
BSQ and BMI mean and standard deviation over time												
	T1		T2		T3		T1		T2		T3	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
BSQ	64.5[b]	2.09	67.2	2.15	75.9[a]	1.99	61.4[b]	2.07	52.7[c]	1.68	47.1[a]	2.76
BMI	19.8	0.26	19.8	0.35	20.3[b]	0.38	19.5	0.27	20.0	0.37	20.1[a]	0.42

BSQ: Body Shape Questionnaire; T1: occasion 1; T2: occasion 2; T3: occasion 3; Mod: moderate; Sev: severe; S: satisfied (BSQ < 80); D: dissatisfied (BSQ ≥ 80); M: mean; SD: standard deviation. BMI: body mass index.

[a] $p < 0.05$ regarding T1; [b] $p < 0.05$ regarding T2; [c] $p < 0.05$ regarding T3.

Some of the BSQ scores at T1, T2, and T3 deserve special attention (Table 3): 1) Females liked their bodies more at T1 than at T2 and T3 ($F = 11.65$; $p = 0.001$); on the other hand, males disliked their bodies more at T1 than at T2 and T3 ($F = 13.17$; $p = 0.001$).

The Bonferroni correction showed that the BMI of females differed significantly between T2 and T3 ($F = 4.61$; $p = 0.03$) while the BMI of males differed between T1 and T3 ($F = 5.95$; $p = 0.03$).

Discussion

The present study found that body dissatisfaction in female adolescents increased over a period of one year while in males it decreased over the same period.

The results also showed that BMI increased over time in both sexes. Other studies corroborate this finding[9,11]. Apparently, BMI increases during adolescent because of weight gain, that is, an increase of body fat in females and of lean mass in males[7,12]. Mirwald *et al.*[12] pointed out that body fat increases in female adolescents because of menarche and hormonal preparation for reproduction. On the other hand, Fortes *et al.*[10] and Baxter-Jones *et al.*[11] emphasize that male adolescents usually gain lean mass during adolescence because of an increase in testosterone released by the anterior pituitary gland.

The results showed that body dissatisfaction among female adolescents differed on the three study occasions (T1, T2, and T3). On T1, T2, and T3, the prevalences of body dissatisfaction increased significantly over time, going from 43.3% to 56.7% to 66.5%, respectively. Other studies confirmed this significant increase over time[3,4] but there are no studies in Brazil that can be used for comparison. During adolescence, the internalization of an ideally thin body in addition to the frequent comparisons of body appearance made by society may be the main factors that encourage female adolescents to dislike their weight and physical appearance[23,25,26]. Body dissatisfaction among girls can then be called "normative discontent" because of the high prevalence reported by the scientific literature[3,4,8]. Since feelings/thoughts of dislike toward one's own body are very frequent among female youth, weight and body dissatisfaction is one of the triggers of abnormal eating behaviors[10,17]. Furthermore, there is evidence that older adolescents have much higher prevalences of body dissatisfaction than younger adolescents[5,7,28]. Perhaps this is explained by the increase in BMI that occurs between ages 10 and 19 years[11]. Either way, this subject requires further study for better scientific clarification.

Contrary to females, the prevalence of body dissatisfaction among males decreased significantly over time, going from 23.9% (T1) to 14.6% (T2) to 3.7% (T1). Helfert and Warschburger[3] corroborate these findings, since the concern with body weight among the males in their study decreased over one year. However, these results contradict other studies. Gondoli *et al.*[4] and Caqueo-Urizar *et al.*[27] estimated that the prevalence of body dissatisfaction during puberty may increase in males, just like it does in females. They mention the need of longitudinal studies with male samples to better clarify this issue.

Female BSQ scores increased from T1 to T3, confirming other studies. Helfert and Warschburger[3] found that body dissatisfaction in girls aged 11 to 16 years increased over a one-year period. However, Gondoli *et al.*[4] did not find changes in body dissatisfaction over a three-year period. These discrepancies may stem from the different instruments used by these studies. Standardization of the instruments that measure adolescents' concern with their bodies is advisable to enable more plausible and reliable comparisons in the future.

In summary, the increase in body dissatisfaction seen in females during adolescence may be explained by sexual attractiveness. According to Rodgers *et al.*[26], the beginning of puberty, which is the period from ages 10 to 14 years, is when females start displaying interest in males. However, females may feel that they do not meet the ideal beauty standards[18]. Gondoli *et al.*[4] point out that if these girls are unable to flirt successfully, they may start to dislike their bodies, which may then have a negative impact on their eating behavior in an attempt to change their body shape.

The male BSQ scores over time found by the present study corroborate those found by other studies[3]. Body dissatisfaction seems to decrease during adolescence among males[7,28]. Perhaps this phenomenon is influenced by the internalization of the muscular body commonly desired by boys[5,23,24]. The increase in lean mass that occurs during adolescence in males may be considered a protective factor against the development of feelings and thoughts of dislike against one's own body[7,29]. Nevertheless, some authors emphasize that the ideal body may vary according to culture[15,23,30-32]. So it is possible that in some cultures, a gain in muscle mass is not good for the body image of male adolescents.

The change in body dissatisfaction found among boys over a one-year period may be explained by the instrument used by the present

study. The BSQ focuses on one's concern with excess weight and dislike of body fat. Males seem to be more concerned with muscles[13]. Hence, the decrease in male adolescents' concern with adiposity, and thus body dissatisfaction, seems notorious.

Some of the present findings are interesting and original but the study has limitations. One of the limitations was the use of a self-administered questionnaire. Studies have highlighted that youth may not answer questionnaires reliably[18]. However, Fortes and Ferreira[7] pointed out that self-administered instruments may be considered the gold standard in studies with large samples because they are easy to use and inexpensive. The sample loss that occurred over the study period may be considered another limitation. These losses were due to absences on T2 (152 adolescents) and T3 (173 adolescents), incomplete anthropometric data (T2 = 6 and T3 = 10 adolescents), or incomplete questionnaires (T2 = 19 and T3 = 12 adolescents). This fact may be biased the present results. But since the final sample size was still considerably large (larger than a representative sample of this specific population would have to be), the sample loss may have reduced the information bias that could influence the results. Furthermore, not measuring the presence of psychiatric symptoms, such as those of depression, may be another limitation. Some studies show that psychiatric[27] and depression[3] symptoms may affect body dissatisfaction. Finally, this seems to be the first study in Brazil that compares body dissatisfaction over time in adolescents.

In conclusion, both body dissatisfaction prevalences and scores changed over time for males and females. Females seem to be more susceptible to negative feelings towards their bodies during adolescence, while males like their bodies more over time.

Longitudinal studies on the affective and behavioral variables of Brazilian adolescents are recommended. These studies promote the advancement of science in this area and allow more appropriate interventions to be made on this youth to reduce their body dissatisfaction.

Acknowledgments

The "Fundação de Amparo à Pesquisa do Estado de Minas Gerais (Fapemig)" by the funding of research project.

References

1. Thompson JK. The (mis) measurement of body image: ten strategies to improve assessment for applied and research purposes. Body Image. 2004;1(1):7-14.
2. Fitzsimmons-Craft EE, Harney MB, Koethler LG, Danzi LE, Riddel MK, Bardone-Cone AM. Explaining the relation between thin ideal internalization and body dissatisfaction among college women: The roles of social comparison and body surveillance. Body Image. 2012;9(1):40-9.
3. Helfert S, Warschburger P. A prospective study on the impact of peer and parental pressure on body dissatisfaction in adolescent girls and boys. Body Image. 2011;8(1):101-9.
4. Gondoli DM, Corning AF, Salafia EHB, Bucchianeri MM, Fitzsimmons EE. Heterosocial involvement, peer pressure for thinness, and body dissatisfaction among young adolescent girls. Body Image. 2011;8(2):143-8.
5. Miranda VPN, Conti MA, Bastos R, Ferreira MEC. Body dissatisfaction in Brazilian adolescents in small towns of Minas Gerais. J Bras Psiquiatr. 2011;60(3):190-7.
6. Santos EMC, Tassitano RM, Nascimento WMF, Petribu MMV, Cabral PC. Satisfação com o peso corporal e fatores associados em adolescentes do ensino médio. Rev Bras Ped. 2011;29(2):214-23.
7. Fortes LS, Ferreira MEC. Comparação da insatisfação corporal e do comportamento alimentar inadequado em atletas adolescentes de diferentes modalidades esportivas. Rev Bras Educ Fis Esporte. 2011;25(4):707-16.
8. Triches RM, Giugliane ERJ. Insatisfação corporal em escolares de dois municípios da região Sul do Brasil. Rev Nutr. 2007;20(2):119-28.
9. Siervogel RM, Demerath EW, Schubert C, Remsberg KE, Chumlea WC, Sun S, et al. Puberty and body composition. Horm Res. 2003;60(1):36-45.
10. Fortes LS, Almeida SS, Ferreira MEC. Processo maturacional, insatisfação corporal e comportamento alimentar inadequado em jovens atletas. Rev Nutr. 2012,5(5):575-86.
11. Baxter-Jones D, Eisenmann JC, Sherar LB. Controlling for maturation in Pediatric exercise science. Pediatr Exerc Sci. 2005;17(1):18-30.
12. Mirwald RL, Baxter-Jones ADG, Bailey DA, Beunen GP. An assessment of maturity from anthropometric measurements. Med Sci Sport Exerc. 2002;34(4):689-94.
13. Frederick DA, Buchanan GM, Sadehgi-Azar L, Peplau LA, Haselton MG, Berezovskaya A. Desiring the muscular ideal: men's body satisfaction in the United States, Ukraine and Ghana. Psych Men Masculinity. 2007;8(2):103-17.
14. White J, Halliwell E. Examination of a sociocultural model of excessive exercise among male and female adolescents. Body Image. 2010;7(2):227-33.
15. Amaral ACS, Cordás TA, Conti MA, Ferreira MEC. Equivalência semântica e avaliação da consistência interna da versão em português do Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3). Cad Saude Publica. 2011;27(8):1487-97.
16. Kelly NR, Bulik CM, Mazzeo SE. An exploration of body dissatisfaction and perceptions of black and white girls enrolled in an intervention for overweight children. Body Image. 2011;8(2):379-84.
17. Alves E, Vasconcelos FAG, Calvo MCM, Neves J. Prevalence of symptoms of anorexia nervosa and dissatisfaction with body image in female adolescents in Florianópolis, Santa Catarina, Brazil. Cad Saude Publica. 2008;24(3):503-12.
18. Mousa T, Mashal RH, Al-Domi HA, Jibril MA. Body image dissatisfaction among adolescent schoolgirls in Jordan. Body Image. 2010;7(1):46-50.
19. Conti MA, Cordás TA, Latorre MRDO. Estudo de validade e confiabilidade da versão brasileira do Body Shape Questionnaire (BSQ) para adolescentes. Rev Bras Saúde Mater Infant. 2009;9(3):331-8.
20. Bighetti F, Santos CB, Santos JE, Ribeiro RPP. Tradução e avaliação do Eating Attitudes Test em adolescentes do sexo feminino de Ribeirão Preto, São Paulo. J Bras Psiquiatr. 2004;53(6):339-46.
21. Fortes LS, Amaral ACS, Costa LS, Conti MA, Cordás TA, Ferreira MEC. Qualidades psicométricas do Eating Attitudes Test (EAT-26) para a população adolescente masculina brasileira. Psicol Refl Crit. 2013. [no prelo]
22. Critério de Classificação Econômica Brasil. Disponível em: <http://www.datavale-sp.com.br/CCEB.pdf>. Acesso em: 1º fev. 2011.
23. Fortes LS, Almeida SS, Laus MF, Ferreira MEC. Level of psychological commitment to exercise and comparison of body dissatisfaction of athletes participating in the Pan-American School Games. Rev Bras Med Esporte. 2012;18(4):238-41.
24. Silva DAS, Nahas MV, Sousa TF, Del Duca GF, Peres KG. Prevalence and associated factors with body image dissatisfaction among adults in Southern Brazil: a population-based study. Body Image. 2011;8(3):427-31.
25. ISAK – The International Society for Advancement for Kineanthropometry. First printed. Australia: National Library of Australia; 2001.
26. Rodgers R, Cabrol H, Paxton SJ. An exploration of the tripartite influence model of body dissatisfaction and disordered eating among Australian and French college women. Body Image. 2011;8(1):208-15.
27. Caqueo-Urizar A, Ferrer-Garcia M, Toro J, Gutierrez-Maldonado J, Penaloza C, Cuadros-Sosa Y, et al. Associations between sociocultural pressures to be thin, body distress, and eating disorder symptomatology among Chilean adolescent girls. Body Image. 2011;8(1):78-81.
28. Laus MF, Miranda VPN, Almeida SS, Costa TB, Ferreira MEC. Geographic location, sex and nutritional status play an important role in body image concerns among Brazilian adolescents. J Health Psych. 2012;17(6):315-22.
29. Fortes LS, Miranda VPN, Amaral ACS, Ferreira MEC. Insatisfação corporal de adolescentes atletas e não atletas. J Bras Psiquiatr. 2011;60(4):309-14.
30. De Bruin AP, Woertman L, Bakker FC, Oudejans RRD. Weight-related sport motives and girl's body image, weight control behaviors, and self-esteem. Sex Roles. 2009;60(9):628-41.
31. Timerman F, Scagliusi FB, Cordás TA. Acompanhamento da evolução dos distúrbios de imagem corporal em pacientes com bulimia nervosa, ao longo do tratamento multiprofissional. Rev Psiq Clín. 2010;37(3):113-7.
32. Fortes LS, Morgado FFR, Ferreira MEC. Fatores associados ao comportamento alimentar inadequado em adolescentes escolares. Rev Psiq Clín. 2013;40(2):59-64.