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Association of nutritional status and sexual maturation with dissatisfaction with body image

Associação de estado nutricional e maturação sexual com insatisfação com a imagem corporal

Abstract

Objective: To evaluate the association of nutritional status and sexual maturation with body dissatisfaction in adolescents. ***Methods***: This is a crosssectional study carried out with adolescentes aged 10 to 14 from public schools. Weight, height, BMI for age, waist circumference, percentage of body fat,sexual maturation (Tanner's scale) and body dissatisfaction were assessed using the Scale for Assessment of Body Dissatisfaction for Adolescents (EEICA). For the statistical analysis, the SPSS version 17.0 program was used and the Kolmogorov-Smirnov, Pearson's Chi-square, Student's T or Anova tests were used, considering a significance level of 5%. ***Results:*** The sample consisted of 345 adolescents, 53.6% female. The majority (63.6% girls and 66.7% boys) are eutrophic. The mean EEICA sco ,302r for females (11.46 ± 5.90) was higher than for males (9.29 ± 4.71) (p <0.001). In both sexes, the BMI for age, percentage of body fat and waist-to-height ratio were associated with a higher score in the EEICA (p <0.001). In the female, the post-puberals were more dissatisfied than the pubescent ones. ***Conclusion***: It was observed a higher score in the female, as well as an association between body dissatisfaction and nutritional status in both sexes and sexual maturation in females. Such findings reinforce the importance of approaching the theme and its possible consequences, stimulating reflection on beauty standards

Keywords: Body Image. Adolescent. Nutritional Status.

Resumo

Objetivo: Avaliar a associação do estado nutricional e maturação sexual com a insatisfação corporal em adolescentes. ***Métodos:*** Trata-se de estudo transversal, realizado com adolescentes de 10 a 14 anos de escolas públicas. Avaliaram-se peso, altura, IMC para idade, perímetro da cintura, percentual de gordura corporal, maturação sexual (escala de Tanner) e insatisfação corporal, por meio da pontuação na Escala de *Evaluación de Insatisfación Corporal para Adolescentes* (EEICA). Para as análises estatísticas, utilizou-se o programa SPSS versão 17.0 e realizaram-se os testes de Kolmogorov-Smirnov, Qui-quadrado de Pearson, *t* de Student ou Anova, considerando-se nível de significância de 5%. ***Resultado:*** A amostra foi composta por 345 adolescentes, sendo 53,6% do sexo feminino. A maioria (63,6 % meninas e 66,7% dos meninos) são eutróficos. A pontuação média da EEICA no sexo feminino (11,46 ± 5,90) foi superior ao masculino (9,29 ± 4,71) (p<0,001). Em ambos os sexos, o IMC para idade, percentual de gordura corporal e razão cintura/estatura associaram-se a uma maior pontuação na EEICA (p<0,001). No sexo feminino, as pós-puberes foram mais insatisfeitas que as púberes. ***Conclusão:*** Observou-se maior pontuação no sexo

feminino, assim como associação entre insatisfação corporal e o estado nutricional em ambos os sexos e com a maturação sexual no sexo feminino. Tais achados reforçam a importância da abordagem do tema e suas possíveis consequências, estimulando a reflexão sobre os padrões de beleza.

Palavras-chave: Imagem Corporal. Adolescentes. Estado Nutricional

INTRODUCTION

Adolescence is a phase characterized by biopsychosocial changes, as it consists of the transition between childhood and adulthood. In this phase, adolescents increase their concern about appearance and acceptance in the social environment, in the which they interact, seeking to achieve society's cultural goals and expectations.[1]

The concern with body image and weight has become more and more frequent in this audience, since the standard of beauty imposed by contemporary society is a lean and athletic body. Such standard can trigger dissatisfaction with body image, eating disorders, stress and depression, with females being the most vulnerable.[2,3]

In addition to social aspects, the characteristics changes of the phase, such as sexual maturation and changes in body composition, can promote dissatisfaction with body image. In girls, it occurs mainly after menarche, since it leads to greater deposition of body fat.[4] Due to the concern with social acceptance and body changes, it is common in this phase of life to have dissatisfaction with body image, which is defined as a discontent with the image related to the shape of the body and its feelings, as well as its attitudes and experiences.[5,6]

Based on the above considerations, the present study aimed to evaluate the association of nutritional status and sexual maturation with body dissatisfaction in adolescents..

METHOD

This study was carried out with a subsample based on data from the "JF Corações" (JF Hearts) survey, conducted with students from public schools in the city of Juiz de Fora, Minas Gerais. This is a cross-sectional, school-based study, carried out in the academic period of 2011 and 2012.

The sample size was calculated based on the 2009 School Census, conducted by the Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira – INEP (National Institute of Educational Studies and Research Anísio Teixeira), from the Ministério da Educação (Ministry of Education). All adolescents aged to 10 to 14 years who attended the day of data collection were selected.

The research was approved by the Comitê de Ética em Pesquisa com Seres Humanos da Universidade Federal de Juiz de Fora (Human Research Ethics Committee of the Federal University of Juiz de Fora) with opinion on 09/2010. The study participants and their guardians received clarifications and, after agreeing to participate, delivered the informed consent form signed by the legal guardians.

The inclusion criteria for the participants were: belonging to the target population (age between 10 to 14 years old, of both sexes) and agreement to participate in the study voluntarily. The exclusion criteria were: the non-consent of legal guardians or students to participate in the study; adolescents using pacemakers and/or orthopedic prostheses that compromise anthropometric and/or body composition assessments; with special needs and girls who reported pregnancy or lactation.

Data collection – Anthropometric assessment

To measure body weight, a portable electronic scale, Tanita Iroman®, with a maximum capacity of 130 kilos was used. Participants were weighted with minimal feasible clothing, barefoot and unadorned. To obtain the height, a portable stadiometer, Alturaexata®, was used. Participants were in an upright position, barefoot

and their ankles against the stadiometer platform. From the measurements of weight and height, Body Mass Index (BMI) was calculated, which was analyzed by the World Health Organization (WHO) Anthroplus program, for children and adolescents from 5 to 19 years old, which uses Organização Mundial da Saúde (World Health Organization) data as a reference.[7]

The waist circumference was measured at the midpoint between the last rib and the iliac crest, using a flexible and inelastic measuring tape. The measurement of the waist-to-height ratio was obtained by the ratio between them, with a single cutoff point of 0.5, with lower values being desirable.[8]

The percentage of body fat was obtained using the digital bipolar bioimpedance scale (Tanita Iroman®). Before the assessment, participants were instructed to fast for eight hours of food and liquids; do not exercise, do not consume alcohol and foods contained caffeine (coffee, cola-based soft drinks, chocolates, chocolate milk and tea), in the 12 hour before the test. They were also instructed to wear light clothing on the day of the assessment. The volunteer was asked to remove all metals objects, such as necklaces, rings, bracelets, watches, belts and others; later, the volunteer was positioned in the center of the scale, above the metal sensors, with the mass equally distributed between the feet, without shoes and with light clothing. The cutoff point used for excess body fat was 25% for boys and 30% for girls.[9]

All measures were standardized and collected by previously trained researches.

Sexual Maturation

Sexual maturation was assessed using the Tanner scales. The criteria proposed by Tanner divides puberty into five stages, according to the sexual maturation of the breasts, by the pubic hair and genital organs, with stage I referring to the prepubertal; stages II III and IV, as pubescent and the last stage (V), as post-pubertal. The indication of the stages was performed by self-assessment, without interference from the evaluator and after previous explanation of the instrument. Subsequently, the variable was dichotomized, being considered individuals who were in the first phase (prepubertal) and, as matured, the others.[1]

Body dissatisfaction

For the analysis of body dissatisfaction, the Escala de Evaluación de Insatisfación Corporal para Adolescentes – EEICA (Body Dissatisfaction Assessment Scale for Adolescents – BDASA), composed of 32 questions of self-completion in the form of Likert scale, with a variation of six categories, being the 1st "never" and the 6th "ever", was used. The score is calculated by the sum of the answers and varies from 0 to 96 points, being performed as follows: questions with positive direction receive a value of 0 for the answer "never", "almost never" and "sometimes"; the value 1 for the answer "many times"; the value 2 for the answer "almost always"; and the value 3 for the answer "always". Questions with negative direction, are scored opposite to those with positive direction. The higher the score, the greater the body dissatisfaction.[10]

Statistical Analysis

Initially, the normality of the variables was assessed using the Kolmogorov-Smirnov test. The variables were categorized and presented by absolute and relative frequencies, according to gender and compared using Pearson's Chi-square test. The BDASA score was described according to nutritional status and sexual maturation and compared using Student's t test or Anova. For variables with a statistically significant

difference, a post hoc test was performed. The SPSS version 17.0 software was used and the statistical significance considered was 5%.

RESULTS

The sample consisted of 345 adolescents, enrolled in public schools in the city of Juiz de Fora, aged between 10 and 14 years old, average of 11.89 ±, 1,34 years old, being 53.6% female.

Regarding nutritional status, the majority (63.6% girls and 66.7% boys) are eutrophic. No statistical difference was found in the classification of nutritional status between genders according to BMI. Regarding the percentage of fat, the female sex presented values higher than the male (p = 0.048). As for sexual maturation, it is observed that most of those evaluated are in the pubertal phase (77.9% female and 64.5% male). Furthermore, among girls, 52.9% reported the presence of menarche (Table 1).

Table 1 Anthropometric and sexual maturation characteristics of the sample, according to sex. Juiz de Fora-MG, 2013.

Variable		Female n (%)	Male n (%)	p value
BMI by age	Low weight	7 (3,8)	2 (1,3)	0,384
	Eutrophy	117 (63,6)	106 (66,7)	
	Overweight	38 (20,7)	28 (17,6)	
	Obesity	22 (12,0)	23 (14,5)	
% Body fat	Adequate	130 (71,8)	128 (81,0)	0,048
	Elevated	51 (28,2)	30 (19,0)	
Waist/height ratio	Adequate	150 (82,0)	126 (80,3)	0,687
	Elevated	33 (18,0)	31 (19,7)	
Sexual maturation	Prepubertal	20 (11,0) [a]	37 (23,9) [a]	0,006
	Pubescent	141 (77,9) [b]	100 (64,5) [b]	
	Post-pubertal	20 (11,0) [a,b]	18 (11,6) [a,b]	

BMI by age: Body mass index by age
% of body fat: body fat percentage
Observation: different letters indicate statistical difference between groups.

The average BDASA score in female was 11.46 ± 5.90, and in males, 9.29 ± 4.71, with a significant difference (p < 0,001). In both sexes, the BMI parameters by age, body fat percentage and waist/height ratio were associated with a higher BDASA score (p < 0,001). In female sex, in addition to these parameters, sexual maturation was also associated with greater dissatisfaction, with post-pubertal adolescents being more dissatisfied than pubertal adolescents (Table 2).

Table 2 Score of the Body Dissatisfaction Assessment Scale for Adolescents (BDASA), according to nutritional status and sexual maturation, by sex. Juiz de Fora-MG, 2013.

Variable		BDASA score	p
		Female	
BMI by age	Low weight	8.71 ± 4.386[a, b]	≤ 0,001[¥]
	Eutrophy	10.09 ± 5.055[a, b]	
	Overweight	13.47 ± 5.396[a, c]	
	Obesity	16.06 ± 8.021[c]	

Table 2 Score of the Body Dissatisfaction Assessment Scale for Adolescents (BDASA), according to nutritional status and sexual maturation, by sex. Juiz de Fora-MG, 2013. (Continues)

Variable		BDASA score	p
		Female	
% of body fat	Adequate	10.02 ± 4.878	≤ 0,001
	Elevated	14.09 ± 6.667	
Waist/height ratio	Adequate	10.61 ± 5.456	≤ 0,001
	Elevated	15.12 ± 6.561	
Sexual maturation	Prepubertal	10.80 ± 4.336[a, b]	0.016[£]
	Pubescent	11.04 ± 5.558[a]	
	Post-pubertal	15.00 ± 8.233[b]	
		Male	
BMI by age	Low weight	12.00 ± 11.314[a, b]	≤ 0,001[¥]
	Eutrophy	8.25 ± 4.186[a]	
	Overweight	10.75 ± 4.608[a, b]	
	Obesity	12.35 ± 5.015[b]	
% of body fat	Adequate	8.70 ± 4.558	≤ 0,001
	Elevated	11.87 ± 4.696	
Waist/height ratio	Adequate	8.53 ± 4.326	≤ 0,001
	Elevated	12.52 ± 5.098	
Sexual maturation	Prepubertal	9.05 ± 4.636	0.136
	Pubescent	9.84 ± 4.929	
	Post-pubertal	7.50 ± 3.053	

Note: ¥ Post hoc games test Howell, £ Hochberg's GT2. P value <0.05.
BMI by age: Body mass index by age
% of body fat: body fat percentage
Observation: different letters indicate statistical difference between groups.

Among the questions addressed in the BDASA questionnaire, there are some answers obtained. About 18% of the participants answered that they sometimes felt rejected and/or ridiculed by other people because of their appearance; 15.7% said that they sometimes felt sad about their body image; 20.6% would always like to have more willpower to control what they eat; 9.6% always think that, if their physical aspect does not improve, they will have problems in the future to relate; and regarding the question "How often, when you see your whole body in the mirror, do you not like it?", 13.3% answered that always and 20.6% sometimes.

DISCUSSION

Adolescence is a phase marked by major biological, psychological and social changes, with greater concern for inclusion in a particular social group. With this pressure for social acceptance, the concern with body image has increased more and more. This fact was observed in this study, since high scores were obtained in the BDASA questionnaire and these were significantly higher in adolescents with BMI, high body fat percentage and waist/height ratio. Moreover, sexual maturation has led to greater dissatisfaction among women.

The questionnaire score was higher in females, and from a sociocultural point of view this difference can be understandable, since boys and girls receive different cultural and social stimuli, which can directly influence the way they feel about their physical appearance.[11] Studies show a prevalence of body dissatisfaction in females between 32.2% and 83%.[5,12-16]

The results obtained in the study show that girls who have a higher percentage of body fat, as well as a higher BMI, tend to be more dissatisfied when compared to others. Branco et al.,[15] when analyzing adolescents of both sexes, aged between 14 and 19 years old, observed that overweight and obese girls had greater dissatisfaction with their body image. Studies show that concern about weight and body image are often the result of a standard of beauty imposed by society, which leads girls to inappropriate eating practices and a greater deposition to depression.[17]

Regarding the percentage of body fat, both girls and boys who express this high parameter are more dissatisfied with their body shape. The finding are similar to another study which when analyzing female adolescents with an average age of 12 years, found that those with moderate to high values of the percentage of fat were more dissatisfied with their body image.[18]

Such results may reflect a standard exposed by the media, according to which the idealized body leads to difficulties in acceptance. Due to the stimuli they receive, girls are encouraged to be thinner and boys to have a muscular body, considered the ideal body. The media ends up working to reinforce this ideal body standard.[11]

It was also observed, in both sexes, a relationship between the waist/height ration and dissatisfaction with body image. Those who presented a high waist-to-height ratio are more dissatisfied than those who presented this adequate parameter. Another study, when analyzing this same parameter, found similar results, but there was no statistical proof.[19] This dissatisfaction with body image may be related to the cultural stimulus they receive from society.[11]

In this study, there were no differences in the BDASA score in the difference stages of sexual maturation in males; however, in girls this difference can be noticed, as it appears that in the final stage of sexual maturation they are more dissatisfied. Other studies confirm this finding, demonstrating that the majority of adolescents who have already had menarche would like to reduce their body weight.[4]

Moreira et al.,[20] compared girls of the same age before and after menarche, and noted a significant difference in body mass composition, both in terms of lean and fat mass. The deposition of body fat is a common characteristic of this phase, being especially evident in females. Thus, the greater deposition of body fat in adolescents after menarche may be associated with body dissatisfaction.[4]

Among the limitations of the study, we can mention the method of assessing body satisfaction, the BDASA scale, which does not have a defined cutoff point, which makes it difficult to accurately count satisfied and dissatisfied people. However, the findings are relevant and contribute to the literature.

CONCLUSION

The results show that, although more than half of the sample has a nutritional status of eutrophy, the BDASA scores were high, indicating body dissatisfaction. There was an association between the BDASA scale score and BMI by age, body fat percentage and waist/height ratio. Furthermore, girls in the post-pubertal stage had higher scores than pubertal girls.

Such findings reinforce the importance of addressing the theme and its possible consequences, stimulating reflection on beauty standards.

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Contributors

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