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# Association Between Body Image and Mental Health in Adolescents: A Social Issue

Sandro Legey<sup>1</sup> , Alberto Souza Sá Filho<sup>2</sup> , Pedro Augusto Inacio<sup>3</sup> , Talita Rodrigues Mendes<sup>4</sup> ,  
João Lucas Lima<sup>5</sup> , Dianne Papini<sup>6</sup> , Antônio Egídio Nardi<sup>7</sup> , Patricia Sardinha Leonardo<sup>8</sup> ,  
Rodrigo Alvaro Brandão Lopes-Martins<sup>9</sup> , Sérgio Machado<sup>10</sup> 

<sup>1</sup> Ph.D. Laboratory of Panic and Respiration, Institute of Psychiatry of the Federal University of Rio de Janeiro; Multidisciplinary Laboratory of Physical Activities, Sports and Physical Education, Veiga de Almeida University, Cabo Frio, RJ, Brazil . ORCID: 0000-0003-2867-3218. E-mail: sandrolegey@gmail.com

<sup>2</sup> Ph.D. Post Graduate Program of Evangelical University of Goiás (UniEVANGÉLICA), Anápolis, Brazil. ORCID: 0000-0001-9434-4231. E-mail: doutor.alberto@outlook.com

<sup>3</sup> Master's student. Post Graduate Program of Evangelical University of Goiás (UniEVANGÉLICA), Anápolis, Brazil. ORCID: 0000-0001-9354-1460. E-mail: pedroqinacio@gmail.com

<sup>4</sup> Master's student. Post Graduate Program of Evangelical University of Goiás (UniEVANGÉLICA), Anápolis, Brazil ORCID: 0000-0002-1492-8462. E-mail: talitacorredeira@hotmail.com

<sup>5</sup> Master. Laboratory of Physical Activity Neuroscience, Neurodiversity Institute, Queimados-RJ, Brazil. ORCID: 0000-0003-2943-0736. E-mail: joaolucaslima@gmail.com

<sup>6</sup> Esp. Laboratory of Physical Activity Neuroscience, Neurodiversity Institute, Queimados-RJ, Brazil. ORCID: 0009-0002-6471-8102. E-mail: daiannepapini@gmail.com

<sup>7</sup> MD. Ph.D. Laboratory of Panic and Respiration, Institute of Psychiatry of the Federal University of Rio de Janeiro. ORCID: 0000-0002-2152-4669. E-mail: antonioenardi@gmail.com

<sup>8</sup> Ph.D. Post Graduate Program of Evangelical University of Goiás (UniEVANGÉLICA), Anápolis, Brazil. ORCID: 0000-0002-7662-7702. E-mail: patricia.martins@unievangelica.edu.br

<sup>9</sup> Ph.D. Post Graduate Program of Evangelical University of Goiás (UniEVANGÉLICA), Anápolis, Brazil. ORCID: 0000-0002-4533-1335. E-mail: rodrigo.martins@unievangelica.edu.br

<sup>10</sup> Ph.D. Laboratory of Panic and Respiration, Institute of Psychiatry of the Federal University of Rio de Janeiro (IPUB/UFRJ), Rio de Janeiro, Brazil and Laboratory of Physical Activity Neuroscience, Neurodiversity Institute, Queimados-RJ. ORCID: 0000-0001-8946-8467. E-mail: secm80@gmail.com

## ABSTRACT

The construct of esthetic beauty is culturally and socially determined and widely disseminated by the media. The body image dissatisfaction (BID) is considered a public health problem, it is an important risk factor for disorders related to mental health, which is highly prevalent in adolescents and has an impact on social behavior. We aimed to evaluate the possible association between BID and the mental health aspects of depression and risk of eating disorders and identify the prevalence in adolescent boys and girls. The sample consisted of 308 adolescent students: 167 girls (54.2%) and 141 boys (45.8%). BID was identified by the silhouette scale. The Childhood Depression Scale (CDS) and Eating Attitudes Test (EAT-26) were used to assess MH. The chi-squared contingency test showed an association between body image and mental health variables in both sexes. Results: 70.1% of the girls and 76.6% of the



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boys exhibited BID. The girls demonstrated a significant association between body image and depressive symptoms ( $X(1) = 8.523$ ;  $p = 0.004$ ) and the risk of ED ( $X(1) = 14.281$ ;  $p = 0.000$ ). However, the boys exhibited no interactions between body image and mental health-related factors. Although BID was high in adolescents of both sexes, it may be a marker for depression and eating disorders in girls.

**Keywords:** body image dissatisfaction; depression; eating disorders.

## RESUMO

A construção da beleza estética é cultural e socialmente determinada e amplamente divulgada pela mídia. A insatisfação com a imagem corporal (IC), considerada um problema de saúde pública, é um importante fator de risco para transtornos relacionados à saúde mental que apresenta alta prevalência em adolescentes e impacta sobre o comportamento social. Objetivamos avaliar a possível associação entre IC e os aspectos de saúde mental da depressão e risco de transtornos alimentares e identificar a prevalência em meninos e meninas adolescentes. Método: A amostra foi composta por 308 adolescentes escolares: 167 meninas (54,2%) e 141 meninos (45,8%). A IC foi identificada pela escala de silhueta. A Escala de Depressão na Infância e o Teste de Atitudes Alimentares (EAT-26) foram utilizados para avaliar a saúde mental. O teste de contingência qui-quadrado mostrou associação entre a imagem corporal e as variáveis de saúde mental em ambos os sexos. Resultados: 70,1% das meninas e 76,6% dos meninos apresentaram IC. As meninas demonstraram associação significativa entre imagem corporal e sintomas depressivos ( $X(1) = 8,523$ ;  $p = 0,004$ ) e risco de transtorno alimentar ( $X(1) = 14,281$ ;  $p = 0,000$ ). No entanto, os meninos não exibiram interações entre a IC e os fatores relacionados à saúde mental. Conclusão: Embora o IC tenha sido elevado em adolescentes de ambos os sexos, pode ser um marcador de depressão e transtornos alimentares em meninas.

**Palavras-chave:** insatisfação com a imagem corporal; depressão; transtornos alimentares.

## 1. Introduction

Body image is a mental picture that individuals have of the size and shape of their body, a multidimensional construct represented by feelings, thoughts and behaviors regarding their physical attributes (Legey et al., 2016). The concept of esthetic beauty is culturally and socially determined and widely disseminated by the media, that is, slim women and muscular men (Carvalho, Nunes, Moraes, & Veiga, 2020; Petroski, Pelegrini, & Glaner, 2012) causes people to become excessively preoccupied with body image and increasingly dissatisfied with their own appearance (Legey et al., 2016). It is known that this situation directly implies the dynamic interactions between the being and the environment, and adolescents seem to be more vulnerable to the pressures imposed by society (Petroski et al., 2012), since they are in a phase characterized by physical, psychological, emotional and cognitive transformations, significantly affecting perception of their own body (Marques, Legal, & Höfelmann, 2012).

Body image can be assessed by figure scales or questionnaires; however, when the domain investigated is perceptive, silhouette figures are more often used (Legey et al., 2016). Body image dissatisfaction (BID) is the difference between perceived and ideal or desired body image and is a serious public health problem (Boothroyd, Tovee, & Evans, 2021). Several cross-sectional studies show that BID is associated with sociodemographic factors (age, sex, and sociodemographic condition), anthropometric indicators (body mass index, waist circumference and body fat percentage), physical inactivity or sedentary behavior and common mental disorders (Pelegrini et al., 2012). The prevalence varies from 57 to 84% in adolescent girls and 49 to 82% in boys (Dion et al., 2015), normally more marked in girls, resulting from media and societal pressure, which is increasingly dictating beauty standards characterized by excessive thinness (Petroski et al., 2012).

BID is an important risk factor for the development of mental health-related disorders such as depression, anxiety, suicidal thoughts and eating disorders (Dion et al., 2015; Soares Filho et al., 2020), which may contribute to adolescents experiencing bullying, since habits and eating patterns are formed in this phase of life. Stressful and threatening environments are strongly related to the incidence of mental disorders (Schmidt, 2007), mainly implying deleterious outcomes on the production of brain-derived trophic substances (Miao, Wang, & Sun, 2020), which in turn affect cognitive development and educational (Vogel & Schwabe, 2016). The reverse is



also true (Tillmann, Tobin, Avison, & Gilliland, 2018). So, such conditions have the potential to affect negative changes in social behavior and human relationships with the environment in which they live (Mehta, 2007).

Faced with this scenario, eating behavior stands out, influenced by the media and social relationships, is correlated with BID and may contribute to the development of eating behavior such as anorexia and nervous bulimia (Pizetta et al., 2015; Stefanova, Bakalar, & Baska, 2020). With respect to the risk behaviors for eating behavior, a cross-sectional study with 220 Brazilian students (10-17 years old) of both sexes from the public school system found a strong relationship between BID and risk behaviors such as fear of gaining weight, idealizing thinness, excessive food preoccupation, bingeing and purging (de Souza Santos, Maciel, Fagundes, & Barbosa, 2020). Along these same lines, a study with 780 adolescents in the Slovak Republic (average age of 13.5 years; 56% boys) found a positive correlation between risk behaviors and eating behavior and body image (Stefanova et al., 2020).

Evidence indicates a possible bidirectional relationship between body image and depression (Soares Filho et al., 2020). In addition, positive associations between BID and anxiety and/or depression are commonly reported in the literature, with studies showing that body image is a predictor of these mental disorders (Simbar et al., 2020). A cohort-cross-sectional study with 875 students (13 to 17 years old) performed in Lima, Peru, found an association between BID and depressive symptoms, and dissatisfied students were 3.7 times more likely to report depressive symptoms (Flores-Cornejo, Kamego-Tome, Zapata-Pachas, & Alvarado, 2017). In addition, a web-based Korean study on risk behavior with 36,655 boys and 35,780 girls showed a correlation between perceived body weight and depressed mood (Lim Y & B., 2017).

Although the body image of adolescents is a relevant question and deserves the attention of public entities, both in the psychological context of políticas de health promotion and in the environmental e social, few studies explored its relationship with mental health in Brazilian adolescents, primarily an analysis by sex. As such, investigations in this area should be performed in order to contribute to better understanding of the issue, thereby enabling the planning of preventive actions and early interventions aimed at promoting the health of this vulnerable population. Thus, the purpose of the present study was to determine the prevalence of BID and possible associations with depressive symptoms and risk behavior for eating behavior in a large sample of Brazilian adolescents, stratified by sex. In addition, this study tested the hypothesis that BID would be associated with mental disorders in adolescents and hopes to contribute to greater understanding about this possible association.

## Methods

### *Sample*

This is a descriptive, cross-sectional quantitative study whose convenience sample consisted of 308 adolescents aged between 13 and 17 years, enrolled between the fifth grade of elementary to the third year of secondary school, in two public schools in the city of Armação dos Búzios, located in Rio de Janeiro state, Brazil. The administrators of the participating schools authorized data collection and the students' parents gave their informed consent, according to National Health Council Resolution 466/2012 and the Declaration of Helsinki, approved by the Research Ethics Committee from Federal University of Rio de Janeiro, under number 3,105,242. Informed consent was obtained from the parents of 352 students; however, adolescents that did not complete all the anthropometric tests and those whose instruments were not correctly filled out were excluded. Thus, the study sample consisted of 308 adolescents, 87.5% of those initially recruited. The final sample was composed of 141 boys and 167 girls.



### ***Study Design***

The experimental procedures were conducted during physical education classes, four times in a week, under the supervision of researchers and collaborators. At the first visit, students and parents were informed of all the study procedures and objectives. Next, written informed consent was obtained from the students and their parents. At the second visit the adolescents were familiarized with the mental health-related disorders (CDI-27 and EAT-26) and body image instruments (Silhouette scale). At the third meeting the students completed the two instruments in the classroom, with ambient temperature adjusted to 22°C. All the study participants received the same verbal orientation, there was no communication between them, and the response time was not limited. Anthropometric variables (body weight and height) were collected at the fourth and final visit.

### ***Anthropometric variables***

The following anthropometric and body composition variables were measured: height (cm) and weight (Kg) to calculate body mass index ( $BMI = \text{weight}/\text{height}^2$ ), using a digital scale (Filizola®, PL 180, Brazil), accurate to 0.01 Kg and a stadiometer accurate to 0.1 cm (Sanny®, ES 2020, Brazil). All the anthropometric measures were taken according to International Society for the Advancement of Kinanthropometry measures.

### ***Body Image***

In order to estimate body image satisfaction, a silhouette scale was used with male and female figures representing several body sizes numbered 1 to 9 (Scagliusi et al., 2006; Stunkard, Sorensen, & Schulsinger, 1983). The individuals marked the silhouette that most resembled their current body image and which they would like to have. Body image dissatisfaction was considered the difference between the current and ideal silhouette. Individuals were classified as satisfied if the difference was zero and dissatisfied when different from zero.

### ***Depression***

The Childhood Depression Inventory (CDI), adapted from the Beck Depression Inventory for adults, validated for use in Brazil and demonstrating adequate psychometric characteristics, was used. The CDI is a self-administered instrument used to detect depressive symptoms in young people aged 7 to 17 years. This inventory is composed of 27 items divided into affective, cognitive, somatic and behavioral symptoms. Each question has three response options, scored between 0 and 2 ( $a = 0, b = 1, c = 2$ ), with the sum of the values considered the score. The cutoff point of the CDI was established at 17 points (Coutinho M, Oliveira MX, Pereira DR, & IO., 2014).

### ***Eating Attitudes Test (EAT-26)***

In order to assess the risk behaviors for eating behavior, the Eating Attitudes Test (EAT-26), validated for Portuguese, was applied (Bighetti, Santos, Santos, & Ribeiro, 2004). This self-administered questionnaire contains 26 questions on a Likert scale, scored as follows: always = 3; very frequently = 2; frequently = 1; occasionally, rarely or never = 0). The EAT-26 is composed of three subscales, each assessing different eating behaviors: diet (13 items), bulimia and food preoccupation (6 items) and oral control (7 items). The score is calculated from the sum of the responses to each item, varying from 0 to 78 points, and the higher the score, the greater the risk of developing eating behavior. However, 25 is the only reverse scored item. Scores greater than or equal to 21 indicate risk for eating behavior (Fortes, Amaral, Almeida, Conti, & Ferreira, 2016).



### Statistical Analysis

The data were treated using SPSS 20.0 software (SPSS Inc., New York), and descriptive analysis characterized the sample, calculating central tendency (mean) and dispersion (standard deviation). Data analysis used the chi-squared contingency test at a significance level of 0.05.

### Results

The general sample characteristics are presented in Table 1. A total of 308 adolescents, 167 girls (54.2%) and 141 boys (45.8%), participated in the study. The average depression ( $>17$ ) and risk for eating behavior scores ( $\geq 21$ ) were below, with the clinical cutoff values. In addition, average age, weight, height and BMI are presented in Table 1 for both girls and boys.

**Table 1.** Sample characteristics (n = 308).

Variables	Girls (n = 167)	Boys (n = 141)
	(M $\pm$ SD)	(M $\pm$ SD)
Age (years)	15.4 $\pm$ 1.2	15.6 $\pm$ 1.2
Weight (kg)	58.2 $\pm$ 12.2	62.2 $\pm$ 12.8
Height (cm)	162.0 $\pm$ 5.9	172.0 $\pm$ 8.0
Body mass index (kg/m <sup>2</sup> )	22.2 $\pm$ 4.0	21.1 $\pm$ 4.1
Depression	10.4 $\pm$ 8.9	9.06 $\pm$ 8.2
Eating Attitudes	14.5 $\pm$ 11.1	9.2 $\pm$ 9.0

Abbreviations: M, mean; SD, standard deviation.

Source: table produced by the authors.

The chi-squared exact test showed an association between satisfaction with perceived body image and depressive symptoms ( $X(1) = 8.523$ ;  $p = 0.004$ ). In addition, the results demonstrate that dissatisfied girls exhibit an odds ratio of 5.402 (95% CI = 1.565 - 18.644) for depressive symptoms when compared to satisfied girls (Table 2). There was also a significant correlation between satisfaction level and body image and risk of eating behavior ( $X(1) = 14.281$ ;  $p = 0.000$ ). Thus, the results show that dissatisfied girls have an odds ratio of 10.667 (95% CI = 2.458 - 46.297) in terms of the risk of eating behavior when compared to the satisfied group.

The same analyses were performed for boys; however, body image was not associated with depression and eating behavior. It was also observed that boys dissatisfied with their body image were at greater risk of depressive symptoms and developing eating behavior when compared to their satisfied counterparts.



**Table 2** – Prevalence of mental health-related disorders, according to satisfaction with body image.

Female		BI satisfaction						
		Satisfied - n (%)	Dissatisfied - n (%)	Total - n (%)	X <sup>2</sup>	p-value	OR	95% CI
<b>Depression</b>	<i>Asymptomatic</i>	47 (94.0%)	87 (74.4%)	134 (80.2%)	8.523	0.004*	5.402	1.565 – 18.644
	<i>Symptomatic</i>	3 (6.0%)	30 (25.6%)	33 (19.8%)				
<b>Eating Disorder</b>	<i>Risk free</i>	48 (96.0%)	81 (69.2%)	129 (77.2%)	14.281	0.000*	10.667	2.458 – 46.297
	<i>At risk</i>	2 (4.0%)	36 (30.8%)	38 (22.8)				
Male		BI satisfaction						
		Satisfied - n (%)	Dissatisfied - n (%)	Total - n (%)	X <sup>2</sup>	p-value	OR	95% CI
<b>Depression</b>	<i>Asymptomatic</i>	28 (84.8%)	88 (81.5%)	116 (82.3%)	0.196	0.658	1.273	0.437 – 3.704
	<i>Symptomatic</i>	5 (15.2%)	20 (18.5%)	25 (17.7%)				
<b>Eating Disorder</b>	<i>Risk free</i>	32 (99.0%)	93 (86.1%)	125 (88.7%)	2.963	0.085	5.161	0.655 – 40.646
	<i>At risk</i>	1 (3.0%)	15 (13.9%)	16 (11.3%)				

Legend: X<sup>2</sup>– Pearson's chi-squared; OR – Odds Ratio; 95%CI – 95% confidence interval; \* p < 0.05.

Source: table produced by the authors.

## Discussion

The present study assessed the relationship between depressive symptoms and the risk of developing eating behavior, in both sexes of a large sample of adolescents. The results revealed that 70.1% of the girls and 76.6% of the boys were dissatisfied with their body image; however, only the girls showed positive and significant associations between satisfaction level and body image, depressive symptoms and risk of eating behavior. Thus, dissatisfied girls are more likely to display depressive symptoms and risk of eating behavior.

It is important to underscore that the high prevalence of BID corroborates many studies carried out in this population, since approximately two-thirds of students desire a different silhouette from that perceived. One study with 214 adolescents (average of 12.4 years old) and predominantly girls (65.4%) found 74.3% BID (75.7% for girls and 71.6% for boys), with girls preferring to be slimmer and boys desiring a more muscular body, despite the fact that the BMI and waist circumference of most of the adolescents were within the normal range for their age group (Marques et al., 2012). Another study with 1,019 adolescents (aged 13 to 19 years) from public and private schools reported that 75.0% of the sample exhibited BID, with 41.4% desiring a smaller and 33.7% a larger silhouette than that perceived (Carvalho et al., 2020). Similarly, an investigation with 1,109 Iranian students between 10 and 18 years of age (504 girls and 605 boys) found a high body dissatisfaction index (over 75%) (Hatami, Taib, Djazayery, Mojani, & Mejlej, 2015). Another study with 641 adolescents between 11 and 17 years old found a BID prevalence of 60.4% (boys = 54.5%, girls = 65.7%), with the boys (26.4%) expressing greater desire to increase body silhouette size, while the girls (52.4%) preferred to decrease it (Petroski et al., 2012). Pelegrini et al. (Pelegrini et al., 2012) reported 71.4% BID in 660 adolescents aged 14 to 19 years (317 boys and 343 girls) and, once again, girls and boys desired a smaller and larger body silhouette, respectively.

As a function of the high BID prevalence, adolescents are highly vulnerable to the emergence of food and mental-health related disorders (Carvalho et al., 2020; Petroski et al., 2012). Society-imposed physical and



esthetic demands may explain the high dissatisfaction percentages found. In this respect, these individuals are pressured to conform to the current ideal image of beauty or socially acceptable esthetic standards, which value female thinness and a muscular male body (Carvalho et al., 2020), causing them to become preoccupied with physical appearance, which may lead to an increase in BID levels (Nowak, 1998). Studies show that sociocultural factors such as media and interpersonal influences, internalizing ideas of beauty and comparing appearances may affect perceived body image (Tiggemann, Hayden, Brown, & Veldhuis, 2018). A study with 220 university students showed that exposure to ideal images of thinness results in greater body and facial dissatisfaction than normal images, and a larger number of “likes” on Instagram was associated with more comparisons of appearance and facial dissatisfaction (Tiggemann et al., 2018).

Cross-sectional studies have been carried out to determine the relationship between body image and mental health parameters. The present study found a positive association between satisfaction level and perceived body image and depressive symptoms in girls ( $X(1) = 8.523$ ;  $p = 0.004$ ). Other studies also found a significant association between these variables (Simbar et al., 2020). In a cross-sectional study conducted by Soares Filho *et al.* (Soares Filho et al., 2020) with 2,162 Brazilian adolescents (18 and 19 years old), BID caused by excess weight was associated with depressive disorder symptoms. Similarly, an investigation with 875 Peruvian adolescents (11 to 17 years old) found a relationship between BID and depressive symptoms, observing that dissatisfied individuals were 3.7 times more likely to report depressive symptoms, which may be exacerbated by bullying and chronic stress, a mechanism not yet fully elucidated (Flores-Cornejo et al., 2017; Soares Filho et al., 2020). A web-based Korean study on risk behavior conducted with adolescents (36,655 boys and 35,780 girls) found that depressed mood was significantly associated with perceived low weight in boys and with perceived low and excess weight in girls (Lim Y & B., 2017). In addition, a study with 2000 adolescents between 15 and 18 years of age demonstrated significant body image effects in all the psychological health indicators (Sujoldzic & De Lucia, 2007). A cross-sectional investigation of 3,706 undergraduates (2,699 women and 765 men) showed that BID for both sexes was associated with a higher level of depressive symptoms (El Ansari, Dibba, & Stock, 2014).

The study in question also found an association between BID and the risk of eating behavior ( $X(1) = 14.281$ ;  $p = 0.000$ ). A review conducted by Vaquero-Cristóbal *et al.* (Vaquero-Cristóbal, Alacid, Muyor, & López-Miñarro, 2013) showed that excessive preoccupation with body image, seeking to conform to socially imposed ideals, influences eating behavior and may contribute to eating behavior. A study with 220 public school students in Brazil (10 to 17 years old) reported a positive association between the desire for a smaller silhouette and risky eating behaviors (de Souza Santos et al., 2020). Another cross-sectional study with 335 public school students (10 to 19 years old) found that more than one-quarter of the adolescents with a distorted body image were also susceptible to developing eating disorders (Pizetta et al., 2015). An investigation carried out in the Slovak Republic with 780 adolescents of both sexes, aged between 11 and 15 years, revealed a positive association between eating behavior and body image (Stefanova et al., 2020). Furthermore, a study with 221 Korean and 227 Chinese students (15 to 18 years old) demonstrated a significant positive relationship between body image and eating habits, suggesting that as satisfaction with body image increases, eating habits become more desirable (Ro & Hyun, 2012). The results reported by Aparicio-Martinez *et al.* (Aparicio-Martinez et al., 2019) in Spain, with 168 university students aged 18 to 25 years, also suggest a significant relationship between body image, BID and eating disorders.

Studies show that a high level of body dissatisfaction may pose a threat to well-being and that BID exhibits a relationship with low self-esteem (Aparicio-Martinez et al., 2019) and limitations in psychosocial performance, associating it with depressive symptoms and risky eating behaviors (El Ansari et al., 2014; Marques et al., 2012).



Recent investigations that showed an association between BID, self-esteem and mental health, as well as the role of stress or emotional suffering in behavioral disorders, reinforce these findings (Chae, 2017).

The differences found between boys and girls may be based on the greater social pressure that the latter experience to conform to the ideal physical type (El Ansari et al., 2014; Lira, Ganen, Lodi, & Alvarenga, 2017; Pizetta et al., 2015; Sujoldzic & De Lucia, 2007), who tend to value physical appearance more, and the relationship between BID and mental health-related problems is stronger in groups that are more preoccupied with this aspect (Soares Filho et al., 2020). Thus, body image could have a greater effect on depressive symptoms and the risk of eating behavior in this group. Due to the perceived body changes during adolescence, such as an increase in body fat percentage, girls are more vulnerable to negative perceptions of body image as they are exposed to the thin ideal standard promoted by the media (Carvalho et al., 2020; Pizetta et al., 2015; Soares Filho et al., 2020), including social media, where images and content stimulate girls to aspire to an unrealistic and unattainable body (Aparicio-Martinez et al., 2019; Lira et al., 2017). This dissatisfaction in girls contributes to an increase in body image-related disorders and inadequate eating attitudes, such as restrictive diets (Aparicio-Martinez et al., 2019; Carvalho et al., 2020; Soares Filho et al., 2020).

**Limitations.** Since this is a cross-sectional study, causality could not be determined. The use of self-administered questionnaires is always prone to bias, although they have been validated for the population in question.

**Practical and professional applications.** We understand that the results of our study can be an important starting point for the introduction of public policies and specific professional conduct in Brazilian schools, providing transversal practices of group discussions on the subject, guiding children and adolescents about body image, offering support mental health and questioning harmful actions such as bullying. To achieve this, a strong interdisciplinary intervention would be required.

## Conclusion

The data show a high prevalence of BDI in adolescent students. In addition, significant associations were found between body image and depressive symptoms and the risk of eating behavior in girls. As such, BID may represent a marker for depression and eating disorders in this population.

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