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ORIGINAL ARTICLE

Assessment of the perception of physical competence in Brazilian adolescents of different nutritional status

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Abstract

Purpose Considering the increase in the prevalence of overweight and obese adolescents, this study aimed to analyze the perception of physical competence in Brazilian adolescents of different nutritional status.

Methods A population-based cross-sectional study was performed and included 2.757 (15 ± 4 years-old) adolescent students (1.302 boys, 1.455 girls) from south of Brazil. Strength, flexibility, and aerobic endurance questions were used to evaluate the perception of physical competence. To evaluate nutritional status, body mass index (BMI) was used.

Results The prevalence of overweight and obesity in adolescents was 21.2%, with 25.4% for boys and 17.5% for girls. Girls with lower perception of aerobic endurance were more likely to be overweight/obese. Boys with a poor perception of flexibility were about 10 times more likely to be overweight/obese. Adolescents with a weak and moderate perception of strength were less likely to be overweight/obese.

Conclusion We concluded that perception of physical competence differs depending on the nutritional status of adolescents. Lower perceptions of aerobic endurance and flexibility favor the development of overweight and obese adolescents. However, greater perception of strength competence mostly appears in overweight/obese adolescents.

Keywords Nutritional status · Adolescent · Muscle strength · Physical endurance · Physical competence

Introduction

High levels of sedentary behavior [1–4] and the decreasement in physical activity levels in the transition from childhood to adolescence [5] are key contributors to several adolescent health problems, such as obesity. In this context, Brazil has demonstrated an increasing prevalence of overweight and obese individuals during recent years, with approximately 30.0% of the child and adolescent populations now affected [6].

Adolescent obesity can have consequences not only for the individual's current health, but also for the quality of life in adulthood, since there is a greater likelihood of overweight and obese adolescents becoming obese adults [7, 8]. In addition, rather than the physical consequences [9, 10], obesity is associated with psychological impairment, especially for body image. In adolescents, a negative perception of body image and body dissatisfaction affects emotional health, and can result in low perceived competence, anxiety, and depression symptoms [11, 12].

Evidence suggests that overweight and obese adolescents have a reduced capacity to perform physical activities, such as sports and physical exercise [13]. In this sense, reduced opportunities to partake in these activities may be related to a poor perception of physical competence [14]. The lack of physical activity, besides being negatively associated with nutritional status, can result in physical and motor skill impairment, with less proficiency for daily activities [15].

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These patterns of association highlight the effect of physical activity on the development of self-perception. A physically active environment can induce a more positive attitude toward active behaviors, thereby enhancing physical knowledge and building self-confidence [16, 17]. Physical activity is frequently unpredictable, whereas fundamental movement skills lead to the development of physical capabilities and perceived competence [18].

Considering the association between nutritional status and exercise, adolescents with normal weight may have more opportunities to engage in physical activities. This positive assumption is not only related to weight loss, but also can be used to encourage pursuit of improved health status. Evidence from the literature indicates that adolescents with normal weight perform better in situations involving exercise and sports than those who are overweight/obese [19–21], leading to higher perceived competence in those with normal weight and low perceived competence in those who are obese.

However, there are few reports on the association between perception of physical activity and nutritional status. Therefore, considering the increase in the prevalence of overweight and obese adolescents, this study aimed to analyze the perception of physical competence in Brazilian adolescents of different nutritional status.

Methods

This is a cross-sectional population-based study of 2.757 adolescent students (1302 boys, 1455 girls) (age 15 ± 4 years) selected with proportionate-to-size from the South of Brazil. All participants were students from the 9th grade of elementary school to the 3rd grade of high school from public institutions administrated by Santa Catarina State. Ethics approval was obtained from Santa Catarina State University (approval number 502.531) and those who participated in the study provided signed informed consent. Sample size was conducted according to the procedures described by Luiz and Magnani (2000) [22]. It was calculated considering a 95.0% confidence interval, and an error of 3.0%. The prevalence was estimated by 50.0%. By utilizing conglomerate school approach, it was considered a design effect of 1.5, which represents an increase of 50.0% of the sample. A correction was also made due to possible sample slippages by incomplete questionnaires. It was added another 40.0% and estimate was made based on infinite population. It was required at least 2.243 adolescents. Sample was derivate from 26 different public schools from eight cities from South of Brazil.

Measures

Perception of physical competence

Strength, flexibility, and aerobic endurance questions were used to evaluate the perception of physical competence [23]. Likert scale questions were used (1-bad, 2-weak, 3-moderate, 4-strong, 5-excellent) to evaluate each physical competence.

Nutritional status

To evaluate nutritional status, body mass index (BMI) was used. Height and weight were self-reported and used to calculate BMI (kg/m^2). Nutritional status was classified using the criteria presented by Cole et al. (2000) [24]. For analysis, we divided the adolescents into two groups: normal weight, and those who were either overweight or obese.

Control variables

Control variables were also considered. Sociodemographic outcomes included age (continuous variable), socioeconomic status [25], and racial identity (self-designated). Leisure-time physical activity was a behavioral variable and was evaluated using the Brazilian Portuguese version of the transtheoretical model (stages of change) [26]. Analyses were also controlled for mood state and mood was assessed using the 24-item Brazilian Portuguese version of the Brunel Mood Scale [27]. The Brunel Mood Scale assesses anger, confusion, depression, fatigue, tension, and vigor.

Procedures

Authorization to conduct the research was obtained from the Santa Catarina Education Department. Students were investigated at the school during physical education classes by two trained researchers. Prior to questionnaire administration, an explanation and instructions were provided. All variables were collected using standardized questionnaires. The participants were told that their answers were anonymous and confidential.

Statistical analysis

Data analysis was conducted using SPSS for Windows version 17.0. Data were analyzed in two steps, with explorative analyses conducted following descriptive analyses (absolute and relative frequency). The Chi square test was used to verify the association between perceived physical competence and nutritional status. Inferential analyses were also

conducted using a binary logistic model, which was used to analyze the likelihood of nutritional status being a function of the perception of physical competence [normal weight was indicated as a protection factor (0) and overweight/obese as a risk (1)]. The excellent category was used as reference and analyses were conducted separately for gender since they differed across exposures and outcome variables; values were expressed as odds ratio (OR) and respective 95.0% confidence intervals (95.0% CI) and analysis was adjusted for sociodemographic variables (model 1), mood state (model 2), and leisure-time physical activity (model 3). The full model was also considered (model 4). The significance level was defined as $p < 0.05$.

Results

The prevalence of overweight and obesity in adolescents was 21.2% (95.0% CI = 19.6%–22.8%). When assessed by gender, the prevalence was 25.4% (95.0% CI = 22.9%–28.0%) for boys and 17.5% (95.0% CI = 15.5%–19.7%) for girls. A 3.1% (95.0% CI = 2.4%–3.8%) overall prevalence of obesity was observed [boys 3.6% (95.0% CI = 2.6%–4.8%) and girls 2.7% (95.0% CI = 1.9%–3.7%)].

Associations were observed between nutritional status and the perception of physical competence. Greater flexibility and endurance competence were associated with normal weight. However, greater perceived competence for strength was associated with overweight/obesity. Differences in perceived competence between normal weight and overweight/obese adolescents were observed. The proportion of adolescents with a strong perception of strength was greater in the overweight/obese group. On the other hand, the proportion of adolescents with a strong perceived competence for flexibility was greater in those with normal weight (Table 1).

Boys had a greater perception of physical competence in comparison with girls. In general, the majority of boys had a strong and excellent perception of physical competence, while girls appeared to evaluate themselves as having a moderate perception of competence. Thus, a larger proportion of girls were found to have poor, weak, and moderate perception in comparison with boys (Table 2).

In general, when adjusting for all the variables, girls with lower perception of aerobic endurance were more likely to be overweight/obese compared to girls with excellent perception of endurance competence. Girls whose perception of competence (aerobic endurance) was weak or moderate were 5 and 4 times, respectively, more likely to be overweight/obese. On the other hand, when adjusting for all the variables, girls with a weak and moderate perception of strength were 83.0% and 71.0%, respectively, less likely to be overweight/obese (Table 3).

Table 1 Perception of physical competence according to nutritional status among adolescents from south of Brazil

	Normal weight		Chi square *p* value	Overweight/obesity	
	n = 1965			*n* = 530	
	n	% (95.0% CI)		*n*	% (95.0% CI)
Strength					
Bad	24	1.2 (0.8–1.8)	29.66	3	0.6 (0.1–1.6)
Weak	202	10.3 (9—11.7)	< 0.001	37	7.0 (5.0–9.5)
Moderate	965	49.1 (46.9–51.3)		214	40.4 (36.2–44.7)
Strong	583	29.7 (27.7–31.7)		202	38.0 (34.0–42.4)
Excellent	191	9.7 (8.4–11.1)		74	14.0 (11.1–17.2)
Flexibility					
Bad	58	3.0 (2.2–3.8)	< 0.001	28	5.3 (3.5–7.5)
Weak	269	13.7 (12.2–15.3)	25.25	101	19.0 (15.8–22.7)
Moderate	952	48.4 (46.2–50.7)		264	49.8 (45.5–54.2)
Strong	494	25.1 (23.2–27.1)		98	18.5 (15.3–22.1)
Excellent	192	9.8 (8.5–11.2)		39	7.4 (5.3–9.9)
Aerobic endurance					
Bad	82	4.1 (3.3–5.2)	20.09	22	4.2 (2.6–6.2)
Weak	290	14.8 (13.2–16.4)	< 0.001	116	21.9 (18.4–25.7)
Moderate	868	44.2 (42.0—46.4)		237	44.7 (40.4–49.1)
Strong	514	26.2 (24.2–28.2)		112	21.1 (17.7–24.9)
Excellent	211	10.7 (9.4–12.2)		43	8.1 (5.9–10.8)

For boys, when adjusting for all the variables, a similar pattern of results was observed (Table 4). Compared to boys with an excellent perception of flexibility, boys with a poor perception were about 10 times more likely to be overweight/obese. A negative association between low perception of competence for strength and the likelihood of being obese/overweight was also observed in boys. Boys with a weak and moderate perception of strength were 82.0 and 79.0%, respectively, less likely to be overweight/obese. There was no statistical significant association between competence for aerobic endurance and nutritional status.

Discussion

Our study aimed to analyze the perception of physical competence in Brazilian adolescents with different levels of nutritional status. A high prevalence of overweight and obesity was observed in the study sample, consistent with

Table 2 Perception of physical competence according to gender among adolescents from south of Brazil

	Boys		Chi square *p* value	Girls	
	n = 1.302			*n* = 1.455	
	n	% (95.0% CI)		*n*	% (95.0% CI)
Strength					
Bad	14	1.1 (0.6–1.8)	< 0.001	20	1.4 (0.8–2.1)
Weak	52	4.0 (3.0–5.2)	269.65	215	14.8 (13.0–16.7)
Moderate	495	38.0 (35.4–40.7)		810	55.6 (53.1–58.2)
Strong	535	41.1 (38.4–43.8)		323	22.2 (20.1–24.4)
Excellent	206	15.8 (13.9–17.9)		87	6.0 (4.8–7.3)
Flexibility					
Bad	36	2.8 (1.9–3.8)	< 0.001	66	4.5 (3.5–5.7)
Weak	137	10.5 (8.9–12.3)	140.71	271	18.6 (16.7–20.7)
Moderate	566	43.5 (40.8–46.2)		781	53.8 (51.1–56.3)
Strong	386	29.6 (27.2–32.2)		255	17.5 (15.6–19.6)
Excellent	177	13.6 (11.8–15.6)		82	5.6 (4.5–6.9)
Aerobic endurance					
Bad	36	2.8 (1.9–3.8)	160.73	83	5.7 (4.6–7.0)
Weak	155	11.8 (10.2–13.8)	< 0.001	296	20.4 (18.3–22.5)
Moderate	513	39.4 (36.7–42.1)		719	49.4 (46.8–52.0)
Strong	403	31.0 (28.4–33.5)		277	19.0 (17.1–21.2)
Excellent	195	15.0 (13.1–17.0)		80	5.5 (4.4–6.8)

previous studies with Brazilian adolescents. Mello, Castagna, Bergmann, and Bergmann [28] and Pedroni et al. [29] observed 27.8 and 40.1% of the population to be overweight or obese, respectively. It is important to consider that excess weight, in the study by Pedroni et al. [29], was determined using measures of skin folds thickness (a more accurate measure of obesity); this may contribute to a higher prevalence of overweight and obesity among adolescents than that found in our study.

In addition, similar to our results, a systematic review, Bibiloni et al. [30] found that obesity tends to be higher in boys [31, 32]. Other studies in Brazilian adolescents also observed a significantly higher prevalence of obesity in males (9.0%) than in females (6.0%) [33]. However, females (13.0%) had a significantly higher prevalence of overweight than males (10.0%) [33], and the boys and girls in our study were not statistically different in the rate of obesity. It is important to note that many empirical researches have demonstrated that girls had a higher prevalence of excess weight and obesity [6, 34, 35].

Those studies have shown that the gender difference may be a consequence of different opportunities for recreation and physical activity between females and males. Sociocultural aspects affect lifestyle from childhood, and may create a context in which girls are conditioned to more sedentary activities, while boys are more physically stimulated [1]. In addition, females have a biological predisposition to accumulate body fat, thus contributing to higher levels of obesity [36]. Our results do not support these hypotheses, and therefore, studies should exercise caution while comparing boys and girls as the results might be affected by different sample sizes, age range of the adolescents, research location, and sampling methods. Recent evidence shows that, in Brazil, the gap in health behaviors between boys and girls is decreasing. Both groups may present with health-compromising diets and sedentary behavior patterns [37], which may partially explain our results.

Several factors may be related to overweight and obesity prevalence, for example, studies have suggested that excess weight and obesity can be a consequence of lifestyle [5, 38–40]. The choice of low energy expenditure leisure activities and unhealthy food consumption are factors that favor the development of obesity [1–3, 39]. These general profiles of unhealthy behaviors tend to cluster in low- and middle-income countries such as Brazil, and might be related to demographic changes and Westernization [41]. It is important to note that an unhealthy lifestyle, rather than nutritional status, can have a harmful effect on psychological status, with impairment of adolescent self-perception [42].

Regarding psychological consequences of excess weight and obesity, there are evidences pointing to a negative body perception as well as a low self-esteem [23, 36]. These factors can subsequently reduce motivation to participate in leisure-time physical activities, contributing to the establishment of an inactive lifestyle [43, 44]. In this sense, the normal weight condition allows adolescents to perform more effectively in situations involving endurance and flexibility. This may explain the better perception of competency regarding these physical attributes by adolescents with normal weight [19, 20, 35]. Better perceptions of competency are demonstrated by adolescents who have experienced more opportunities and sporting success involving these activities [16].

Studies indicate that obese adolescents have difficulty performing motor tasks involving flexibility and endurance [5, 19, 45]. As a result, there are implications on the perception of these adolescents in their ability to perform particular tasks [16, 44], reducing their sense of competence. According to our results, low perceptions of competency relating to endurance and flexibility increase the chances of overweight

Table 3 Association between perception of physical competence and nutritional status among adolescent girls from south of Brazil

	OR_{Crude} (95.0% CI)	Model 1[a] ORad (95.0% CI)	Model 2[b] ORad (95.0% CI)	Model 3[c] ORad (95.0% CI)	Model 4[d] ORad (95.0% CI)
Strength					
Bad	0.29 (0.06; 1.36)	0.04 (0.00; 0.42)**	0.13 (0.02; 0.80)*	0.17 (0.03; 1.02)	0.10 (0.01; 1.11)
Weak	0.36 (0.19; 0.68)**	0.16 (0.07; 0.34)**	0.14 (0.06; 0.34)**	0.19 (0.08; 0.46)**	0.17 (0.06; 0.47)**
Moderate	0.45 (0.27; 0.77)**	0.28 (0.15; 0.52)**	0.22 (0.11; 0.44)**	0.36 (0.18; 0.72)**	0.29 (0.13; 0.66)**
Strong	0.57 (0.33; 1.00)	0.41 (0.22; 0.77)**	0.36 (0.18; 0.73)**	0.62 (0.31; 1.25)	0.49 (0.21; 1.12)
Excellent	1	1	1	1	1
Flexibility					
Bad	2.34 (0.95; 5.74)	3.82 (1.27; 11.53)*	4.14 (1.22; 14.04)*	2.81 (0.86; 9.13)	1.98 (0.43; 8.95)
Weak	1.77 (0.85; 3.69)	2.63 (1.07; 6.47)*	2.66 (0.98; 7.25)	2.27 (0.89; 5.74)	2.66 (0.85; 8.28)
Moderate	1.16 (0.57; 2.33)	1.47 (0.63; 3.42)	1.43 (0.56; 3.63)	1.21 (0.51; 2.89)	1.29 (0.45; 3.72)
Strong	1.10 (0.52; 2.36)	1.19 (0.50; 2.81)	0.81 (0.31; 2.12)	0.99 (0.40; 2.43)	0.84 (0.28; 2.49)
Excellent	1	1	1	1	1
Aerobic endurance					
Bad	1.42 (0.55; 3.60)	2.20 (0.70; 6.87)	1.88 (0.51; 6.89)	2.50 (0.68; 9.12)	2.92 (0.59; 14.47)
Weak	1.96 (0.92; 4.17)	2.92 (1.13; 7.54)*	3.53 (1.18; 10.50)*	4.07 (1.37; 12.09)*	5.13 (1.30; 20.16)*
Moderate	1.55 (0.75; 3.21)	2.41 (0.98; 5.90)	2.88 (1.03; 8.06)*	3.15 (1.12; 8.89)*	3.91 (1.06; 14.34)*
Strong	1.26 (0.58; 2.75)	1.96 (0.78; 4.92)	2.30 (0.80; 6.59)	2.40 (0.84; 6.90)	3.53 (0.94; 13.18)
Excellent	1	1	1	1	1

Independent variables: the excellent category was used as reference

Dependent variable: normal weight was indicated as a protection factor (0) and overweight/obese as a risk (1)

Ad adjusted

*Significant at $p < 0.05$. **Significant at $p < 0.01$

[a]Sociodemographic variables: age, socioeconomic status and racial identity

[b]Mental health: mood state

[c]Behavioural: physical activity

[d]Full model

and obesity in adolescents. Studies have shown that perception of competency interferes with the perception of self-efficacy in adolescents [12, 23]. Hence, these adolescents are predisposed to developing a discouraging attitude towards new challenges [16].

Adolescents with low perceptions of physical competence tend to choose sedentary leisure activities [16, 19], and lower motor competence is associated to lower physical fitness in adolescents [46]. As adolescence is an important period during which individuals may adopt life-long exercise habits [5], good perception of physical competence in this population seems to be very important. Thus, poor perceptions of physical competence may contribute to the depreciation of quality of life, and favor the chances of overweight and obesity.

Some empirical researchers have found that obesity has a positive effect on the absolute muscle strength of adolescents [47, 48]. However, this relationship seems to be bidirectional and may explain the association between low perceived competence for strength and a lower likelihood of being overweight or obese. Our findings suggest that a higher BMI can promote success in motor skills involving strength, and the ability to perform successfully seems to be important to the improvement of perception of strength competence in adolescents. The important theoretical framework of self-determination theory has demonstrated that the degree to which basic psychological needs are satisfied provides greater intrinsic motivation for the individual to pursue goal-directed behavior; in this sense, psychological needs such as competence seem to be essential to promote self-determined motivation for physical activity and healthy psychological functioning [49, 50].

Our results are an indicative that the exploitation of the power capacities of this population may become a successful strategy to combat obesity [16, 46]. In circumstances such as physical education at school or in leisure-time physical activities, adolescents who demonstrate greater motivation and persistence when faced with a situation involving strength (tug of war, for example), tend to perform these tasks with greater success, and the willingness of teenagers to perform tasks in physical education classes is one of the strongest predictors of good perception of

Table 4 Association between perception of physical competence and nutritional status among adolescent boys from south of Brazil

	OR_{Crude} (95.0% CI)	Model 1[a] ORad (95.0% CI)	Model 2[b] ORad (95.0% CI)	Model 3[c] ORad (95.0% CI)	Model 4[d] ORad (95.0% CI)
Strength					
Bad	0.33 (0.04; 2.76)	0.04 (0.00; 0.44)**	0.04 (0.00; 0.49)*	0.000 (0.000;)	0.00 (0.00;)
Weak	0.82 (0.39; 1.74)	0.25 (0.10; 0.60)**	0.24 (0.09; 0.63)**	0.22 (0.07; 0.66)**	0.18 (0.04; 0.68)*
Moderate	0.71 (0.48; 1.06)	0.27 (0.16; 0.45)**	0.30 (0.17; 0.54)**	0.29 (0.16; 0.52)**	0.21 (0.10; 0.45)**
Strong	1.11 (0.76; 1.63)	0.65 (0.41; 1.02)	0.78 (0.46; 1.32)	0.74 (0.45; 1.23)	0.63 (0.34; 1.18)
Excellent	1	1	1	1	1
Flexibility					
Bad	3.09 (1.37; 6.96)**	4.00 (1.52; 10.52)**	4.88 (1.62; 14.64)**	6.30 (2.03; 19.48)**	9.58 (2.37; 38.69)**
Weak	2.64 (1.53; 4.55)**	3.09 (1.60; 5.98)**	3.57 (1.67; 7.64)**	3.19 (1.45; 7.01)**	4.13 (1.56; 10.92)**
Moderate	1.90 (1.21; 2.96)**	2.03 (1.18; 3.48)*	2.08 (1.11; 3.92)*	2.89 (1.52; 5.47)**	2.51 (1.14; 5.49)*
Strong	0.94 (0.58; 1.53)	0.95 (0.55; 1.63)	0.80 (0.42; 1.53)	1.16 (0.61; 2.19)	0.88 (0.40; 1.91)
Excellent	1	1	1	1	1
Aerobic endurance					
Bad	2.04 (0.88; 4.73)	2.72 (1.02; 7.25)*	2.30 (0.78; 6.79)	1.56 (0.47; 5.16)	2.20 (0.50; 9.67)
Weak	3.16 (1.91; 5.23)*	3.85 (2.09; 7.08)**	3.00 (1.49; 6.07)**	2.03 (1.04; 3.96)*	2.22 (0.95; 5.18)
Moderate	1.02 (0.68; 1.68)	1.97 (1.17; 3.32)*	1.45 (0.78; 2.68)	1.22 (0.70; 2.12)	1.28 (0.63; 2.59)
Strong	1.07 (0.68; 1.68)	1.16 (0.69; 1.94)	1.03 (0.57; 1.89)	0.82 (0.47; 1.41)	1.01 (0.51; 2.00)
Excellent	1	1	1	1	1

Independent variables: the excellent category was used as reference

Dependent variable: normal weight was indicated as a protection factor (0) and overweight/obese as a risk (1)

Ad adjusted

*Significant at $p < 0.05$. **Significant at $p < 0.01$

[a]Sociodemographic variables: age, socioeconomic status and racial identity

[b]Mental health: mood state

[c]Behavioural: physical activity

[d]Full model

competence [48]. Indeed, exercises can lead to better perception of physical competence in adolescents with poor motor skills [14].

Some studies show that boys have a better perception of physical competence and self-efficacy compared to girls, suggesting some gender differences [23, 44, 46]. The social conditions that affect boys and girls show that girls are still subject to remnants of an education system with submission of values and reduced freedom, while boys are subject to values of strength and virility [51]. In this context, the fact that active boys tend to prefer more active activities can be better understood [45]. Leisure-time physical activity opportunities are, therefore, more prevalent in boys and this likely contributes to differences in perceived competence. As adolescents with normal weight are exposed to more active behaviors, they are consequently encouraged more frequently and have more success in building skills involving resistance [16]. This may explain the fact that perception of competence for aerobic resistance is a contribute variable for girls and not for boys. In our results, a low perception of endurance competence only exposed girls to overweight/obesity, and boys experienced a greater perception of endurance competence compared to girls.

Public health interventions should be tailored to promote physical activity within an environment that results in a positive psychological outcome, such as perception of physical competence [15]. Our work shows the importance of a supportive physical education environment to psychological well-being, and reveals that adolescents with a poor perception of physical competence can be at risk for overweight and obesity. Evidence shows the importance and impact of physical education on health [52, 53]. Significant individuals in an adolescent's life must consider the impact of their actions on behaviors. The encouragement to pursue physical activity through the support of psychological needs might contribute to more positive outcomes [52]. A lower perception of physical competence represents important constraints to physical activity, which in turn may expose adolescents to obesity.

Strengths and limitations

There are a number of limitations that should be addressed. Data are from a cross-sectional study and the associations may occur in a reverse direction. Indeed, data were self-reported and the limitations that accompany self-reported BMI are well known. Results regarding the perception of physical competence and BMI must be analyzed carefully as participant answers might be led by social desirability. It is also important to consider that student perception of physical competence can be influenced by different environments and significant others, such as physical education teachers, parents, and friends, however, these variables were not investigated. On the other hand, the sample was composed of a representative number of adolescents from Brazil, a middle-income country, which is rare in the literature. The results allowed the investigation of a psychological variable in the context of a major public health problem. In addition, the study took different models into account, using sociodemographic, behavioral, and mental health variables.

Conclusion

The perception of physical competence differs depending on the nutritional status of adolescents. Lower perceptions of physical competence favor the development of overweight and obese adolescents. Adolescents with normal weight tend to perceive themselves as more competent and the normal weight condition seems to contribute to greater perception of success in activities involving resistance and flexibility. However, the role of physical competence should not be generalized, as a greater perception of strength competence mostly appears in overweight/obese adolescents. The observed differences in the perception of physical competence suggests that the promotion of physical activity in adolescents can be more effective when supporting essential psychological needs.

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Compliance with ethical standards

Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval Ethical approval was obtained from Santa Catarina State University (approval number 502.531).

Informed consent Informed consent was obtained from all individual participants included in the study.

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