ORIGINAL ARTICLE

Analysis of the physical activity level, depression, anxiety and stress according to sex in adolescent students: cross-sectional study

Análise do nível de atividade física, depressão, ansiedade e estresse segundo o sexo em adolescentes escolares: estudo transversal

Análisis del nivel de actividad física, depresión, ansiedad y estrés según sexo en estudiantes adolescentes: estudio transversal

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ABSTRACT

Objective: to compare the level of physical activity and symptoms of depression, anxiety and stress according to sex in school adolescents. **Methods:** cross-sectional study with students from public high schools. For data collection were used: Sociodemographic and lifestyle questionnaire, International Physical Activity Questionnaire (IPAQ) and Depression Anxiety Stress Scale for Youth (DASS-Y). Pearson's chi-square or Fisher's exact tests and the univariate General Linear Model were used in the analysis. **Results:** participation of 516 adolescents, 214 male and 302 female adolescents. Both sexes present less physical activity practice than that recommended for adolescents. Male participants have a greater practice of physical activity outside of school compared to female adolescents, predominantly soccer (33.0%). Female participants had more severe levels of depression (p = 0.002), anxiety (p = 0.013) and stress (p = 0.004) compared to male adolescents (weak Cohen's d). **Conclusion:** there is no difference in the level of physical activity in school adolescents according to sex. Male adolescents present greater practice of physical activities outside of school. Female adolescents present higher levels of depression, anxiety and stress.

Descriptors: Adolescent; Depression; Anxiety; Stress Psychological; Exercise.

RESUMO

Objetivo: *comparar o nível de atividade física e sintomas de depressão, ansiedade e estresse segundo o sexo em adolescentes escolares.* ***Métodos:*** *estudo transversal com estudantes do ensino médio de escolas públicas. Utilizou-se na coleta de dados: Questionário sociodemográfico e de estilo de vida, Questionário Internacional de Atividade Física (IPAQ) e Escala de Depressão, Ansiedade e Estresse para Adolescentes (EDAE-A). Testes qui-quadrado de* Pearson *ou exato de* Fisher *e o Modelo Linear Generalizado Univariado foram utilizados na análise.* ***Resultados:*** *participaram 516 adolescentes, 214 do sexo masculino e 302 do feminino. Ambos os sexos apresentam prática de atividades físicas menor que o recomendado para adolescentes. Participantes do sexo masculino apresentam maior prática de atividade física fora da escola em comparação aos do sexo feminino, predominando o futebol (33,0%). Participantes do sexo feminino apresentaram maior gravidade dos níveis de depressão (p = 0,002), ansiedade (p = 0,013) e estresse (p = 0,004) em comparação aos do sexo masculino (d de* Cohen *fraco).* ***Conclusão:*** *não há diferença do nível de atividade física em adolescentes escolares segundo o sexo. Adolescentes do sexo masculino apresentam maior prática de atividades físicas fora da escola, e adolescentes do sexo feminino apresentam maior gravidade dos níveis de depressão, ansiedade e estresse.*

Descritores: *Adolescente; Depressão; Ansiedade; Estresse Psicológico; Exercício Físico.*

RESUMEN

Objetivo: *comparar el nivel de actividad física y síntomas de depresión, ansiedad y estrés según sexo en adolescentes escolares.* ***Métodos:*** *estudio transversal con estudiantes de escuelas secundarias públicas. Para la recolección de datos se utilizaron: Cuestionario Sociodemográfico y de Estilo de Vida, Cuestionario Internacional de Actividad Física (IPAQ) y Escala de Depresión, Ansiedad y Estrés para Adolescentes (EDAE-A). En el análisis se utilizaron las pruebas chi-cuadrado de Pearson o exacta de Fisher y el Modelo Lineal General Univariado.* ***Resultados:*** *participación de 516 adolescentes, 214 hombres y 302 mujeres. Ambos sexos presentan una menor práctica de actividad física que la recomendada para los adolescentes. Los participantes del sexo masculino tienen una mayor práctica de actividad física extraescolar en comparación con las adolescentes del sexo femenino, predominando el fútbol (33,0%). Las mujeres participantes tenían niveles más severos de depresión (p = 0,002), ansiedad (p = 0,013) y estrés (p = 0,004) en comparación con los hombres (d de Cohen pequeña).* ***Conclusión:*** *no existe diferencia en el nivel de actividad física en adolescentes escolares según el sexo. Los adolescentes hombres presentan mayor práctica de actividades físicas fuera de la escuela. Las adolescentes mujeres presentan mayores niveles de depresión, ansiedad y estrés.*

Descriptores: *Adolescente; Depresión; Ansiedad; Estrés Psicológico; Ejercicio Físico.*

INTRODUCTION

Regular physical activity is associated with the prevention of noncommunicable chronic diseases such as diabetes mellitus, cardiovascular diseases, chronic respiratory diseases, some types of cancer and mental disorders. Its effects are extremely positive and lead to a reduction in morbidity and mortality from these diseases[1]. Worldwide, 81% of the population does not meet the physical activity recommendations according to guidelines of the World Health Organization (WHO) [1,2]. Health professionals have different roles in promoting physical activity, whether by counseling, offering guidance or follow-up and supervision.

Physical activity provides benefits such as improving cardiorespiratory fitness, healthy growth, promotes cognitive health, and reduces symptoms of anxiety, stress and depression. Sixty minutes of moderate to vigorous physical activity per day should be performed by this group in order to enhance the beneficial effects in disease prevention[2].

A study of adolescents from 37 countries showed that the older the children and adolescents, the less physical activity they practice. Of the total, 26.6% of 11-year-old boys practiced daily physical activity. This prevalence decreased to 23.9% in 13-year-old boys and to 18.9% in 15-year-olds. In 11-year-old girls, the prevalence of daily physical activity was 18.2%. Among 13- and 15-year-old girls, prevalence rates were 12.9% and 9.4%, respectively[3].

In Brazil, several regions present data similar to those found in the international literature. In a study of 74,589 Brazilian adolescents aged 12 to 17 years conducted in the year 2020, an instrument to assess frequency and time of physical activity was used, and a higher prevalence of physical inactivity was found in females compared to males (70.7 versus 38.0%)[4].

Depression, stress and anxiety also pose serious public health problems in adolescents. According to data from the Global Student Health Survey involving more than 60,000 adolescents aged 12-15 years from 30 countries, the prevalence of depressive symptoms in this age group is 28.7%. This study also showed that anxiety is more prevalent among females, with 25.5% prevalence for extreme anxiety symptoms that begin in adolescence and progress with advancing age. The authors also concluded that the longer the sitting time (> 3 hours/day), the greater the occurrence of depressive symptoms in both boys and girls[5].

Currently, there are public policies aimed at reducing physical inactivity among adults and adolescents in accordance with the global action plan aimed at developing suitable environments for physical activity, in an attempt to reduce 15% of physical inactivity by 2030 through the creation of programs that encourage the practice of sports and recreational activities[6].

There are gaps in the production of knowledge about the relationship between levels of physical activity and symptoms of depression, anxiety and stress in Brazilian adolescents, especially the stratified analysis seeking to understand differences between sexes. In view of this, studies on this topic are needed so that the responsible bodies have better direction in the development of new public policies and actions aimed at promoting the practice of physical activity and preserving mental health, considering the specificities of each sex. In this context, the aim of the present study was to compare the level of physical activity and symptoms of depression, anxiety and stress according to sex in adolescent students.

METHODS

This is a cross-sectional and analytical study conducted between February and July 2018 in state public schools in the municipality of Goiânia, capital of the state of Goiás, Central West region of Brazil.

Population

The study population consisted of adolescents residing in Goiânia and enrolled in one of the 85 state public high schools in this municipality, estimated at 35,104 students in 2017.

The study included students of both sexes aged 14-19 years from 16 institutions in the state education network, who had been regularly enrolled for at least two months before the study was conducted.

Students who had a physical disability such as paraplegia and hemiplegia or those in a wheelchair were excluded from the study, as the questionnaires used to assess the level of physical activity did not have specific questions for this group.

Sampling

Simple random sampling was used by drawing the schools and then classrooms. All students from the drawn classes were invited to participate in the study. The sample calculation was performed using the formula $n = Z^2 P(1-P)/d^2$[7]. The total of 516 students was estimated, considering a 95% ($\alpha = 0,05$) confidence interval, with an expected power of 80% and (d) effect size (study precision) of 0.30. In addition, 10% of potential losses were considered.

Data collection

Data collection was performed during two visits to schools. On the first visit, after the invitation and clarifications in the classroom, students received guidance on the study and the Informed Consent form with the recommendation that those aged under 18 years took the document to their parents/legal guardians in order to obtain their consent by signature. On the second visit to the school, students under 18 years of age whose parents or guardians signed the Informed Consent received guidance on the study and upon agreeing to participate in the study, signed the Informed Assent form.

The instruments described below were used in data collection.

- Questionnaire for investigating the profile of students regarding sociodemographic data and lifestyle, which was prepared by the authors based on the literature review. Variables such as age, sex, family income, housing, lifetime and current use of tobacco, alcoholic beverages and illicit drugs, practice of physical activity inside and outside school and type of physical activity practiced were investigated with use of this questionnaire.
- The Depression, Anxiety and Stress Scale for Youth (DASS-Y)[8,9] was applied to assess symptoms of depression, anxiety and stress.
- The International Physical Activity Questionnaire (IPAQ)[10] was applied to assess the level of daily physical activity practice.

Measurements

Sociodemographic, economic and lifestyle characteristics

The following sociodemographic and economic variables were analyzed: age (years), sex (male or female), family income in minimum wages (grouped into 1–2, 3–4 or ≥ 5 minimum wages) and housing (with company or alone).

The following lifestyle variables were investigated: lifetime use of tobacco (yes or no), current use of tobacco (yes or no), lifetime use of alcoholic beverages (yes or no), current use of alcoholic beverages (yes or no), lifetime use of illicit drugs (yes or no), current use of illicit drugs (no or yes), types of drugs used (such as marijuana, cocaine, Lysergic Acid Diethylamide (LSD) and others), practice of physical activity inside the school (yes or no), practice of physical activity outside the school (yes or no) and type of physical activity practiced (soccer, volleyball, bodybuilding, basketball, handball or others).

Level of physical activity

It was assessed using the IPAQ[10,11]. It is a self-administered instrument consisting of eight semi-open questions. Its information allows estimating the time spent per week in different dimensions of physical activity (walking and physical exertion of moderate and vigorous intensities) and physical inactivity (sitting position)[10,11].

The IPAQ was validated in Brazil[10,11] with the following classification: sitting position, walking, moderate efforts and vigorous efforts[10]. The level of physical activity is calculated by recording the frequency (days) and duration (minutes) of efforts, and classified as very active, active, minimally active and sedentary[10-12].

The classification criteria are: very active physical activity level for those who perform more than five days of activity per week for more than 30 minutes/day; active activity level for those who perform more than three days a week for more than 20 minutes/day; irregularly active are those who perform the activity insufficiently, not meeting the weekly frequency and duration; and the

sedentary are those who do not perform any activity for at least 10 minutes straight during the week[10-12]. It is considered valid for evaluating adolescents[10].

Symptoms of depression, anxiety and stress

These were assessed using the DASS-Y[8], which was proposed by a group of five psychologists who validated and adapted the Depression Anxiety and Stress Scale (DASS-21) – Short Form[9] for Brazilian adolescents.

The questionnaire is self-administered and seeks to acquire information about symptoms of depression, anxiety and stress. Participants indicate if they have experienced each of the symptoms described in the items in the previous week[8,9].

The short version consists of 21 questions divided into seven items for each dimension (depression, anxiety and stress), and the scores for each one are determined by the sum of items in each dimension[9].

The items for each dimension are: depression (items 3, 5, 10, 13, 16, 17, 21), anxiety (items 2, 4, 7, 9, 15, 19, 20) and stress (items 1, 6, 8, 11, 12, 14, 18). The sum of the 21 items results in a measure that tracks negative symptoms related to mental health. Higher scores indicate worse mental symptoms related to anxiety, stress and depression[9].

Each item is scored using a four-point Likert-type scale, where:

0. does not apply to me at all;
1. applies to me to some extent or part of the time,
2. applies to me to a considerable extent or a large part of the time,
3. applies to me a lot or most of the time[8].

The adopted cutoff points are:

1. depression: normal (0 to 9 points); mild (10 to 13); moderate (14 to 20); severe (21 to 27); extremely severe (≥ 28 points);
2. anxiety: normal (0 to 7); mild (8 to 9); moderate (10 to 14); severe (15 to 19); extremely severe (≥ 20 points), and;
3. stress: normal (0 to 14); mild (15 to 18); moderate (19 to 25); severe (16 to 33); extremely severe (≥ 34 points)[8].

Statistical analysis

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS version 21.0) software (IBM, Chicago, United States). In the descriptive analysis, quantitative variables were represented by mean and Standard Deviation (SD) and qualitative variables were represented as absolute (n) and relative (%) frequency, stratified by sex (male and female). Pearson's χ^2 or Fisher's exact tests were used to compare qualitative variables between groups. The univariate Generalized Linear Model (GLM) was used for comparison between continuous variables. The effect size was established by Cohen's d when comparing quantitative variables and by Crámer's V when comparing qualitative variables. The effect size (Cohen's d) was classified as: 0–0.1 as insignificant; 0.1–0.2 as weak; 0.2–0.4 as moderate; 0.4-0.6 as relatively strong; 0.6–0.8 as strong; and 0.8-1, very strong[13]. Regarding Crámer's V, the closer to 0 is considered a weak association between variables, and the closer to 1 is considered a strong association[14]. A significance level of $p < 0.05$ was adopted.

Ethical aspects

The present study was approved by the Research Ethics Committee of the Pontifícia Universidade Católica de Goiás (Certificado de Apresentação de Apreciação Ética) CAAE No. 74378817.9.0000.0037/2018). The recommendations of Resolution No. 466/2012 of the National Health Council were followed.

RESULTS

The sample consisted of 516 students enrolled in state public educational institutions in the city of Goiânia, 302 (58.5%) female and 214 (41.5%) male.

The participants' mean age was 15.9 (SD = 1.15) years, most had a family income of 1-2 minimum wages (55.6%) and lived with their family (99.3%). Almost 70% of adolescents reported having already tried tobacco (27.9%) or alcoholic beverages (68.0%) and 15.3% had already used illicit drugs in their lives. These characteristics show no statistical difference between sexes, except for the mean age, which is slightly higher among male adolescents (Table 1).

Most students reported practicing physical activity inside (82.6%) and outside school (58.9%). The percentage of female adolescents who did not perform physical activity both inside and outside the school environment was significantly higher compared to male adolescents ($p = 0.001$ and $p < 0.001$, respectively), with the effect size of this difference being more intense in relation to practices of physical activities outside of school. Soccer was the exercise modality most practiced by male adolescents (33.3%), while female adolescents preferred other modalities (25.8%) (Table 1).

No statistical difference was found in the level of physical activity between male and female adolescents ($p = 0.226$), as summarized in Table 2.

Table 1 - Description and comparison of demographic, economic and lifestyle data among male and female adolescents attending public schools, Goiânia, Goiás, Brazil, 2018

Variables	Total (n = 516)	Sex		*p*-value	Effect size
		Male (n = 214)	Female (n = 302)		
Age (years), mean (SD)	15.9 (1.2)	16.1 (1.2)	15.8 (1.1)	0.005†	0.260‡
Family income (minimum wages*), n (%)					
1–2	287 (55.6)	117 (54.7)	170 (56.3)	0.177§	0.082/
3–4	185 (35.9)	73 (34.1)	112 (37.1)		
≥ 5	44 (8.5)	24 (11.2)	20 (6.6)		
Housing, n (%)					
With somebody	512 (99.3)	212 (99.1)	300 (99.4)	0.690§	0.096/
Alone	4 (0.8)	2 (0.9)	2 (0.6)		
Lifetime use of tobacco, n (%)					
Yes	144 (27.9)	65 (30.4)	79 (26.2)	0.293§	0.046/
No	372 (72.1)	149 (69.6)	223 (73.8)		
Current use of tobacco, n (%)					
Yes	31 (6.0)	16 (7.5)	15 (5.0)	0.237§	0.052/
No	485 (94.0)	198 (92.5)	287 (95.0)		
Lifetime use of alcoholic beverages, n (%)					
Yes	353 (68.0)	152 (71.0)	201 (66.6)	0.282§	0.047/
No	163 (31.6)	62 (29.0)	101 (33.4)		
Lifetime use of illicit drugs, n (%)					
Yes	79 (15.3)	33 (15.4)	46 (15.2)	0.953§	0.003/
No	437 (84.7)	181 (84.6)	256 (84.8)		
Current use of illicit drugs, n (%)					
Yes	22 (4.3)	12 (5.6)	10 (3.3)	0.203§	0.056/
No	494 (95.7)	202 (94.4)	292 (96.7)		
Type of drugs used, n (%)					
Marihuana	55 (10.7)	24 (11.2)	31 (10.3)	0.363§	0.092/
Cocaine	4 (0.8)	2 (0.9)	2 (0.7)		
LSD	4 (0.8)	3 (1.4)	1 (0.3)		
Others	17 (3.3)	4 (1.9)	13 (4.3)		
None	436 (84.5)	181 (84.6)	255 (84.4)		
Practice physical activity at school, n (%)					
Yes	426 (82.6)	191 (89.3)	235 (77.8)	0.001§	0.148/
No	90 (17.4)	23 (10.7)	67(22.2)		
Practice physical activity outside of school, n (%)					
Yes	304 (58.9)	155 (72.4)	149 (49.3)	< 0.001§	0.238/
No	212 (41.1)	59 (27.6)	153 (50.7)		
Type of physical exercise practiced, n (%)					
Soccer	108 (20.9)	71 (33.2)	56 (20.2)	< 0.001§	0.324/
Volleyball	19 (3.7)	5 (2.3)	14 (4.6)		
Weightlifting	37 (7.2)	18 (8.4)	19 (6.3)		
Basketball	6 (1.2)	6 (2.8)	0 (0.7)		
Handball	1 (0.2)	0 (0)	1 (0.3)		
Others	133 (25.8)	55 (25.7)	78 (25.8)		
None	212 (41.1)	59 (27.6)	153 (50.7)		

Note: LSD: Lysergic acid diethylamide; SD: standard deviation; *minimum wage of R$954.00; †Fisher's exact test; §Pearson's χ^2 test; ‡Cohen's d; /Crámer's V.

Male adolescents performed significantly more frequency and time of physical activities than female adolescents, especially when evaluating vigorous activities. However, the effect size is insignificant (Table 3).

Female adolescents had higher scores for symptoms of depression, anxiety and stress than male adolescents, as shown in Table 4, even though the effect size was also insignificant.

Female adolescents had more symptoms of depression and stress, with greater severity (Table 5) and a small effect size (0.188).

DISCUSSION

Approximately half of participants were inactive or irregularly active, with no difference between sexes. Although differences were identified in the practice of physical activities at school in the frequency (times a week) and duration (minutes/day) of walking, moderate and intense exercises, as well as in the average of symptoms of depression, anxiety and stress in male and female adolescents, the magnitude of this difference is insignificant, leading to relativize this finding.

Likewise, note that female adolescents had a higher degree of anxiety, stress and depression compared to male adolescents, with a weak effect size, indicating the need to also consider the magnitude of this difference.

On the other hand, it was evident that compared to female adolescents, males notably perform more physical activities outside of school.

A study reveals that female adolescents report having more barriers to the practice of physical exercise, such as difficulty moving to the place where exercise can be practiced, laziness, family habits, sedentary lifestyle, while male adolescents present less of these barriers with increasing age[15].

Table 2 - Level of physical activity according to sex in adolescents attending public schools, Goiânia, Goiás, Brazil, February to July 2018

Level of physical activity (IPAQ)	Total (n = 516) n (%)	Sex		*p*-value*	Effect size†
		Male (n = 214) n (%)	Female (n = 302) n (%)		
Very active	26 (5.0)	15 (7.0)	11 (3.6)	0.226	0.079†
Active	229 (44.4)	96 (44.9)	133 (44.0)		
Irregularly active	215 (41.7)	88 (41.1)	127 (42.1)		
Sedentary	46 (8.9)	15 (7.0)	31 (10.3)		

Note: Data presented in n (%); International Physical Activity Questionnaire (IPAQ); *Pearson's χ^2 test; †Crámer's V.

Table 3 - Comparison of frequency (times a week) and duration (minutes/day) of walking, moderate and intense exercise among male and female adolescents attending public schools, Goiânia, Goiás, Brazil, February to July 2018

Variables	Total (n = 516)	Sex		*p*-value*	Effect size†
		Male (n = 214)	Female (n = 302)		
Walking					
Frequency (days)	3.5 (2.4)	3.8 (2.4)	3.3 (2.4)	0.038	0.017
Duration (minutes)	52.7 (48.8)	57.1 (52.9)	49.6 (45.6)	0.086	0.006
Moderate					
Frequency (days)	2.8 (2.3)	3.0 (2.3)	2.6 (2.4)	0.081	0.001
Duration (minutes)	59.0 (53.7)	60.9 (53.2)	57.6 (54.2)	0.504	0.003
Vigorous					
Frequency (days)	1.7 (2.0)	2.4 (2.1)	1.26 (1.7)	< 0.001	0.009
Duration (minutes)	46.4 (54.2)	60.8 (55.3)	36.3 (51.1)	< 0.001*	0.001
Total					
Frequency (days)	8.0 (4.9)	9.1 (5.0)	7.2 (4.7)	< 0.001*	0.017
Duration (minutes)	158.1 (111.5)	178.7 (117.2)	143.5 (105.1)	< 0.001*	0.009

Note: Data presented as mean (Standard Derivation); *Univariate Generalized Linear Model; †Cohen's d.

It is known that the practice of physical exercise is extremely important for everyone in the prevention of noncommunicable chronic diseases[16]. When performed at moderate to vigorous intensity, it is associated with several physical health benefits during childhood and adolescence, including better cardiorespiratory and mental health indices and improved bone mineral density. In addition to these benefits, adolescents who regularly practice vigorous physical activities have better school performance[17].

A systematic review with meta-analysis[18] indicates that between 2001 and 2016, approximately 80% of male adolescents practiced physical activity below the recommended level, while this rate was approximately 90.0% for female adolescents, which is an overall pattern of insufficient physical activity. Such data were reiterated in the present study.

The level of physical activity is associated with the marginalization index, sex, age and school infrastructure[17]. Research indicates an association between socioeconomic level and the level of vigorous activities in boys and girls[19,20]. However, among adolescents of higher socioeconomic status, boys have a greater practice of vigorous activities compared to girls[19].

Table 4 - Comparison of the mean obtained for anxiety, stress and depression symptoms between male and female adolescents attending public schools, Goiânia, Goiás, Brazil, February to July 2018

Variables	Total (n = 516)	Sex		*p*-value*	Effect size†
		Male (n = 214)	Female (n = 302)		
Depression	14.6 (11.7)	12.3 (11.2)	16.2 (11.7)	0.001*	0.034
Anxiety	11.0 (9.8)	9.42 (9.0)	12.2 (10.2)	0.002*	0.028
Stress	17.6 (11.7)	15.1 (11.7)	19.3 (11.3)	< 0.001*	0.036
DASS	21.6 (14.7)	18.4 (13.8)	23.9 (15.0)	< 0.001*	0.038

Note: Data presented as mean (standard derivation); *Univariate Generalized Linear Model; DASS: Depression Anxiety Stress Scale; †Cohen's d.

Table 5 - Comparison of the severity of anxiety, depression and stress symptoms among male and female adolescents attending public schools, Goiânia, Goiás, Brazil, February to July 2018

Variables	Total (n = 516) n (%)	Sex		*p*-value*	Effect size†
		Male (n = 214) n (%)	Female (n = 302) n (%)		
Anxiety					
Normal	234 (45.3)	109 (50.9)	125 (41.4)		
Mild	35 (6.78)	14 (6.5)	21 (7.0)		
Moderate	97 (18.79)	41 (19.2)	56 (18.5)	0.013*	0.188
Severe	37 (7.17)	14 (6.5)	23 (7.6)		
Extremely severe	113 (21.8)	36 (16.8)	77 (25.5)		
Depression					
Normal	208 (40.3)	108(51.9)	100 (33.1)		
Mild	79 (15.3)	30 (14.0)	49 (16.2)		
Moderate	72 (13.9)	26 (12.1)	46 (15.2)	0.002*	0.132
Severe	66 (12.7)	22 (10.3)	44 (14.6)		
Extremely severe	91 (17.6)	28 (13.1)	63 (20.9)		
Stress					
Normal	241 (46.7)	120 (56.1)	121 (40.3)		
Mild	58 (11.2)	25 (11.7)	33 (11.0)		
Moderate	74 (14.3)	21 (9.8)	53 (17.7)	0.004*	0.109
Severe	74 (14.3)	28 (13.1)	46 (15.3)		
Extremely severe	67 (12.9)	20 (9.3)	47 (15.7)		

Note: Pearson's χ^2 test, $p < 0.05$*; †Crámer's V.

Higher socioeconomic status favors the practice of vigorous physical activities developed through sports[19]. Support from friends, family, body competence, the perception of the value and usefulness of physical and sports education are more prevalent factors in boys who practice vigorous physical activities compared to girls[20].

In the context of the intra-school environment, during break times, it appears that the choices of activities differ between boys and girls. Boys see break time as an opportunity to engage in competitive games, while girls see it as an opportunity to socialize with friends[19], leading to lower levels of physical activity in this context[21].

Girls had a higher occurrence of more severe levels of anxiety, depression and stress in the present study. On social networks and in the mainstream media, it is possible to observe the publicity of models with "perfect bodies", building a conception of ideal in society, mainly in reaction to girls, generating a movement in search of reaching expectations. In girls, this search generates greater dissatisfaction with their body image, sadness, bad mood, disappointment, guilt, feelings of failure, concentration problems, difficulty working, fatigue and health concerns, compared to boys[22,23].

It is known that physical activity is responsible for improving self-esteem, self-concept, mood, socialization, cognitive functions and reducing symptoms related to anxiety, stress and depression[24]. Thus, it is important to stimulate, support and encourage the practice of physical activities among adolescents, especially female adolescents. Considering the great capillarity of the Family Health Strategy throughout Brazil and the large population reach of primary care services around the world, this issue should be on the agenda of all health professionals.

Despite its contributions to knowledge in the area, the study has limitations. Although the instruments used have been validated and widely used in epidemiological studies given the low cost and ease of application, there are more accurate methods and equipment to determine the level of physical activity than the questionnaires used, such as physiological markers and electronic movement sensors to measure daily physical activity, as well as biochemical parameters for detecting levels of depression, anxiety and stress in adolescents or even the specialized professional diagnosis. Other limitations include the impossibility of attributing causality in the direction of the associations found, as it is a cross-sectional study, and the lack of regression analysis to control possible confounders.

Considering the importance of following the recommendations for healthy living habits, especially the practice of regular physical exercise to reduce symptoms of depression, anxiety and stress, essentially in girls, interdisciplinary studies testing interventions aimed at this population group are recommended. These can subsidize the development of public policies to improve this scenario and a better future for these young people, especially female adolescents.

CONCLUSION

Adolescents of school age attending high school in public schools have lower levels of physical activity practice than levels recommended for their age group. There is no difference between the level of physical activity in relation to the sex of adolescents. However, male adolescents practice more physical activities outside the school context, especially football, basketball and weightlifting, compared to female adolescents. There is no difference between the amount of anxiety, depression and stress symptoms between sexes, although in terms of severity, female adolescents have more severe levels of anxiety, depression and stress than male adolescents.

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CONFLICT OF INTERESTS

None.

AUTHORS' CONTRIBUTIONS - CRediT

SASR: conceptualization; data curation; formal analysis; investigation; methodology; project administration; resources; supervision; validation; visualization; writing - original draft and writing - review and editing.

MPSC: conceptualization; data curation; formal analysis; investigation; methodology; project administration; resources; validation and writing - original draft.

AMC: methodology; project administration; supervision; validation; visualization; writing - original draft and writing - review and editing.

KSC: conceptualization; data curation; formal analysis; investigation; methodology; project administration; resources; supervision; validation; visualization; writing - original draft and writing - review and editing.

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