Factors Associated with the Practice of Physical Activity of Leisure in Adolescents

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Abstract: *The objective of this research is to verify the factors associated with the practice of leisure-time physical activity (LTPA) in adolescents in the school context. A cross - sectional quantitative study was carried out with students from Joinville's municipal public school system, who are enrolled in the schools that received the best average in the Basic Education Development Index (BEDI) in the year 2015.A total of 233 students, all with a chronological age of 12 to 14 years, who answered a questionnaire, were evaluated on the LTPA evaluation through the self-report of closed questions about sociodemographic, health and leisure conditions of anthropometric assessments with the following indicators: Body mass index (BMI); Abdominal circumference (AC); Waist/hip ratio; (WHR) and waist/height ratio (WHtR).The main results of this study were: Adolescents who are physically active in leisure time have a higher prevalence of quality of life; There is the recognition of the improvements made possible by the LTPA associated with the stamina to so in the population studied; Non-LTPA practitioners had a higher risk index for measures of WHtR and WHR; Adolescents who do not practice LTPA have a higher prevalence of sedentary behavior. Concluding that LTPA may be an alternative for the integral development of the studied population.*

Keywords: Motor Activity; Leisure Activities; Student Health

1. Introduction

The practice of physical activities in adolescence leads to an active lifestyle in adulthood. It is believed that active adolescents are more likely to become active adults [1, 2].

The National Survey of School Health[1] report provides data collected on all Brazilian states capitals and the Federal District. In a sample of 2,630,835 schoolchildren, were considered active the ones who accumulated 300 minutes or more of physical activity per week, insufficiently active those who had 1 to 299 minutes of physical activity per week and inactive those who did not accumulate time spent exercising. The results show that 60.8% of the students are insufficiently active and 4.8% are inactive.

The triad of pediatric physical inactivity[3] involves three interrelated components: 1°.exercise deficit, characterized by insufficient levels of physical activity, in face of the public health current recommendations; 2°. Pediatric dynapenia, a condition characterized by low levels of muscle strength with functional limitations not caused by muscle diseases; 3°. Physical illiteracy,described by the lack of confidence, competence, motivation and knowledge to move forward proficiently in a variety of physical activities. Since physical inactivity is a multifactorial phenomenon, even if BMI is in normal patterns, a child who does not have sufficient levels of physical activity should be directed to interventions.

An active individual who practices physical activities regularly, enjoys several benefits, both in physical and psychosocial characters such as reduction ofdepression, stress, anxiety, improvement in self-confidence, self-esteem, and in cognitive function[4-6].

Understanding the reasons that influence the participation of adolescents in the practice of physical activity is key to guide its promotion and subsequently increase the populationlevels of physical activity [7]. Measuring physical activity is a subject of great diligence in the health system, having the potential to be linked to the school environment as a research target, thanksto the notoriety of its scopeconfirmed by a great reach potential.

Consequently, leisure-time physical activity comes as a pro-health proposal. As confirmed by studies, the benefits of LTPA practice are consistent among all physical activity domains[8]. It stands out as one of the most beneficialand relevant to public health, since it contributes to the prevention of cardiovascular diseases, lower risks of many types of cancer, reduced risk of all-cause mortality, and also prevention and improvement of mental health[8.]

Leisuretime is a moment apart from obligations, enabling individuals to enjoy it the waythey like best, giving room to multiple experiences having pleasure and well-beingas the main goals[9]. It is valid to confirm that choices are fundamental for psychological well-being[10.]

We emphasize that this study is the product of readings, discussions, experiences and reflections for the discernment and trustworthiness of its results, so its outcome could enable the maintenance of public health, quality of life and improvement in education. Thestudy investigated the understanding of the factors associated with LTPA practice among young students from the public elementary school in Joinville, SC, identifying the level of LTPA, the sociodemographic profile of students, health conditions and anthropometric indicators aiming at a tangible understanding of the improvements made possible by the LTPA in the scope of health, education and society.

2. Methods

In this study, a quantitative cross-sectional research was conducted, characterized by the direct observation of a

planned number of individuals in a single opportunity, estimating the frequency with which a particular health event manifests itself in a specific population, besides the factors associated with it[11].

The city of Joinville has 526,338 inhabitants, 69 thousand are students who attend the municipal public school system, in a total of 84 educational institutions, equivalent to 12 thousand students in the age group of 12 to 14 years[12]. The research studied a population of students aged 12 to 14 from three public schools in Joinville (SC). The criteria for choosing schools was to select the three of them that obtained the best grades in the Basic Education Development Index in2015.

This research complied with the norms of the National Health Council 466/12 and was referred to the Human Research Ethics Committee of the IELUSC Faculty and received approval with protocol number 2,611,749 / 2018. Participants were contacted by the researcher and informed about the objectives of the study then both parents and students signed the Informed Consent Form.

The sample selection was made in an intentional, non-probabilistic way, with the total of 223 students, 85 boys and 138 girls, who answered a questionnaire that aimed to identify their sociodemographic, health and habits conditions. The questionnaire was duly validated by three masters and doctors in the area concerning clarity and relevance, the level of LTPA was mediated through self-report, the result of the study was defined based on the World Health Organization, given the recommendation of 150 weekly minutes of physical activity per adolescent[13].

Anthropometric measurements such as waist, abdomen and hip were performed, and then weight and height of each student were checked, estimating anthropometric indicators of Body Mass Index (BMI), waist-hip Ratio (WHR) and waist-to-height ratio (WHtR).

BMI was calculated usingheight and weight(kg/m²), which was published by a portable scale forweight measurement, the teens were barefoot, remaining in a biped position, with both feet resting on the platform and weight distributed in both feet, in a stable position and with the head in the Frankfurt plane, the measure was written down in kilograms, with the use of a decimal place after the decimalpoint. A portable stadiometer was used to measure the stature, the adolescent evaluated remained without footwear, in biped position and with the head in the Frankfurt plane, the measurement was recorded in centimeters. The result was calculated based on the World Health Organization's growth reference data and ranked with the cohort point of 21.4 for the 12-year age group; 22.4 for the 13-year-old age group; 23.3 for the 14-year-old age group[13].

Waist circumference measurements for the WHtR and WHR were made in contact with the skin, with the individual surveyed standing, arms flexed and crossed in front of the thorax, with a non-elastic anthropometric tape positioned in the horizontal plane between the lower rib margin and the iliac crest, the participants were asked to stay in the orthostatic position without obstructing the breath. The

individualsremained in the orthostatic position to measure the hip with the tape positioned in the horizontal plane at the level of the point of the greatest gluteal region circumference. It was used the cohort point 0.43 for boys and 0.48 for girls [14]to classify the WHtR.It was used the cohort point of 0.89 for males and 0.78 for females [13]to classify the WHR. A descriptive and bivariate analysis of the data was performed to test the association between the result (LTPA) and the independent variables (gender, grade, skin color, siblings, place of residence, family educational background, upbringing/raising styles, diet, presence or absence of pain and chronic diseases, use of medicines,understanding of the health benefits attributed toLTPA, stamina for daily LTPA, sedentary time and anthropometric indicators such as BMI, WHR, WHtR). Gross and multivariate analysis were performed using Poisson regression, estimating gross and adjusted prevalence ratios, with the respective 95% confidence intervals calculated. All variables with p≤0.020, (eating habits;health effects of LTPA;stamina for daily LTPA;sedentary time;WHtR;WHR) were part of the multiple model. The data were tabulated in the Statistical Package for the Social Sciences - SPSS, version 22 in Portuguese.

3. Results

The study analyzed 223 adolescents, atan average age of 12.60 ± 0.79, body mass 47.43 ± 11.13 and height 155.89 ± 13.42. The prevalence of LTPA practice was 148 (66.4%). Table 1 presents the characteristics of the sample related to LTPA practice, and no variable presented a significant association.

Table 1: Gross analysis of sample characteristics. Joinville-SC, Brazil, 2018 (n = 223)

Variables	Leisure-Time Physical Activity		Gross PR (CI 95%)	
	Yes	No		p*
	n (%)	n (%)		
Gender				
Male	59 (69,4)	26 (30,6)	1,00	
Female	89 (64,5)	49 (35,5)	1,04 (0,94-1,14)	0,477
Grade				
8th to 9th	44 (59,5)	30 (40,5)	1,00	
7th	104 (69,8)	45 (30,2)	0,93 (0,84-1,02)	0,125
Skin Color				
Brown/Asian/ indigenous	47 (72,3)	18 (27,7)	1,00	
Black	7 (87,5)	1 (12,5)	0,88 (0,71-1,10)	0,261
White	94 (62,7)	56 (37,3)	1,08 (0,97-1,09)	0,163
Siblings				
3 or more	20 (66,7)	10 (33,3)	1,00	
0 to 2	128 (66,3)	65 (33,7)	1,00 (0,87-1,15)	0,970
Place of Residence				
Rural	43 (71,7)	17 (28,3)	1,00	
Urban	105 (64,4)	58 (35,6)	1,06 (0,95-1,17)	0,301
Family Educational Background				
Higher Education	72 (67,9)	34 (32,1)	1,00	
Elementary/ High School	76 (65,0)	41 (35,0)	1,02 (0,93-1,12)	0,639
Upbringing/raising style				
Permissive	61 (65,6)	32 (34,4)	1,00	
Authoritarian	87 (66,9)	43 (33,1)	0,99 (0,90-1,09)	0,836

* p-value obtained by the Wald test of the Poisson regression.

PR: Prevalence ratio.

Table 2 presents relevant indicators of the adolescents health, such as: eating habits, chronic pain, chronic diseases, use of medication, daily stamina and sedentary time, alongside anthropometric measurements of BMI, WHR and WHtR.

Table 2: Gross analysis of health-related and anthropometric variables of the adolescents. Joinville-SC, Brazil, 2018 (n = 223)

Variables	Leisure-Time Physical Activity		Gross PR (CI 95%)	*p**
	Yes n (%)	**No** n (%)		
Eating Habit				
Unhealthy	32 (51,6)	30 (48,4)	1,00	
Healthy	116 (72,0)	45 (28,0)	0,63 (0,59-0,67)	<0,001
Pain				
No	94 (66,2)	48 (33,8)	1,00	
Yes	54 (66,7)	27 (33,3)	1,00 (0,90-1,10)	0,943
Chronic diseases				
No	125 (68,3)	58 (31,7)	1,00	
Yes	23 (57,5)	17 (42,5)	1,08 (0,96-1,22)	0,194
Medicines				
No	124 (66,7)	62 (33,3)	1,00	
Yes	24 (64,9)	13 (35,1)	1,01 (0,89-1,15)	0,833
Health benefits of LTPA				
No	5 (8,5)	54 (91,5)	1,00	
Yes	143 (87,2)	21 (12,8)	0,59 (0,55-0,62)	<0,001
Daily stamina for LTPA				
Low stamina	50 (46,7)	57 (53,3)	1,00	
High stamina	98 (84,5)	18 (15,5)	0,75 (0,69-0,82)	<0,001
Sedentary Time				
> 4 hours/day	92 (96,8)	3 (3,2)	1,00	
2 to 4 hours/day	22 (24,2)	69 (75,8)	1,70 (1,60-1,81)	<0,001
<2 hours/day	34 (91,9)	3 (8,1)	1,05 (0,96-1,14)	0,298
BMI				
Risk	35 (79,5)	9 (20,5)	1,00	
No risk	113 (63,1)	66 (36,9)	1,14 (1,02-1,27)	0,025
WHtR				
Risk	10 (18,5)	44 (81,5)	1,00	
No risk	138 (81,7)	31 (18,3)	0,65 (0,60-0,70)	<0,001
WHR				
Risk	38 (38,0)	62 (62,0)	1,00	
No risk	110 (89,4)	13 (10,6)	0,68 (0,63-0,74)	<0,001

* p-value obtained by the Wald test of the Poisson regression.
PR: Prevalence ratios; LTPA: Leisure-time Physical Activity; BMI: Body Mass Index; WHtR: Waist-to-Height Ratio; WHR: Waist-to-hip ratio.

The program was not adjusted for LTPA, keeping the following variables: health benefits of LTPA; daily stamina for LTPA; sedentary time (2 to 4 hours/day); WHtR and WHR.

Table 3: Adjusted prevalence ratios (PR) and confidence intervals (95% CI) for the practice of leisure-time physical activity in adolescents. Joinville-SC, Brazil, 2018 (n = 223)

Variables	Adjusted PR (CI 95%)	*p**
Eating habits		
Unhealthy	1,00	
Healthy	0,95 (0,91-1,00)	0,066
Health benefits of LTPA		
No	1,00	
Yes	0,81 (0,73-0,88)	<0,001
Daily stamina for LTPA		
Low stamina	1,00	
High stamina	0,91 (0,86-0,95)	<0,001
Sedentary time		
> 4 hours/day	1,00	
2 to 4 hours/day	1,42 (1,31-1,55)	<0,001
<2 hours/day	1,03 (0,97-1,09)	0,305
WHtR		
Risk	1,00	
No risk	0,94 (0,89-1,00)	0,034
WHR		
Risk	1,00	
No risk	0,93 (0,87-0,99)	0,024

* p-value obtained by the Wald test of the Poisson regression.
PR: Prevalence ratios; LTPA: Leisure- time Physical Activity; WHtR: Waist-Stature Ratio; WHR: Waist-to-hip ratio.

4. Discussion

The main results of this study were: 1. Adolescents who are physically active in leisure time have a higher prevalence of quality of life; 2. Understanding of the improvements made possible by LTPA and the stamina for it; 3. The ones who do not practice LTPA presented a higher risk index in the WHtR and WHR measuses; 4. Adolescents who do not practice LTPA have a high prevalence in sedentary behavior, higher than the recommendation adopted by the World Health Organization.

Results from this research affirm that there is potential to associate LTPA to satisfaction with the daily life in adolescents, our data show that the population studied has the stamina to do so and confirm the perception that there is improvement thanks to LTPA. Data from another research show a sense of self-esteem and competencein physically active adolescent girls[15].

The total volume of LTPA is associated with a lower risk of coronary heart disease, which we can relate to the analysis of the anthropometric data of WHR and WHtR in this study. A result that can be linked to researches indicating that LTPA is associated with a lower risk of coronary heart disease[16, 17]. However,the literature shows that non-supervised and high-intensity exercises for people with heart problems may increase the risk of ventricular arrhythmias and sudden cardiac death during or after exercising[18].

It was observed at progressively younger ages, poor physical and mental health, including metabolic and cardiovascular problems[3]related to the proportion of sedentary time spent in this period of human development.

Therefore, we can observe that this proportion of sedentary time found in this research correlates with other studies[19-21], where the general prevalence of sedentary behavior in primary school students exceedsthe daily recommendations[13]. As already shown, more than two or three hours per day spent in sedentary behavior is related to the decline in mental, physical and psychosocial health[22, 23].

Our study has a significant association between the adolescents who do not practice LTPA and the higher incidence of time spent in sedentary behavior, there are few studies of this nature that present this association. LTPA can be aligned to a programaiming the reduction of sedentary time. Given that sedentary behavior and physical activity are factors that can be changed[24]. Researches show that among Brazilian adolescents LTPA is a prominent domain among other physical activity domains studied.

A possible limitation of this study was the size of the sample that allows us to consider the results only regarding the population in question. This study demonstrated that LTPA is associated with several benefits, and as showed in the results of the research, adolescents understand the benefits of exercising, assuming that the practice of physical activity in leisure time may be an alternative to reduce sedentary time levels and an improvement in the quality of life related to eating habits, reduction of risk factors for NCDs, improving public health and education aiming at a series of benefitsto society.

This research can be accounted relevant for the dissemination of knowledge, because we need theoretical and practical subsidies in the face of the challenge of keeping ourselves up-to-date and qualified professionals to develop practices based on evidence.

It is suggested to future studies the analysis of students from schools that present the lowest scores in the Basic Education Development Index, to establish a possible association of the data or a larger number of adolescents surveyed. It can be reapplied in other age groups and other cities to verify the existence of the same pattern of results to broaden the understanding of the phenomenon studied.

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