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Original Article

LIFESTYLE AND PHYSICAL FITNESS IN ADOLESCENTS: DIFFERENCES BETWEEN THE SEXES IN SPORTS PRACTICE

ESTILO DE VIDA E APTIDÃO FÍSICA EM ADOLESCENTES: DIFERENÇAS ENTRE OS SEXOS NA PRÁTICA ESPORTIVA

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ABSTRACT
The aim of this study was to compare the lifestyle profile and physical fitness of adolescents who practice sports and to verify whether there is an association between female and male genders. Ninety-three adolescents (11-14 years old) who practice sports participated in the study. The variables of physical fitness and lifestyle were analyzed using descriptive statistics, and the difference between the sexes was analyzed using the Mann-Whitney test. The Spearman test was used to identify associations, considering $p<0.05$ as significant for all tests. In lifestyle, preventive behavior and stress control were greater for females ($p=0.04$, respectively). In physical fitness, strength, flexibility and speed were different between the sexes ($p<0.05$). Females showed an association between physical activity and speed ($r=-0.334$; $p=0.046$), preventive behavior and resistance ($r=0.466$; $p=0.004$) and speed ($r=-0.487$; $p=0.002$), and stress control with flexibility ($r=0.336$; $p=0.044$) and speed ($r=-0.337$; $p=0.044$). For males, there was an association between diet and strength; and diet with speed ($r=-0.344$; $p=0.008$). These findings reinforce the need to consider sex differences when assessing lifestyle and physical fitness in adolescents.
Keywords: Adolescent development. Motor activity. Health.

RESUMO
O objetivo deste trabalho foi comparar o perfil de estilo de vida e a aptidão física de adolescentes que praticam esporte e verificar se existe associação para o sexo feminino e masculino. Participaram 93 adolescentes (11-14 anos), que praticam esporte. As variáveis de aptidão física e estilo de vida foram analisados por meio da estatística descritiva, e a diferença entre os sexos pelo teste de Mann-Whitney. Para identificar associações foi utilizado o teste de Spearman, considerando $p<0,05$ como significativo para todos os testes. No estilo de vida, o comportamento preventivo e controle de estresse é maior para o sexo feminino ($p=0,04$, respectivamente). Na aptidão física, a força, flexibilidade e velocidade foram diferentes entre os sexos ($p<0,05$). O sexo feminino apresentou associação entre atividade física e velocidade ($r=-0,334$; $p=0,046$), comportamento preventivo e resistência ($r=0,466$; $p=0,004$) e velocidade ($r=-0,487$; $p=0,002$), e controle de estresse com a flexibilidade ($r=0,336$; $p=0,044$) e velocidade ($r=-0,337$; $p=0,044$). Para sexo masculino houve associação entre alimentação e força; e alimentação com velocidade ($r=-0,344$; $p=0,008$). Esses achados reforçam a necessidade de considerar as diferenças entre os sexos ao avaliar o estilo de vida e a aptidão física em adolescentes.
Palavras-chave: Desenvolvimento do adolescente. Atividade motora. Saúde.

Introduction

Lifestyle can be defined as a set of behaviors, preferences and practices present in daily life, which can be transformed into healthy or unhealthy habits[1]. The components that make up lifestyle are: physical activity, diet, preventive behavior, social relationships and stress control[1], among others. In the sporting sphere, lifestyle can influence the physical fitness and health of children and adolescents[2], which is defined as the ability to carry out daily physical activities without generating a great deal of wear and tear on the body[1]. Among the components of physical fitness, flexibility, speed, strength and muscular endurance stand out, which can influence the practice of physical activity and sports by adolescents[3,4].

In this case, habits (positive or negative) acquired during adolescence can persist into adulthood, reinforcing the importance of early monitoring through physical assessments[2]. For this reason, lifestyle and physical fitness generate various benefits, including improved mental health and academic performance[5], as well as contributing to reducing the development of chronic diseases throughout life[2].

Previous studies have shown that lifestyle and physical fitness levels in adolescents are fundamental not only for physical performance, but for health in general[1,2,4–6]. The interaction

between lifestyle and physical fitness components makes it possible to explore and understand possible differences and relationships[2,4–6].

In this way, investigating the levels of physical fitness among boys and girls who practice sport regularly, analyzing the relationships between different lifestyle components, can provide subsidies for effective interventions in the context of sport and school, promoting the adoption of healthy habits among adolescents and improving physical performance[4].

Therefore, the aim of this study was to compare the lifestyle profile and physical fitness of adolescents who practise sport and to see if there is an association for males and females.

Methods

Design

The study is of an applied nature, with a quantitative and descriptive approach, considering a cross-sectional study; with secondary analysis of a project developed by the Institutional Program for Scientific Initiation Scholarships, of the Physical Education Course at the University of the Joinville Region. The research was carried out with voluntary participants who were aware of the confidentiality of the data. This study was also submitted to and approved by University of the Joinville Region Research Ethics Committee, in accordance with the National Health Council's Resolution for research with human beings, under opinion number 7.190.973 (CAAE: 83338724.9.0000.5366).

Participants

The study population was made up of adolescents aged between 11 and 14 who took part in some form of sport in 2024, provided by the Sports Department (SESPORT) of the Municipality of Joinville, Santa Catarina. SESPORT promotes formal and non-formal sports practices. To this end, children and teenagers between the ages of six and 16, who are students at Joinville schools (municipal, state, federal and private), can take part in the “Movimenta Joinville Program - Sports Initiation”.

The sample was made up of 93 adolescents, female (n=36) and male (n=57). Of the girls, 36% (n=13) played futsal and 64% (n=23) played volleyball. Of the boys, 53% (n=30) play basketball, 26% (n=15) handball and 21% (n=12) volleyball. It should be noted that the candidates were chosen intentionally (for convenience), i.e. by inviting voluntary participation.

The inclusion criteria were adolescents who: 1) participate in one of the sports provided by SESPORT; 2) had the authorization of their guardians to participate; 3) took part in all the physical tests; 4) answered the questionnaire in full. On the other hand, participants who did not meet the inclusion criteria were excluded from the sample.

Evaluation instrument

The physical fitness variables were the 2kg Medicine Ball Throw Test to measure upper limb strength - ULS (m), the Horizontal Jump Test to measure lower limb strength - LLS (m), the Sit and Reach Test to measure Flexibility, the 1-minute sit-up test to measure Local Muscle Strength - LMS (rep.) and the 20-meter run test to measure Speed (sec.), according to the Projeto Esporte Brasil (PROESP-BR) Manual[7].

Finally, the validated Lifestyle Profile Questionnaire (LPQ)[1], was applied, with 15 closed questions divided into five components: Diet, Physical Activity, Preventive Behavior, Social Relationships and Stress Management. The answers were classified into four options: [0] never (not part of your lifestyle) [1] sometimes [2] almost always [3] always (part of your lifestyle). If the scores are between 2 and 3, it indicates positive behavior, but if they are between 0 and 1, it indicates risky behavior.

FOOD a) You usually eat well at breakfast. b) You eat fruit and vegetables every day. c) You avoid fried and other fatty foods.
PHYSICAL ACTIVITY d) You participate in Physical Education classes at your school. e) Do you practice any type of physical exercise, sport, dance or fight outside of school PE? f) You usually walk or cycle on your daily commute.
PREVENTIVE BEHAVIOR g) You are informed and try to prevent sexually transmitted diseases. h) You avoid risky situations and violent people. i) You know and avoid the harmful effects of smoking, alcohol and other drugs.
RELATIONSHIPS j) You seek to cultivate friendships and are satisfied with your relationships. k) Your leisure time includes meetings with friends or group recreational activities. l) The school environment and your relationship with teachers are good.
STRESS MANAGEMENT m) You are satisfied with your body and the way you are. n) You find your parents' demands for school results normal. o) Imagining what your future will be like is exciting.

Chart 1. Research Instrument: Lifestyle Profile
Sources: Nahas[1]

Procedure

An initial meeting was held with the coordinators of SESPORT, asking for authorization to collect the adolescents, after which they signed a consent form to take part in the study. The guardians also attended a meeting to be aware of the objectives of the research, with the aim of authorizing the adolescents to participate or not by means of the Informed Consent Form (ICF). Afterwards, the adolescents were taken to the Gymnasium, where they were given a brief explanation of the purpose of the research and then handed the consent form, agreeing to volunteer for the study.

Two teachers and three undergraduates, all from University of the Joinville Region Physical Education course, were trained and aware of the research protocols/instruments[7]. For the physical tests, the adolescents were asked to wear uniforms and appropriate sports shoes. The first test applied was the Horizontal Jump, where they were instructed to jump as far forward as they could. Next up was the 2kg Medicine Ball Throw Test, in which the adolescents were asked to throw the ball as far as they could. For the Flexibility Test, participants were asked to sit on the floor and try to reach their toes with their arms outstretched and hands joined. The adolescents performed these tests twice and recorded the best result for analysis. For LMS, the participant was asked to do as many sit-ups as possible in 1 minute. Finally, to measure Speed, the participant was asked to run 20 meters in the shortest time possible. In both tests, the adolescents only had to make one attempt. It should be noted that the tests were organized in a circuit format, where the adolescent would perform one test and then move on to another immediately afterwards.

After the physical tests, the adolescents were asked to sit down and answer the PEVI questionnaire, and if they had any questions, they could ask one of the researchers, with no set time for answering.

Statistical Analysis

The information was transferred directly to Microsoft Excel and then analyzed in the R Studio software (v 4.1.1, 2024). The data was not normal, according to the Shapiro-Wilk test. To this end, the results were analyzed using descriptive statistics, with the median and inclusive quartiles - first (Q1=25%) and third (Q3=75%); as well as absolute and relative frequency (%)

to characterize the sample. The difference between the sexes (female and male) was analyzed using the Mann-Whitney test. In addition, the Spearman test was used to identify associations between lifestyle and physical fitness variables in the different sexes, considering correlations above 0.20, classified as: weak (0.20-0.39); moderate (0.40-0.69); strong (0.70-0.89); and very strong (0.90-1.00). It should be noted that all the tests considered $p<0.05$ to be significant.

Results

Ninety-three adolescents between the ages of 11 and 14 took part in the study, 39% girls [13.5 (12.9; 13.8) years old] and 61% boys [13.4 (12.9; 13.7) years old].

Table 1 shows the difference in lifestyle between females and males, and it can be seen that preventive behavior and stress control is higher for females (p=0.04, respectively).

Table 1. Comparison of lifestyle scores [median (quartiles)] between the sexes.

Variables	Female (n=36)	Male (n=57)	*P*
Food	1,7 (1,3; 2,0)	1,7 (1,3; 2,0)	0.766
Physical Activity	2,7 (2,3; 3,0)	2,7 (2,3; 3,0)	0.786
Preventive Behavior	3,0 (2,7; 3,0)	3,0 (2,3; 3,0)	**0.049**
Social Relations	2,7 (2,3; 3,0)	2,3 (2,3; 2,7)	0.076
Stress control	2,7 (2,3; 3,0)	2,3 (2,0; 2,7)	**0.043**

Note: P= significant for <0.05; n= sample number.
Sources: os autores.

In addition, Table 2 shows a significant difference in physical fitness, and it can be seen that strength in the upper and lower limbs, flexibility and speed were different between the sexes ($p<0.05$), with only ML endurance showing no significant difference (p=0.07).

Table 2. Comparison of physical fitness values [median (quartiles)] between the sexes.

Variables	Female (n=36)	Male (n=57)	*P*	Δ
ULS	330 (319,5; 370)	425 (370; 500)	**0.000**	-95
LLS	167 (157,3; 177,0)	176,0 (165; 192)	**0.005**	-9
Flexibility	42,5 (38; 50)	33,0 (25; 43)	**0.000**	9,5
LMS	33 (28; 36)	34 (31; 39)	0.075	-1
Velocity	4,3 (4,1; 4,4)	4,1 (3,7; 4,3)	**0.002**	0,2

Note: P=significant for <0.05; n=sample number; Δ=difference between medians; ULS=upper limbs; LLS=lower limbs; LMS=localized muscle.
Sources: os autores.

The associations were separated between sexes, where it was found that for females (Table 3) there was a negative association between physical activity and speed (r=-0.334; p=0.046), preventive behavior had a positive association with LMS (r=0.466; p=0.004) and negative with speed (r=-0.487; p=0.002), while stress control was positively associated with flexibility (r=0.336; p=0.044) and negatively associated with speed (r=-0.337; p=0.044).

Table 3. Association between lifestyle and physical fitness in females.

Variables (Female)	ULS	LLS	Flexibility	LMS	Velocity
Food	-	-	-	0,203	-0,319
Physical Activity	-	-	-	0,231	**-0,334***
Preventive Behavior	-	0,322	-	**0,466****	**-0,487****
Social Relations	-	-	0,200	-	-0,313
Stress control	-	-	**0,336***	0,308	**-0,337***

Note: *<0.01; **<0.01; ULS=upper limbs; LLS=lower limbs; LMS=Localized muscle.
Sources: os autores.

For males (Table 4), there was a positive association between eating and upper limb strength (r=0.315; p=0.016) and a negative association between eating and speed (r=-0.344; p=0.008).

Table 4. Association between lifestyle and physical fitness in males.

Variables (male)	ULS	LLS	Flexibility	LMS	Velocity
Food	**0,315***	0,249	-	-	**-0,344****
Physical Activity	-	-	-	-	-
Preventive Behavior	-	-	-	-	-
Social Relations	-	-	-	-	-0,200
Stress control	-	0,202	-	-	-

Note: *<0.01; **<0.01; ULS=upper limbs; LLS=lower limbs; LMS=Localized muscle.
Sources: os autores.

Discussion

The aim of the study was to compare the lifestyle profile and physical fitness of adolescents who practiced sport and to see if there was an association between females and males. In this case, it was found that females had better results for flexibility, preventive behavior and stress control, and males had better values for speed and strength of the ULS and LLS, which were considered significant ($p<0.05$). Associations were found, revealing that females showed a relationship between physical activity and speed; preventive behavior with LMS and speed; stress control with flexibility and speed. Males showed associations between eating and ULS and speed.

In terms of lifestyle, girls had better scores for preventive behavior and stress management compared to boys. In this sense, females have a higher level of healthy behaviors compared to males, including preventive behaviors[8]. However, contrary to this study, females are more susceptible to stress. On the other hand, perceived stress may be related to an unhealthy lifestyle rather than a hormonal response, such as an increase in cortisol[9]. Furthermore, this issue of healthy behaviors is also related to situations within the family, given the age group and level of dependence. To this end, the study by Monserrat-Mesquida et al. [10] found that the healthy lifestyle (including diet and physical activity) of family members is associated with the healthy habits of children and adolescents.

When analyzing the difference between physical fitness, females showed better results for flexibility. Women generally have greater flexibility than men[4]. As a way of improving athletes' stretching, continued sports practice can help improve motor control and body awareness, facilitating the execution of movements that involve flexibility[11].

Looking at the relationships between the variables, females showed an association between preventive behavior and the physical fitness of LMS and speed, indicating that practices aimed at health prevention may be related to better performance in these physical capacities[8]. Likewise, females showed an association between stress control and flexibility and speed physical fitness, which may indicate that strategies to manage stress may be related to greater concentration on physical abilities[8]. In line with these findings, a study carried out in Piauí with 74 adolescents (14 to 19 years old), although it did not make any associations, found that females performed less well than boys in relation to LMS, but better in relation to flexibility[2]. For the behavioral aspect, although stress control indicated moderate scores for both sexes, girls showed greater adherence to preventive practices and healthy lifestyle habits[2].

For males, diet was associated with upper limb strength and speed, suggesting that a balanced diet can favor the development of these physical abilities, providing essential nutrients for energy production and muscle recovery. In this respect, both proper nutrition and regular physical activity play a fundamental role in improving the body composition of adolescents, contributing to good sports performance[2]. In addition, this study found that males had better results for speed and strength of the upper limbs and lower limbs when compared to females. Corroborating this, a study of 526 students aged between seven and 15 in Rio Grande do Sul found that boys performed better in terms of strength and speed compared to girls, with higher values especially for students in older age groups and from urban areas[5]. As a hypothesis for these findings, boys are usually encouraged to practice sport more from an early age than girls, and have a motivational predisposition to be interested in sport, especially team sports[12]. This difference over the course of one's life may differ in the results observed[12]. It is also assumed that maturation is another factor that influences these results[13], where changes in body composition and increases in muscle strength significantly affect performance between the sexes[14]. These differences related to hormonal aspects (GH and IGF-I) have fundamental metabolic effects during sport, especially in males, who show greater musculoskeletal adaptations and changes in strength than girls[15]. However, physical education teachers can adjust their practices to optimize development and opportunities for early and late maturing adolescents.

The limitations of this study lie in the low sample size, between the sexes, and the fact that it was restricted to the municipality of Joinville/SC, which reduces the accuracy of the results and does not represent the general population of adolescent sports practitioners. Lack of longitudinal analysis and control of other variables such as sleep, motivation, fatigue and muscle mass can influence the results. For this reason, the results should be interpreted with caution. However, these observations can be seen as an opportunity for future research.

Conclusion

In view of the findings, it can be concluded that the lifestyle and physical fitness of adolescents are influenced by gender, with distinct patterns between girls and boys. Adolescent girls showed greater involvement in preventive behavior and better stress control, as well as greater flexibility. Boys showed better levels of speed and muscle strength.

These findings reinforce the need to consider the differences between the sexes when assessing lifestyle and physical fitness in adolescents, suggesting specific approaches for each group to promote health and physical performance. Therefore, sports policies need to consider these differences in order to guarantee equitable opportunities, promoting the development of life skills so that everyone has access to them.

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