Rev Bras Cineantropom Hum

original article

DOI: http://dx.doi.org/10.5007/1980-0037.2016v18n5p567

Perceived barriers to physical activity practice in high school students

Barreiras percebidas à prática de atividades físicas em escolares do ensino médio

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Abstract – In an attempt to understand the problem of declining physical activity (PA) among adolescents, there has been an increasing interest in identifying perceived barriers (PB) that can reduce the involvement of adolescents in PA. The aim of this study was to identify PB to PA practice among public high school students. The samples was composed of 348 students aged 14-19 years, 46.8% females and 53.2% males. To investigate BP, an instrument consisting of 12 statements and validated for the study population was used. The analysis of results was carried out by descriptive statistics, Kruskal Wallis test to check the possible differences in PB throughout high school years and chi-square for the difference in proportions of barriers. Having many tasks to do, lack of time and adverse weather conditions were the most cited PB. There was no difference in the perception of barriers among high school years (males: p = 0.44; females: p = 0.23). PB "not having how to go or return" (p = 0.04), "adverse weather conditions" and "laziness" (p = 0.02), "lack of time" (p = 0.01) and "at home nobody performs PA" (p = 0.04) showed statistically significant differences between sexes. Both sexes reported similar barriers; however, girls reported higher number of PB and with greater frequency. Identifying which PB prevent the adoption of a physically active lifestyle may be the beginning of solutions to minimize the negative effects.

Key words: Adolescent; Behavior; Exercise.

Resumo – *Procurando entender o problema do declínio da atividade física (AF) entre os adolescentes, cresce a importância de se identificar quais as barreiras percebidas (BP) que podem reduzir a chance de envolvimento na prática de AF. Objetivou-se identificar as BP à prática de AF pelos escolares do Ensino Médio (EM) de uma escola pública federal. Participaram 348 escolares, de 14 a 19 anos, 46,8% do sexo feminino e 53,2% do sexo masculino. Para investigar as BP foi utilizado um instrumento composto por 12 afirmativas, validado para a população do estudo. Foi realizada análise dos resultados por estatística descritiva, teste de Kruskal Wallis para verificar a possível diferença das BP entre os anos de EM e Qui-quadrado para a diferença de proporções das barreiras. Ter muitas tarefas para fazer, a falta de tempo e as adversidades climáticas, foram as BP que receberam maiores frequências de respostas positivas. Não foi encontrada diferença na percepção das barreiras entre os anos de EM (masculino: p=0,44; feminino: p=0,23). As barreiras "não tenho como ir ou voltar" (p=0,04), "o clima dificulta" e "tenho preguiça" (p=0,02), "falta tempo" (p=0,01) e "em casa ninguém faz" (p=0,04) apresentaram diferença estatisticamente significativa entre os sexos. Ambos os sexos relataram barreiras semelhantes, porém, as meninas referiram um maior número de BP e com maiores frequências de respostas. A identificação de quais as BP que dificultam ou impedem a adoção de um estilo de vida fisicamente ativo, pode ser o início de soluções que minimizem os efeitos negativos destas.*

Palavras-chave: *Adolescente; Comportamento; Exercício.*

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Received: 02 March 2016
Accepted: 07 July 2016

INTRODUCTION

Physical activity (PA) is an important factor to prevent the development of non-communicable diseases such as cardiovascular disease, cancer, diabetes[1,2], hypertension and cholesterol[3] and is also a behavioral determinant of risk of overweight and obesity[4]. According to the world Health Organization (WHO)[1], physical inactivity is a major death risk factor worldwide and, although diseases associated with lack of PA commonly manifest in adulthood, scientific evidence points to their development early in childhood and adolescence[5].

The habits that define the lifestyle of an individual are established and consolidated before adulthood[6], and physically active children and adolescents are more likely to be sufficiently active in adulthood[7]. However, survey data indicate that during adolescence, PA decreases, with association between decreased PA levels with increasing age[8-10].

In an attempt to understand the problem of PA decline among adolescents, there is a growing need of identifying which elements can cause this phenomenon, since active behaviors are influenced by the interaction of a variety of biological, behavioral and environmental factors[11]. Studies have made reference to factors that impair the practice of PA as barriers[6,9,12-16].

According to Brown[17], barriers are obstacles perceived by individuals and that have a negative influence, reducing the chance of engaging in PA practice. A recent systematic review conducted by Martins et al.[18] brings the perspective of adolescents about PA barriers and facilitators. In the works found, attitudes towards physical activity, motivation, body image perceptions, entertainment and the influence of friends, family, physical education teachers and environmental opportunities for PA practice, were mentioned.

Although studies on the perception of barriers[5,16,19] and associated factors[13,20] have already been developed, including those investigating South Brazilian adolescents[6,14,15], the characteristics of each age group and socio-cultural characteristics must be identified, approaching the analysis of barriers to the reality of the study population[12]. it was observed that students included in this study are part of an education system with own characteristics and that have shown significant positive results in the selection and evaluation processes to which they have been submitted, obtained by the full-time dedication of students[21], who may be involved in various extracurricular activities, in detriment to participation in physical activities.

Thus, the aim of this study was to identify perceived barriers (PB) that impair the involvement in PA practice by public high-school students from Santa Maria, RS.

METHODOLOGICAL PROCEDURES

This cross-sectional and descriptive study had a population of 377 public high-school students enrolled in the 2015 school year (10th, 11th and 12th grades). All students were invited to participate. The inclusion criteria

adopted were being regularly enrolled, returning the Informed Consent Form (ICF) signed by parents or guardians and also by the student and answering all questions of the survey instruments. Not answering any of the instruments was considered as an exclusion criterion.

Data were collected through the application of instruments in June 2015 in the last week of school before school break during physical education classes. This study was approved by the Ethics Research Committee (CEP) of the Federal University of Santa Maria (UFSM) under protocol number 1.108.196 of 06/12/2015.

To identify the barriers, the instrument proposed by Santos et al.[22] was used, which consists of 12 questions in a Likert scale, with the following response options for every situation that may pose a barrier to PA practice: "strongly disagree", "disagree" "agree," "strongly agree". For analysis purposes, adolescents were classified only according to the presence or absence of PB. Factors to which the adolescent responded "agree" or "strongly agree" were considered PB and when the answer was "disagree" or "strongly disagree", it was not considered a barrier.

For information on the physical activity (PA) level, the short-version International Physical Activity Questionnaire, IPAQ, was used, which was validated for use in adolescents by Guedes et al.[23]. This version is composed of eight open questions and its information allows us estimating the time spent per week in different PA dimensions (walks and physical efforts of moderate and high intensity) and physical inactivity (sitting position). The results of this study show that, in adolescents both sexes over 14 years, the IPAQ presents acceptable measurement properties for monitoring PA level. For classification of the PA level, those with time longer than 300 minutes / week of PA will be considered as active and as insufficiently active, those with time less than 300 minutes / week[1].

Descriptive data analysis was performed in the characterization of the study population and in the statements of the survey instrument. The data distribution curve was analyzed through the Kolmogorov-Smirnov test and after, the Kruskal Wallis test was used to check the possible difference of barriers throughout the high school years. A test for the difference in proportions (chi-square) was used for the analysis of individual barriers between sexes, respecting the significance level of 5%.

RESULTS

Table 1 describes the study population stratified by sex, high school grade, PA level and PB. The study included 348 students of the total enrolled in high school, 53.2% males (n = 185) and 46.8% females (n = 163), with mean age of 16.28 ± 1.07 years. Of all students, 29 (7.7%) did not participate in the study, either because they refused or because they were not present on the days of data collection.

Of all schoolchildren evaluated, more than half were classified as physically active (58.6%); however, girls showed higher percentage of physical

inactivity (53.1%) compared to boys (36.8%). Regarding barriers for PA practice, girls reported more PB than boys in all high school grades.

Table 1. Distribution of the study population stratified by sex, high school grade, physical activity level and perceived barriers to PA practice.

Characterization	Male		Female		Total	
	n	%	n	%	n	%
Population						
10th Grade	73	52.5	66	47.5	139	100
11th Grade	60	51.7	56	48.3	116	100
12th Grade	52	55.9	41	44.1	93	100
Physical Activity Level						
Active						
10th Grade	47	33.8	38	27.3	85	61.2¤
11th Grade	39	33.6	29	25.0	68	58.6¤
12th Grade	31	33.3	20	21.5	51	54.8¤
Insufficiently Active						
10th Grade	26	18.7	28	20.1	54	38.8¤
11th Grade	21	18.1	27	23.3	48	41.4¤
12th Grade	21	22.6	21	22.6	42	45.2¤
Perceived Barriers – PB#						
10th Grade	4	-	5	-	-	-
11th Grade	3	-	7	-	-	-
12th Grade	2	-	6	-	-	-

Values obtained by the avenge PB stratified in high school grades. ¤ Total of 100% is obtained by adding active and insufficiently active subjects. Values presented in f: frequency; %: percentage

Table 2 shows the frequency and percentage of responses to the presence of PB among all the students who participated in the study. The occurrence of positive responses (agree or strongly agree) for each barrier was grouped for each statement of the instrument, and after stratified by sex.

Table 2. Frequency and percentage of the presence of perceived barriers to physical activity, stratified by sex

Barriers to Physical Activity	n	Male		Female		*p Value*
		n	%	n	%	
I don't find nearby places	125	43.2	56.8	71	54	-
I don't know places	73	29	39.7	44	60.2	-
Friends live far away	113	50	44.2	63	55.8	-
I don't have how to come and go	92	36	39.1	56	60.9	0.04*
Adverse weather conditions	180	74	41.1	106	58.9	0.02*
I'd rather do other things	157	69	43.9	88	56.1	-
I'm lazy	136	54	39.7	82	60.3	0.02*
I do not feel motivated	79	31	39.2	48	60.8	-
I have many tasks	220	97	44.1	123	55.9	-
Lack of time	185	75	40.5	110	59.5	0.01**
Lack of company	178	91	51.1	87	48.9	-
At home nobody performs PA	62	23	37.1	39	62.9	0.04*

X^2: Pearson's Chi-square test for the presence of barriers between sexes; * P <0.05; PA: physical activity; n +: refers to the frequency of answers as one perceived barrier

The PB most reported by both sexes were "I have many tasks to do" (63.2%), followed by "lack of time" (53.2%) and "adverse weather conditions" (51.7%). PB with the lowest frequency of answers by students were "I do not know nearby places where I can go" (21%) and "it is difficult to make physical activity at home because at home nobody performs PA" (17.8%). With the exception of barrier "it is difficult to make physical activity without a company", all the others had higher frequencies of answers in females compared to males. PB "I don't have how to come and go", "adverse weather conditions" "laziness", "lack of time" and "it is difficult to make physical activity at home because at home nobody performs PA" showed a statistically significant difference between sexes.

When analyzing PB stratified by school grade, there was no significant difference (male: $p = 0.44$; female: $p = 0.23$). Perceived barrier "adverse weather conditions" was more prevalent among girls in the 10th grade (44.3%) and "I have many tasks to do" among girls in the 11th (35%) and 12th grades (27.6%) (Figure 1). For males, barrier "it is difficult to make physical activity without a company" was the most prevalent for 10th and 11th graders (41.1% and 38.9% respectively). In the 12th grade, barrier "I have many tasks" (35.1%) was the most reported among students (Figure 2).

There is a tendency to decrease the number of PB by students of both sexes over the years, with increasing education. Despite this tendency, there was no statistical difference between the mean PB in different school grades.

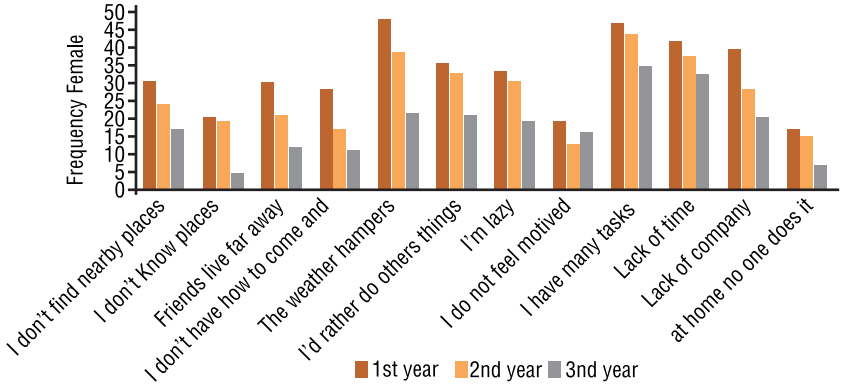

Figure 1. Frequency of responses to the presence of perceived barriers to physical activity for females, stratified by school grade.

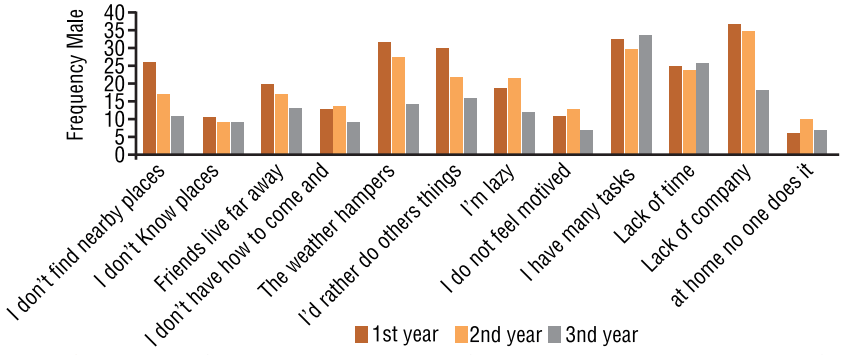

Figure 2. Frequency of responses to the presence of perceived barriers to physical activity for males, stratified by school grade.

DISCUSSION

As PA is multifactorial behavior influenced by the interaction of biological, behavioral and demographic aspects[11,24], which can provide positive or negative influence on individuals[25], collecting information to assist understanding how these factors act on the involvement of individuals with PA becomes fundamental. Since Brazil is a country of great cultural and social diversity, investigations aimed at identifying the relevant features of each study group become important tool to obtain information about the barriers that may hinder or prevent PA practice.

For adolescents in this study, having many tasks to do, followed by lack of time and adverse weather conditions were the main PB. The school in which these students are enrolled is notoriously recognized by the presence of large amount of extracurricular tasks, some of compulsory nature, which can cause adolescents to perceive them as a barrier. The fact that 12th graders reported it as the main PB corroborates this justification. The proximity of tests for admission to universities can make students to spend more time dedicated to studies at the expense of time spent for PA.

When the study population is stratified by school grade, the perceived barrier "I have many tasks to do" is also presented as the most prevalent among 11th grade girls. The literature presents justification for this barrier, emphasizing the fact that the tasks related to home and family care begin to be attributed in adolescence[9], and socially are roles assigned to girls, which makes the time to practice some activity to become limited. However, this justification loses strength with the fact that changes in family relationships are taking place and roles that were assigned exclusively to women today are shared by all family members.

Another reason that can be attributed to the fact that the large amount of tasks is considered a barrier by 11th grade girls lies in the opportunity to go to the university, which starts in high school. The Federal University located in the city where the study was conducted offers a program in which students can perform objective tests at the end of each high school grade: 10th grade (PS1), 11th grade (PS2) and 12th grade (PS3). Involvement in the study by PS2 students may have affected these findings.

It seems that PB "I have many tasks" triggers the perception of lack of time, since the performance of tasks and extracurricular activities take time and involvement after school hours, which could be used for PA practice. Although it was found through different instruments used in this study, the lack of time was also considered a barrier for adolescents from Curitiba, PR[20] and also for adolescents from Santa Maria, RS[15], the latter being specifically referred to as the time dedicated to studies.

Research conducted by Müller and Da Silva[14] with adolescents from the rural area of Pelotas, RS, seems to strengthen the claim of lack of time to be related to the time spent with studies and homework. The authors concluded that educational level was directly associated with the prevalence of lack of time: the higher the educational level, the higher prevalence of lack of time.

Another issue that justifies the lack of time is the involvement with new technologies[15] and the excessive use of electronic media at home, a fact observed in American schoolchildren[27]. Arab Students[13] also reported a lack of time and was one of the five barriers most reported by 40% of Polish adolescents, indicating that home or other commitments have been perceived as a priority on PA[28].

Regarding PB "adverse weather conditions", the results confirm that the climatic conditions of southern Brazil are a strong barrier to PA practice, as has been reported in other studies developed in the region[6,14,15]. Climate instability ultimately impairs PA practice, especially in the winter[6], making it difficult to carry out outdoor activities[14], negatively interfering with PA practice. Climatic variations in Santa Maria are very sharp, with high temperatures in summer and wet and cold winter, which discourages people to the practice of physical exercises, aggravated by the lack of appropriate outdoor places such as safe streets and parks, and lack of adequate infrastructure in indoor places.

It is noteworthy that data of this study were collected in June, at the beginning of the winter season. This situation, coupled with the fact that physical education classes are held in the institution in the first periods of the school day, between 07:20 am and 10:00 am, may have influenced this result.

The difficulty in making PA without some company was the only PB that showed positive responses higher in boys compared to girls, and the most prevalent for male 10th and 11th graders. Much of the free time in adolescence is filled with the company of friends and the adoption of behaviors is linked to interactions with the circumstances to which adolescents are exposed[27] and the characteristics and behaviors of their peers. Another study also found reports that the main barriers cited by adolescents are of socio-cultural nature and include the lack of company of friends[16].

Friends can influence motivation[11] and thus the fact of having no company can be considered a strong barrier, because without social support generated by the presence of a friend, the engagement to in some practice becomes difficult, since behaviors result from group interactions. This justification gains support with the results of studies in which friends have similar physical activity levels[11,29], adolescents with sports friends have a tendency to be physically active[20] and adolescents who have friends who exercise can more easily perceive the benefits of PA[30].

One of the less prevalent barriers among students in this study was "it is difficult to make physical activity at home because at home nobody performs PA". Family support is an important aspect to understand the benefits of PA[30]. However, the example of parents in relation to performing or not PA is not a factor that interferes with the proactive behavior of adolescents. The characteristics of this age group, which involve certain detachment from the nuclear unit and the search for greater autonomy, makes this barrier to be against one of the most prevalent, lack of company, which is only perceived as a barrier when the friend cannot be along.

The trend found that PB decrease from the 10th grade to the 12th grade can also find justification on issues involving the relationship of adolescents

with their peers. The entry into the high school is a new stage in school life, marked by the end of elementary school. New students arriving to school and the redistribution of classes establish new relationships and the consolidation of these friendship ties take time to be strengthened. When arriving in the 12th grade, these relationships already solidified and network of friends is once again formed.

Overall, adolescent girls in the three school grades reported more barriers when compared to boys, corroborating what has been found in literature, regardless of country[13,20], place of residence, rural[14] or urban[6], state capitals[9,16] or inland cities[15] in which studies have been conducted.

Some limitations of this study should be highlighted: (1) difficulty of establishing the cause and effect temporality inherent of cross-sectional studies; (2) despite the thorough guidance to participants on the instrument and the importance of collecting information, the self application aspect of the questionnaire can lead to loss of more accurate information, and (3) although the instrument is validated for the study population and offers statements that meet the environmental, cultural and social aspects of southern Brazil, it is a closed instrument and can cause loss of information. In addition (4), the study includes only students from a public school, with own characteristics of its education system, suggesting caution in extrapolating the results to other populations.

However, these limitations do not invalidate the importance of the findings, since the information collected seem to be unprecedented for the population of this education system. It is noteworthy that many of the students are from other Brazilian regions and bring with them particularities and specific customs of their places of origin. This unique feature found in this study allows these results, with traces of the Brazilian cultural diversity, to be extrapolated to other groups, even if it has not been one of the research goals.

CONCLUSION

The findings showed that for the study participants, the most prevalent PB were "I have many tasks to do", "lack of time" and "adverse weather conditions". Boys and girls reported similar barriers; however, girls reported a higher number of PB and with greater frequency. An important point to be considered relates to the finding that barriers to students to engage in PA practices are related to the amount of tasks and homework, and consequently lack of time. The long school day, which is characteristic of the federal education system, together with the pedagogical praxis of teachers in relation to extra class school tasks, may limit the involvement with PA, often subjecting the adolescent to choose between achieving school obligations or the search for a more active and healthier lifestyle.

Aware of the benefits of PA and sports activities on individuals, these practices must be encouraged, supported and made possible within the school context, searching for actions able to reduce the barriers that may

hinder the involvement of adolescents in PA, while minimizing the negative effects caused by physical inactivity. Searching for this information within the school environment is an interesting strategy, as the school is the place where the appropriation and construction of knowledge has been developed, making it a promising space for actions in this purpose.

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