Adolescent physical activity: the role of parental social support and the level of physical activity. Social Support and Physical Activity of Parents and Adolescents.

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Abstract

Background: Maximising the level of physical activity in adolescents has been a concern for many researchers given the benefits provided by physical activity.

Aim: To verify the relationship between the level of moderate vigorous physical activity (MVPA) of parents or legal guardians and that of social support (SS) with the level of MVPA in adolescents.

Methods: Cross-sectional study that selected 1390 (59.6% female) adolescents. The questionnaires IPAQ, QAFA and ASFA were used.

Results: In relation to boys, receiving incentives from parents who “assist always” (OR=1.96 – CI95%=1.16–3.32) and having parents/legal guardians who meet the MVPA recommendations (OR=2.78 – CI95%=1.76–4.38) was associated with meeting the MVPA recommendations. The probability increases when adjusted by socioeconomic status (OR=3.47 – CI95%=1.73–6.96) or education level (OR=4.20 – CI95%=1.96–9.02). Regarding girls, parents who “encourage sometimes” was associated negatively (OR=0.61 – CI95%=0.37–0.98) and meet the MVPA recommendations (OR=2.04 – CI95%=1.46–2.87) was associated positively with meeting the recommendations for adolescents. The likelihood raises when adjusted by socioeconomic status (OR=2.11 – CI95%=1.36–3.29) or education level (OR=4.30 – CI95%=2.41–7.69).

Conclusions: Having parents who meet with the physical activity recommendations demonstrated higher results in adolescents engaging 60 minutes of MVPA daily when compared to receiving social support, for both boys and girls.

Background

The increase in the prevalence of physical inactivity, both in developed and developing countries, is of great concern since it is the fourth leading cause of death in the world, besides increasing the risk of suffering from 35 chronic diseases^{1,2}. It is estimated that, on average, every fourth one in the world population is not active enough³. Therefore, if current trends continue, the WHO (World Health Organization) goal of achieving an insufficient 10% relative reduction in physical activity (PA) in the population by 2025 will not be achieved^{4,5}.

Following the WHO recommendations, adolescents (13 to 18 years old) should perform a minimum of 60 minutes/day of moderate vigorous physical activity (MVPA) in order to benefit their health⁶. In the case of adults, it is indicated to practise 150 minutes a week of moderate physical activity (MPA) or 75 minutes of vigorous physical activity (VPA)⁶.

In Brazilian adolescents, physical inactivity in free time reaches 54.3%⁷. The factors that can influence these data are very varied, including sociodemographic, economic or social/family support indicators, among others⁸⁻¹⁶.

In this sense, numerous national and international studies indicate that the level of social support (SS) in the family context, as well as in the peer group, is linked to higher levels of PA in adolescents¹⁷⁻¹⁹. In addition, the fact that parents practise PA at the same time is a good model for children to get involved in PA²⁰⁻²³. A longitudinal study that included 13.000 students observed that PA engaged by parents showed an association with that engaged by their children²³.

However, to date, the studies have presented the association of the PA level of parents or legal guardians and SS in isolation²⁰⁻²³. The present study seeks to investigate the chance that an adolescent has to comply with the MVPA recommendations if parents or legal guardians also comply with it and, in parallel, it investigates the SS received from parents or legal guardians to practise PA (encourage, practise together, transport, assist and comment on how well the adolescent is doing his/her PA). Once investigated, this gap can contribute to a better understanding of how to maximise the levels of MVPA in adolescents, with the support and example coming from parents (father, mother, caregiver).

Thus, the aim of this study was to verify the relationship between the level of MVPA of parents or legal guardians and that of SS with the level of MVPA in adolescents.

Methods

The study followed the standards of research involving human beings of the National Health Council (resolution number 466/2012), having been approved by the Research Ethics Committee of the Federal University of Paraná (CAAE: 98133218.8.0000.0102) and authorised by adolescents' the parents or legal guardians by means of a free and informed consent form.

This is a cross-sectional study conducted in 2018 with a representative sample of adolescents aged 15 to 17 enrolled in a public high school.

For the preliminary sample calculation, an association of OR=1.49 was considered between SS and PA²⁴, a prevalence of being insufficiently active of 50%²⁵, a confidence level of 95% ($\alpha=0.05$) with a power of 80% ($\beta=0.20$), resulting in a minimum sample of 804 subjects. However, an increase of 30% was considered for possible losses and refusals, which estimated a minimum sample required for the study of 965 subjects. The sample was selected from the process of sampling by multiple stages, conglomerates, in three stages: 1st stage - all state schools were stratified according to each of the nine administrative regions of the city of Curitiba; 2nd stage - two schools were drawn in each regional; 3rd stage - a simple random selection of a class of each year was performed, according to the number of students, separated by sex, required for a given region. Finally, all students in each class were invited to participate in the study.

A total of 2506 adolescents were evaluated. Those who presented physical and/or cognitive limitations (informed by the school) (n=12) and were 18 years old (n=125) were exempt. We also excluded the adolescents who did not present the informed consent form (n=104), those who refused to participate in

the study, or missed the day of collection (n=56), as well as those who answered the questionnaires incorrectly or did not answer about PA level (n=819). Thus, the analytical sample of the study was 1390 adolescents.

Statistical analyses carried out subsequently showed that this sample could identify statistically significant ratios above 1.36 and below 0.73, considering a power of 80% ($\beta=20\%$), a confidence level of 95% ($\alpha=5\%$) and considering a prevalence of 34% of adolescents with low SS and who did not meet the minimum recommendations for PA.

Physical Activity - Parents / Legal Guardians and Adolescents

The moderate vigorous physical activity (MVPA) level of parents or legal guardians was measured through the IPAQ questionnaire - short version (International Physical Activity Questionnaire), in which parents or legal guardians reported "how many days a week" and "how long a day" they practised MVPA, over a normal week²⁶. The time dedicated to each physical activity (PA) practice (leisure and displacement) per week was categorised according to the current recommendations of MVPA practice ("it meets the recommendations" ≥ 150 minutes per week of MVPA practice and "it does not meet" (<150 minutes per week of MVPA practice)⁶.

The PA level of adolescents was evaluated by the *Physical Activity Questionnaire for Adolescents* (QAFA)²⁷. This questionnaire was first developed in the checklist format by Sallis et al, 1996²⁸ for North American adolescents, translated and adapted for Brazilian adolescents by Farias-Júnior et al, 2012²⁷. The questionnaire consists of a list of 24 types of MVPAs, with the possibility of adolescents adding activities beyond those listed. In Brazilian adolescents, the questionnaire showed good reproducibility (CCI=0.88; CI_{95%}=0.84-0.91) and concurrent validity when compared to 24-hour recall ($r=0.62$; $p<0.001$)²⁷. To analyse the MVPA level, it was classified as "it meets the recommendations" (≥ 60 minutes per day of MVPA practice) and "it does not meet" (<60 minutes per day of MVPA practice), to consider the recommendation by the WHO is that adolescents (13 to 18 years old) perform at least 60 minutes/day of MVPA to obtain health benefits⁶.

Social Support received from parents or legal guardians for the practice of Physical Activity.

The social support (SS) of the adolescents' parents or legal guardians to practise PA (physical activity) was measured by the scale of 5 items *Social Support for Physical Activity Practice for Adolescents* (ASAFA), which has satisfactory consistency (SS of parents $\alpha \geq 0.77$ and IFC ≥ 0.83)²⁹. Adolescents reported the frequency (never=1, rarely=2, frequently=3, always=4) with which parents offered some type of SS for the practice of PA (encourage, practise, transport, assist, comment) during a typical or normal week²⁹, through the questions: "How often do your parents encourage you to practise PA? Do they practise PA with you? Do they transport you or provide transportation so that you can go to the place where you practise PA? Do they assist you in PA? Do they comment that you are doing your PA well?" For purposes of analysis, and with the aim of ensuring comparability with similar studies³⁰, the response

options "rarely" and "frequently" were grouped and classified as "sometimes". Thus, the weekly frequency categories of SS were classified as never, sometimes and always.

Sociodemographic Information and Health

Sex was self-reported ("male", "female") and age was calculated from the date of birth (informed by the adolescent) subtracted from the date of data collection and divided by 365, resulting in: "15 years", "16 years", "17 years".

The nutritional status was calculated by the Body Mass Index (BMI), from the measured data of body mass and height (kg/height). The evaluation of the body mass was carried out by a trained researcher using a portable digital anthropometric scale (W721, Wiso, Brazil) with resolution of 100 grams and capacity of 150 kilograms (Kg). The adolescents were barefoot, wearing only light clothing and were guided to maintain their anatomical position, to position themselves with their backs to the scale and to distribute their body mass equally between both feet. A portable stadiometer (W721, Wiso, Brazil) was used to measure the total height of the participants. The participants were in the anatomical position with the head positioned in the Frankfurt Plan and, at the time of measurement, they performed an inspiratory apnea. Two measurements were performed and in case of divergences of more than 0.1 centimetres (cm) between measurements the procedure was performed again³¹. The technical error of measurement was obtained by carrying out a number of repeated measurements on the same subject, either by the same observer, taking the differences and entering them into an appropriate equation. For intra-observer TEM of the two measurements taken it was used the following equation: , where "D" is the difference between measurements and "N" is the number of individuals measured³². Likewise, intraclass correlation coefficient (ICC) was calculated to verify the reliability of the measurements, giving a result of 0.96.

The identification of nutritional status was carried out through the classifications of BMI Z scores for each sex and age proposed by the WHO, being: Low weight = <-2 SD (standard deviation), Eutrophic = ≥ -2 SD and $<+1$ DP, Overweight = $\geq +1$ SD and $<+2$ DP and Obesity = $\geq +2$ SD, classified as "not overweight" and "overweight"³³. The education level of the main family breadwinner and his/her socioeconomic status (SES) were evaluated with a standardised questionnaire³⁴. The Education level was classified as: Elementary School, Secondary School or higher Education levels. SES was classified into three categories: "low" (class C+D), "medium" (class B1+B2) and "high" (class A1+A2) (ABEP, 2016)³⁴.

Collecting data

Parents and/or legal guardians received the questionnaire at home to answer it. The parents'/legal guardians' questionnaire was sent out by the adolescents together with the terms of consent for the adolescents to agree to. Adolescents who had parental permission to participate in the survey answered the questionnaire at school during physical education classes with the help of the researchers who applied the questionnaire.

Data Analysis

After having identified the data distribution by the Kolmogorov-Smirnov test, descriptive statistics were used to distribute absolute and relative frequencies. The chi-square test (χ^2) was used to verify differences in proportions in relation to sex and recommended levels of MVPA in adolescents. Pearson's chi-square test was used to compare proportions between genders, then a post hoc test was used to demonstrate which categories showed the greatest difference.

Binary logistic regression was used to test the relationship among the study variables (between the level of MVPA of parents or legal guardians and that of SS with the level of MVPA in adolescents). By the enter criterion, the value of $p \leq 0.20$ for the entry of the variable in the adjusted model was adopted. Afterwards, the interaction for age, nutritional status, main breadwinner's education level and socioeconomic status (SES) logistic regression analysis models were introduced (multiplication of the possible moderating variable with the independent variable - example: age * SS: practice). In all, 20 interactions were tested (age, nutritional status, main breadwinner's education level and SES with the SS scale and MVPA parentes - significant values were presented in tables 2 and 3)

To avoid bias related to the complex sample selection process (cluster stratification), the association analyses were corrected by the complex design using the SPSS software version 23.0 "complex sample" command. This procedure was used to ensure that the estimates reflect the population data of the elementary units in the sample.

Results

The sample was composed by 1390 adolescents (59.6% female) and their respective parents/ legal guardians. Table 1 show the variables of the study stratified by sex, where: nutritional status ($p=0.001$), SES ($p=0.015$) and the level of MVPA of parents ($p=0.021$) showed significant differences (Table 1).

In relation to boys, receiving incentives from parents who "assist always" ($OR=1.96 - CI95\%=1.16-3.32$) and having parents/legal guardians who meet the MVPA recommendations ($OR=2.78 - CI95\%=1.76-4.38$) was associated with meeting the MVPA recommendations. The chances of boys meeting 60 minutes of MVPA daily increases by almost 3x when parents meet the recommendation of MVPA and have a high socioeconomic status ($OR = 3.47 - CI95\% = 1.73-6.96$). It increases by almost 4x when parents comply with the MVPA recommendation and have a high level of education ($OR = 4.20 - CI95\% = 1.96-9.02$) (Table 2).

Regarding girls, parents who "encourage sometimes" ($OR=0.61 - CI95\%=0.37-0.98$) and meet the MVPA recommendations ($OR=2.04 - CI95\%=1.46-2.87$) was associated with meeting the recommendations for adolescents. The chances of girls meeting 60 minutes of MVPA daily increases when their parents meet the MVPA recommendation and have a high socioeconomic status ($OR = 2.11 - CI95\% = 1.36-3.29$). It increases by almost 4x when parents comply with the MVPA recommendation and have a high level of education ($OR = 4.30 - CI95\% = 2.41-7.69$) (Table 3).

Table 1, 2, 3.

Discussion

Numerous studies indicate that the level of SS in the family context, as well as recommended levels of PA (physical activity) from parents or legal guardians are linked to higher levels of PA in adolescents^{16-23,35}. However, scientific literature has analysed these variables independently. Aiming at this, the present study sought to investigate the variables in the same sample of adolescents, in order to analyse how much the fact of having parents or legal guardians physically active and receiving their support for the practice of PA could contribute to achieve the recommendations of Moderate Vigorous Physical Activity (MVPA) in adolescents.

Boys

In the present study, for boys, the support of parents related to assist and the fact of having parents who meet the MVPA recommendations were associated with meeting recommended MVPA levels. A systematic review³⁵ published in 2010 consistently observed that adolescents who received greater Social Support (SS) reported higher levels of PA, reinforcing the importance of this support in adolescent (boys and girls) participation in PA³⁵. However, the low number of studies made it impossible to analyse the association among different types of SS, PA intensities and adolescent characteristics, such as sex and age³⁵.

In the study by Prado et al³⁰, the fact of always receiving positive reinforcement from parents was associated with boys PA. In the same way, there are other studies that show encouragement as a way of SS most commonly reported by adolescents, regardless of their source³⁵⁻³⁸. Most of the SS types explored in this study did not present a significant association with the practice of PA. This finding was observed as well in the multivariate analyses by Fermino et al²⁴, Prado et al³⁰ and Piola et al³⁶, who also did not observe significant associations between most types of SS and PA.

In this sense, Duncan et al³⁷ observed that older adolescents have greater perception from family members when this comes in the form of encouragement and talk about PA. Similarly, Yao and Rhodes²² also noted that parental encouragement was the SS most strongly related to their children's PA.

Parental SS for adolescents to engage PA is a crucial factor, however, the scientific literature has reported a greater emphasis on social support from friends than that provided from families, for older adolescents, according to a systematic review performed by Mendonça and colleagues (2014)³⁸. Nevertheless, having active parents (i.e., parents who comply with PA recommendations) as role models, seems to have a positive influence even with older adolescents, as indicate the results of our study. Thus, in this age phase, adolescents may not give as much relevance to the SS of parents, but they may give as much importance to the example they offer about PA practice³⁸.

In a systematic review³⁹ of studies that examined both children's and parents' PA, conducted in countries with high development index (United States, United Kingdom, Australia, Canada, France and Portugal) all with cross-sectional design, it was showed that fathers' MVPA was associated with that MVPA of children, as well as the participation in vigorous activities of children was associated with the practice of VPA (vigorous physical activity) of parents³⁹. For mothers, the practice of MPA (moderate physical activity) was associated with the practice of MPA that of children³⁹. Both associations were confirmed for weekdays and weekends³⁹.

The physical activities reported by parents in their childhood and adolescence were also associated with higher levels of PA among adolescents⁴⁰. Adolescents with physically active parents in the past and currently, were six times ($OR=6.670 - CI_{95\%}=1.940-2.790$) more likely to be physically active compared to adolescents whose parents/legal guardians were not physically active in the past⁴⁰. Therefore, it seems necessary to understand these parental constructions that measured PA since childhood^{39,40}.

Girls

In the case of girls, the fact of receiving incentives from parents (encourage) and having parents/legal guardians who comply with the MVPA recommendations was associated with complying the MVPA recommendations, encourage was associated negatively and comply with the MVPA recommendations positively. Piola et al³⁶, in the city of Curitiba (Brazil), in a study of adolescents found that the fact that parents "always" commented positively on the activities was absolutely associated with the practice of PA in post-pubertal adolescents (girls and boys) ($OR=2.60 - CI_{95\%}=1.01-6.71$). Variations in associations between different types and sources of SS can also be observed according to the age and sex of adolescents^{19,38,41}. As in the study of Prado et al³⁰, where having parents who "practise" PA together with their daughters was positively associated with the practice of PA (five or more days in the week of 60 minutes of MVPA) for girls. Some studies show that SS from friends seems to be more associated with meeting the PA recommendation in older adolescents³⁸. In this sense, encouraging girls to practise PA could be an important tool, coming from parents and family members, to maximise levels of PA. This is due to the fact that an increased SS contributes to raise the level of PA in adolescents¹⁹.

Complying with the MVPA recommendations established for parents contributes to increasing the chance of adolescent girls complying with the MVPA recommendation by almost twice as much. Bound together, these findings demonstrate that the regular practice of parents' PA, combined with the support they provide to their children for, this purpose, are important factors not only for adolescents in PA, but also for the practice of MVPA. When close people are present and value their behaviour, adolescents' self-esteem tends to rise; thus, it increases their perception of self-efficacy²¹; what can contribute, inexorably, to higher levels of PA²¹. Parental or legal guardian encouragement can have a direct influence on the active

participation of adolescents, since it can lead adolescents to participate in a more automatic process, establishing routines.

The results confirm the importance of the family environment for adolescent's PA^{19,22,35,38,39}. It indicates that the influence of the family environment (receiving support from parents or legal guardians and having active parents or legal guardians) in the dynamic behaviour of adolescents, operates, in a way, through the attitudes they receive from parents or legal guardians, such as support and especially the example of being physically active^{23,41}. In the present study, having parents who meet with the PA recommendations demonstrated higher results in adolescents engaging 60 minutes of PA day when compared to receiving SS, for both boys and girls. Nevertheless, more studies are needed to confirm the influence of the parents' example about the meeting of the PA recommendations for adolescents.

At the same time, more studies that investigate the interaction of parental education level and SES are required, since this study has shown that education level and SES increase the possibilities of boys and girls engaging 60 minutes of MVPA, if the main family breadwinner has both high education level and SES. The authors suggest that families with parents with high education level may have more knowledge about the benefits of PA and thus engage more PA and encourage their children. Notwithstanding, on the basis of the results of Global Matrix report, a significant low negative correlation was observed between the overall PA and some sociodemographic indicators (e. g. Human Development Index and the growth national income per capita)⁴². For this reason, developing effective strategies to offer PA opportunities for all should be a national public health prime concern in all countries despite the SES.

Limitations

Some points should be considered when interpreting the results of this study. One of them is reverse causality, a common characteristic in studies with a cross-sectional design, which does not allow investigating a cause and effect relationship or determining the direction of the relationships. However, this design has been used in several studies like this. The study was developed in a single Brazilian city and has typical characteristics of well-developed urban centres, which does not allow extrapolating the findings to rural centres and other cities in the country.

The sample only consisted of adolescent students from public schools making it impossible to extrapolate the results to higher classes. However, the representative sample and statistical analyses ensure an interpretation of the data for large populations of public schools, an important point in the field of interventions related to public and preventive health.

The use of reported measures depends on the accuracy and recall power of the respondent's responses. In an attempt to minimise this bias, researchers were trained to assist adolescents in answering questionnaires. The instrument used to measure physical activity does not allow the identification of all domains and contexts in which the activities were practised. For this reason, obtaining a more accurate

measure would contribute to reducing type 1 error. However, as it is a large study, with a representative sample, the use of questionnaires proved to be the best alternative.

Conclusion

In the present study, having parents who meet with the PA recommendations demonstrated higher results in adolescents engaging 60 minutes of MVPA daily when compared to receiving SS, for both boys and girls. In particular, regarding girls and aiming that one of the big problems related to physical inactivity is to make girls more physically active, the results of this study contribute to warn about the importance of having parents who meet with the recommendation of PA. The repeated encouragement and forms of support from parents/legal guardians, in addition to the example of being physically active, can initiate and build confidence so that the perceived behavioural control is improved and becomes a routine in the adolescents' lifestyle.

Abbreviations

ASAFA=Social Support for Physical Activity Practice for Adolescents

BMI=Body Mass Index

IPAQ=International Physical Activity Questionnaire

MPA=Moderate Physical Activity

MVPA= Moderate Vigorous Physical Activity

PA=Physical Activity

QAFA=Physical Activity Questionnaire for Adolescents

SES=Socioeconomic Status

SS=Social Support

VPA=Vigorous Physical Activity

WHO= World Health Organization

Declarations

Ethics approval and consent to participate (attached statements) - The study followed the standards of research involving human beings of the National Health Council (resolution number 466/2012), having been approved by the Research Ethics Committee of the Federal University of Paraná (CAAE:

98133218.8.0000.0102) and authorised by adolescents' the parents or legal guardians by means of a free and informed consent form. Consent was requested in writing.

Consent for publication - Not Applicable.

Availability of data and material - The datasets generated and/or analysed during the current study are not publicly available, the data are part of a doctoral thesis, which will be defended in February 2020. But are available from the corresponding author on reasonable request. The authors declare that all data supporting the findings of this study are available within the article.

Competing interests - The authors declare that they have no competing interests.

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Authors' contributions - EMC, Responsible for all aspects of the work. JFLG and TSP, Writing the manuscript. JAPSM and WC, Relevant critical content review. All authors read and approved the final manuscript.

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Tables

Table 1. Sociodemographic information and health, social support and data on physical activity stratified by sex (n=1390).

<i>Sociodemographic Information and Health</i>			Boys		Girls		p	TOTAL	
			n	%	n	%		n	%
Age	15		175	37.7	289	62.3	0.090	464	33.4
	16		203	40.5	298	59.5		501	36.0
	17		184	43.3	241	56.7		425	30.6
Nutritional Status	Not Excess of Weight		469	38.8	741	61.2	0.001*	1210	87.1
	Excess of Weight		93	51.7	87	48.3		180	12.9
The main breadwinner's education level	Elementary School		217	40.3	322	59.7	0.490	539	38.8
	Secondary School		192	38.8	303	61.2		495	36.6
	Higher Education levels		153	43.0	203	57.0		356	25.6
SES	Low SES		93 ^a	35.8	167 ^a	64.2	0.015	260	18.7
	Medium SES		348 ^a	40.1	520 ^a	59.9		868	62.4
	High SES		121 ^a	46.2	141 ^b	53.8		262	18.8
<i>SS Parents/Legal Guardians</i>			n	%	n	%	p	n	%
Encourage	Never		104	37.5	173	62.5	0.168	277	19.9
	Sometimes		313	40.3	463	59.7		776	55.8
	Always		145	43.0	192	57.0		337	24.2
Practice together	Never		205	37.4	343	62.6	0.060	548	39.4
	Sometimes		288	42.0	398	58.0		686	49.4
	Always		69	44.2	87	55.8		156	11.2
Transport	Never		268	40.5	394	59.5	0.955	662	47.6
	Sometimes		176	40.1	263	59.9		439	31.6
	Always		118	40.8	171	59.2		289	20.8
Assist	Never		239	39.4	367	60.6	0.355	606	43.6
	Sometimes		235	40.4	346	59.6		581	41.8
	Always		88	43.3	115	56.7		203	14.6
Comment	Never		209	38.7	331	61.3	0.992	540	38.8
	Sometimes		232	43.9	296	56.1		528	38.0
	Always		121	37.6	201	62.4		322	23.2
<i>Level of MVPA**</i>			n	%	n	%	p	n	
Parents/Legal Guardians	It does not meet		411	42.5	557	57.5	0.021*	968	69.6
	It meets (150 minutes/week)		151	35.8	271	64.2		422	30.4
Adolescents	It does not meet		367	65.3	564	68.1	0.296	931	67.0
	It meets (60 minutes/day)		195	34.7	264	31.9		459	33.0

SES: socioeconomic status; SS: Social Support; MVPA: moderate vigorous physical activity;

^{a,b} each letter of subscript indicates a subset of gender (male and female) categories whose column proportions do not differ significantly from each other, Bonferroni's post hoc;

*Statistically significant for the chi-square test for continuity correction; † Statistically significant for the linear association by chi-square test; p<0.05. ** Meets physical activity recommendation (WHO, 2010)⁶

SS Parents/Legal Guardians: How often do your parents encourage you to practice PA (physical activity)? Do they practice PA with you? Do they transport you or provide transportation so that you can go to the place where you practice PA? Do they assist you in PA? Do they comment that you are doing your PA well?

Table 2. Association the social support and the level of physical activity of parents/legal guardians with regards to recommended MVPA levels in adolescent boys (n=1390).

SS Parents/Legal Guardians		RECOMMENDED LEVELS OF MVPA IN ADOLESCENT BOYS (60 minutes/day)													
		Unadjusted					Adjusted†			Interaction ^a			Interaction ^b		
		n	%	OR	CI _{95%}	p	OR	CI _{95%}	p	OR	CI _{95%}	p	OR	CI _{95%}	p
Encourage	Never	104	37.5	1											
	Sometimes	313	40.3	1.40	0.74-2.62	0.305									
	Always	145	43.0	1.35	0.84-2.16	0.215									
Practice together	Never	205	37.4	1											
	Sometimes	288	42.0	0.82	0.40-1.66	0.577									
	Always	69	44.2	0.85	0.45-1.60	0.613									
Transport	Never	268	40.5	1											
	Sometimes	176	40.1	0.86	0.52-1.44	0.570									
	Always	118	40.8	1.37	0.80-2.33	0.247									
Assist	Never	239	39.4	1			1								
	Sometimes	235	40.4	1.26	0.66-2.41	0.484	1.28	0.71-2.30	0.418						
	Always	88	43.3	1.90	1.07-3.39	0.029	1.96	1.16-3.32	0.012*						
Comment	Never	209	38.7	1			1								
	Sometimes	232	43.9	1.55	0.84-2.87	0.165	1.50	0.85-2.67	0.166						
	Always	121	37.6	0.73	0.44-1.20	0.218	0.78	0.49-1.27	0.328						
MVPA Parents (150 minutes/week)	It does not meet	411	42.5	1			1			1			1		
	It meets	151	35.8	2.68	1.69-4.24	0.000	2.78	1.76-4.38	0.000*	4.20	1.96-9.02	0.000*	3.47	1.73-6.96	0.000*

SS: Social Support; MVPA: moderate vigorous physical activity; †Adjusted by the enter criterion, the value of p≤0.20 for the entry of the variable in the adjusted model was adopted; Interaction^a by main breadwinner's education level; Interaction^b by socioeconomic status (SES). *Statistically significant for the test; p<0,05; SS Parents/Legal Guardians: How often do your parents encourage

you to practice PA (physical activity)? Do they practice PA with you? Do they transport you or provide transportation so that you can go to the place where you practice PA? Do they assist you in PA? Do they comment that you are doing your PA well?

Table 3. Association the social support and the level of physical activity of parents/legal guardians with regards to recommended MVPA levels in adolescent girls (n=1390).

SS Parents/Legal Guardians		RECOMMENDED LEVELS OF MVPA IN ADOLESCENT GIRLS (60 minutes /day)														
		Unadjusted					Adjusted			Interaction ^a			Interaction ^b			
		n	%	OR	CI _{95%}	p	OR	CI _{95%}	p	OR	CI _{95%}	p	OR	CI _{95%}	p	
Encourage	Never	104	37.5	1			1									
	Sometimes	313	40.3	0.65	0.38-1.08	0.097	0.61	0.37-0.98	0.042*							
	Always	145	43.0	1.01	0.66-1.55	0.966	1.06	0.71-1.59	0.771							
Pratice togheter	Never	205	37.4	1												
	Sometimes	288	42.0	1.33	0.74-2.38	0.883										
	Always	69	44.2	1.39	0.80-2.40	0.685										
Transport	Never	268	40.5	1												
	Sometimes	176	40.1	0.78	0.49-1.25	0.301										
	Always	118	40.8	1.07	0.68-1.69	0.774										
Assist	Never	239	39.4	1												
	Sometimes	235	40.4	0.97	0.55-1.68	0.892										
	Always	88	43.3	1.08	0.65-1.80	0.758										
Comment	Never	209	38.7	1			1									
	Sometimes	232	43.9	1.36	0.84-2.20	0.209	1.25	0.82-1.89	0.302							
	Always	121	37.6	1.41	0.91-2.18	0.127	1.46	0.96-2.23	0.075							
MVPA Parents (150 minutes/week)	It does not meet	411	42.5	1			1			1			1			
	It meets	151	35.8	1.99	1.42-2.80	0.000	2.04	1.46-2.87	0.000*	4.30	2.41-7.69	0.000*	2.11	1.36-3.29	0.001*	

SS: Social Support; MVPA: moderate vigorous physical activity; ^aAdjusted by the enter criterion, the value of $p \leq 0.20$ for the entry of the variable in the adjusted model was adopted; Interaction^a by main breadwinner's education level; Interaction^b by socioeconomic status (SES). *Statistically significant for the test; $p < 0.05$; ^aSS Parents/Legal Guardians: How often do your parents encourage you to practice PA (physical activity)? Do they practice PA with you? Do they transport you or provide transportation so that you can go to the place where you practice PA? Do they assist you in PA? Do they comment that you are doing your PA well?