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Youth's Physical Activity and Fitness from a Rural Environment of an Azores Island

João Pedro Gouveia [1,*], Pedro Forte [2,3,4] and Eduarda Coelho [1,2]

1 Department of Sports Sciences, Health and Exercise, University of Trás-os-Montes e Alto Douro, Edifício de Ciências do Desporto, Quinta de Prados, 5001-801 Vila Real, Portugal; ecoelho@utad.pt
2 Research Center in Sports, Health and Human Development, CIDESD, 6201-001 Covilhã, Portugal; pedromiguel.forte@giscedouro.pt
3 Department of Sports, Douro Higher Institute of Educational Sciences of the Douro, Rua Vitorino da Costa, Nº 46, 4560-708 Penafiel, Portugal
4 Department of Sports Sciences and Physical Education, Instituto Politécnico de Bragança, 5300-253 Bragança, Portugal
* Correspondence: joaopsgouveia@gmail.com; Tel.: +351-91-840-9153

Abstract: This study aimed to characterize and compare physical activity (PA) and fitness levels by sex in 109 students of a rural environment. The participants were between 15 and 20 years old, from the Santa Maria High School in the Azores' Santa Maria island. PA levels were assessed by International Physical Activity Questionnaire (IPAQ)-short form. The physical fitness was evaluated by the Fitnessgram battery tests. The sample of this study were physically active, 67.9% were classified with high and moderate PA levels. Regarding the sex comparisons, no significant differences between PA levels were founded. However, males presented higher values of vigorous physical activity, whereas females spent more time in moderate activity, such as walking. Moreover, females had more time in sitting positions during the week and weekend. Regarding the physical fitness levels, males presented significantly higher performances in the upper strength ($p < 0.001$) and aerobic capacity tests ($p < 0.001$), whereas females showed higher values in the sit and reach test ($p < 0.001$), in the trunk lift test ($p < 0.005$), and in the fat mass values ($p < 0.001$). It seems reasonable to assume that there is a sociodemographic influence on the PA and physical fitness levels in our sample. We may speculate that rural life provides more opportunities for youth for being physically active than urban life. No differences were founded between sexes for physical activity. However, differences were found between sex for strength, flexibility, cardiorespiratory fitness, and body composition. That might be explained by the biological differences and the type of physical activity habits that each sex use to have in rural environmental.

Keywords: physical activity; physical fitness; rural environment; adolescents and youngsters

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1. Introduction

The XXI century is characterized by the raise of new technologies, being this fact markedly related with physical activity (PA) decreasing levels (WHO 2010; Baptista et al. 2011). This considerable PA reduction as a prominent characteristic of modern societies. That may lead to decreasing the population physical fitness levels with a direct impact on their health and well-being (Chillon et al. 2011; Petroski et al. 2012; Rodrigues et al. 2012; Das and Chatterjee 2013; Sylejmani et al. 2019). Today, the vast majority of young people occupy their free time with sedentary activities such as reading, watching television and video, surf the internet, listening or playing music, going to the cinema, and dating (Esculcas and Mota 2005; Nodari et al. 2016). Physical inactivity is the fourth risk factor for global mortality; the contribution to mortality is about 6%, equivalent to 3.2 million of deaths per year (WHO 2010). There is also an association between PA practice and the absence of metabolic pathologies in young people (Tolocka et al. 2019). The aerobic

and muscular fitness has been considered as predictive metabolic and cardiovascular pathologies (Baptista et al. 2011).

It has long been commonly accepted that a certain amount of regular physical activity is an important and healthy way to prevent diseases (Cavill et al. 2008; WHO 2010; Gordia et al. 2010; Baptista et al. 2011). The benefits of regular PA are divided into two major groups strongly interrelated, health promotion, and physical fitness. The possible positive repercussions on health and survivability are assessed by the physical condition and capacity status (Barata et al. 1997). The physical activity and fitness improvements allow to contribute for health promotion, such as cardiovascular system; respiratory function; obesity control and weight reducing; skeleton mineral bone's density increase; locomotor system increasing functionality; muscle tone and strength; immunostimulating and psychological effects; healthy growth process; and the enrichment of the psychomotor skills. Improving physical fitness can obtain better results in morphological components and the control of adiposity. Moreover, improving the skeletal muscle may lead to neuromechanical and coordinating capacity better performance. Finally, increasing oxygen uptake and tolerance to exercise effort, and the optimization of the metabolic insulinic actions and the lipid and glucidic energy substrates activity (Barata et al. 1997; Warburton et al. 2006; Janssen and LeBlanc 2010; McKinney et al. 2016).

The urban environments expansion process in cities offer reduced or insufficient possibilities to promote PA in youths (Petroski et al. 2012; Rodrigues et al. 2012). There are countless reasons for this phenomenon and it is possible to highlight: the conditions decrease for human daily life physical activity, such as the degradation of conditions and opportunities to promote PA; the decrease in the importance of living spaces; less game fields and adventure playgrounds; the reduction of mobility autonomy in everyday life of urban youths (Rodrigues et al. 2005). Thus, it is imperative to consider the cities expansion plans regarding to children and young people PA promotion (Lopes and Neto 2014; Kim and Hyun 2018; Drenowatz et al. 2020; McCrorie et al. 2020). The literature supports that individuals in rural areas are more prone to be active (Gordia et al. 2010; Rodrigues et al. 2012) and with higher physical fitness levels in comparison to those in the urban areas (Rodrigues et al. 2005; Petroski et al. 2012; Sylejmani et al. 2019; McCrorie et al. 2020). These findings were also verified in young sports practitioners (Das and Chatterjee 2013). Upon that, it is important to consider that the buildings construction state and perspectives may encompasses interventions to promote PA and health (Chillon et al. 2011; Sylejmani et al. 2019).

The PA is defined as any body movement by the skeletal muscles that requires energy expenditure and include working, domestic tasks, and leisure physical activities (WHO 2010). PA is also an extremely complex phenomenon, which will necessarily have different meanings, depending on the context in which it is performed (Maia and Oliveira 2001). This definition includes all types of activities such as walking, cycling, go to work/school, dancing, traditional games, gardening, and housework, not being confined to just practice sports or exercise (Cavill et al. 2008). Moreover, physical fitness is a state characterized by the ability to perform daily activities with vigor and demonstration of traits and abilities that are associated with a low risk of premature development of pathologies associated with inactivity and sedentary behavior (Balady et al. 2000). Young people with higher levels of PA have higher correlation values with the maximum and submaximal indicators of cardiovascular fitness and strength and muscular endurance compared to sedentary ones (Malina 2006). The higher the levels of physical fitness, the lower the risk of physical activity-related diseases (Balady et al. 2000; Warburton et al. 2006; Janssen and LeBlanc 2010; McKinney et al. 2016). Physical fitness can encompass one orientation where the components are limited to health related capacities and sports-motor athletic performance (Maia et al. 2001). The physical fitness has been measured by cardiorespiratory fitness, strength, muscular endurance, and flexibility variables (Wilder et al. 2006; Masley 2009). Moreover, the body composition and metabolic components are also assessed by physical fitness based on its association with obesity-related problems (Marques and Gaya 1999;

Masley 2009). In view of these considerations, it is important to know the regional PA and fitness to characterize the population.

The majority of the studies showed that a large percentage of children and young people have unsatisfactory levels of physical fitness (Triani and Silva 2011; Reis et al. 2018; Sousa et al. 2019). Regarding the sex differences, males usually have higher levels of physical fitness in comparison to females (Triani and Silva 2011; Sylejmani et al. 2019). Males have also higher aerobic capacity and muscular fitness (Lima et al. 2007; Ulbrich et al. 2007; Reis et al. 2018). However, the lower limbs' flexibility is usually higher in females (Ulbrich et al. 2007; Sylejmani et al. 2019). The physical fitness levels seem to increase with age in both sexes, possibly related to the advance in growth and maturation biological stages (Rodrigues et al. 2005; Ulbrich et al. 2007; Reis et al. 2018). Moreover, the males are prone to be more active than females. This finding is possibly related to the fact that males are more prone to be involved in vigorous physical activities and sports practices (Esculcas and Mota 2005; Gordia et al. 2010; Baptista et al. 2011; Voser et al. 2017; Joens-Matre et al. 2008). However, physical activity decreases with age, mainly observed from the transition to adolescence and from this to adulthood. This phenomenon is mostly expressed in females than in males (Trost et al. 2002; Maia and Lopes 2003; Telama 2009; Baptista et al. 2011). It also seems that physical fitness is greatly influenced by environmental factors. Where, youths from rural populations may have higher levels of cardiorespiratory and muscular fitness and lower levels of fatness than their urban peers (Rodrigues et al. 2005; Chillon et al. 2011; Petroski et al. 2012; Rodrigues et al. 2012; Das and Chatterjee 2013; Sylejmani et al. 2019; Drenowatz et al. 2020). Furthermore, it was shown that urban–rural differences in physical fitness are more pronounced in normal weight children and that these differences increase with age (Drenowatz et al. 2020). It seems reasonable to assume that rural life provides more opportunities for youth for being active than urban life.

The Azores' islands are typically rural environments with a predominance of large pasture areas and forest surfaces. However, the majority of the population is congregated in small cities or towns. Currently, it is possible to observe a growing and unorganized expansion from urban to rural areas. That is due the construction of structures and infrastructures with poor landscape integration. It can be explained by the increase in tourist demand and, consequently, holding capacity (Cancela d'Abreu 2005). Santa Maria is a small island located at the southeastern end of the Portuguese archipelago. With a total area of 97 km^2 a resident population of 5500 inhabitants and a population density of 61 inhabitants/km^2, 46% of this island area is covered by agricultural holdings. Vila do Porto, is the only municipality that encompasses the entire island of Santa Maria, consisting of only five parishes in the island. (Cancela d'Abreu 2005).

However, these islands are mostly visited and attracted by tourists. In the last decade, tourism in the Azores has grown exponentially, mainly due to the liberalization of air space in 2015 where, over the past three years, overnight stays and guests rose about 70% (Elavai 2018). Therefore, tourists may seek hospitality conditions and guesthouses. In the last few years, the number of hotels has doubled, with a 57% growth and a 120% increase of total beds, where housing for local accommodation grew by 250%, while rural tourism increased 180% (Elavai 2018). This rampant touristic interest may possible contribute to change the Azores's rural environmental to urban (Chang et al. 2018; Ibãnescu et al. 2018). The tourism is considered to be a driving factor for the local economy; it is also conventionally considered a substantial contributor to environmental problems. Upon that, tourism has not been seen as a vehicle for environmental protection and landscape preservation (Chang et al. 2018). This is also valid for urban areas (Dumitru 2012). However, to raise concerns about the region's development regarding youth's activities, it is important to know the PA and fitness of the local population.

The PA can be measured using laboratory tests and force platforms (Maia and Oliveira 2001). These methods are objective and precise, but require sophisticated and expensive equipment. The field tests (less accurate in comparison to laboratory tests) are less complex, with greater applicability in different contexts and in large samples. The field tests are

possible to be diaries, questionnaires, physiological markers, behavioral observations, nutritional support, and mechanical and electronic monitoring are the most used (Maia and Oliveira 2001). Questionnaires are low cost instruments used for PA assessment in large samples (Gordia et al. 2010). The physical fitness assessment includes measures of body composition, cardiorespiratory endurance, muscular strength and endurance, and musculoskeletal flexibility (Meredith and Welk 2013). There are some testing batteries like Fitnessgram, CAHPER, EUROFIT, PCFSN, ALPHA (Pate et al. 2012). However, the widely used is Fitnessgram (Plowman et al. 2006; Guedes et al. 2012; Murray et al. 2012). That said, the aim of this study was to characterize the youth's (males and females) PA and fitness levels at the Santa Maria island. It was hypothesized that PA and physical fitness components varies according to sex and the youths' PA levels are high in this rural environment.

2. Materials and Methods

2.1. Sample

The sample was composed by 109 students, 73 males, and 36 females, with an average age of 16.47 (±1.46) years. The Santa Maria High School is the only educational establishment on the island for the 2nd and 3rd cycle of education, as well as for secondary. Based on that it allows to assume that the sample was representative of the respective local school population. All assessments were carried out at Santa Maria High School in physical education classes. All evaluations were carried out by the same investigator in collaboration with the physical education teachers who, received instructions on the specific conditions for carrying out each test and measurement. The exclusion criteria for participants were: existence of neurological or anatomical pathologies of any nature; deformations resulting from congenital diseases or from clinically proven traumatic processes. The participants desire for voluntary collaborates with this research was considered. An informed written consent from the parents or guardians were provided beforehand. This research project was supported by the school's Executive Council regarding the dissemination and awareness of the entire school community. The collaboration of class directors was also required, within the scope of their respective councils, to motivate students and guardians to their participation. The results and conclusions of the work, an integral part of the activities of the School Health Project, were subsequently presented and disseminated to the school community. The study was approved by the Education Regional Direction with process number DSP/15-29. All procedures were in accordance with the Helsinki Declaration for Research on Humans.

2.2. Instruments

The PA level was assessed with the IPAQ—International Physical Activity Questionnaire (short-form), for estimating physical activity at school, in sports and in leisure time, regarding the last 7 days (Matsudo Sandra et al. 2001; Vespasiano et al. 2012). Each subject was asked about the weekly frequency (number of times) and the time (minutes/day) spent in carrying out physical activities of a vigorous and moderate nature, their walking habits and the number of hours sitting and/or lying down (on a weekday and weekend). The classification of the subjects' habitual physical activity was performed according to the respective scoring and classification protocol of the questionnaire itself ("Guidelines for data processing and analysis of the international physical activity questionnaire"). The student's PA levels where classified as high, moderate, or low.

The questionnaires were filled out in the classroom, with teacher's supervision, which allowed the minimization of inaccuracies in the answers; a detailed prior explanation was carried out, allowing a greater degree of confidence in the obtained results.

The physical fitness level was assessed by the Fitnessgram battery (Meredith and Welk 2013). The body mass index was obtained by the division of weight per height square, whereas fat mass percentage was obtained by tricipital and geminal skinfolds measuring. The musculoskeletal system functional health status was assessed by the push-up (upper-

body strength and endurance), curl-up (abdominal strength and endurance), trunk lift (trunk extensor strength and flexibility), and sit and reach tests (hamstring flexibility); the aerobic capacity was evaluated by the progressive aerobic cardiovascular endurance run test (PACER). The subject's classification was carried out according to the values referenced to the Fitnessgram criterion, which correspond to the state of physical fitness considered as healthy, categorizing the performance in three distinct zones: the "Below the Healthy Zone" zone, which comprised individuals whose fitness levels were below the reference values, indicating the risk of contracting diseases related to physical inactivity; the "Healthy Physical Fitness Zone—ZSAF", which represented the zone where the subjects who presented a satisfactory degree of proficiency were in relation to the criterion standards established by the battery; and, "Above the Healthy Zone", which covered individuals whose values were above these same criteria (Meredith and Welk 2013). Regarding the physical fitness diagnostic tests to evaluate the subject's maximum capacities, two essential assumptions when performing them were takin in account. The total absence of fatigue which implied the exclusion of similar requests to these, implying a total rest in the 24 h preceding its realization, and an optimal motivation and maximum commitment through the awareness of the responsibility of integrating the sample of a work of this nature, in order to achieve the best performance and the most accurate measurements possible.

2.3. Statistical Analysis

Descriptive statistics was used to characterize the different variables involving central tendency and dispersion parameters (mean and standard deviation). The variables presented a normal distribution verified by the Kolmogorov–Smirnov test and distribution asymmetry and kurtosis. The T-test were used for PA and fitness comparison and qui-squared test for PA levels comparison between sex. The level of significance was $p < 0.05$. Effect size statistics was calculated using Cohen's d. The effect size were considered as small effect ($d < 0.2$), medium effect ($0.2 < d < 0.8$) and large effect ($d > 0.8$) (Lakens 2013). The statistical analysis were made with the Statistical Package for Social Sciences (SPSS, V.22.0).

3. Results

3.1. Physical Activity

The sample of this study demonstrated to be physically active with 67.9% characterized with high and moderate PA levels (Table 1). Males showed the highest percentage of high PA levels while females had higher percentages in moderate and low levels.

Table 1. International Physical Activity Questionnaire (IPAQ) classification protocol.

PA Levels	Criteria		
High	Performing vigorous physical activities in at least 3 days, accumulating at least 1500 MET-min/week;	Performing vigorous, moderate activities and walking combined in 7 or more days accumulating at least 3000 MET-min/week.	
Moderate	Performing vigorous physical activities in 3 or more days for at least 20 min daily;	Performing moderate physical activities and walking combined in 5 or more days for at least 30 min daily;	Performing moderate physical activities and walking combined in 5 or more days accumulating at least 600 MET-min/week.
Low	Subjects without any PA practice or those who report some activity but in insufficient quantity to be inserted in the previous two categories.		

The males presented higher values of vigorous activity, females showed more time spent in and moderate activity and walking compared to males. In the sexes comparison, we did not observe significant differences between PA levels. Females presented slightly higher values of total PA. Females also showed more sitting time compared to males both

during the week and at the weekend. Regarding weekly energy expenditure, we observed some balance in the activity levels between the two sexes. (Tables 2 and 3).

Table 2. Physical activity levels of the sample (IPAQ).

Physical Activity Levels (IPAQ)	Males (n = 76)	Females (n = 33)	Total (n = 109)
High	35.5%	33.7%	30.3%
Moderate	35.5%	37.1%	37.6%
Low	29.0%	29.2%	32.1%

Note. $p = 0.959$.

Table 3. Mean, standard deviation, and physical activity (PA) comparisons between sex.

PA	Males (n = 76)	Females (n = 33)	t	p	d
	Mean (±sd)	Mean (±sd)			
Vigorous PA	1263.56 (±1473.59)	1143.33 (±1348.06)	0.41	0.68	0.084
Moderate PA	947.95 (±1009.58)	1043.33 (±1149.70)	−0.44	0.66	−0.090
Walking	236.38 (±337.24)	307.08 (±338.09)	−1.03	0.31	−0.209
Total PA	2447.89 (±1756.53)	2493.75 (±2042.49)	−0.12	0.90	−0.025
Weekly daily sitting time	529.73 (±140.29)	537.50 (±124.91)	−0.28	0.78	−0.057
Weekend sitting time	382.60 (±224.99)	383.89 (±177.77)	−0.03	0.98	−0.006

Note. PA = physical activity, sd = standard deviation.

3.2. Physical Fitness

Regarding the Fitnessgram's healthy fitness zones, the anthropometric variables of most of the subjects were in or above the ZSAF. As to the biomotor variables, this previous trend was not observed in the push-up and sit and reach tests; which presented percentages greater than 50% of individuals outside the respective reference zones. The curl-up test and the pacer test also revealed some failure rate, with a prevalence of more than 30% of subjects outside the healthy zone. The best performances were found in the trunk lift test with a subject rate in and above the ZSAF, with scores higher than 90% (Table 4).

Table 4. Categorization of the variables under study in relation to Fitnessgram healthy fitness zones.

Variables	Below the ZSAF	ZSAF	Above the ZSAF
Fat mass	15.6%	57.8%	26.6%
Body mass index	9.2%	71.6%	19.3%
Push-up	55.0%	43.1%	1.8%
Curl-up	37.6%	45.0%	17.4%
Trunk lift	8,3%	40.4%	51.4%
Sit and reach	62.4%	37.6%	-
Pacer	37.6%	56.0%	6.4%

Regarding anthropometry (Figure 1), significant differences were founded between sex for mean fat mass (t = −3.385; $p < 0.001$; d = −0.689). The females presented 28.62% (±9.15%) and the males 20.20% (±13.47%) of fat mass. The body mass index presented no significant differences between sex (t = −0.622; $p = 0.535$; d = −0.127). Figure 1 present the comparison between males and females for fat mass (left) and body mass index (right).

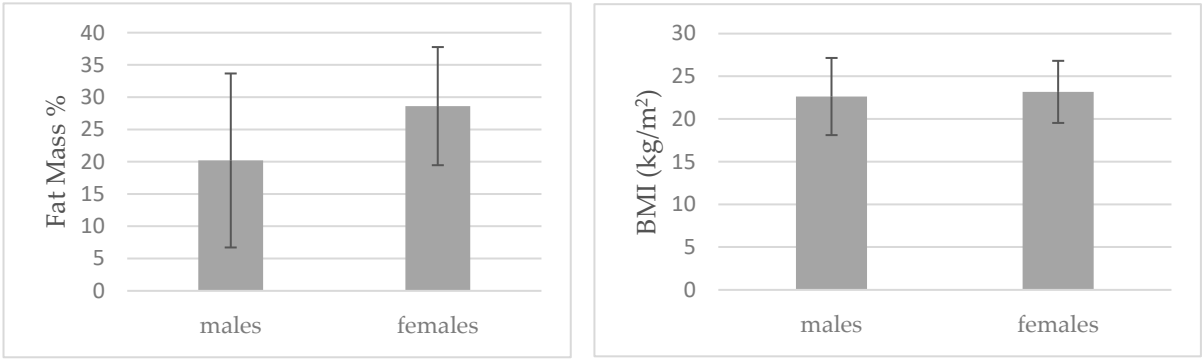

Figure 1. Mean (M) and standard deviation for fat mass percentage (**left**) and body mass index (**right**).

The Table 5 presents the comparison between sexes for the biomotor variables. Significant differences were observed in the upper body strength, flexibility, and aerobic capacity. In this context, we found the existence of significant differences with large effect between sex in the push-up test (t = 6.022; $p < 0.001$; d = 1.226) and in the pacer test (t = −5.253; $p < 0.001$; d = 0.797), with the higher values in males. Females presented higher results in the sit and reach test with moderate effect ($p < 0.001$).

Table 5. Mean, standard deviation, and PF comparisons between sex.

PF	Males (n = 76)	Females (n = 33)	t	p	d
	Mean (±sd)	Mean (±sd)			
Push-up	15.84 (±7.37)	7.72 (±4.69)	6.022	<0.001 **	1.226
Curl-up	28.67 (±18.43)	28.33 (±14.39)	0.096	0.92	0.020
Trunk Lift	30.17 (±7.79)	34.62 (±7.31)	−2.857	0.005	−0.582
Sit and reach (right)	16.30 (±8.24)	22.70 (±7.66)	−5.734	<0.001 **	−0.797
Sit and reach (left)	16.00 (±8.69)	22.07 (±7.75)	−5.253	<0.001 **	−0.730
Pacer	60.82 (±21.36)	35.11 (±12.32)	6.683	<0.001 **	1.361

Note. PF = physical fitness, sd = standard deviation, ** $p \leq 0.05$.

4. Discussion

This study aimed to characterize youths PA and fitness of an Azores rural environment (Island of Santa Maria). It was hypothesized that PA and physical fitness levels vary by sex and the sample presented high levels of PA. The main finding was that there were no significant differences in PA levels between sexes. The males presented higher aerobic capacity and muscular fitness. However, females presented higher trunk, lower back, and hamstring muscles flexibility.

Currently, it is possible to observe in the Azores' a tendency for unorganized expansion from urban to rural areas (Cancela d'Abreu 2005). That is due the construction of structures and infrastructures with poor landscape integration. It can be explained by the increase in tourist demand and, consequently, holding capacity (Elavai 2018). This rampant touristic interest may possible contribute to change the Azores's rural environmental to urban (Chang et al. 2018; Ibãnescu et al. 2018). Therefore, it is imperative to consider the cities expansion plans regarding to children and young people PA promotion.

The IPAQ-SF questionnaire was used to assess PA. This instrument has been widely used in PA epidemiological studies with large samples (Gordia et al. 2010). The IPAQ present reliability and it is valid instrument in youths (Guedes et al. 2005). The Fitnessgram battery test was used to assess physical fitness. This battery is valid and guarantee health related components, it has been used in previous studies with Portuguese samples (Plowman et al. 2006; Guedes et al. 2012; Murray et al. 2012).

In the present study, the participants were classified with high and moderate levels of PA. This fact might be due the possibility of rural environmental provides facilities

to increase the PA levels (Gordia et al. 2010; Rodrigues et al. 2012). The present study presented no differences between sex. That contradicts several studies that advocate males with higher PA levels in comparison to females (Cavill et al. 2008; Maia and Lopes 2003; Baptista et al. 2011). This phenomenon can be explained by the youth's cooperation in daily tasks and household livelihood such as agriculture and livestock.

Regarding to physical fitness and anthropometric variables, when comparing sex, we found the existence of significant differences for fat mass. Where, females presented higher levels of fat mass. That is in agreement with literature, where females are prone to have higher levels of body fat mass (Sousa et al. 2019). No significant differences were observed in body mass index between sexes. These results are in agreement with literature (Lima et al. 2007; Oliveira et al. 2017; Reis et al. 2018; Joens-Matre et al. 2008). The youths from rural populations may have a lower body mass index and sum skinfolds in comparison to urban peers (Chillon et al. 2011; Das and Chatterjee 2013; Joens-Matre et al. 2008). Regarding the Fitnessgram's healthy fitness zones, fat mass and body mass index of most of the subjects were in or above the ZSAF. These findings may be related to the fact that this population was mostly categorized with high and moderate PA levels, with a direct impact on the individuals body composition (Mayor and Magalhães 2010; Diniz and Pacheco 2010). Muscular strength and cardiorespiratory fitness also showed a large percentage of subjects in healthy zones, possibly due they living in rural environment (Petroski et al. 2012; Rodrigues et al. 2012; Das and Chatterjee 2013; Sylejmani et al. 2019). The high failure rate in the sit and reach test may be related to the decrease in flexibility levels with the advancement of maturation and growth process (Malina 2006; Ulbrich et al. 2007). The comparisons between sex for the biomotor variables, it seems to be a trend for males to have higher levels of physical fitness than girls. These findings are supported by the literature (Triani and Silva 2011; Petroski et al. 2012; Sylejmani et al. 2019). We verified the existence of significant differences in the upper strength and aerobic capacity as in previous studies, where males presented higher performances (Cordel et al. 2018; Reis et al. 2018; Souza 2018). In flexibility, the higher scores presented by females are in accordance with literature (Oliveira et al. 2017; Cordel et al. 2018; Souza 2018). Based on literature reports, youths from rural populations may have higher physical fitness levels than their urban peers (Rodrigues et al. 2005; Chillon et al. 2011; Petroski et al. 2012; Rodrigues et al. 2012; Das and Chatterjee 2013; Sylejmani et al. 2019; Drenowatz et al. 2020).

This study allowed to highlight the importance that place of residence and the appropriate external motivation for promoting PA and health should be taken in account in any governmental urban development state strategy (Lopes and Neto 2014; Kim and Hyun 2018; McCrorie et al. 2020). Although the present study was based on data collected from students of a public school, the results may be affected by specific conditions and the geographical location, should be considered in the generalization in the Portuguese student population. The PA assessment was done through the application of a questionnaire where, necessarily, we will consider the subjectivity inherent to the students own answers. The major limitation of this study was that it was not possible to compare the results with a developed city youths. For futures studies it is of relevant interest to investigate and compare PA and physical fitness levels between rural and urban populations.

5. Conclusions

No significant differences between sex were observed in PA levels. As to physical fitness, males presented higher aerobic capacity and muscular fitness in comparison to females. On the other hand flexibility and fat mass were higher in females. This study did not compare rural and urban populations. However, it seems reasonable to assume that sociodemographic may influence the levels of PA and fitness, where, in the present study PA levels were high. The rural environments expansion and urbanization may be planed considering the populations PA levels and its facilities and infrastructures.

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