CHARACTERIZATION OF PHYSICAL ACTIVITIES PERFORMED BY ADOLESCENTS FROM CURITIBA, BRAZIL

Introduction: Various studies have been developed and published in relation to the recommendations for physical activity and associated factors. However, there is a lack of studies that detail the places where physical activity is practiced, as well as its frequency, duration and volume. Objective: To describe the places, types, frequency, duration and volume of physical activities performed by adolescents in Curitiba, Brazil. Methods: A cross-sectional study conducted in 2013-2014, through a household survey with 495 adolescents (12 to 17 years). The places used, and the frequencies of the practice of physical activity were self-reported as either “goes” or “does not go.” The practice of physical activity was determined through the Physical Activity Questionnaire for Adolescents, by type, frequency, duration and weekly volume. The types of physical activity were described with frequency distribution, weekly frequency, duration, and volume, by the median and interquartile range. Gender comparison was tested with the Chi-square and Mann-Whitney U tests (p<0.05). Results: The most frequently reported places for physical activity were public squares, parks, soccer fields, schools and sports halls. Soccer fields, schools, sports halls and skate parks were more used by boys, while girls attended gyms (p<0.05). The physical activities most practiced were soccer, skating/rollerblading, cycling, walking and active games. A higher proportion of boys practiced soccer, skating/rollerblading, cycling, running/jogging, and basketball (p<0.05), whereas the physical activities most practiced by girls were walking, walking the dog, dancing, playing games, and gyms (p<0.05). Sports (720 min/week), aerobic exercises (400 min/week) and conditioning exercises (345 min/week) were the activities with the highest weekly volume. Boys showed higher weekly frequency, duration and volume of practice of sports and active games than girls (p<0.05). Conclusion: Public places with structures were the most used places, and sports were the most practiced activities.

Keywords: Exercise; Adolescent; Leisure Activities; Epidemiologic studies.

RESUMEN

Introducción: Varios estudios sobre las recomendaciones de actividad física e factores asociados han sido desarrollados y publicados. No obstante, faltan estudios que detallen los lugares para la práctica de actividad física, además de la frecuencia, duración y volumen. Objetivo: Describir los lugares, tipos, frecuencia, duración y volumen de las actividades físicas realizadas por adolescentes de Curitiba, Brasil. Métodos: Estudio transversal realizado entre 2013-2014, por medio de cuestionario domiciliar con 495 adolescentes (12 a 17 años). Los lugares utilizados y las frecuencias de la práctica de actividad física fueron auto-reportadas de acuerdo a la frecuencia semanal y divididos en “no frecuenta” y “frecuenta”. La práctica de actividad física fue determinada a través del Questionario de Actividad Física para Adolescentes por tipo, frecuencia, duración y volumen semanal. Los lugares y actividades físicas más practicadas fueron fútbol, skate/patines, ciclismo, caminata y juegos activos. Una proporción mayor de menores practicaban fútbol, skate/patines, ciclismo, corrida/trote y baquete (p<0,05) mientras que las menores practicaban caminata, passeio com cães, danza, juegos y brincadeiras y ginástica de academia (p<0,05). Los deportes (720 min/semana), ejercicios aeróbicos (400 min/semana) y de condicionamiento (345 min/semana) fueron las actividades con mayor volumen semanal. Los menores mostraron mayor frecuencia, duración y volumen de práctica de deportes y juegos activos, lo que las menores (p<0,05). Conclusión: Líneas de investigación realizaron comparaciones con las otras actividades y deportes practicadas en las más utilizadas y actividades deportivas que las más practicadas. Nivel de Evidencia III: Estudio de pacientes no consecutivos; sin padrón de referencia “ouro” aplicado uniformemente.

Descritores: Ejercicio; Adolescente; Actividades de Lazer; Estudios epidemiológicos.

RESUMEN

Introducción: Varios estudios sobre las recomendaciones de actividad física e factores asociados han sido desarrollados y publicados. Sin embargo, faltan estudios que detallen los lugares para la práctica actividad física, además de la frecuencia, la duración y el volumen. Objetivo: Describir los lugares, tipos, frecuencia, duración y volumen de las actividades físicas realizadas por adolescentes de Curitiba, Brasil. Métodos: Estudio transversal realizado entre 2013 y 2014, por medio de cuestionario domiciliar con 495 adolescentes (12 a 17 años). Los lugares para la práctica de actividades físicas fueron auto-reportadas de acuerdo a la frecuencia semanal y divididos en “No frecuenta” y “frecuenta.”
La práctica de actividad física fue obtenida por medio del Cuestionario de Actividad Física para Adolescentes por tipo, frecuencia, duración y volumen semanal. Los tipos de actividad física fueron descritos con la distribución de frecuencias y la frecuencia semanal, la duración y el volumen, por la mediana y la amplitud intercuartílica. La comparación entre los sexos se realizó con Qui-cuadrado y U de Mann-Whitney (p < 0,05). Resultados: Los lugares más relatados fueron plazas, parques, campos de fútbol, escuelas y gimnasios de deportes. Los campos de fútbol, escuelas, gimnasios y pistas de skate fueron más utilizados por niños, mientras que las niñas utilizaban más gimnasios (p < 0,05). Las actividades físicas más practicadas fueron fútbol, skate/patines, ciclismo, caminata y juegos electrónicos activos. Una proporción mayor de niñas practicaban fútbol, skate/patines, ciclismo, carrera/trote y baloncesto (p < 0,05), mientras las niñas realizaban caminata, pasear con perros, baile, juegos y juguetes y ejercicio en gimnasios (p < 0,05). Los deportes (720 min/semana), ejercicios aeróbicos (400 min/semana) y de acondicionamiento (345 min/semana) fueron las actividades con mayor volumen semanal. Los niños presentaron mayor frecuencia semanal, duración y volumen de práctica de deportes y juegos electrónicos activos que las niñas (p < 0,05). Conclusión: Lugares públicos y con estructuras fueron los más utilizados y las actividades deportivas fueron más practicadas. Nivel de evidencia III; Estudio de pacientes no consecutivos; sin el estándar de referencia ‘oro’ aplicado constantemente.

Descriptores: Ejercicio; Adolescente; Actividades Recreativas; Estudios epidemiológicos.

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INTRODUCTION

Regular physical activity (PA) during childhood and adolescence is associated with multiple health benefits and greater chances of remain active in adulthood. National estimates indicate that 25.0% of adolescents do not practice any physical activity and 50% do not exercise at the recommended levels. The preference of children and adolescents for sports activities is predominant in the Americas (10.8%–39.0%) and Europe (5.0%–28.5%), while in Asia, aerobic activities such as walking/running or cycling (38.1%–23.5%).

In Brazil, sports activities, mainly soccer, were the most reported ones. Despite the importance of identifying the prevalence of physical activity at recommended levels and the associated factors, studies that identified the types of activities focused on describing the type and frequency of physical activities, failing to describe the volume of practice and the places where they are held. It should be pointed out that characteristics of urban planning, proximity and availability of places have an important role in facilitating such practice.

Describing the sites, types, and frequency of physical activities performed by adolescents is an important step towards promoting more active behaviors in view of the potential of promoting more effective and evidence-based interventions. The objective of this study was to describe the places, types, weekly frequency, duration and volume of physical activities performed by adolescents from Curitiba, Brazil.

MATERIAL AND METHODS

The data from this study are part of the International Physical Activity and the Environment Network (IPEN) project (www.ipenproject.org). In Brazil, data collections were carried out in Curitiba-PR from August/2013 to May/2014. The study presents a cross-sectional design by means of a household survey. Complementary information can be found in the literature. The project has been approved by the Research Ethics Committee of PUCPR (135-945/2012). All participants signed an Informed Consent Form.

In Curitiba, there were 2,395 census tracts considered primary sampling units and they were selected for their walkability characteristics and local income. In order to maximize the variability of walkability and income, the tracts were classified into deciles for both variables. The tracts located at the four extremes (low/high) of walkability and income, the tracts were classified into deciles for both variables. The preference of children and adolescents for sports activities is predominant in the Americas (10.8%–39.0%) and Europe (5.0%–28.5%), while in Asia, aerobic activities such as walking/running or cycling (38.1%–23.5%). In Brazil, sports activities, mainly soccer, were the most reported ones.

The physical activity places located near the household were evaluated by asking the following question: “In a normal week, do you go to these places near your residence (10-15 minutes walking) to practice any physical activity?” The options of answers for the places (park, square, walking/running track, cycle paths, soccer fields, gymnasiums or sports courts, gym, clubs, outdoor gym, skateboarding bowls, school and others) ranged from 0-7 days/week. For the purposes of analysis, they were categorized into: 0 “does not go” and ≥ 1 “goes”.

The physical activity practiced by the adolescents was evaluated using the Physical Activity Questionnaire for Adolescents (QAPA), which includes a list of 24 activities, and the adolescents could add activities other than those listed. For the purposes of description, it was determined whether the adolescent does not do any physical activity (0 min/week) or does some physical activity (≥ 1 min/week).

From the physical activities listed in the QAPA, the adolescents were asked about the usual activities practiced during the week in their free time. These activities were analyzed in three ways: frequency (days/week), duration (minutes/day) and volume (minutes/week) by calculation [frequency * duration]. The activities were grouped into the five categories below: 1) Sports (soccer, indoor soccer, handball, basketball, skateboarding, athletics, rhythmic gymnastics, fights, volleyball, beach volleyball, tennis and beach soccer); 2) Physical conditioning (dancing, bodybuilding, crunches and push-ups and fitness activities); 3) Aerobics (running/jogging, cycling, walking, playing games and doing playfull activities and walking the dog); 4) Water exercises (surfing, bodyboarding, and swimming); 5) Active gaming. The latter was analyzed separately because of the growing debate and the adolescents’ interest in interactive games and because they can be played in different places and intensities. Walking and cycling for commuting purposes were excluded from the analysis. The classification used followed the grouping suggested in the Compendium of Physical Activities.
To describe the sample, the following variables were used: Sex of the adolescent registered by the interviewer, age was based on the date of birth until the date of the interview, then classified into three age groups ("12-13 years","14-15 years" and "16-17 years"). Body mass and height were measured directly using a scale and digital stadiometer (Brand: Wiso, Model: W721) and used to calculate Body Mass Index, in four categories: "underweight"; "normal weight"; "overweight" and "obesity". Socioeconomic level was evaluated using a standardized questionnaire from the Brazilian Association of Survey Companies (ABEP). For the purposes of analysis, the socioeconomic level was grouped as "high" (classes A + B) and "low" (classes C+D+E).

Data analysis

The sample was characterized with distribution of absolute and relative frequency. The physical activity places frequented were described according to the sex. The types of physical activity were described according to usual practice, frequency (days/week), duration (minutes/day) and weekly volume (minutes/week). Data normality was confirmed using the Kolmogorov-Smirnov test and the data did not present normal distribution. Median and interquartile range were used to describe the results. Comparison between the proportions of the places frequented and practice of physical activity was made with the Chi-square test and Fisher's exact test. Comparison of the variables of weekly frequency (days/week), duration (minutes/day) and volume (minutes/week) was made using the Mann-Whitney test. All analyses were conducted using the software SPSS 20.0 and significance level of 5%.

RESULTS

Of the adolescents identified (n=930), the refusal rate for participation in the survey was 46.3%, and the final sample was 495 adolescents (50.7% girls). Most participants were aged 12–13 (41.4%), were at a low socioeconomic level (59.0%), presented normal nutritional status (58.3%) and do some physical activity in their free time (77.2%), with a higher proportion of boys (p<0.001). (Table 1)

In general, the most frequented places were squares (27.2%), parks (25.7%), soccer fields (24.9%), schools (22.8%) and gymnasiums or sports courts (16.0%). Among the boys, the most frequented places were soccer fields (37.5%), squares (30.3%), parks (28.4%), schools (27.9%) and gymnasiums or sports courts (21.6%), while among the girls, squares (23.6%), parks (22.4%), gymnasiums (18.4%), schools (16.7%) and outdoor gyms (15.5%) were the most frequented places. A higher proportion of boys frequented soccer fields (p<0.001), schools (p=0.009), gymnasiums or sports courts (p=0.001) and skateboarding bowls (p=0.002) was found, while girls frequented more gyms (p=0.020). (Figure 1)

The physical activities most practiced by adolescents were soccer (27.9%), skateboarding/rollerblading (22.6%), cycling (18.8%), walking (18.0%) and active gaming (16.6%). Compared between the sexes, a greater proportion of boys reported cycling (25.4% p<0.001), basketball (9.4% p=0.015), running/jogging (17.2% p=0.038), soccer (44.7% p<0.001), futsal (13.9% p<0.001) and skateboarding/rollerblading (29.1% p<0.001). Among the girls, the most practiced activities were walking (23.1% p=0.003), dancing (11.2% p<0.001), fitness activities (4.8% p=0.012), handball (2.4% p=0.030), playing games and doing playful activities (5.6% p=0.041) and walking the dog (19.5% p=0.020). (Table 2)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Male</th>
<th>Female</th>
<th>p</th>
<th>Total</th>
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<td></td>
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<td>Age group (years)</td>
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<td>Nutritional status (BMI*)</td>
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<td>Socioeconomic level</td>
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</table>


![Figure 1](https://via.placeholder.com/150)

![Figure 2](https://via.placeholder.com/150)

Table 1. Description of characteristics of study participants stratified according to the sex of adolescents. Curitiba-PR, 2013-2014 (n=495).

Table 2. Description of the type of physical activity practiced by adolescents according to sex. Curitiba-PR, 2013-2014 (n=382).

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Sports (720 min/week), aerobic activities (400 min/week) and physical conditioning (345 min/week) were the activities with the highest weekly volume. Boys do sports with more weekly frequency, duration and weekly volume (p<0.001) and active games with higher frequency and weekly volume compared with girls (p<0.05). No significant differences were observed in the other groups of activities. (Table 3)

DISCUSSION

This was one of the first studies describing in detail the places where adolescents practice physical activities and the types, weekly frequency and duration of exercising in Curitiba-PR. Most studies have reported levels of physical activity related to recommendations and associated factors. Although these levels are measured using questionnaires — a subjective measure — this allows to describe the places and the most popular activities, which is one of the strengths of the study.

In this study, public spaces were the most frequented ones by adolescents practicing physical activity. In data obtained through systematic observation of parks and squares in the city of Curitiba, adolescents represent 14 to 35% of users, despite the great variation on the days of the week and time of day. To some extent, the results could be explained by the large availability of parks, squares in the city, and facilities that include sports gyms and the use of school facilities in certain periods. As living near these places is associated with higher levels of physical activity, it should be noted that the presence of adequate structures and the availability of activities are associated with greater chances of using these spaces. In a study conducted in the United States, in outdoor areas, adolescents were more likely to engage in activities of higher intensities.

The physical activities most reported by boys were soccer, skateboarding/rollerblading, cycling, active gaming, running/jogging and indoor soccer, while girls reported walking, walking the dog, skating/rollerblading, active gaming, cycling and volleyball. Soccer ranking at the top of the most practiced activities, especially by boys, reflects the country’s social and cultural concerns, as sports are usually one of the main contents of Physical Education classes in school. Besides that, similar results were found in other studies. Although results shows soccer was the most performed activity as sports are usually one of the main contents of Physical Education classes in school.

Although results shows soccer was the most performed activity among girls, the behavior of girls is the opposite. Understanding which factors explain this behavior, especially among girls, is an important step to mitigate or counteract the decline in physical activity levels. Although a study shows that engaging in sports does not reduce the decline of physical activity to adulthood, encouraging this practice may help maintain this behavior.

Despite the importance of reporting the most frequented places and the physical activities performed, exploring the intrinsic and extrinsic factors for adopting these behaviors can help understanding these results. Therefore, offering physical activities in places and types of activities with adequate intensity and duration should be considered to reach out to the youth.

Some limitations should be considered in interpreting the results. The lack of studies reporting information about physical activities such as weekly frequency, duration and volume makes it difficult to compare the results. The sample is not representative of local adolescents, as they were picked from intentionally selected census tracts. The use of questionnaires presents a limitation regarding the accuracy of the physical activities analyzed and a potential overestimation of the reported volumes.

Table 3. Description of the frequency, duration and volume of the types of physical activities stratified by the sex of the adolescents. Curitiba-PR, 2013-2014 (n=382).

<table>
<thead>
<tr>
<th>Type of physical activity</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration (minutes/day)</strong></td>
<td>IQR</td>
<td>IQR</td>
<td>p</td>
</tr>
<tr>
<td>Weekly frequency (days/week)</td>
<td>4.0</td>
<td>5.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Duration (minutes/day)</td>
<td>120.0</td>
<td>120.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Weekly volume (minutes/week)</td>
<td>360.0</td>
<td>900.0</td>
<td>120.0</td>
</tr>
<tr>
<td><strong>Duration (minutes/day)</strong></td>
<td>IQR</td>
<td>IQR</td>
<td>IQR</td>
</tr>
<tr>
<td>Weekly frequency (days/week)</td>
<td>5.0</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Duration (minutes/day)</td>
<td>60.0</td>
<td>90.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Weekly volume (minutes/week)</td>
<td>240.0</td>
<td>400.0</td>
<td>150.0</td>
</tr>
<tr>
<td><strong>Duration (minutes/day)</strong></td>
<td>IQR</td>
<td>IQR</td>
<td>IQR</td>
</tr>
<tr>
<td>Weekly frequency (days/week)</td>
<td>4.0</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Duration (minutes/day)</td>
<td>40.0</td>
<td>50.0</td>
<td>85.0</td>
</tr>
<tr>
<td>Weekly volume (minutes/week)</td>
<td>120.0</td>
<td>380.0</td>
<td>240.0</td>
</tr>
<tr>
<td><strong>Duration (minutes/day)</strong></td>
<td>IQR</td>
<td>IQR</td>
<td>IQR</td>
</tr>
<tr>
<td>Weekly frequency (days/week)</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Duration (minutes/day)</td>
<td>60.0</td>
<td>30.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Weekly volume (minutes/week)</td>
<td>120.0</td>
<td>270.0</td>
<td>150.0</td>
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<tr>
<td><strong>Duration (minutes/day)</strong></td>
<td>IQR</td>
<td>IQR</td>
<td>IQR</td>
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<tr>
<td>Weekly frequency (days/week)</td>
<td>3.0</td>
<td>5.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Duration (minutes/day)</td>
<td>60.0</td>
<td>150.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Weekly volume (minutes/week)</td>
<td>180.0</td>
<td>438.7</td>
<td>90.0</td>
</tr>
</tbody>
</table>

* Soccer, indoor soccer, handball, basketball, skateboarding, athletics, rhythmic gymnastics, fencing, volleyball, beach volleyball, tennis, beach soccer; 
* Running/jogging, cycling, walking, games and playful activities; walking the dog; 
* Dancing, bodybuilding, crunches and push-ups, fitness activities; 
* Surfing/boating, swimming; 
* = Median; IQR = Interquartile Range.
CONCLUSION

Public facilities were the places most used to practice physical activity among adolescents. The most practiced activities were soccer, skateboarding/rollerblading, cycling, walking and active gaming. Sports were the predominant physical activities among the boys, while among the girls, lower-intensity and poorly-structured activities prevailed. Sports presented a higher weekly volume of practice, especially among boys, followed by aerobic and conditioning activities. Active gaming is performed more frequently and with a greater weekly volume among boys than girls. Activities aimed at this group should prioritize the most attractive to the youth, while considering sufficient intensity and volume to afford health benefits. Further studies should include a representative sample and examine potential relationships with socioeconomic and motivational characteristics.

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