

Original Article

Adolescents' physical activity profile according to parental physical activity participation

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ABSTRACT

Marques, A., Martins, J., Sarmento, H., Diniz, J., & Carreiro, F. (2014). Adolescents' physical activity profile according to parental physical activity participation. *J. Hum. Sport Exerc.*, 9(1), pp.81-90. This study aimed to characterize adolescents' physical activity according to parental physical activity participation, in families where one or both of the parents were active or inactive. A total of 1037 adolescents aged 12-18 years, 1037 fathers and 1037 mothers participated in the study. Questionnaires were used to assess child and parents physical activity. Cluster analysis was used for data processing. Adolescents from families where both parents were inactive were characterized by physical inactivity. Adolescents of active parents practiced physical activity in several contexts. Adolescents with an active father and an inactive mother were characterized by the practice of unorganized physical activity. Finally, adolescents from active mothers and inactive fathers were characterized by the practice of organized physical activity. Two active parents enhance the potential influence on the child's adoption of physical activity as a spontaneous behaviour in leisure-time. Having one active parent (active role model) is better than two less active or sedentary parents. **Key words:** PHYSICAL ACTIVITY, ADOLESCENTS, PARENTS.

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INTRODUCTION

Health benefits of regular physical activity (PA) on young people are well documented (MacKelvie et al., 2002; Sallis & Patrick, 1994; Stensel et al., 2008). PA improves bone mineral density, cardiovascular health, aerobic fitness, muscular strength and endurance, and has been consistently associated with better psychological health (Strong et al., 2005). Despite evidence of the health benefits of PA, many adolescents in Portugal (Teixeira & Seabra et al., 2008) and other countries (Cantera-Garde & Devís-Devís, 2000; Currie et al., 2004; Duke et al., 2003) do not practice enough PA to benefit their health (at least 60 minutes of moderate-to-vigorous PA every day). Therefore, in order to improve the levels of PA, and prevent health problems, there is a need to understand the factors related to young people PA and to develop effective intervention programmes.

Ecological models (Sallis & Owen, 1997) highlight the various levels and potential factors related to PA. Social variables represent some of the most important modifiable factors for young people PA. Parents generally have a strong influence on their children behaviour (Fuemmeler et al., 2011; Gustafson & Rhodes, 2006; Moore et al., 1991). This influence can be exerted through a range of mechanisms: parental encouragement, financial and logistic support, beliefs and attitudes toward PA, and role modelling (Welk, et al., 2003). Based on the social cognitive model (Bandura, 1986) it can be conjectured that active parents will have active children (Taylor et al., 1994). In a longitudinal study Yang et al., (1996) observed the importance of parental influence and concluded that active adolescents had active parents. The reason why some adolescents fail to continue to practice PA is often related to the parent's attitudes and behaviour towards PA. Ornelas et al. (2007) observed that parental participation is the most reliable predictor of their children's engagement in PA. The parental model is relatively well accepted as a possible mechanism for parent-child aggregation of PA. However, other studies indicate that the relationship between parent PA and child PA is weaker than expected (Jago et al., 2010; McMurray et al., 1993). The inconsistency in the studies is clear in reviews of the associations between parent and child PA (Ferreira et al., 2007; Gustafson & Rhodes, 2006). This inconsistency may be related to the methodological differences used in the studies, and the type of PA and the context in which parents are engaging in PA (Saelens & Kerr, 2008). Parents active in the workplace may not provide the same model as parents active in leisure-time. This idea is supported by the findings of a study examining parental PA by type (Wagner et al., 2004).

The influence of parental PA on children PA is inconclusive, so more studies are needed to better understand this relationship. This understanding is important for: the development of intervention programs directed toward the family, the promotion of regular PA among young people, and the prevention of health complications resulting from a sedentary lifestyle. Thus, this study aimed to characterize adolescents PA and psychosocial correlates according to parental PA participation, in families where one or both of the parents were active or inactive.

MATERIAL AND METHODS

Participants

The participants were 1037 adolescents (488 boys, 549 girls) aged 12–18 years (mean age 15.6 ± 2.2), from 6 randomly selected public schools in the Metropolitan Lisbon Area, 1037 fathers (mean age 44.4 ± 7.8) and 1037 mothers (mean age 42 ± 6.6). The criteria used for the choice of the students were their participation in Physical Education classes, and not having any health problems that could limit their practice of physical activity.

Instruments

Lintunen's scale was used to measure adolescents' perceived physical competence (Lintunen, 1990). Perception of health was assessed with a selection on a 4-point scale ranging from "I am not feeling well" (=1) to "I am very healthy" (=4). The questions concerning students' attitudes toward school and Physical Education were: "What do you think about going to school?" and "What do you think about your PE lessons at school?" These questions were the same as the questions in the WHO study (Aaro et al., 1986). Answers were given on a 5-point scale ranging from "I dislike it very much" to "I like it very much". A questionnaire developed by Ledent et al. (1997) was used to determine child participation in organized and unorganized PA, participation in competitions, and the type of PA participation. It included questions related to motives for participation or non-participation in PA. In addition, young people were asked about their parents' PA involvement. Studies using this questionnaire with a Portuguese population were published previously (Santos et al., 2004), as well as were the validation procedures (Piéron et al., 1997).

Parents' leisure-time PA (LTPA) was assessed by a self-report questionnaire. Parents were asked to report the details of their LTPA, including the activities, duration of each session, and frequency (sessions per week). In total, there were 22 activities adapted from Telama et al. (2002). The test-retest reliability of the LTPA activities was carried out within a one-week interval across 100 participants. Using intraclass correlation coefficient (ICC), the reliability was high (ICC=0.90 to 0.95). A metabolic equivalent (MET) value was assigned to each reported LTPA. The activities were classified as light (<3 METs), moderate (3–6 METs) and vigorous (>6 METs) (Ainsworth et al., 2011). Based on the recommendation of AHA/ACSM (Haskell et al., 2007), the participants were considered active if they reported engaging in MPA ≥ 5 days per week for ≥ 30 minutes each day and/or VPA ≥ 3 days per week for ≥ 20 minutes each day, or both, achieving at least 10 MET-minute.hr.wk⁻¹. Those who reported some activity, but at a lower level than the recommended, were classified as less active or sedentary.

Procedures

Prior to starting the questionnaire application, institutional consent was sought to carry out the research. In addition, informed written consent was obtained from all participants. Adolescents filled out the questionnaires in 2008, in Physical Education classes. They took home their fathers' and mothers' questionnaires, one in each envelope containing the questionnaire and a letter explaining the purpose of the study and asking for a return of the completed questionnaire within two days. The adolescents returned their parents' questionnaires. Of the 2680 adolescents that responded the questionnaire 1037 returned both father and mother filled questionnaire for a response rate of 38.7%. In the current study were only used the questionnaire responded by child, father and mother from the same family. The study received approval from the National Commission for Data Protection, the institutional review board of the Faculty of Human Kinetics, and the Portuguese Minister of Education.

Data analysis

A database was made with the answers to the questionnaires, adding the adolescents' responses to the fathers and mothers. Based on parents' classification according to the recommendation for PA, a new variable on the database was computed. To identify the characteristics of the adolescents related to their parents' LTPA a cluster analysis was conducted. From the analysis using the computed variable of parent LTPA, 4 clusters emerged: 1) adolescents with less active or sedentary parents (n=824, 79.5%), 2) adolescents with active parents (n=32, 3.1%), 3) adolescents with an active father and a less active or sedentary mother (n=160, 15.4%), and 4) adolescents with an active mother and a less active or sedentary father (n=21, 2%). The variables used to characterize the clusters were: gender, age (12-15 years, 16-18 years), the adolescents' PA practice in several contexts, perceptions of health, competence, athletic

qualities, fitness and body image, motives to be involved in PA, and perception of PA undertaken by parents. Statistical analyses were performed with the program SPAD 3.5 (System Portable pour l'Analyse des données). The level of significance was set at 0.05.

RESULTS

The proportion of parents who achieved the recommended PA levels (MPA $\geq 5 \times 30$ min/wk and/or VPA $\geq 3 \times 20$ min/wk, or both, achieving at least 10 MET-minute.hr.wk-1) was 11.8% (18.5% men and 5.1% women) (Table 1).

Table 1. Parents LTPA practice classification.

Weekly practice	Fathers		Mothers		Total	
	n	%	n	%	n	%
Less active or sedentary	845	81.5	984	94.9	1829	88.2
Active	192	18.5	53	5.1	245	11.8
Total	1037	100.0	1037	100.0	2074	100.0

The characteristics of the young people that come from families where both parents were classified as inactive are fundamentally characterized by physical inactivity in every context; both organized and unorganized (Table 2). Consistent with these answers is the fitness and athletic self-perception, where participants reported that they considered themselves below the average, when compared with their peers. The absence of PA is, according to the answers, due to the lack of time and interest. An interesting aspect was the fact that adolescents demonstrated having a correct perception of their parents' PA practice.

Table 2. Cluster of adolescents with both parents less active or sedentary.

Variables	Modalities	p	
n=824 (79.5%)	Perception of father's participation in PA	Inactive	0.000
	Satisfaction with appearance	Below the average	0.001
	Frequency of organized PA practice	Never	0.003
	Reason for not practicing PA	Don't have time	0.005
	Fitness self-perception	Below the average	0.005
	Perception of mother's participation in PA	Inactive	0.008
	Organized PA practice	No	0.015
	Frequency of unorganized PA practice	Never	0.018
	Reason for not practicing PA	There are more interesting things	0.034
	Athletic qualities self-perception	Below the average	0.046

Adolescents with active parents practiced PA as well. The characteristic of the cluster was the daily practice of unorganized PA and 4 to 6 times per week in a club. The reasons mentioned for the participation in PA were the desire to meet new people, to be in shape, and the thrill of competition. It was interesting to note that the main influence for the young people's PA participation was their parents. Finally, the perception that they had of their parents' PA was accurate.

Table 3. Cluster of adolescents with both parents active.

	Variables	Modality	p
n=32 (3.1%)	Perception of mother's participation in PA	Active	0.000
	Frequency of unorganized PA practice	Every day	0.001
	Practice PA to meet people	Very important	0.002
	Perception of father's participation in PA	Active	0.002
	Practice PA to stay fit	Very important	0.005
	Persons who most influenced PA practice	Parents	0.010
	Practice PA to be in shape	Very important	0.017
	Practice PA to enjoy competition	Important	0.020
	Age at first involvement in competitive PA	9 years	0.020
	Health perception	Very good health	0.024
	Practice PA because it's fun	Very important	0.028
	Practice PA with friends	Always	0.038
	Frequency of organized PA practice	4 to 6 times a week	0.047

The cluster of adolescents with an active father and an inactive mother is characterized by the practice of unorganized PA, indicated as bike riding, and the occasional practice of PA with friends. The adolescents had an accurate perception of their father's PA, and inaccurately reported that their mother practiced PA.

Table 4. Cluster of adolescents with an active father and a less active or sedentary mother.

	Variables	Modalities	p
n=160 (15.4%)	Perception of mother's participation in PA	Active	0.000
	Perception of father's participation in PA	Active	0.005
	PA practiced informally	Bike riding	0.007
	Practice PA with friends	Sometimes	0.008
	Persons who most influenced PA practice	Parents	0.010
	Attitude towards PE	Indifferent	0.042

Adolescents from families where only the mother was classified as active are characterized by the practice of organized PA, and parents were found to be the main influence on their children's PA practice. This answer is supported by the fact that adolescents considered PA participation "very important" because of family influence. Also in this class, a contradiction was observed between the practice of PA by their father and the children's perceptions.

Table 5. Cluster of adolescents with an active mother and a less active or sedentary father.

	Variables	Modality	p
n=21 (2%)	Perception of father's participation in PA	Active	0.000
	Persons who most influenced PA practice	Parents	0.003
	Practice PA because my family expects it	Very important	0.006
	Importance of sports practice	Very important	0.006
	Activity practiced	Fighting sports	0.006
	Age at first involvement in competitive PA	6 years	0.022
	Practice PA to meet people	Less importance	0.026
	Practice PA to potentially earn money	Important	0.036
	Athletic qualities self-perception	Very athletic	0.036
	Practice organized PA	Yes	0.042

DISCUSSION

Understanding the correlates of young people's participation in PA is a research priority. Parents are one of the most important socializing agents for their children, and their behaviour is considered to be a correlate of the young people's PA patterns (Ornelas et al., 2007; Yang et al., 1996). So, it is important to comprehend the relationship between parents' and children's behaviour toward PA. Whereas previous research has studied mainly the relationship between parents' and child's PA, the present study sought to characterize young people's PA according to their parental LTPA.

Most of the parents were less active or sedentary, confirming the results from other studies that show that the PA level of Portuguese adults is among the lowest in the European Union (European-Commission, 2010; Martinez-Gonzalez et al., 2001). Relative to the relationship between parental PA and child's PA, the results of the present study show that parents' PA is positively associated with the young people's PA. The cluster where fathers and mothers were physically active is characterized by the adolescent's practice of PA, with or without supervision. This finding is consistent with other studies in which it was found that when both parents were categorized as active more than 90% of their sons were also active (Freedson & Evenson, 1991). More recently the same was observed in studies with representative samples of Australian and American young people (Cleland et al., 2005; Ornelas et al., 2007). To corroborate the consistency of the clusters, adolescents reported that persons who most influenced them to practice PA were their parents. In contrast, the cluster where both parents were less active or sedentary is characterized by the adolescents' inactivity and by the lack of willingness to be involved in PA. These adolescents responded negatively to the practice of PA due to lack of time or having more interesting things to do. Altogether, these findings support the theoretical social cognitive model (Bandura, 1986), and suggest that strategies to promote PA among young people may need to involve the parents in order to be more successful.

The cluster of adolescents whose mother was physically active is characterized by the practice of organized PA, the age when they started to practice organized PA, and also the fact that they considered it very important to participate in PA because of their family's expectations. In both clusters the fact emerged that parents had the greatest influence on the PA practice of their sons. However, it was not possible to determine which one of the parents the answer referred to, though it is supposed that the parent was the

active one. These results are in accordance with Fogelholm et al. (1999) and contrast with findings of Moore et al. (1991), where it was verified that active fathers had more influence on the children's PA than did active mothers.

Gender did not emerge to characterize any cluster. Similarly, Fuemmler et al. (2011) and Garcia et al. (1995) also did not find any gender effect. The impact of parent modelling on adolescents' PA is independent of their gender. The fact that boys and girls perceived the role modelling the same way may explain why the gender did not characterize the clusters. On the other hand, parental support and encouragement might be responsible for the gender variations in young people PA, since boys tend to be more encouraged and supported to practice PA (Gustafson and Rhodes, 2006). Age also did not emerge to characterize the clusters. This finding suggests that the impact of parent modelling on the adolescents does not decline over the years, confirming the stability of the role modelling observed in previous studies (Madsen et al., 2009; Sallis et al., 1988).

Due to the fact that there is an association between parents' PA and sons, there has been optimism in interventions to promote PA based on the family because of their central role in the development of health related behaviour in young people (Taylor et al., 1994). Thus, it is important that community and schools focus on reaching the parents in order for young people's programs to be effective (Bagley et al., 2006; McBride et al., 2005). Reaching the parents means increasing awareness of the importance of PA for health, to create opportunities for them to be involved in PA, and to invite them to participate with their child, mainly with the youngest, since they are at critical ages for the acquisition of habits that can endure for a lifetime (Yang et al., 1996).

The current investigation had some limitations. PA was self-reported rather than objectively measured, which could be subject to bias. This study was conducted in an urban area, and thus the results cannot be generalized to other populations, particularly from rural areas. The results regarding one active parent cannot be extrapolated to single-parent families, due to the possible confounding effect of negative modelling. The analysis was cross-sectional, thereby making it impossible to determine cause and effect behaviour related to parent and child PA participation.

The present study also had some strength. The definition of active and less active or sedentary parents was based on the recommendation of AHA/ACSM (Haskell et al., 2007), which is a reliable reference. The characterization of the PA of parents was achieved only through the utilization of the LTPA and ignored PA in the workplace, because children might not be aware of their parents' PA in that setting. The male and female guardians, who live with the children, were categorized as parents because they represent a daily role model.

CONCLUSIONS

In summary, the results revealed that having two active parents enhances the potential influence on the adolescents' adoption of PA as a spontaneous behaviour in leisure-time. Having only one active parent (active role model) is better than two less active or sedentary parents. This indicated the importance and strength of two parents' PA role modelling, and that at least one active parent tends to compensate for the lack of a role model.

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