

## Original Articles

# Physical Activity Rates Among Adolescents: The Gender Role in Spain

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### Abstract

Physical activity in adolescence may contribute to develop healthy adult lifestyles and help reduce chronic disease incidence. The aim of the present study was to determine the physical activity (PA) rates among adolescents, distinguish PA rate patterns for gender and age groups, and calculate the number of adolescents who meet the current PA guidelines. A validated questionnaire was used to collect data from 583 adolescents aged 12 to 18 years. We calculated their usual PA rates and considered that the International PA guidelines were followed if the subjects were physically active at least 60 minutes a day for 5 or more days per week. Of the sample participants, only 35.4% followed the International PA guidelines (57.6% males, 14.0% females). The older the subjects, the less physically active they were, and this trend was much more evident among females. We conclude that the PA rates among adolescents are quite low, with a high percentage of subjects who do no PA, especially females, which will have a negative impact on their health in the short, mid and long term.

### Key words

Exercise; Gender differences; Young people

### Introduction

Physical activity (PA), defined as any body movement which implies consuming energy, is the energy consumption

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component that varies the most and is found, to a certain extent, under voluntary control.<sup>1</sup> Physical inactivity is the fourth leading cause of death worldwide.<sup>2</sup> The lack of PA is closely related with the incidence of numerous chronic diseases and a lower quality of life.<sup>3</sup> Cardiovascular disease studies in adolescents indicate a high prevalence of risk factors, especially obesity and physical inactivity.<sup>4,5</sup> The long-term health implications of inactivity among children and teenagers are of utmost concern since the risks are compounded in adulthood, and they favour the early onset of atherosclerosis<sup>6</sup> diabetes mellitus, mental disorders and certain cancer types.<sup>7</sup>

According to World Health Organization data, chronic diseases are the cause of 60% of deaths worldwide. According to estimations, this figure could reach 73% by the year 2020, and the majority of these diseases are associated with a sedentary lifestyle. Practicing PA lowers the older we become and populations with less economic means tend to be less active than those with more resources.<sup>8</sup>

PA rates decline rapidly during secondary school years, and rates are consistently lower among adolescent girls than among adolescent boys.<sup>9</sup> The National Heart, Lung and Blood Institute's Growth and Heart Study reported that

between the ages of 9 and 18 the average scores for female activity dramatically decrease.<sup>9</sup>

Practicing PA is conditioned by factors which each person individually determines, by the relation among them and by the atmosphere in which they live. As a public health problem, physical inactivity is a relatively recent phenomenon because social and economic development has led to more sedentary lifestyles.<sup>10</sup> The importance of PA for health has been acknowledged and recommendations to help increase PA have been made.<sup>11</sup>

Adolescence is a critical stage to intervene with programs aiming to increase this population's PA levels, especially considering that behavioral patterns are generally established in adolescence and the habits acquired during the teen years are likely to be carried over into adulthood.<sup>12</sup>

The practice of physical activity among adolescent boys and girls is socially conditioned over time.<sup>9</sup> In recent years, the rates of PA among females have risen but even today, they continue below those for males. Perhaps the explanation lies in the complex interaction among factors related to the different development of motor skills or the physical differences in growth and maturity as well as social conditioning.

In Spain, the consequences of sedentary lifestyles and low PA rates, as manifest in the rapidly increasing incidence of overweight and obesity as well as type 2 diabetes, are now major concerns for public health authorities.<sup>13-16</sup> Therefore, this research aims to calculate PA rates among a sample of Valencian adolescents and to determine the effects that gender and age may have on these rates. The challenge we face is to adequately assess adolescent PA habits and after analysing the data, to establish a starting point to develop feasible, specific intervention programs.

## Methods

This study was conducted in Valencia (Spain) from October 2008 to March 2009 and involved 583 adolescents (303 females) aged 12-18. All participants attended one of three randomly selected high schools. Written informed consent was obtained from the school administrators, the parents or guardians of each participant, as well as the individual participants before data were collected.

A self-reported, anonymous questionnaire was specifically devised for this study in order to collect data on the amount of PA that subjects usually engaged in during the week. The questionnaire had been devised by combining the tools already used in the bibliography, submitted to a

validation and reliability process in terms of the different ages of the study sample and was distributed among the students in their classrooms. The survey takers followed unified instructions.

Subjects were asked to indicate the PA they did outside school hours and during school recreation periods, and if they travelled actively to and/or from school (i.e. on foot, by bicycle). With this information, we calculated the Metabolic Equivalent of Task (MET), a physiological measure expressing the energy cost of physical activities, defined as the ratio of metabolic rate (therefore the energy consumption rate) during a specific PA to a reference metabolic rate, set by convention at  $3.5 \text{ ml O}_2 \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$  or equivalently. The total time a subject spent doing moderate PA ( $>3$  METs) on any given day was calculated. A PA rate index was created using variables of frequency and length of time. There were four levels of PA practice based on the number of days per week the subject engaged in physical activity for at least 60 minutes per day: 1=less than one day/week, 2=one day/week, 3=two-four/days per week, and 4=five or more days per week.

Based on current international PA guidelines for adolescents (60 minutes of moderate or vigorous exercise everyday or almost every day of the week),<sup>2,17,18</sup> the analysis considered that students adhered to the PA guidelines when they were physically active for at least 60 minutes a day for 5 or more days per week (that is, level 4).

A descriptive analysis was done with the PA frequencies and percentages according to the sample's gender and age. The percentages for the levels of PA practiced were compared in terms of gender and age with a Pearson's Chi-square test. The level of significance was  $p=0.05$ . The PA described in the questionnaires was included in a single variable which was divided into four levels of PA ( $<1$  day/week, 1 day/week, 2-4 days/week and  $\geq 5$  days/week). The data were analysed using the SPSS statistics package for Windows (SPSS version 17.0).

## Results

Only 35.4% of the adolescents in the study sample followed the International guidelines for PA (Table 1). Of the four PA levels, Level 4 ( $\geq 5$  days/week) predominated ( $p<0.05$ ); that is, just over a third of the participants actually followed the guidelines. Of the three levels that did not follow the guidelines, Level 3 (2-4 days/week) predominated ( $p<0.05$ ). Thus, it seems that almost two-thirds (64.6%) of the students did less than the

recommended amounts of PA. In fact, the data suggest that more than a third (35.4%) of our study sample was insufficiently active or completely inactive. The percentage of students in our sample who exercised less than once a week (18.4%) or only once a week (17.0%) is indeed important since these PA frequency rates are not sufficient to protect their bodies from cardiovascular and related diseases.<sup>13,14,16</sup>

The percentage of adolescents who followed the guidelines lowered the older they became. This was especially true for female students, although the values obtained were not significant for either gender. Likewise, the percentage of those who practiced PA 2-4 days/week dropped as age increased. The exact opposite was observed for Level 1 (<1 day/week) as the percentage increased with the students' age, although the differences were not significant in either case.

The percentage of students who followed the guidelines (57.6%) was significantly higher for males than for their female counterparts (14.0%) (p<0.001). Nonetheless, the percentage of students at levels 1, 2 and 3, i.e., those who fell below the guideline recommendations, was higher for females than for males; however, the differences were again not significant.

Among those who did not follow the guidelines, there was a higher percentage of females in all the age groups

studied: p<0.001, <14 years; and p<0.05 for both 14-15 year olds and >15 years of age.

Among the subjects who followed the guidelines, the percentage of male students was higher for all the age groups, and the difference was significant: p<0.05, for both 14-15 year olds and >15 years of age, but not significant for the <14-year old students.

### Discussion

Our results reveal a PA pattern which is in line with other publications<sup>15,19</sup> since the majority of these adolescents practice less PA than recommended. Although a small percentage of adolescents actually do follow the WHO's guidelines (35.4%),<sup>17</sup> there are still many (29.2%) who exercise only 2-4 days/week (moderately active). Moreover, the data from our study draw attention to the students who exercise once a week or less (35.4%), given that these frequency rates are clearly insufficient to provide the healthy benefits of regular and vigorous PA.<sup>17,20</sup>

The high prevalence of PA that we observed, its harmful health and environmental consequences, and evidence for effective PA promotion strategies, convert this into a paediatrics problem.

To young people who are offered participation in the

**Table 1** Number (N) and percentage (%) of subjects in the sample (n=583) who meet the physical activity guidelines and the physical activity rates distributed by gender and age group

Gender	Age group	Physical activity guideline adherence <sup>†</sup>									
		NO						YES			
		Physical activity rates (days/week) <sup>‡</sup>									
		<1		1		2-4		Total NO		≥5	
		N	%	N	%	N	%	N	%	N	%
Males	<14 years	2	4.3	0	0	15	32.9	17	36.2	30	63.8
	14-15 years	9	8.9	9	8.9	27	26.7	45	44.6	56	55.4
	>15 years	15	12.4	11	9.1	26	21.5	52	43.0	69	57.0
	Total	26	9.7	20	7.4	68	25.3	114	42.4	155	57.6
Females	<14 years	10	20.4	14	28.6	16	32.7	40	81.6	9	18.4
	14-15 years	23	20.5	31	27.7	39	34.8	93	83.0	19	17.0
	>15 years	42	35.6	28	23.7	37	31.4	107	90.7	11	9.3
	Total	75	26.9	73	26.2	92	33.0	240	86.0	39	14.0
Total	<14 years	12	12.5	14	14.6	31	32.3	57	59.4	39	40.6
	14-15 years	32	15.0	40	18.8	66	31.0	138	64.8	75	35.2
	>15 years	57	23.8	39	16.3	63	26.4	159	66.5	80	33.5
	Total	101	18.4	93	17.0	160	29.2	354	64.6	194	35.4

<sup>†</sup>Moderate or vigorous physical activity at least 60 minutes a day for 5 or more days per week.

<sup>‡</sup>For at least 60 minutes a day.

study did not perform physical activity so this study revealed that adolescents are more likely to participate in programs related to promoting physical activities when suitable facilities and materials are also made available.

In this sample, PA diminishes with age for both genders, although not significantly, which coincides with most studies.<sup>9</sup> This trend can be attributed to a combination of biological, psychosocial and cultural factors, and will be modified only if all children establish regular PA habits before reaching adolescence because our study reveals that those teenagers who did more PA stated they had done so since they were very young. The development of positive attitudes towards the lifelong practice of PA is crucial if the current trends are to be corrected.

In this sample, boys were significantly more active than girls. This trend has also been observed by other researchers<sup>9,19,21,22</sup> although the differences previously reported in the literature are not as pronounced as those found in our study.

The differences in PA between males and females, which seem to be the result of social conditioning, were confirmed in this study. The notable increase in PA rates detected among females may be attributed to the current modernisation of Spanish society.

It is true that until quite recently, the socialisation process in Spain meant that women were all but discouraged from engaging in PA, exercise or sports since these were considered exclusively masculine pursuits. This social conditioning has given way to beliefs, attitudes and values that, even today, favour socialisation through the practice of sports for males, but not for females.<sup>20</sup> Furthermore, the idea of PA and sport in Spain has traditionally been one of competition and promoted only those with outstanding motor capacities for competitive purposes. Thus, if motivation is the basic ingredient for increasing PA, it is clear that the Spanish variety of social conditioning must be replaced with modern socialisation processes which allow youngsters to become enthusiastic, and this will only take place when young people are encouraged to engage in the activity, feel relatively competent in a given PA, and are confident that others accept them and want them to participate.<sup>13,14,19</sup>

Although evidence for the benefits of PA for health has been available since the 1950s, promoting PA among Spanish adolescents like those in our study sample, therefore, requires an extensive and intensive population-based strategy in order to reverse the current trend of increasing inactivity. It is absolutely essential that adolescents be provided with opportunities to practice PA

not only at school but also in their leisure time. Moreover, it is vital to create sustainable settings which enable physically active adolescents, especially females, to be socially accepted and personally motivated. Families, teachers, health professionals and other social agents must be made aware that practicing PA will not only enhance a youngster's physical and emotional well-being, but it will also benefit his/her overall health today and in the future.<sup>23,24</sup> These changes will only come about if there is a more widespread change in Spaniards' attitudes toward the participation of young people in athletic pursuits and toward the involvement of young women in physical activities.

Although limited by the small size and socio-demographic characteristics of the sample, this study provides a viable base for future cross-sectional studies with a larger sample sizes. Given the results which highlight the extremely low PA rates among adolescents and even lower rates among females and older adolescents, research must continue to focus on patterns of adolescent PA so as to better understand the reasons why this population practices less PA, and to gain insight into the gender and age differences found. Physical activity promotion must start early in life; although the 'how much' remains unknown and needs further research, the lifelong benefits of adolescent PA on adult health are unequivocal.

In conclusion, this study revealed that adolescents are more likely to participate in programs related to promoting physical activities when suitable facilities and materials are also made available.

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