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ORIGINAL

PHYSICAL ACTIVITY TRENDS IN SPANISH ADOLESCENTS

EVOLUCIÓN DE LA PRÁCTICA DE LA ACTIVIDAD FÍSICA EN LOS ADOLESCENTES ESPAÑOLES

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ABSTRACT

This study tries to find out the tendency of moderate-to-vigorous physical activity and to assess whether the trends are maintained with regard to socio-demographic factors such as sex and age, and also socio-economic factors and how they vary depending on the region. The sample comprises Spanish adolescents aged between 11 and 18 years, from the 2002 and 2006 surveys of the Health Behaviour in School-aged Children (HBSC) study. The main results reveal that, despite a certain increase in physical activity level in the four years span between both surveys (particularly in younger adolescents), these levels are still a long way from the recommendations. Likewise, data mark, as immediate needs, the promotion of an active lifestyle among adolescents from 13 years onwards (particularly among the girls) and also among adolescents of lower socio-economic status in some regions.

KEY WORDS: moderate-to-vigorous physical activity, adolescence, sex, age, Family Affluence Scale, region.

RESUMEN

Este estudio se propone conocer la evolución de la práctica de actividad física moderada-vigorosa y examinar si la tendencia se mantiene en función de factores sociodemográficos, como el sexo y la edad, así como de factores socioeconómicos y su influencia según la comunidad autónoma. La muestra está compuesta de adolescentes españoles de 11 a 18 años de las ediciones 2002 y 2006 del estudio *Health Behaviour in School-aged Children* (HBSC). Los principales resultados muestran que, a pesar de un cierto aumento en el nivel de actividad física en los cuatro años que distan entre ambas ediciones (especialmente en los adolescentes más pequeños), estos niveles se encuentran todavía lejos de las recomendaciones. Asimismo, los datos señalan como necesidades más urgentes promover un estilo de vida activo en los adolescentes de 13 años en adelante (especialmente en las chicas) y en los adolescentes de niveles socioeconómicos más bajos de determinadas comunidades autónomas.

PALABRAS CLAVE: actividad física moderada-vigorosa, adolescencia, sexo, edad, capacidad adquisitiva familiar, comunidad autónoma

INTRODUCTION

It is generally acknowledged nowadays that physical activity plays a central role in preventing many diseases, and brings physical, psychological and social benefits, and therefore it is a key factor in a healthy lifestyle. Adolescence is an important developmental stage to generate a healthy lifestyle, particularly, the habit of physical exercise, since it is at this stage when people acquire behaviours of important consequences for their health, for the short as well as for the long term, and which will be hardly changed in adult life (Crockett and Petersen, 1993; Elliot, 1993; Heaven, 1996).

It is well known that childhood is a stage of great physical activity, since due to a drive of biological nature games at this stage involve more movement and activity, whereas in adolescence leisure options gradually become more sedentary. In addition to the lack of physical activity in adolescence comes the dramatic increase in leisure new technologies (computers, television, video-consoles...), which might reduce the time given by young people to other kind of activities (e. g. physical exercise). In this regard, many studies have revealed the connection between these life habits and the increase in people's overweight and obesity, particularly at child-juvenile ages (Hickman, Roberts and Gaspar de Matos, 2000; Roberts, Tynjälä and Komkov, 2004; Vicente-Rodríguez et al., 2008). As a matter of fact, although chronic diseases related to lack of physical activity rarely come up before middle adulthood, some connections have been found now between that lack of activity and overweight and obesity at adolescence, as well as musculoskeletal health and mental health (e.g. Strong et al., 2005).

Besides, it has been ascertained that low levels of activity during the first few decades of life are related to more physiological risk factors during adult life (U.S. Department of Health and Human Services, 1996). Also, the importance of preventing the lack of physical activity at adolescence makes more sense even when it is revealed that such lack of activity lingers on in adult life, because a low level of physical activity at young age leads to develop sedentary lifestyles throughout life (Tammelin, Näyhä, Laitinen, Rintamäki and Järvelin, 2003; Larouche, Laurencelle, Shephard and Trudeau, 2012).

Some studies have pointed out that the analysis of findings over a long period of time has brought to light a gradual and alarming deterioration of adolescents aerobic capacity as compared to what it was in previous decades (Suris, Michaud, Chossis and Jeannin, 2006; Tomkinson, Olds and Gulbin, 2003; Westerstahl, Barnekow-Bergkvist, Hedberg and Jansson, 2003). There are several hypotheses that explain these results, the most often quoted being the increase in sedentariness in industrialised societies (Garland et al., 2011; Tomkinson et al., 2003), as well as the lack of time for sport, be it due to pressure to be successful at school or in a future career, or be it for the large amount of personal and social activities which nowadays compete for the time and energy that young people can give to sport (Suris et al., 2006). However,

not all the research agrees about this evolution, in fact a study carried out with adolescents between 11 and 15 years, in seven European countries, reveals that, by and large, vigorous physical activity has remained stable or made just a slight increase from the mid 80s of the 20th century till the beginning of the 21st century (Samdal et al., 2006).

On the other hand, a great many of studies confirm a higher rate of physical activity among boys as compared to girls (e.g. Borraccino et al., 2009). As concerns Spanish adolescents, Ortega et al. (2005) show with a sample of adolescents between 13 and 18 years that, except for the test of flexibility, boys are fitter than girls. If other objective measures, as for instance the *Computer Science and Applications Inc. (CSA) 7164 activity monitor*, are used to assess the differences between boys and girls with regard to physical activity, the differences are corroborated, so that it is still the boys who show a higher rate of physical activity (Trost et al., 2002). Also, with regard to the level of physical activity as they grow up, there is likewise a high coincidence in the findings of different studies, which implies an obvious decrease of activity as adolescents grow up (Olds et al., 2009), particularly in the case of girls (Ramos, Rivera, Moreno and Jiménez-Iglesias, 2012).

However, as opposed to those socio-demographic variables, adolescent physical activity variation levels depending on socio-economic status have not been researched in such depth. On this point, some studies show a positive correlation of both variables at this developmental stage (Borraccino et al., 2009; Sallis, Zakarian, Hovell and Hofstetter, 1996; Walters, Barr-Anderson, Wall and Neumark-Sztainer, 2009). Nevertheless, it is important to corroborate such relationship with representative samples of Spanish teenage population. Moreover, taking into account that in Spain each region holds its own healthcare management, it would be relevant to find out if that relationship between physical activity and socio-economic status is the same in all regions.

Therefore, the social alarm anticipated by the decreasing tendency in physical activity levels in the last decade needs to be cross-checked with validated data on the target population. In this respect, the purpose of this study is to show, with representative data of the Spanish adolescent population, the differences in physical activity trends between the 2002 and 2006 surveys of the study. In addition, a second aim of this study is to find out in what way socio-demographic and socio-economic differences have developed with regard to physical activity, and also to check if there are any inequalities among regions as concerns this important health habit in adolescence. Furthermore, taking into account the importance that autonomous policies have in reducing socio-economic inequalities with regard to health, this paper tries to ascertain how region management affects the relationship between family affluence and physical activity. In short, with this information it will be possible to see in further detail the extension of the problem and, if need be, to work out the resources for planning accordingly any necessary intervention.

METHOD

Sample

The adolescents under study in this research work were included in the Spanish sample of the *Health Behavior in School-aged Children* (HBSC) study, in both the 2002 and the 2006 surveys. They were boys and girls between 11 and 18 years attending school (further details on the method of this piece of research can be found in Moreno, Muñoz-Tinoco, Pérez Moreno and Sánchez-Queija, 2005, and in Moreno et al., 2008).

The Spanish sample in the HBSC 2002 survey comprised 13,552 adolescents, whereas the HBSC 2006 survey included a higher number of participants, exactly 21,811, as a result of adding an independent sample for each region. That is to say, the 2006 survey includes representative samples of adolescents for each region in Spain.

Measures

The HBSC questionnaire collects information about several topics related to adolescent lifestyle, positive health and their developmental contexts. After almost 30 years of existence, this study has proved the high standards of its bank of measures, complying with reliability and validity requirements. Since it gives extremely detailed information, the paragraphs below quote only those articles which validate the measures applied for this paper.

- Demographic variables.
 - Sex: boys and girls.
 - Age group, with four values: 11-12, 13-14, 15-16 and 17-18 years.
 - Family affluence, estimated by means of the *Family Affluence Scale (FAS)*, with three levels: low, medium and high. This scale has been validated by several experts at London University College by means of a research work comprising over 1,800 adolescents (Wardle, Robb and Johnson, 2002).
 - Region, with 18 values: Andalucía, Aragón, Principado de Asturias, Islas Baleares, Canarias, Cantabria, Castilla y León, Castilla la Mancha, Cataluña, Comunidad Valenciana, Extremadura, Galicia, Comunidad de Madrid, Región de Murcia, Comunidad Foral de Navarra, País Vasco, La Rioja, Ceuta and Melilla.
- Moderate-to-vigorous physical activity.

In line with the guidelines established at the *Young and Active?* international symposium, held in 1997 (Biddle, Cavill and Sallis, 1998), the question used by the HBSC study to assess this physical activity was (Roberts et al., 2007): *Over*

the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? With values between 0 and 7 days.

Just before the question, participants were given an explanation which literally read: *“Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, school activities, playing with friends, or walking to school. Some examples of physical activity are running, brisk walking, rollerblading, biking, dancing, skateboarding, swimming, soccer, basketball, football and surfing. For this next question, add up all the time you spent in physical activity each day.”* So, it was pointed out that their answers must take into account the total amount of time, that is, it was not necessary to have done 60 minutes in one go, but they could add up different bouts in which they had had some kind of physical activity throughout the day.

Procedure

For the survey procedure, the HBSC International Coordinator underlines that three basic conditions are abiding: in the first place, the questionnaires must be filled out by the school children themselves; in the second place, the questionnaires must be administered within the school premises and by surveyors specifically trained for this questionnaire and, finally, the anonymity of the answers must be guaranteed and protected, as well as the proper understanding of the questionnaire (with that purpose, in bilingual areas, the questionnaires were wholly printed in both languages).

The data analyses used in this paper focused firstly on those significance tests most adequate to the particularities of the studied variables, in this case Student's t-test and ANOVA. Afterwards, statistically significant data were corroborated with effect size measures, specifically with eta squared (η^2) and Cohen's *d*.

RESULTS

Level of moderate-to-vigorous physical activity in the 2002 and 2006 surveys depending on sex, age and family affluence.

Firstly, differences between the HBSC 2002 and 2006 surveys with regard to level of moderate-to-vigorous physical activity were analysed, that is, number of days per week when adolescents reported to have felt physically active for at least 60 minutes. Accordingly, table 1 shows the sample distribution for the seven days of the week and it reveals a slightly higher frequency in 2006 as compared to 2002.

Table 1. Number of days when adolescents feel physically active for at least 60 minutes a day, in HBSC 2002 and 2006 surveys.

	2002		2006	
	<i>N</i>	%	<i>n</i>	%
0 DAYS	684	5.10%	1256	6.00%
1 DAY	1226	9.20%	1846	8.80%
2 DAYS	2492	18.80%	3412	16.30%
3 DAYS	2493	18.80%	3698	17.60%
4 DAYS	1866	14.00%	2993	14.30%
5 DAYS	1566	11.80%	2481	11.80%
6 DAYS	864	6.50%	1281	6.10%
7 DAYS	2098	15.80%	4005	19.10%

The analysis of the mean number of days per week in each survey (see Table 2) revealed a statistically significant mean difference $t(29057) = 5.66, p < 0.001$, 3.68 in 2002 and 3.81 in 2006, however the effect size was negligible ($d = 0.06$).

Table 2. Mean number of days when adolescents feel physically active for at least 60 minutes a day, in HBSC 2002 and 2006 surveys.

	<i>n</i>	<i>M</i>	<i>SD</i>	Minimum	Maximum
2002	13289	3.68	2.07	0	7
2006	20973	3.81	2.15	0	7

After that the differences between the two surveys with regard to sex of the adolescents, age and family affluence were examined with the aim to find out which specific groups gave truly visible differences in the increase of moderate-to-vigorous physical activity.

The differences between boys and girls (see Table 3) were virtually the same in both surveys: 2002, $t(13146) = 18.32, p < 0.001, d = 0.32$, and 2006, $t(20418) = 25.71, p < 0.001, d = 0.35$. That is, in 2002 as well as in 2006, boys gave more time to physical activity than girls, these were significant differences and with small effect sizes. From the 2002 to the 2006 survey, there was an increase in the mean number of days adolescents felt physically active, although the effect size was negligible for both boys ($d = 0.10$) and girls ($d = 0.05$). Otherwise, it must be highlighted that the increase was higher in boys, with a mean 0.21 days, as compared with girls, with a rise of only 0.11 days.

Table 3. Mean number of days when adolescents feel physically active for at least 60 minutes a day, in HBSC 2002 and 2006 surveys, depending on sex.

	BOYS			GIRLS		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
2002	6721	4.00	2.13	6831	3.35	1.96
2006	10234	4.21	2.15	11577	3.46	2.09

With regard to age, table 4 shows that developmental differences in 2006 were

higher than in 2002. Particularly, in 2002 the mean number of days per week adolescents reported to feel physically active decreased with age, from 3.76 days a week in 11-12-year-olds, to 3.51 days in 17-18-year-olds, $F(1, 13286) = 336.04$, $p < 0.001$; whereas in the 2006 survey the means decreased from 4.22 days in 11-12-year-olds down to 3.41 days in 17-18-year-olds, $F(1, 20969) = 663.10$, $p < 0.001$. This reduction with age happened at an earlier stage in the 2006 survey, since decline started at age 11-12 years, whereas in the 2002 survey decline started at age 13-14 years.

Table 4. Mean number of days when adolescents feel physically active for at least 60 minutes a day, in HBSC 2002 and 2006 surveys, depending on age group.

	11-12 YEARS			13-14 YEARS			15-16 YEARS			17-18 YEARS		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
2002	3273	3.76	2.19	3176	3.85	2.06	3732	3.61	1.96	3371	3.51	2.06
2006	5869	4.22	2.23	5499	3.84	2.14	5733	3.7	1.99	4710	3.41	2.16

Also, effect size tests (Cohen's *d*) presented on table 5 show that differences as regards age group in the 2002 survey were negligible ($d < 0.20$). And yet, in 2006 there were small effects for 11-12-year-olds against 15-16 and 17-18-year-olds, and also between 13-14-year-olds and 17-18-year-olds, revealing that the younger adolescents gave a higher mean number of days than the older ones.

Table 5. Effect size values (Cohen's *d*) after cross-checking all values by age group, in HBSC both surveys, 2002 and 2006.

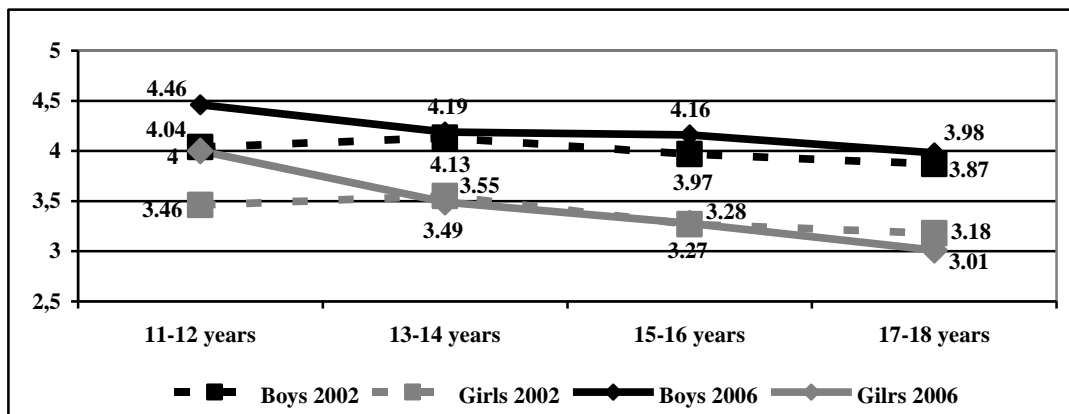
	2002				2006			
	11-12 years	13-14 years	15-16 years	17-18 years	11-12 years	13-14 years	15-16 years	17-18 years
11-12 years		0.04	0.07	0.12		0.17	0.25	0.37
13-14 years			0.12	0.17			0.07	0.2
15-16 years				0.05				0.14
17-18 years								

When comparing the 2002 with the 2006 survey by age group, only the younger adolescents showed any differences. That is, increase in days per week when they felt physically active over those four years was only detected in 11-12 year-olds, with a small effect size ($d = 0.21$).

Then, differences by age group for boys and girls separately were examined.

Graph 1 shows that an increase in physical activity in 11-12-year-olds took place in the boys group, who went up from 4.04 days a week in 2002 to 4.46 days in 2006 ($d = 0.19$), as well as in the girls group, who went up from 3.46 days in 2002 to 4 days in 2006 ($d = 0.25$). Also, the differences between sexes in all age groups remained the same in both surveys, since it was the boys who felt physically active more often than the girls.

Graph 1. Mean number of days when adolescents feel physically active for at least 60 minutes a day, in HBSC 2002 and 2006 surveys, depending on age and sex groups.



With regard to the differences depending on family affluence, table 6 reveals that those adolescents with the highest family affluence reported a higher level of physical activity. Differences between low affluence adolescents and high affluence ones were significant and with small effect size, as much in the 2002 survey, $F(2, 13167) = 43.83, p < 0.001, d = 0.23$, as in the 2006 one, $F(2, 20772) = 58.75, p < 0.001, d = 0.21$. For instance, in the 2006 survey low affluence adolescents claimed to be physically active 3.54 days a week, whereas high affluence adolescents reported 3.99 days a week.

On the other hand, the increase in physical activity in Spanish adolescents in 2006 as compared to 2002 was similar in the three levels of the Family Affluence Scale. However, the differences in effect size between 2002 and 2006 were negligible ($d = 0.05$ low level, $d = 0.03$ medium level and $d = 0.04$ high level).

Table 6. Mean number of days when adolescents feel physically active for at least 60 minutes a day, in HBSC 2002 and 2006 surveys, depending on family affluence.

LOW			MEDIUM			HIGH		
<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>

2002	3314	3.43	2.10	6283	3.67	2.06	3573	3.90	2.03
2006	3236	3.54	2.18	9658	3.74	2.15	7882	3.99	2.12

Comparisons of level of moderate-to-vigorous physical activity by region

Table 7 gives the mean number of days per week when adolescents undertook moderate-to-vigorous physical activity in each region. Data given here belong to 2006, because this is the survey that compares regions.

Table 7. Mean number of days when adolescents feel physically active for at least 60 minutes a day, in the 2006 HBSC survey, depending on region.

	<i>n</i>	<i>M</i>	<i>SD</i>
National mean	20973	3.81	2.15
Andalucía	1648	3.93	2.16
Aragón	1306	3.83	2.15
Asturias (Principado de)	1249	3.86	2.18
Baleares (Islas)	1053	3.95	2.13
Canarias	1273	3.84	2.17
Cantabria	1041	3.88	2.15
Castilla y León	1184	3.93	2.11
Castilla la Mancha	1265	4.03	2.09
Cataluña	880	3.70	2.11
Comunidad Valenciana	985	3.65	2.21
Extremadura	1171	3.89	2.18
Galicia	1488	3.74	2.21
Madrid (Comunidad de)	996	3.85	2.16
Murcia (Región de)	1110	3.73	2.10
Navarra (C. Foral de)	1262	3.84	2.12
País Vasco	1078	3.77	2.24
Rioja (La)	1047	3.89	2.16
Ceuta y Melilla	998	3.91	2.20

Differences by region as regards mean number of days when adolescents felt physically active were significant, $F(17, 21016) = 2.24$, $p = 0.002$, but with a negligible effect size ($\eta^2 = 0.002$). Therefore, there were not any clear differences in frequency of moderate-to-vigorous physical activity of adolescents among regions.

Region influence over the relationship between moderate-to-vigorous physical activity and family affluence

Finally, next step was to examine whether the relationship between family affluence of Spanish adolescents and number of days they feel physically active varies depending on their region.

Table 8. Mean number of days when adolescents feel physically active for at least 60 minutes a day, depending on their family affluence and their region, in the HBSC 2006 survey.

		<i>N</i>	<i>M</i>	<i>SD</i>	Test of significance	<i>ES</i>
National mean	Low	3236	3.54	2.18	$F(2, 20773) = 58.76,$ $p < 0.001$	$\eta^2 = 0.01$
	Middle	9658	3.74	2.15		low-high:
	High	7882	3.99	2.12		$d = 0.21$
Andalucía	Low	258	3.83	2.19	$F(2, 1625) = 0.62,$ $p = 0.537$	$\eta^2 = 0.001$
	Middle	749	3.91	2.15		low-high:
	High	621	4.00	2.15		$d = 0.08$
Aragón	Low	171	3.17	2.13	$F(2, 1287) = 16.57, p$ < 0.001	$\eta^2 = 0.03$
	Middle	581	3.69	2.13		low-high:
	High	538	4.17	2.11		$d = 0.47$
Asturias (Principado de)	Low	213	3.52	2.23	$F(2, 1239) = 5.75,$ $p = 0.003$	$\eta^2 = 0.01$
	Middle	638	3.81	2.16		low-high:
	High	391	4.13	2.18		$d = 0.28$
Balears (Islas)	Low	193	3.52	2.20	$F(2, 1035) = 8.95,$ $p < 0.001$	$\eta^2 = 0.02$
	Middle	476	3.88	2.13		low-high:
	High	369	4.28	2.02		$d = 0.37$
Canarias	Low	222	3.61	2.15	$F(2, 1254) = 3.99,$ $p = 0.019$	$\eta^2 = 0.01$
	Middle	542	3.73	2.18		low-high:
	High	493	4.04	2.15		$d = 0.20$
Cantabria	Low	165	3.44	2.10	$F(2, 1029) = 4.38,$ $p = 0.013$	$\eta^2 = 0.01$
	Middle	513	3.93	2.22		low-high:
	High	354	4.02	2.05		$d = 0.28$
Castilla y León	Low	149	3.59	2.21	$F(2, 1169) = 5.78,$ $p = 0.003$	$\eta^2 = 0.01$
	Middle	545	3.81	2.13		low-high:
	High	478	4.16	2.03		$d = 0.28$
Castilla Mancha	Low	160	3.59	1.99	$F(2, 1251) = 6.12,$ $p = 0.002$	$\eta^2 = 0.01$
	Middle	598	3.97	2.09		low-high:
	High	496	4.23	2.09		$d = 0.31$
Cataluña	Low	104	3.21	2.13	$F(2, 868) = 3.21,$ $p = 0.041$	$\eta^2 = 0.01$
	Middle	389	3.79	2.17		low-high:
	High	378	3.75	2.05		$d = 0.26$
Comunidad Valenciana	Low	151	3.20	2.29	$F(2, 975) = 9.44,$ $p < 0.001$	$\eta^2 = 0.02$
	Middle	472	3.53	2.14		low-high:
	High	355	4.03	2.20		$d = 0.37$
Extremadura	Low	211	3.68	2.17	$F(2, 1161) = 6.51,$ $p = 0.002$	$\eta^2 = 0.01$
	Middle	539	3.74	2.23		low-high:
	High	414	4.2	2.09		$d = 0.25$
Galicia	Low	291	3.45	2.22	$F(2, 1475) = 5.52,$ $p = 0.004$	$\eta^2 = 0.01$
	Middle	731	3.69	2.18		low-high:
	High	456	3.98	2.22		$d = 0.24$
Madrid (Comunidad de)	Low	80	3.74	2.44	$F(2, 985) = 2.60,$ $p = 0.075$	$\eta^2 = 0.005$
	Middle	394	3.69	2.12		low-high:
	High	514	4.01	2.13		$d = 0.12$
Murcia (Región de)	Low	153	3.22	1.99	$F(2, 1098) = 5.91,$ $p = 0.003$	$\eta^2 = 0.01$
	Middle	516	3.73	2.07		low-high:

		High	432	3.90	2.13		$d = 0.32$
Navarra Foral de	(C,	Low	156	3.27	2.14	$F(2, 1236) = 7.07,$ $p = 0.001$	$\eta^2 = 0.01$ low-high: $d = 0.34$
		Middle	622	3.83	2.08		
		High	461	4.00	2.15		
País Vasco		Low	165	3.57	2.27	$F(2, 1065) = 0.83,$ $p = 0.435$	$\eta^2 = 0.002$ low-high: $d = 0.12$
		Middle	517	3.80	2.25		
		High	386	3.83	2.23		
Rioja (La)		Low	136	3.30	2.26	$F(2, 1039) = 7.22,$ $p = 0.001$	$\eta^2 = 0.01$ low-high: $d = 0.38$
		Middle	521	3.88	2.14		
		High	385	4.11	2.1		
Ceuta y Melilla		Low	219	3.70	2.22	$F(2, 980) = 1.59,$ $p = 0.205$	$\eta^2 = 0.003$ low-high: $d = 0.15$
		Middle	402	3.95	2.15		
		High	362	4.03	2.23		

Table 8 shows important differences among certain regions. Andalucía, Comunidad de Madrid, País Vasco, Ceuta and Melilla stood out for not yielding any differences in the number of days per week when adolescents from different socio-economic status felt physically active.

The rest of the regions yielded significant differences with small effect size between adolescents of low and high socio-economic status, that is, high affluence adolescents felt physically active more days than low affluence adolescents.

These differences in the relationship between physical activity and family affluence were more remarkable in Aragon, where the difference between high and low affluence had a medium-low effect size ($d = 0.47$). That is to say, high affluence adolescents felt physically active 4.17 days a week, whereas that only happened 3.17 days to low affluence adolescents. Also, La Rioja, Islas Baleares and Comunidad Valenciana stand out because the differences between their adolescents of high and low affluence in number of days per week when they felt physically active were significant and with effect sizes over 0.35 (high family affluence: 4.11 days, and low family affluence: 3.3 days, in La Rioja; high family affluence: 4.28 days, and low family affluence: 3.52 days, in Islas Baleares; high family affluence: 4.03 days, and low family affluence: 3.2 days, in Comunidad Valenciana).

DISCUSSION

As it is explained in the introduction, there is currently widespread concern about the low level of physical activity and the high frequency of a kind of leisure ever more sedentary among the adolescent population. As some experts point out, this may be one of the main causes of the high rates of overweight and obesity recorded among the Spanish adolescent population at the turn of the new century. However, it becomes important to assess the trends in

physical activity levels over the past decade with a representative sample of Spanish adolescent population.

Hence, this paper takes the aim to compare the level of physical activity undertaken by Spanish adolescents between the 2002 and the 2006 surveys of the HBSC study. What the results reveal is a certain increase in the level of moderate-to-vigorous physical activity of Spanish adolescents, in 2006 as compared to 2002. And this becomes clearer and more obvious in the case of males of age 11-12 years. Although this increase of physical activity might suggest a positive interpretation of facts, it becomes necessary to seriously think of the wide gap between the current level of this kind of physical activity observed in the Spanish adolescent population and the guidelines set by the experts. This paper shows, particularly, how Spanish adolescents claim to have been physically active at least 60 minutes a day for an average of only 3.68 days a week, whereas experts establish that such physical activity must be taken by adolescents at least daily (Biddle et al., 1998).

Therefore, some of the most interesting data of the present study reveal that despite a certain increase of physical activity over the four years between both surveys of the study, experts and people in charge of promoting healthy habits still face a clear challenge: to raise even higher the frequency of such activity. But above all, they should get that increase to become a fact among girls, for the rise of their physical activity (from 3.35 days a week in 2002 to 3.46 days in 2006) is virtually half of that of the boys (from 4 days a week to 4.21 days). Therefore the data in this paper support the findings of previous studies (Consejo Superior de Deportes, 2011; García-Moya, Moreno, Rivera, Ramos and Jiménez-Iglesias, 2012; Lasheras, Aznar, Merino and López, 2001; Motl et al., 2005), since they show how teenage girls, in this respect, are still the disadvantaged part of the population, because they keep less active lifestyles.

Secondly, following what is explained in the introduction, as childhood goes by and adolescence comes in, boys and girls become less and less active, thereby it can be expected that the trend towards a decrease of physical activity will go on in full adolescence, as the findings of a good number of research works corroborate (Consejo Superior de Deportes, 2011; Lasheras et al., 2001; Perula de Torres et al., 1998; Roberts et al., 2004; Sallis, 2000). With regard to this reduction of physical activity as they grow older, there are considerable differences between both surveys of the study; as a matter of fact, although both studies reveal a reduction with older age in the number of days they report to be physically active, such reduction is three times as large in 2006 adolescents (it comes down from 4.22 days a week, age 11-12 years, to 3.41 days, age 17-18 years) as compared to 2002 adolescents (whose levels come down from 3.76 days a week to 3.51 days). Moreover, the increase in physical activity that took place between 2002 and 2006 was only recorded in 11-12 year-olds, because from 13 onwards, young people reduce their physical activity dramatically. Thus, although a decrease in physical activity as adolescence goes by is to be expected, it is advisable that that reduction does

not plummet as it has happened in the last few years.

The results shown so far lead to think that those programmes carried out in Spain in the last decade to promote an active lifestyle among young people have achieved some success with young adolescents, but there are doubts about the efficiency of those programmes in middle and late adolescence. In spite of the fact that the education policies to promote physical activity have been carried out in both primary and secondary schools, it seems necessary to assess what differences have been in both intervention policies with regard to their implementation, efficiency and power to keep the changes in the medium and in the long terms.

On the other hand, the socio-economic status of adolescents has also proved to affect their level of physical activity. As a matter of fact, this paper reveals that adolescents of high family affluence report to be physically active more days a week (almost 4 days a week on average) as compared to those of low family affluence (3.54 days a week). Indeed, other researches underline that opportunities to undertake any physical activity are conditioned by mainly socio-economic factors which affect the access, availability and response to the necessary means to carry it out (Boyce and Dallago, 2004; WHO/HBSC Forum, 2006). Although the findings support the existence of inequalities in the active lifestyle of Spanish adolescents, it is important to highlight a positive datum: the increase in physical activity recorded in 2006 as compared to 2002 affects likewise the three levels of socio-economic status under study. However, it would be desirable a more equitable increase which should foster an active lifestyle among low family affluence adolescents.

The analysis of the differences in moderate-to-vigorous physical activity of adolescents by region does not yield any truly outstanding data, which supports the findings of the study carried out by the Consejo Superior de Deportes (2011) on sport habits of the school population. However, examining differences in moderate-to-vigorous physical activity depending on family affluence in the regions under study in the 2006 HBSC survey, the findings reveal a clear situation of inequality, as there are visible differences among regions. As a matter of fact, in the regions of Aragon, La Rioja, Islas Baleares and Valencia, adolescents in less affluent families get a lower physical activity rate than adolescents in higher economic status families. And yet, in Andalucía, Comunidad de Madrid, País Vasco, Ceuta and Melilla, such social differences are not detected, since adolescents in low family affluence feel physically active virtually the same days a week as adolescents in well-off households. This regional unbalance seems to suggest that there are other differences in youth physical activity promotion programmes which must be taken into account in order to level the socio-economic inequalities imposed on adolescents depending on which region they live in.

CONCLUSION

In short, it must be emphasized that in spite of the increase in moderate-to-vigorous physical activity of adolescents in the 2006 survey of the study as compared to those in 2002, the levels are still too far behind the recommendations made by the experts. Also, this study points to the need to improve the rate of physical activity among the young female population and to hold back the fast drop of this activity detected throughout adolescence. Likewise, it is underlined the need to foster an active lifestyle among adolescents in the lower socio-economic levels, particularly in the regions of Aragon, La Rioja, Islas Baleares and Valencia.

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