

Relationship between the levels of physical activity and the defining features of the roles of aggression-victimization situations in schoolchildren

Relación entre los niveles de actividad física y los rasgos definitorios de roles de situaciones de agresión-victimización en escolares

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Abstract

There is a social concern for the low levels of physical activity of the population, especially of the children. Moreover, violent behaviours of aggression-victimization in schools are common, and there are defining personal traits depending on the role played. Therefore, a study was designed with two purposes: 1) identifying whether there are differences between the physical activity level, the perceptions of being considered strong, coward, aggressor, victim and to start fights, depending on the gender and grade of the student; 2) knowing the type of relationship between the levels of physical activity practice of Primary Education students and the perceptions of their classmates about being considered strong, coward, aggressor, victim and to start fights. The study design was ex post-facto of descriptive and correlational type, of epidemiological character. A total of 94 children aged 8-12 years ($M = 9.73$, $DS = 1.24$) from two rural centres in Zaragoza participated in the study. The instruments administered were PAQ-C (Physical Activity Questionnaire for Older Children) and Test de Evaluación de la Agresividad entre Escolares (BULL-S). The results showed that the boys obtain higher levels of physical activity, in being considered strong, coward, aggressor and start fights, compared to girls, being significant except to be considered a coward. Depending on the grade of the students, all the variables decrease from 3rd to 6th of Primary Education. In addition, it exists positive and significant correlation between the physical activity level and being considered strong and that start the fights.

Keywords

Physical activity levels; violent behavior; schoolchildren; elementary school; rural zone.

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Resumen

Existe una preocupación social por los bajos niveles de actividad física de la población, en especial de los niños. Por otro lado, son habituales las conductas violentas de agresión-victimización en los centros escolares, existiendo rasgos definitorios personales en función del rol alcanzado. Por eso, se diseñó un estudio con dos finalidades: 1) identificar si hay diferencias entre el nivel de actividad física, las percepciones de ser considerado fuerte, cobarde, que pega, víctima y de empezar las peleas, en función del sexo y curso del alumnado; 2) conocer el tipo de relaciones existentes entre los niveles de práctica de actividad física del alumnado de Educación Primaria y las percepciones de sus compañeros de clase sobre ser considerado fuerte, cobarde, que pega, víctima y de empezar las peleas. El diseño del estudio fue ex post-facto de tipo descriptivo y correlacional, de carácter epidemiológico. Participaron 94 niños de 8-12 años ($M = 9,73$, $DS = 1,24$) de dos centros rurales de Zaragoza. Los instrumentos administrados fueron el PAQ-C (Physical Activity Questionnaire for Older Children) y el Test de Evaluación de la Agresividad entre Escolares (BULL-S). Los resultados mostraron que los chicos obtienen valores superiores en el nivel de actividad física, en ser considerado fuerte, cobarde, que pega y que empieza las peleas, respecto al de las chicas, siéndolo significativamente a excepción del ser considerado cobarde. En función del curso del alumnado, todas las variables disminuyen de 3º a 6º de Educación Primaria. Además, existe correlación positiva y significativa entre el nivel de actividad física y ser considerado fuerte y que empieza las peleas.

Palabras clave

Niveles de actividad física; conductas violentas; escolares; educación primaria; zona rural.

Introduction

There is a social concern about the low levels of physical activity practice of the current population, especially in children and adolescents, which may be due to the fact that it is part of their lifestyle (Rodés, Piqué, & Trilla, 2007) and has an impact on their health, as demonstrated by numerous studies, such as: Warburton, Nicol and Bredin (2006), US Department of Health and Human Services (2008), Muñoz and Delgado (2010), Kokkinos (2012), Bouchard, Blair, and Haskell (2012) and Reiner, Niermann, Jekauc, and Woll (2013).

Caspersen, Powell, and Christenson (1985, p. 126) define physical activity as "any body movement produced by skeletal muscles, resulting in an energy expenditure higher than a resting energy expenditure or basal metabolism". It has four attributes or dimensions:

frequency, intensity, duration and sort of practice (Aznar & Webster, 2006 and Strath et al., 2013).

Based on Craggs, van Sluijs, Corder, Panter, Jones, and Griffin, (2011) the practice of physical activity is conditioned by 60 determinants which classify into five groups or correlates: 1) demographical and biological factors (such as gender and age); 2) psychological factors (such as self-esteem and self-perception); 3) behavioral factors (such as sedentary behavior and vigorous physical activity); 4) socio-cultural (such as peer social support and parental / family support); 5) physical-environmental (such as distance to school and community safety).

Besides, Sallis, Prochaska and Taylor (2000) reported that in children the most important factors associated with their physical activity levels are: child gender, parents overweight, preference for physical activity, intention, barriers, previous physical activity, healthy diet, programs / accessibility, and time away from home. Regarding sex, numerous national and international studies show that men show higher levels of physical activity than women; for example, Collings et al. (2014), López, González and Díaz (2016), Orhan (2015), Pašić, Milanović, Radisaulgević, Jurak, Sorić and Mirkov (2014) and Sanz (2017).

A method to measure levels of physical activity is self-report, which provides subjective measures (Sirard & Pate, 2001). There are numerous types of self-report questionnaires, such as: Physical Activity Questionnaire for Older Children (PAQ-C) and Physical Activity Questionnaire for Adolescents (PAQ-A) (Kowalski, Crocker, & Donen, 2004; validated for Spanish adolescents by Martínez-Gómez et al., 2009).

Furthermore, relationships between peers are necessary in schools, although sometimes there may be problems in them, for example, derived from dissocial behaviors, which, according to the American Psychiatric Association (2000), are those that deviate from social norms. An example of this sort of behavior are aggressions between peers, categorized in instrumental and reactive or emotional (Pérez, 2015). When aggressive behavior is intentional, harmful, persistent, and among schoolchildren, it is called bullying (Cerezo, 1999).

Ávila (2013) distinguishes four roles played in aggressive behaviors: bully or aggressor, bullied or victim, collaborator, and witness, although different subtypes of roles could also be identified. With regard to this contribution, it is important to know the traits that define the different roles. According to Ovejero (2013), one of the defining characteristics of the school

aggressor is to be physically stronger, one of the victims' is to be physically weaker and one of the collaborators' is to be a coward, although the latter could also define the victims, since it's a trait that can be inferred indirectly from other characteristics.

Cerezo and Méndez (2013) consider that in order to be recognized as a bullying victim or aggressor, at least 25% of the classmates must confirm it. Pérez (2015) contends that there seems to be no consensus in the current literature regarding the ages of more frequent bullying-victimization behaviors, although he points out that some authors argue that they are more frequent in primary education than in secondary education.

Chacón, Zurita, Castro and Linares (2017) showed that schoolchildren who practiced physical activity were exposed to situations of a pure and instrumental type of aggression, which occurred with greater assiduity if the practice of physical-sport activity was more frequent.

The situations of aggression-victimization among schoolchildren are very serious, since, as Arroyave (2012) points out, they have an impact at a personal, family and social level, with consequences that go beyond the feeling of discomfort that students may feel, as sequels can be manifested many years after the student finishes school, such as general psychological stress and specific and immediate psychiatric disorders in adulthood, not to mention the most shocking consequence that is the ideation and attempt of suicide.

Based on the abovementioned and on the importance of identifying factors to prevent such violent situations, a study was carried out to describe several defining characteristics of the roles of aggression-victimization situations from the perception of the classmates, the general levels of physical activity and the relation between both, in the Primary Education students of rural areas of Zaragoza.

The aims of the study are two: 1) to identify if there are differences between the level of physical activity, the perceptions of being considered strong, a coward, a bully, a victim and a troublemaker (the one who starts the fight), according to the sex and grade of the students; 2) to know the sort of relation existing between the levels of physical activity practice of Primary Education students and the perceptions of their classmates about being considered strong, a coward, a bully, a victim and a troublemaker.

Material and method

Study design

Based on Mateo (2004), the study carried out is considered to be ex post-facto, descriptive, and correlational, aiming to describe the levels of physical activity and the different social variables established and to know the sort of relation between them. In addition, the research conducted is a behavioral epidemiological study (Dishman et al., 2013).

Participants

The principals of the schools CEIP Benedicto XIII (Illueca, Zaragoza) and CRA Puerta de Aragón (Ariza, Zaragoza) were informed of the research to be carried out with students from the 3rd to the 6th grade of Primary Education of both this centers. Once the permission of the principals to carry out the study as designed and agreed was obtained, each student was given an informed consent document so that their parents or legal guardians knew the characteristics of the study to be performed and authorized him to participate in it.

The study involved 94 children (62 Illueca students and 32 Ariza students), aged 8 to 12, with a mean of 9.73 years ($SD = 1.24$), of which 46 were girls. According to the grade of the students, 34 children were in the 3rd grade of Primary Education (PE), 16 were of the 4th grade, 33 were of the 5th grade and 11 of the 6th grade of Primary Education. As to their age, 19 8-year-olds, 22 9-year-olds, 26 10-year-olds, 19 11-year-olds and 8 12-year-olds participated.

Tools and materials

The tools used have been a questionnaire on physical activity and a test of evaluation of social behaviors.

The physical activity questionnaire was the PAQ-C (Physical Activity Questionnaire for Older Children), suitable for children between 8 and 14 years of age, which allows assessing their general levels of physical activity (Kowalski, Crocker, & Donen, 2004). The PAQ-C questionnaire has been validated in a Spanish population aged 13 to 17 years by Martínez-Gómez et al. (2009). The questionnaire consists of nine questions about the activities performed

during the last seven days, prior to the day it is distributed, and the last one on whether or not he was sick that week (in case of illness, he is not selected for the sample). Each child obtains a final score between 1 and 5, meaning the more physical activity, the greater.

The other tool used was the Aggressive Assessment Test among Schoolchildren (BULL-S) (Cerezo, 2000). Although this test was initially designed to know the social and affective structure of the classroom group, including aspects related to bullying by giving a model for students and another for teachers, this study was only carried on students, with questions only related to established social variables, since it is one of the purposes with which it was originally designed. The results obtained from the test are individual to the student, but related to the perception of his or her classmates.

Study variables

The independent variables were: to be considered strong by peers, to be considered a coward by peers, to be considered violent by peers, to be considered a victim of aggression by peers and to be considered a person who usually starts fights. In each of these variables, a count was made of the number of classmates who considered each participant any of these variables. In addition, other independent variables were the gender (boy / girl) and the grade (3rd / 4th / 5th / 6th of Primary Education) of the students.

The dependent variable was the level of general physical activity performed by the child, expressed in a range from 1 to 5.

Analysis of data

Data analysis was implemented using the IBM SPSS 20 software. An initial analysis was performed in order to find possible missing and atypical values (not found). Then, the Kolmogorov-Smirnov statistical test was applied to know the distribution of the variables, all of which were non-normal except for the one related to the level of physical activity.

The Levene test to determine whether to assume equal variances ($p \leq .05$) or not equal ($p > .05$), the T-Student test for independent samples and the Cohen's d-value to identify the existence of difference between the means of physical activity variables and the Mann-Whitney U test to identify these differences in social variables, based on gender, were then applied. The

ANOVA test and the Kruskal and Wallis H test were used to identify these differences according to the student's grade, respectively. Lastly, the Spearman correlation test was applied to measure the magnitude and sort of relation between the independent and the dependent variables.

Results

Tables 1 and 2 show the descriptive statistics of the general level of physical activity, the number of people who consider them strong, a coward, a bully, a victim and a troublemaker, depending on the sex and the grade of the students.

As it can be seen in Table 1, in all variables, boys obtained higher average scores than girls (in the standard deviations as well) except for the general level of physical activity. The largest difference between means is in the variable "considered strong" (3.52) and the lowest in "general level of physical activity" (.36).

Table 1. *Descriptive statistics of the level of physical activity and the social behaviors of the students according to their sex.*

	Gender	N	Mean	SD	S Error M
General level of physical activity	boys	48	3.13	.55	.08
	girls	46	2.77	.56	.08
To be considered strong	boys	48	4.15	3.96	.57
	girls	46	.63	1.22	.18
To be considered a coward	boys	48	1.33	2.55	.37
	girls	46	.85	1.43	.21
To be considered violent	boys	48	2.06	3.11	.45
	girls	46	.24	.57	.08
To be considered a victim of aggression	boys	48	1.02	1.59	.23
	girls	46	1.37	2.13	.31
To be considered a person who usually starts fights	boys	48	2.21	3.43	.5
	girls	46	.22	.79	.12

On the other hand, depending on the grade of the students, it can be observed that in all variables, the students of 3rd grade of PE have scored higher than the ones of the 6th grade of

PE. In addition, this decrease is progressive based on the grade in the relative variables “to be considered a coward” and “to be considered violent”.

Table 2. *Descriptive statistics of the level of physical activity and social behaviors of the students based on their grade.*

	Grade	N	Mean	SD	S Error M
General level of physical activity	3rd	34	3.05	.48	.82
	4th	16	2.85	.78	.19
	5th	33	2.98	.10	.59
	6th	11	2.74	.51	.15
To be considered strong	3rd	34	2.47	2.73	.47
	4th	16	2.69	4.32	1.08
	5th	33	2.33	3.93	.68
	6th	11	2.18	2.68	.81
To be considered a coward	3rd	34	1.82	3.14	.54
	4th	16	.75	.78	.19
	5th	33	.70	1.08	.19
	6th	11	.55	.69	.21
To be considered violent	3rd	34	1.68	3.11	.53
	4th	16	1.63	1.63	.76
	5th	33	.64	1.32	.23
	6th	11	.55	.93	.28
To be considered a victim of aggression	3rd	34	1.47	1.75	.30
	4th	34	.38	.62	.16
	5th	33	1.42	2.37	.41
	6th	11	.38	1.54	.47
To be considered a person who usually starts fights	3rd	34	1.56	3.11	.53
	4th	16	1.44	3.37	.84
	5th	33	.91	2.14	.37
	6th	11	.91	1.70	.51

It has been found that there are significant differences in the general level of physical activity of the students based on gender, since $t(92) = 3.14$, $p \leq .001$ and $d = 0.64$ by applying the t-Student test for independent samples, but not by applying the ANOVA test based on the grade, since $F(3,90) = 1.04$, $p > .05$. Based on Morales (2011), it can be stated that the value d obtained is moderate and that stated value means that the average subject of the boys' group is greater than the 73.89% of the individuals in the girls' group.

Tables 3 and 4 present the results obtained to know the existence of differences between the means of the variables of social perceptions according to the gender and the grade of the students, respectively.

Table 3. *Differences in the social perceptions of students according to their gender.*

		Average range	Sum of ranks	Mann-Whitney U	Z	Sig
To be considered strong	boys	62.96	3022	362	-5.84	.000
	girls	31.37	1443			
To be considered a coward	boys	49.68	2384.50	999.50	-.86	.39
	girls	45.23	2080.50			
To be considered violent	boys	57.70	2769.50	614.50	-4.28	.000
	girls	36.86	1695.50			
To be considered a victim of aggression	boys	47.10	2261	1085	-.16	.88
	girls	47.91	2204			
To be considered a person who usually starts fights	boys	57.80	2774.50	609.50	-4.44	.000
	girls	36.75	1690.50			

As it can be seen in Table 3, significant differences were obtained in the means of the variables “to be considered strong, a bully, and a troublemaker”, based on the gender of the students.

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Table 4. Differences in the social perceptions of students based on their grade.

	Mean	SD	Min.	Max.	Chi square	Degrees of freedom	Asymptotic significance
To be considered strong	2.43	3.43	0	15	1.59	3	.66
To be considered a coward	1.10	2.09	0	12	1.58	3	.66
To be considered violent	1.17	2.43	0	14	4.71	3	.19
To be considered a victim of aggression	1.19	1.87	0	10	5.97	3	.11
To be considered a person who usually starts fights	1.23	2.69	0	13	1.07	3	.78

Depending on the student's grade, no significant differences were found between the means in any of the variables related to social perception.

However, based on the correlations between the general level of physical activity of the students and the social perceptions of their peers (Table 5), positive, imperfect, low and significant correlations were obtained between the variable "general level of practice of physical activity" and social perception "consider him strong" ($\rho = .36$; $p \leq .01$) and "consider him a troublemaker" ($\rho = .23$; $p \leq .05$).

Table 5. Relation between the general level of physical activity of students and social perceptions of their peers.

	To be considered strong	To be considered a coward	To be considered violent	To be considered a victim of aggression	To be considered a person who usually starts fights
General level of physical activity	.36**	-.11	.13	-.4	.23*

Note. * Significant correlation at $p \leq .05$; ** Significant correlation at $p \leq .01$.

Discussion

In relation to the levels of physical activity differentiated by the gender of the participant, the results obtained are in agreement with the existing literature, since as Sallis et al. (2000) stated, it is one of the most important differentiating factors in children. In the study, significant differences were obtained based on the sex, being values in boys higher. In contrast, based on the grade of the students, no significant differences have been obtained, although it has been observed that the values of the 3rd grade of PE are higher than those of the 6th grade PE.

These results are in agreement with those obtained in other studies. For example, in the study by Griffiths et al. (2013) significant differences in the percentage of children who complied with the daily recommendations of physical activity practice were obtained, being higher in boys. Collings et al. (2014) also obtained significant differences, with higher values in boys, both in energy expenditure in physical activity, in moderate physical activity and in vigorous physical activity. Moreover, the study carried out by Sanz (2017) also found significant differences in the average number of days a week of compliance with the recommendations, average durations and energy expenditure daily means in moderate-vigorous physical activity, being higher values those of the boys.

In relation to the levels of physical activity based on the student's grade, the results found are also in line with the current trend, that is, they decrease with age, although there were no significant differences between the means of the grades of PE. Similar results were found in studies carried out by Colley et al. (2013), the European Commission (2014), Moreno et al. (2013) and Sanz (2017).

Although no study has been found to analyze the defining characteristics of roles of aggression-victimhood situations and their relation with physical activity levels, as in the study carried out, these seem to be related to those obtained in others studies.

There have been significant differences between the perceptions of classmates regarding “being strong”, “aggressor (who strikes)” and “troublemaker”, being higher the values in boys than in girls. In relation to the variable “being perceived as a coward”, the values have been higher in boys but without any significant difference. In relation to the results obtained and based on the contribution of Ovejero (2013), it could be pointed out that this increases the

chances of children being in situations of aggression-victimization or even bullying, based on the defining traits studied.

In relation to the results obtained on the basis of students' perceptions, Nansel, Overpeck, Pilla, Ruan, Simons-Morton and Scheidt (2001) also found that the prevalence of bullying was higher in boys than in girls in the adolescent population of the United States. On the other hand, Türkmen, Dokgöz, Akgöz, Eren, Vural and Polat (2013) obtained significant differences in the three types of bullying (physical, emotional and verbal) based on sex, being all higher in boys.

Based on the students' grade, it has been observed that all variables of a social nature decrease with age, being higher in the 3rd grade of EP than in the 6th grade of EP, and besides, "being considered a coward" and "being considered an aggressor", they decrease progressively, comparing a grade to the one before. This downward trend bears some relation to that of Perez (2015), who, based on other authors, argues that violent behavior in primary education is more frequent than in secondary education.

Regarding the relation between the levels of physical activity practice and the defining traits perceived by the students, a significant positive correlation has been found between this level and "being considered strong" and "being considered a troublemaker". This seems to be in line with Chacón et al. (2017), since they found a connection between the students practicing physical activity and exposure to aggressive situations.

One of the main implications of the results found in this study would be in the school environment. Teachers should take into account the individual characteristics of the students to prevent and anticipate potential aggression situations among schoolchildren, being appropriate to know who are considered strong, weak and a coward in the class-group, and therefore, the traits that define their roles in the group. In addition, to prevent such situations, they could be acted upon if they occurred and even reduce the consequences of such behaviors.

One of the possible actions to favor the reduction or elimination of aggressive behaviors among schoolchildren could be to increase their levels of physical activity practice, since in addition to obtaining greater healthy benefits, it has been observed that there is an inverse relation between these levels and "to be considered a victim" and "to be considered a coward", and a direct relation with "to be considered strong". This consideration would be especially

important in the school environment in the area of Physical Education and breaks, since they are more related to the practice of physical activity by the students.

Furthermore, it would also be interesting to improve values education for the students who perform more physical activity, because there is a direct connection between these levels and being considered the aggressor and the troublemaker.

Conclusions

The main conclusions of this study are:

- The overall level of physical activity is significantly higher in boys than in girls.
- Counts of the perceptions of classmates about being considered strong, a coward, aggressor and a troublemaker are superior in boys to girls, and are also significantly different, except for being considered a coward.
- The student's overall level of physical activity is positively and significantly related to having classmates consider him or her to be strong or a troublemaker.
- The levels of physical activity and the counts of all social perceptions of classmates decrease with age, being higher in the students of third grade of Primary Education than in the ones of the sixth grade.

We want to highlight two limitations of the study carried out to formulate the pertinent proposals for improvement: 1) the number of participants is not very high; they attend primary education and are from two villages. For future studies, it is proposed to increase the number of participants, the age range and the place of provenience; 2) objective instruments have not been used to measure levels of physical activity, so the accuracy is lower. It would be interesting to carry out a study using other more precise instruments, such as accelerometers.

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