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RESEARCH ARTICLE

Levels of physical activity in childhood. Analysis of Family influence, gender, type of school and place of residence

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ABSTRACT

The practice of physical activity is linked to an improvement in the state of health and integral development in childhood. The aim of this research was to determine the levels of regular physical activity carried out by children in the school, out-of-school, family and socio-community environments. A descriptive and correlational study was carried out with a total sample of 320 subjects aged 3 to 6 years. The levels of physical activity were collected through an ad hoc questionnaire completed by the parents. The results show that only 30.3% of the children participate in some extracurricular sporting activity, while 6.9% attend federated competitions. There is a higher participation in schoolchildren in the last year of Infant Education and, especially, boys are those who do more physical activity than girls. The use of daily active transport is characterised by 30.6%. Most of the subjects do not comply with the recommendations provided by the World Health Organisation regarding the practice of 180 minutes of physical activity per day. The competent authorities in education, social and sports policy are invited to promote the practice of physical activity from early childhood.

Keywords: childhood; physical activity; health; family; sedentary lifestyle

1. Introduction

The practice of physical activity (PA) in childhood is key to promoting a healthy lifestyle from the earliest years of life. This practice can take place in school, out-of-school, family and social environments.

Research shows a close relationship between low participation in physical activity and the negative consequences it has on children's health[1]. However, children who engage in PA have an optimal state of health and well-being, since through this type of practice, benefits are obtained in multiple aspects, constituting, in short, a basic means for their integral development. Likewise, there is evidence that shows that the scarce participation in PA carried out during childhood will continue in the same way throughout adolescence and

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adulthood.

Therefore, this research attempts to understand the situation in which infants find themselves with regard to PA-related habits and, likewise, to report the quantity and frequency of this type of practice in the different environments in which the child finds him/herself. Likewise, the aim is to raise society's awareness of this problem and to promote a healthy lifestyle among children in order to eradicate the appearance of sedentary habits during childhood.

In recent decades, various studies have shown that children do not lead an active and healthy lifestyle, leading to the appearance of multiple pathologies and diseases associated with a sedentary and unhealthy lifestyle[2–6]. Currently, there are numerous recommendations and proposals regarding the practice and amount of physical activity that is advisable. The World Health Organisation (WHO), characterised as one of the largest international organisations that show their effort and commitment to improving the health of the world's population, offers a series of recommendations aimed at children between the ages of one year and five years, unless their state of health advises otherwise. Between the ages of 1 and 4, the WHO recommends at least 180 minutes of PA of varying intensity per day, with at least 60 minutes of moderate to intense PA being considered essential between the ages of 3 and 4. In the same vein, from the age of 5 years onwards, 60 minutes of aerobic PA per day from moderate to intense is suggested[7].

In 2015, the 193 Member States of the United Nations (UN) adopted the 2030 Agenda for Sustainable Development, which currently has a total of 17 Sustainable Development Goals (SDGs). Some of these SDGs highlight the importance of healthy practices, as well as the need to ensure and provide inclusive, equitable and quality education[8–13]. It would be effective to focus on an education that meets the learning needs of all children, as well as to focus on more hours of daily PA in educational centres.

The implementation of the WHO recommendations would eradicate sedentary lifestyles among young people and achieve an active and healthy lifestyle. Despite this, these recommendations are not complied with, as shown in the PASOS study carried out by the Gasol Foundation, which shows that 3 out of every 5 children and adolescents do not comply with these recommendations[14].

Considering these data, it is essential to increase the levels of PA practice in the contexts close to the pupils, such as the out-of-school, social and community environments, and mainly in the family and school environments. Families have a very significant role to play in their children's PA practice, since, as reflected by the Nutrition Research Foundation[15], acquiring an active lifestyle in childhood and adolescence will enable its continuation in adulthood. Dwyer et al.[16] state that the attitudes and values of parents regarding the practice of physical activity have a direct influence on children's behaviour. Likewise, schools should defend the practice of school sports, implementing active and dynamic playgrounds where games and activities aimed at increasing PA times in the school context are proposed, as well as the implementation and operation of specific extracurricular PA programmes. This will create more active children and encourage healthy physical activity throughout the educational community[17]. Childhood is one of the stages characterised by children's natural curiosity and constant learning. It is essential to take into consideration all the necessary factors to achieve a balanced growth and an optimal acquisition of healthy life habits in infants. This importance is reflected in current Spanish legislation. The Organic Law 2/2006, of 3 May, on Education (LOE), modified by the Organic Law 3/2020, of 29 December, on Education, includes in its forty-sixth additional provision, the promotion of the practice of PA and healthy eating. In this sense, the current Royal Decree regulating Infant Education in Spain, reflects in its Article 31, the obligation of educational centres to design a plan of physical activities and healthy habits with the aim of daily sport and physical exercise during the school day.

It is essential to bear in mind some of the limitations of this research, such as the scarcity of literature and

research in the field of children aged 3–6 years.

The main objective of the research was to carry out an analysis of the practice of sport in a sample of 320 boys and girls aged between 3 and 6 years old living in Spain. A comparative analysis was made of the possible influence of family, sex, environment, place of residence and the type of educational centre of the participants on the levels of sports practice. Finally, the aim is to create a planning strategy in order to improve the possibility of daily PA practice in infancy and throughout childhood, promoting a healthy lifestyle.

2. Methodology

2.1. Type of study

The research focuses on a descriptive, cross-sectional, quantitative study. A questionnaire called NYCAFIN was designed and created ad hoc, this questionnaire was validated by a group of experts and collects the levels of PA practice of subjects aged 3 to 6 years in different scenarios of their daily life. This questionnaire has certain advantages over other similar questionnaires, such as its accessibility, as it does not require a large financial budget, and its items cover all possible scenarios of physical activity practice[18].

2.2. Characteristics of the sample

In order to estimate the sample size, the latest data published by the Subdirectorate General for Statistics and Studies of the Ministry of Education and Vocational Training[19] were used regarding schooling in Pre-school Education, calculating a total of 1,749,597 children throughout Spain. With a confidence level of 90% and a margin of error of 5%, the sample size was 273 subjects, resulting in a total of 320 subjects between 3 and 6 years of age. The distribution was 54.7% boys and 45.3% girls.

The inclusion criteria were: 1) voluntary participation; 2) age between 3 and 6 years; 3) presence of a subject with or without disability or illness; 4) school attendance in an educational centre in Spain; 5) informed consent of the family. Subjects were excluded from the study if they did not cover 100% of the data considered obligatory in the form.

2.3. Data collection

For data collection, the aforementioned self-report questionnaire for parents was used, which collected information on the main variables of the research. The language of the questionnaire is Spanish and it is made up of a total of 47 questions centred on 4 blocks of variables:

- **Socio-demographic data,** such as date of completion of the questionnaire, gender, date of birth, weight, height, academic year, type of centre and its location and distance from home.
- **PA in the school environment,** with the aim of ascertaining characteristics on the practice of PA in educational centres. Data were recorded on the frequency, quantity and weekly intensity of the Physical Education sessions taught, the amount of PA carried out in the playground and active participation, frequency of active breaks and data on the possible execution of PA programmes implemented by the centre.
- **PA in the out-of-school environment,** in which information is collected related to the out-of-school environment, the frequency and type of federated sport performed by the subject, the constancy, intensity and amount of time dedicated to playing in the street. Likewise, the use or non-use of active transport to go to and return from school and their daily regularity.
- **PA in the family environment,** obtaining information related to the frequency and number of times per week on the practice of PA by families. Likewise, the use of video games involving PA and, equally, their frequency and intensity. Finally, information is obtained on the number of days per week that the sample

participates in games that involve the practice of PA, as well as the type of intensity that this implies.

- **PA in the social and community environment,** such as, for example, PA performed outside the home, i.e., in the street.

2.4. Procedure

The distribution of the questionnaires and the selection of the sample was by convenience, mainly based on the criterion of geographical proximity of the researchers to the schools. The schools were contacted and the research project was presented to them, finally requesting their participation. The management team of the schools were in charge of providing the questionnaire to the families, who filled it in and accepted the informed consent. A total of 13 schools of different types were visited: public, subsidised and private, urban, semi-urban and rural. The questionnaire was disseminated in the centres during the month of April.

2.5. Data analysis

For the data analysis, all the data reflected in the questionnaire were entered into SPSS v28.0 statistical software and subsequently cleaned and analyzed.

2.6. Ethical aspects

During the course of the study, the ethical principles reflected in the various documents and treaties on research ethics were taken into account, guaranteeing informed consent about the type of study, the non-obligatory nature of the study, the anonymity of the participants, the confidentiality and privacy of the data reflected in the questionnaires, the reporting of the use of the information obtained and other ethical considerations related to research in education[20].

3. Results

Once all the data had been collected from the participant sample, a descriptive analysis was carried out according to the academic year, age and sex of the participants (**Table 1**).

Table 1. Distribution of the sample by grade and gender.

Distribution of the sample by year group and gender				
Academic year/age	**Total**	**Gender**	**N**	**%**
1° ECE (3–4 years)	n = 104	Boy	59	56.7
		Girl	45	43.3
2° ECE (4–5 years)	n = 110	Boy	60	54.5
		Girl	50	45.5
3° ECE (5–6 years)	n = 106	Boy	56	52.8
		Girl	50	47.2

Note. EI = Early childhood education.

A descriptive analysis of the Body Mass Index (BMI) was also carried out, showing a minimum BMI of 10.68%, a maximum BMI of 30.58% and a mean and standard deviation ($p < 0.05$) of 16.36 ± 2.82 for the total sample.

Subsequently, descriptive and correlational analysis of different variables was carried out. Firstly, the relationship between the parents' sporting practice and that of their children (**Table 2**), extracurricular sporting practice and sex (**Table 3**), in relation to the place of residence of the members of the sample (**Table 4**), in relation to the type of centre (**Table 5**) and the percentage of each sport practiced **(Table 6)**.

Table 2. Relationship between the variables sports practice in parents and sports practice in children.

Variable		**Total (%)**	**Does your child participate in any after-school sports activities? (%)**		***p***
			Yes	No	0.**048**
Do either of the parents play sport on a regular basis?	Si	46.3	54.7	42.7	
	No	56.85	45.3	57.3	

Note. The value presented in bold italics shows statistically significant differences for $p < 0.05$.

Table 3. Relationship of the variables sport practice in children and gender of the child.

Variable		**Total (%)**	**Gender (%)**		***p***
			Man	Woman	**0.007**
Participation in extracurricular sports activities.	Si	29.7	36.0	22.1	
	No	70.3	64.0	77.9	

Note. The value presented in bold italics shows statistically significant differences for $p < 0.05$.

Table 4. Relationship between the variables sport practice in children and the child's environment of residence.

Variable		**Total (%)**	**Residence environment (%)**			***p***
			Urban	Semi-urban	Rural	**0.257**
Participation in extracurricular sports activities	Si	29.7	33.7	25.6	25.	
	No	70.3	66.3	74.4	75.0%	

Note. The value presented in bold italics shows statistically significant differences for $p < 0.05$.

Table 5. Relationship between the variables sport practice in children and school ownership.

Variable		**Total**	**Type of centre**			***p***
			Public	Concerted	Private	**0.034**
Participation in extracurricular sports activities	Yes	29.7%	28.1%	52.2%	0%	
	No	70.3%	71.9%	47.8%	100%	

Note. Statistically significant differences were found for $p < 0.05$.

Table 6. Most practiced sports according to gender.

Variable	**Man**	**Woman**
Most practiced sports according to gender	Soccer 16.0%	Swimming 6.02%
	Basquet 4.6% Swimming 4.0% Judo 2.9 % Taekwondo 2.9%	Dance 2.1% Horse riding 2.1% Track & Field 1.4% Judo 1.4%

4. Discussion

The main objective of this research was to analyse the levels of physical activity in the school population aged 3 to 6 years.

In relation to the practice and influence of family physical activity, several studies show the close relationship between PA performed by parents and that performed by their children[21,22]. This research shows that 45.3% of parents practice regular PA, positively influencing the performance of PA by their children. However, the percentage of non-practising families is still high (56.85%). This result shows that a high percentage of families do not comply with the WHO recommendations on PA[8]. Salas et al.[23] show that 58% of parents do not comply with these recommendations either, a value very similar to that of this research. The most practising parents have children with a high percentage of participation in some type of extracurricular

sporting activity, which has a positive impact on the development of healthy behaviours in their children. For this reason, it is necessary that the different institutions and organisations orient families towards the importance of this type of practice both for themselves and for their offspring.

Likewise, there were differences in participation in extracurricular sports activities according to gender, with boys being the ones who practice the most, with 36%. Research by Latorre and his research team[24] already confirmed this higher prevalence of boys' (72%) versus girls' (28%) extracurricular sports practice. And similar results were confirmed by Ortiz et al.[25], where boys continue to be the most participative. However, studies by Delgado-Lobete and Montes-Montes[26], hardly perceive any statistical differences depending on the gender of the subjects.

Similarly, there are differences in the type of sport practised according to gender. In the case of boys, sports such as football, rugby and wrestling activities predominate, while in the case of girls, individual physical-sports activities such as swimming, rhythmic games and dancing predominate[26–28]. The existence of stereotypes currently leads to gender inequalities in the practice of physical activity, in which the female gender is the least involved. In order to increase girls' participation in out-of-school sport, it is necessary to design and implement strategies to boost their interest and motivation, as well as to show society that there is no distinction between male and female sports.

In reference to the residence of the subjects, no strong associations between variables have been found. Subjects living in urban areas (33.7%) are those who participate more in sports activities than those living in rural areas (25%). This result may be a consequence of the lower availability of extracurricular sports activities in rural areas. However, a study of 50 children aged 4 years shows that children from rural areas have a higher level of PA compared to those living in urban areas[29].

Finally, the sample is fundamentally schooled in public and subsidised educational centres, with 52.2% of the sample participating in extracurricular activities and studying in subsidised centres, almost doubling those in public educational centres (28.1%). The largest number of schoolchildren practicing physical activity was obtained in concerted education centers, it is possible that this type of center may present a greater sports offer due to the fees paid by families on a monthly basis or a greater number of available resources and infrastructures. It is important to investigate this in future research to find out what are the causes that cause this fact. The authors of this work have not been able to incorporate a sample of schoolchildren from private centers without public funding. It should be noted that the levels of school physical activity in public schools are also very low, with an average of only one Physical Education session per week in Infant Education[29, 30].

The results of this study and their analysis and interpretation must always be done in the context of the study and cannot be extrapolated to the whole child population. Further studies are needed to understand trends in levels of physical activity in early childhood.

5. Conclusions

The main objective of this research was to find out the current levels of habitual PA of children aged 3 to 6 years in their everyday environments. The results show that more than half of the subjects surveyed do not participate in any sport, with limited participation between the ages of 3 and 4, and therefore determining a small increase in the practice of PA as the academic year of the subjects increases. Similarly, a disparity is found between the participation of boys and girls in sporting activities, being lower in girls. Similar results are found in the type of sport selected according to the gender of the subjects, given that at present we continue to witness stereotyped situations in which society continues to segregate the type of sport practised according to gender, although to an increasingly lesser extent. This shows that a high percentage of boys take part in sports

such as football or even basketball, while girls opt for sports such as dancing, horse-riding and swimming, among others.

The vast majority of the schools participating in the study are located in small and medium-sized towns, which could mean that the daily trips made by the population are of a more active nature. However, the use of active transport to attend the educational centre is only used by a small number of subjects, despite the fact that those who do make use of this type of transport, do so during the 5 days of the school week. The practice of PA by parents and the participation in games involving PA in the street, presents average values of 5 days a week. However, this frequency is not sufficient for parents to comply with the WHO recommendations on PA practice.

This research shows the high percentage of sedentary attitudes in the child population. It is therefore necessary to establish plans and strategies for the promotion and encouragement of PA practices and healthy habits in the child population. Families, educational centres, public and private administrations and society in general must work together to achieve the Sustainable Development Goals of well-being and health, quality education, gender equality and sustainable cities, through the creation of more green areas, parks for children or even spaces where PA can be practised without any kind of risk.

Author contributions

Conceptualization, AV and OR; methodology, VA; software, OR; validation, OR, VA and AV; formal analysis, VA; investigation, VA; resources, OR; data curation, AV; writing—original draft preparation, AV; writing—review and editing, AV, VA and OR; visualization, VA; supervision, OR; project administration, AV. All authors have read and agreed to the published version of the manuscript.

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Ethical approval and consent to participate

The research followed all international standards for educational research.

Conflict of interest

The authors declare no conflict of interest.

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