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ORIGINAL ARTICLE

Sedentarism and use of electronic devices in primary school students: A descriptive study

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ABSTRACT

Sedentary lifestyles, characterized by low physical activity and prolonged screen time, have been associated with negative health effects such as obesity, sleep problems and poor academic performance. The aim of this study was to analyse and describe the levels of sedentary lifestyle and the impact of video game use on the behaviour and health of elementary school students. The sample consisted of 28 students aged 6 to 12 years (13 boys and 15 girls). The Youth Leisure Time Sedentary Behaviour Questionnaire (YLSBQ) and a device use questionnaire (CERV) were used, assessing avoidance factors and negative behaviour related to video games. The main results show that girls showed higher averages of sedentary and avoidance behaviour than boys, while the first cycle of education presented the highest levels of sedentary behaviour. Fifteen percent of the boys and 26% of the girls showed severe problems of video game use, with the third cycle presenting the fewest problems (50% with no problems). This suggests the need to promote active lifestyles and a balanced use of devices to improve the well-being of students and reduce adverse effects on health and academic performance.

Keywords: Technology, Innovation, Sedentary lifestyle, Sedentary time, Technological devices, Video games.

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INTRODUCTION

Sedentarism

Sedentary behaviour is described as the condition of remaining at rest or without movement, which implies the absence of significant caloric energy consumption (Belisario, 2016; Romero, 2009). Sedentary behaviours are characterized as involving energy expenditure equal to or less than 1.5 METs. Examples of these activities include sleeping, sitting, lying down, watching television or forms of entertainment that involve being in front of screens (Pate et al., 2008; Prieto-Benavides, 2020). This trend is due to various factors, such as screen use or family lifestyle, which contribute to the reduction of physical activity (PA) in these developmental stages (Carson et al., 2016). This sedentary lifestyle becomes a determining factor in the development of chronic noncommunicable diseases, such as obesity and overweight (Belisario, 2016).

One of the main causes of sedentary lifestyles in young people and adults is the frequent use of electronic devices and video games, which has been considered insufficient daily tasks to promote and maintain a healthy lifestyle (Zurita-Ortega et al., 2018). Sedentary lifestyles are directly related to the time students spend in front of screens, especially in the interaction with video games, which can be used on various devices and integrate audio and video (Marín-Díaz & García-Fernández, 2005; Belisario, 2016). In this sense, hours in front of screens are closely linked to psychosocial factors and quality of life, due to the great addictive potential, are inducers of violent and aggressive behaviours among young people, turn people into socially isolated beings (Motamed-Gorji et al., 2019) and produce negative effects on school performance, due to absenteeism and a possible decrease in study time (Adelantado-Renau et al., 2019).

Use of screen devices

In recent decades, the use of electronic devices has increased considerably, becoming very present in our lives and completely transforming our society. Due to the increasing use of these technologies, several studies have documented the lack of PA in children and young people, who spend more than two hours daily in front of screens (Fan et al., 2022). Thus, during these developmental stages, sedentary behaviours are more common than PA, because the integration of sedentary habits is more difficult to modify (Fearnbach et al., 2020). Therefore, the American Academy of Pediatrics has recommended that children and adolescents should not spend more than 2 hours a day in front of the TV (Prieto-Benavides, 2020).

Authors such as Saunders et al. (2012) examined the potential positive and negative impacts of sedentary activities. In the case of children, it was observed that an excess of time in front of the TV is linked to lower school performance, sleep problems, difficulties in social interactions and increased alcohol and tobacco consumption, (Prieto-Benavides, 2020; Saunders et al., 2014). Additionally, lack of PA is related to early onset of cardiovascular disease and chronic noncommunicable diseases (Lavie et al., 2019).

Consequences of screen use

The use of electronic devices can have repercussions that depend on the age of the users (Tsang et al., 2023). These consequences occur in different ways depending on different developmental processes and vulnerability (Tsang et al., 2023) and depending on the content exposed and the context in which it takes place (Sharara-Chami et al., 2019). Children under the age of three may be more sensitive to the negative effects of screen exposure due to the rapid growth and plasticity of the brain at these ages (McHarg et al., 2020). Depending on the content, educational programs benefit learning in children, as opposed to video game exposure associated with violent behaviours and lower empathy (Shoshani et al., 2021).

In turn, screen use in primary school students has significant implications for children's health and development (Aparicio et al., 2022). At the physical level, spending too much screen time neglecting physical activity can trigger weight gain, resulting in overweight and obesity (Bakour et al., 2022) and sleep problems, affecting sleep time and quality (Twenge et al., 2019). At the cognitive level, the use of electronic devices can influence academic performance (Arora et al., 2018), developing attention problems and a significant emotional impact due to isolation and reduced social interactions (Daryanti & Fitriahadi, 2022). Finally, at the psychological level these behaviours can foster the development of addictive behaviours, which in turn could trigger psychological disorders such as depression, anxiety and low self-esteem (Feng, 2022).

Recommendations to reduce the use of screens

To combat the abusive use of new technologies, some studies provide general rules and recommendations on the proper use of screens. Some of these recommendations could be the promotion of family engagement with media, to develop a critical approach to violence and its repercussions (Mohammed Abd Elmonem et al., 2021), setting limits on screen time (1.5 hours during school days and 2 hours on weekends and vacations) (Wise, 2018), promoting sleep habits, to improve irritability and distractions (Guerrero et al., 2019).

It can be verified that, during childhood, exposure to screens has to be limited and supervised by an adult (Mohammed Abd Elmonem et al., 2021). Therefore, a study conducted by Brown and the Media and Communications Council (2011), states that screen exposure time depends on age and provides time recommendations for the use of devices (Table 1).

Table 1. Temporary recommendations for the use of electronic devices according to age.

Age	Recommendations
From 0 to 2 years old	No screens
From 2 to 5 years old	Half an hour or an hour a day. From the age of two, children understand and learn more easily through screens, so it is essential that the programs are educational.
From 7 to 12 years old	One hour with adult supervision and provided it is not mealtime.
From 12 to 15 years old	One and a half hours with increased vigilance in social networks.
Over 16 years old	Bedrooms should not have screens

RESEARCH DESIGN

Type of study and participants

A total of 28 primary school students aged 6 to 12 years (13 boys and 15 girls) participated in this descriptive cross-sectional study. Data were collected at the Nuestra Señora del Rosario public school in Dehesas Viejas (Granada). To obtain the sample we took into account sociodemographic data such as sex and age, the grade to which they belonged and the average grade of their academic record.

Instruments

To assess sedentary behaviour, the Youth Leisure Time Sedentary Behaviour Questionnaire (YLSBQ; Atencio-Osorio et al., 2021) was used. The YLSBQ consists of 12 items that assess different specific sedentary behaviours, distributed in four factors that capture sedentary behavioural activities. Each item is measured on a time scale that allows recording the number of minutes devoted to each activity. The reliability of this questionnaire is exposed by a Cronbach's alpha coefficient = 0.867.

To measure the use of electronic devices and video games, the first part of a CERV questionnaire was used. This instrument includes 22 items composed of two parts, grouped in the dimensions avoidance (items: 1,2,3,8,10,11,15 and 16) and negative behaviour (items: 4,5,6,7,9,12,13,14 and 17). This questionnaire was administered individually and a four-point Likert-type scale was used. The sex, age, academic year and grade point average of each participant's academic record were recorded by means of a sociodemographic data questionnaire.

Procedure

Data collection was conducted during the 2023/2024 academic year. The centre, as well as the parents or legal guardians of the participating students, were contacted to provide an oral and written explanation of the nature and purpose of the study. To ensure anonymity and confidentiality, the names of the participants were coded. Each student completed questionnaires on the use of electronic devices and video games. During the administration of the questionnaires, the tutor provided clear and concise instructions and emphasized the importance of answering truthfully. Additionally, he was in charge of supervising the data collection process. Once the students had completed the questionnaires individually and anonymously, they were collected discreetly to preserve the confidentiality of the responses. This study complies with current Spanish legal regulations governing clinical research in humans (Royal Decree 561/1993 on clinical trials), as well as with the ethical principles formulated Declaration of Helsinki 2013 and the law on the protection of personal data (Organic Law 15/1999).

Data analysis

Data are presented as mean and standard deviation, as well as percentages. Due to the descriptive nature of the study, hypothesis testing was not performed, since the objective was only to describe the characteristics of the population. Comparisons between groups were made using data plots, without additional adjustments or regression models. A 95% confidence level was maintained in all data descriptions. Analyses were performed using the SPSS statistical package, version 25.0 for Windows, Chicago).

RESULTS

The present study focuses on analysing and describing the relationship between sedentary lifestyle and hours of screen time among primary school students.

Sedentary lifestyle associated with the use of video games

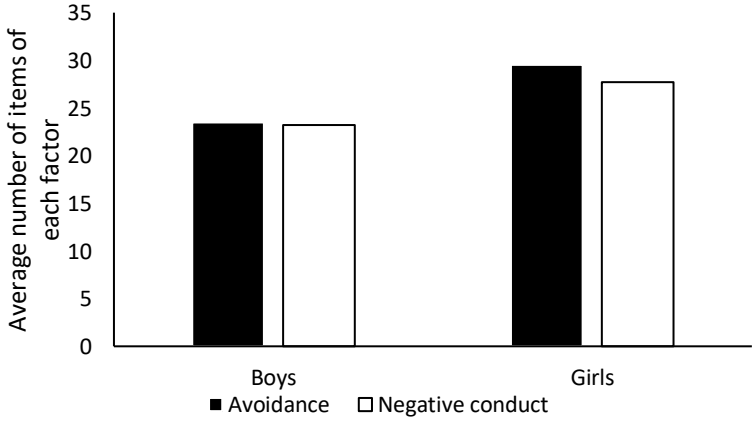

Figure 1. Average sedentary lifestyle associated with problematic video game use (avoidance and negative behaviour) according to sex of schoolchildren.

Figure 1 shows the average sedentary lifestyle associated with problematic video game use, specifically, avoidance factors and negative behaviour in relation to sex. In the case of boys, the average for the avoidance and sedentary behaviour factors is practically identical (23.5 vs. 23.2). However, in the case of girls, the average is higher in both factors, being higher in avoidance than in sedentary behaviour (29.5 vs. 27.7).

Figure 2 shows how in the first cycle the level of avoidance and sedentary behaviour (20.9 vs. 20.2, respectively), associated with problematic video game use, is higher than in the second (16 vs. 14.3) and third cycle (16.1 vs. 14.4). Generally, the avoidance factor tends to have a higher average in all cycles.

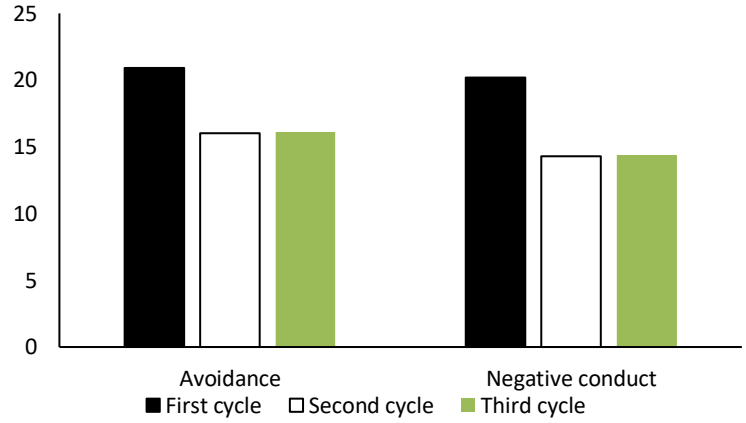

Figure 2. Average sedentary lifestyle associated with problematic video game use (avoidance and negative behaviour) according to schoolchildren's cycle.

Categorization of problematic video game use

The results derived from the categorization of the use of video games reveal that both boys and girls present more potential problems associated with the use of video games (Figure 3). Specifically, 31% of boys and 27% of girls say they have no problems (SP), potential problems increase in both sexes 54% and 47% respectively, and finally severe problems (PS) are shown with 15% in boys and 26% in girls.

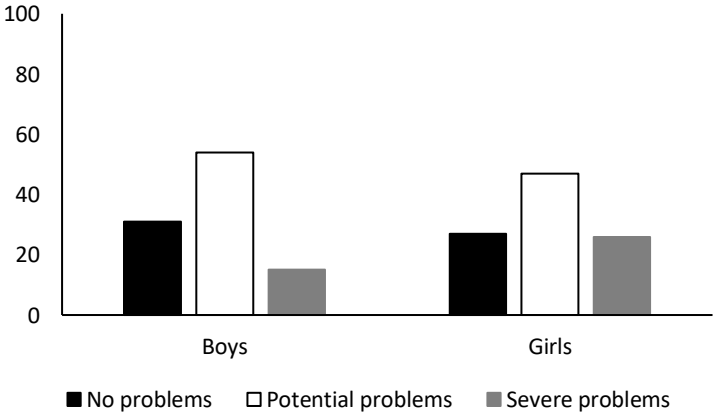

Figure 3. Percentage of problematic video game use by sex.

On the other hand, it is shown that the students with the least problems due to the use of video games are those in the third cycle, where the percentage rises to 50%. On the other hand, students in the second cycle have the highest percentages of severe problems (43%) (Figure 4).

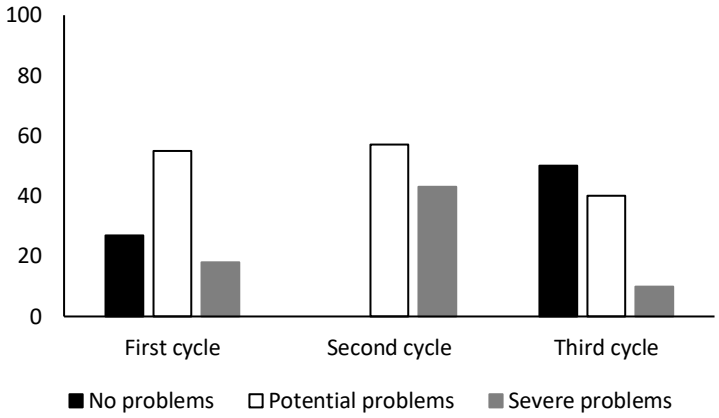

Figure 4. Percentage of problematic video game use as a function of cycle.

DISCUSSION

The present study aimed to analyse and describe the relationships between sedentary behaviour and screen time, specifically through the problematic use of video games in primary school students. The results show that avoidance and sedentary behaviours associated with the use of video games present higher averages in girls compared to boys. In addition, it is observed that the first cycle of primary education presents higher rates of sedentary and avoidance behaviours compared to the more advanced cycles.

Sedentary behaviour and screen time by sex

In this study, girls show a higher average for both avoidance and sedentary behaviour associated with video game use. In contrast, previous research indicates that boys tend to have a higher motivation and frequency of video game use, which increases the likelihood that they will experience negative effects, especially in the development of problem behaviours associated with screen time (Kristen-Lucas & John-Sherry, 2004). However, other studies have highlighted that the influence of gender may vary according to the social and family context Galfo et al. (2022).

Sedentary behaviour as a function of the educational cycle

According to the age of the students, younger schoolchildren seem to be more influenced by problems derived from the use of video games, both in the avoidance factor and sedentary behaviour. This result coincides with the research of Anderson and Dill (2000), who indicate that younger students may be more susceptible to the negative effects of screen time due to their cognitive development and limited ability to manage video game use in a balanced way. This finding is also supported by the study of Throuvala et al. (2020), which reviews how younger students show a greater tendency to use video games as an avoidance mechanism.

However, there are studies that suggest that as students advance in age and educational cycles, problematic video game use may intensify. Labrador et al. (2023) reported that adolescents are more likely to use online video games, which is associated with a higher incidence of loneliness and social anxiety problems. Likewise, Rooij et al. (2014) documented that adolescents may experience increased isolation and poor academic performance to the extent that video game use becomes a predominant activity of their free time.

Limitations and future research

The present study has several methodological and procedural limitations that should be mentioned. Among them are the limitations of a descriptive cross-sectional design, which does not allow us to establish associations between variables or causal relationships and depends on the veracity of the participants' responses to the measures implemented. It is possible that students may have responded in a way that favours a positive self-image. The sample was selected by convenience, which limits its representativeness of the population. In addition, this study does not include an assessment of contextual factors, such as parental influence and social environment, which may have a significant impact on video game use patterns. Nevertheless, the study has important strengths such as participant confidentiality and instruments with high reliability and proven internal validity.

CONCLUSION

In conclusion, this study reveals significant associations between sedentary lifestyles and problematic video game use in elementary school students, with differences by gender and grade level. Through comprehensive data analysis and critical review, the findings suggest that both avoidance factors and problematic behaviours related to video game use may be more prevalent in younger students and girls, although these patterns may vary by context.

It is critical to recognize the needs of each individual and the variability in the effects of video game use and physical activity. Experimental studies could be considered for future research to deepen the understanding of this relationship and its implications in the educational setting. Nevertheless, based on the available data, we can conclude that promoting an active lifestyle that integrates both digital entertainment and physical activity could be beneficial for students' overall development and academic success.

AUTHOR CONTRIBUTIONS

Conceptualization, M.G.-V. and A.R.-M.; methodology and formal analysis, J.L.S.-M. and A.R.-M.; data curation, T.M.-R. and J.L.S.-M.; writing—original draft preparation, M.G.-V. and T.M.-R.; writing—review and editing, J.L.S.-M., and A.R.-M.; supervision, A.R.-M.; funding acquisition, J.L.S.-M. and A.R.-M. All authors have read and agreed to the published version of the manuscript.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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