Psychology, Society & Education (2025) 17(1), 1-10

Psychology, Society & Education

www.uco.es/ucopress/ojs/index.php/psye

The influence of health-promoting schools on the students' active and sedentary behaviour

Alexandra Valencia-Peris*, Lucia Sanchis-Francés & Carlos Chinchilla-Ramírez

Universitat de València, Valencia (Spain)

Keywords

Health promotion
Active schools
Gender
Adolescence
Childhood

Abstract

Physical inactivity and levels of sedentary behaviour among students are associated with health problems, and schools are one of the institutions with the greatest potential for promoting healthy habits. The aim of this study was to compare the levels of physical activity and sedentary behaviour in a sample of schoolchildren according to gender, educational stage, and belonging (or not) to an Active school. A total of 727 students participated (50.3% girls; M_{age} = 12.8). Two questionnaires were used: the *Physical Activity Questionnaire* to assess physical activity levels and the *Young Leisure Sedentary Behaviour Questionnaire* to assess sedentary time. The results show that, regardless of school type: a) the vast majority did not comply with the guidelines, b) boys spent more time in physical activity and screen time than girls, and c) physical activity decreased and screen time increased as students progressed through the educational stage. However, while there were no differences in physical activity according to school type, students who did not belong to an Active school spent more time in sedentary screen time than those who did. These findings call into question the effectiveness of Active schools as a strategy to promote physical activity and reduce sedentary time by eliminating gender and educational stage differences. There is a need to improve intervention approaches in schools to promote holistically healthy and active lifestyles from childhood.

Influencia de las escuelas promotoras de salud en las conductas activas y sedentarias de los escolares

Palabras clave

Promoción de la salud
Escuelas activas
Género
Adolescencia
Infancia

Resumen

La inactividad física y los niveles de sedentarismo en el alumnado se han asociado con problemas de salud, siendo la escuela una de las instituciones con mayor potencial para promover hábitos saludables. El objetivo de este estudio fue comparar el nivel de actividad física y actividad sedentaria en una muestra de escolares en función del género, la etapa educativa y la pertenencia (o no) a una Escuela Activa. Participaron un total de 727 estudiantes (50.3% chicas; M_{edad} = 12.8). Se utilizaron dos cuestionarios: el *Physical Activity Questionnaire* para determinar el nivel de actividad física y el *Young Leisure Sedentary Behaviour Questionnaire* para la actividad sedentaria de pantalla. Los resultados muestran que, independientemente del tipo de escuela: a) la gran mayoría no cumplía con las recomendaciones, b) los chicos dedicaban más tiempo a la actividad física y al uso de pantallas que las chicas y c) la actividad física disminuía y el tiempo de pantalla aumentaba conforme se avanza de etapa. Sin embargo, mientras que no existían diferencias en la actividad física en función del tipo de escuela, el alumnado que no pertenecía a una Escuela Activa dedicaba más tiempo a las actividades sedentarias de pantalla que aquellos que sí pertenecían. Estos resultados cuestionan la eficacia de las Escuelas Activas como estrategia para promover la actividad física y reducir las actividades sedentarias eliminando diferencias entre género y etapa educativa. Es necesario mejorar los enfoques de intervención holísticos en los centros educativos para promover estilos de vida saludables y activos desde la infancia.

* *Corresponding author:* Alexandra Valencia Peris. Facultat de Magisteri. Avda. Tarongers, 4. 46022 València, Spain. alexandra.valencia@uv.es
Cite this article as: Valencia-Peris, A., Sanchis-Francés, L., & Chinchilla-Ramírez, C. (2025). The influence of health-promoting schools on the students' active and sedentary behaviour. *Psychology, Society & Education, 17*(1), 1-10. https://doi.org/10.21071/psye.v17i1.17384
Received: 1 August 2024. *First review*: 19 November 2024. *Accepted:* 14 January 2025.

ISSN 1989-709X

The benefits associated with an active lifestyle are particularly significant for school-aged children and adolescents (Warburton & Bredin, 2017). Numerous studies have shown that regular physical activity (PA) positively impacts an individual's physical, psychological, social, and cognitive well-being (Poitras et al., 2016). In addition to concerns about low PA levels, the effects of sedentary behaviour, such as excessive screen time, significantly limit the time students spend engaging in physical and sports activities (Bull et al., 2020), among other negative health effects (Sanders et al., 2024). According to the 24-hour movement guidelines, children and adolescents should accumulate at least 60 minutes per day of moderate-to-vigorous PA (MVPA), ≤ 2 h/day of recreational screen time, and 9-11 h of sleep per day (5-13 years old) or 8-10 h of sleep per day (14-17 years old) (Tapia-Serrano et al., 2022). In relation to active and sedentary behaviours, only 23.4% of Spanish adolescents comply with physical activity recommendations (Guthold et al., 2020) and 49.1% complied with screen time recommendations before the COVID pandemic (Moraleda-Cibrián et al., 2022).

Scientific evidence indicates that gender, age, or school context are some of the most influential determinants in shaping active lifestyles and influencing health outcomes (Biddle, Atkin et al., 2011; Graham et al., 2014). Research consistently shows that gender differences impact PA levels, with boys typically engaging in more MVPA than girls, often due to sociocultural expectations and access to resources (Brazo-Sayavera et al., 2021; Kretschmer et al., 2023; Sevil et al., 2017). It has also been observed that girls engage in a greater proportion of objectively sedentary time than boys among children and adolescents (Cooper et al., 2015), although there are studies in which these gender differences depend on the type of sedentary activity (educational purposes, social, or technology-based recreation) (Valencia-Peris et al., 2016; Velázquez-Romero et al., 2021). Furthermore, research indicates that adolescents are more sedentary than children, with PA levels decreasing as they progress through school (Moreno et al., 2020). This trend is influenced by a combination of factors, including an increase in academic demands, as well as a rise in screen time associated with both educational and recreational activities (Wang et al., 2019).

Declining PA levels have led institutions and governments to raise alarms about the rising incidence of various diseases (González et al., 2017), with the result that PA is becoming a cornerstone of health and social policy. International and European policies are promoting holistic school approaches, offering various structured domains for health and PA promotion (Cope & Bailey, 2017). In this scenario, schools are seen as key venues in addressing a wide range of public health issues, and PA should be included in all areas where children live, study, and play (Inman et al., 2011). The school context also serves as a primary environment in which structured opportunities for PA can be provided or limited, shaping students' daily routines and attitudes toward lifelong fitness. A recent review of the different actions conducted by European active schools (Bailey et al., 2023) found that the six settings that have the potential to add PA to schoolchildren's lifestyles (although none suffices on its own) were: active breaks, active homework, active learning, active recess, active transport, and school sports programs. Addressing these determinants is essential for designing targeted interventions that foster inclusive, accessible, and sustainable PA habits among young people.

According to the World Health Organization (WHO), a health-promoting school aims to create a healthy environment for living, learning, and working, fostering a setting that encourages community members to make healthy choices and adopt a lifestyle involving physical, social, and psychological health (WHO & UNESCO, 2021). This approach aligns closely with the concept of *salutogenesis* (Antonovsky, 1979), which posits that individuals can enhance their own health and quality of life and is linked to identifying health assets –resources that strengthen the ability of individuals or groups to maintain and improve health and well-being (Morgan & Ziglio, 2007)–.

In Spain, health-promoting schools are present in diverse forms in the different autonomous communities, although the administrations involved are working to promote the creation, development, and implementation of a joint strategy for the promotion of school health (Ministerio de Sanidad & Ministerio de Educación, Formación Profesional y Deportes, 2023). This paper focuses on the Valencian Community, a region in Eastern Spain with five million inhabitants, predominantly state schools, and a million primary and secondary students. In this autonomous community, schools that wish to promote health apply for an annual call published by the administration in which they present an educational project to promote PA and sport among their pupils (Generalitat Valenciana, 2023). Once the call for applications has been resolved and funding has been provided for these projects, the actions must be implemented during the current school year. In this way they become "Educational Institutions for the promotion of physical activity and sport". In this paper these schools are referred to as "Active schools".

A substantial body of research has been conducted to assess the strategies employed by educational institutions to promote health and the challenges encountered in implementing interventions across different age groups (Cassar et al., 2019) and various frameworks and comprehensive approaches have been proposed to address these challenges (Daly-Smith et al., 2020), underscoring the importance of context as a key factor (Jago et al., 2023). Despite this, the effectiveness of these health-promoting initiatives remains a topic of debate. The effectiveness of school-based interventions in increasing PA and reducing sedentary behaviour in children aged 5-11 years, 15-19-year-old adolescents and, > 10-year-old children and adolescents, respectively, has been evaluated in a series of systematic reviews conducted by Borde et al. (2017), Hynynen et al. (2016), and Jones et al. (2020), among others. Their findings indicate that these programs have had limited success and further investigation is required in order to elucidate the factors contributing to this outcome. Additionally, there is no unified approach, complicating the assessment of which parameters or criteria should be evaluated (Hahnraths et al., 2023; Joyce et al., 2017). In Spain, few studies have highlighted the indicators and requi-

rements that should be considered in the context of the health-promoting schools' approach (García-Vázquez et al., 2009; Lleixà et al., 2015, Ramos et al., 2013) and few have evaluated the actions of these schools or their impact on health in general and on students' PA and sedentary behaviour (García-Vázquez, 2017) with inconclusive findings.

The present study

The present study aimed to compare the levels of PA and sedentary screen activity of students based on whether they attend an Active school, their gender, and their educational stage. It is hypothesised that girls will engage in less PA and spend less time on screens, that PA levels will decline and screen time will increase as students progress through the school, and that those belonging to Active schools will be more active and less sedentary than their Non-Active school peers. This paper also sought to analyse the impact of the type of school on accomplishing PA and screen media recommendations in order to determine the effectiveness of Active school practices in promoting healthy lifestyles. In this regard, students in Active schools are expected to achieve a higher degree of compliance in both types of recommendations.

Method

Design

The study provides a descriptive and comparative analysis of the lifestyle habits, specifically PA and sedentary behaviour (screen media) of children and adolescents aged 8 to 18 during the academic year 2022/23. The participants were attending either an Active school or a Non-Active school.

Participants

A total of 727 students (82.5% participation rate) from six primary and secondary schools (four public and two private) in the province of Castelló (Valencian Community, Spain) participated in this study. The three Active schools were involved in a previous phase of the research project, while the Non-Active schools were selected based on proximity and type (public/private) to avoid bias related to the socio-economic status of the student body. The characteristics of the sample are given in Table 1. The participants' ages ranged from 8 to 18 years (M = 12.8, SD = 2.8), divided into three categories based on educational stage: Primary Education (8 to 11 years), Compulsory Secondary Education (12 to 16 years), and Post-Compulsory Secondary Education (17 and 18 years).

Instruments

Participants completed self-administered questionnaires using two validated data collection instruments. The Spanish version of the *Physical Activity Questionnaire* (PAQ) was used, with the PAQ-C version for children aged 8 to 12 years (Kowalski et al., 1997; Manchola-González et al., 2017), and the PAQ-A for adolescents aged 12 to 18 years (Martínez-Gómez et al., 2009). The PAQ is among the top three questionnaires endorsed by a panel of experts for its validity, reliability, and ease of administration, selected from a review of nearly 500 articles (Biddle, Gorely et al., 2011). The PAQ collects information on participation in different types of activities and sports (activity checklist), the level of effort during physical education classes, and activity during lunch, after school, evening, and at the weekend during the past 7 days. Each item is scored between 1 = *Low PA* and 5 = *Very high PA* and the average score denotes the PAQ score. A high score Indicates higher levels of PA. The internal consistency coefficients for the sample of this study were α = .85 for the PAQ-C and α = .89 for the PAQ-A, consistent with other studies (Crocker et al., 1997; Janz et al., 2008). Participants were also classified as physically active or inactive based on the study by Benítez-Porres et al. (2016), which established cut-off points of 2.75 for adolescents and 2.73 for children to meet international recommendations of 60 minutes of daily MVPA (Tapia-Serrano et al., 2022).

The *Youth Leisure Sedentary Behaviour Questionnaire* (YLSBQ) was used to measure daily time spent on sedentary screen-based activities. This questionnaire was developed and

Table 1

Characteristics of the sample

	Active school students	Non-Active school students	Total
	n (%)	*n* (%)	*n* (%)
Total	434 (59.7)	293 (40.3)	727 (100)
Gender			
Girls	226 (52.1)	140 (47.8)	366 (50.3)
Boys	208 (47.9)	153 (52.2)	361 (49.7)
Educational stage			
Primary Education	162 (37.3)	140 (47.8)	302 (41.5)
Compulsory Secondary Education	183 (42.2)	128 (43.7)	311 (42.8)
Post-Compulsory Secondary Education	89 (20.5)	25 (8.5)	114 (15.7)

validated on a large sample of Spanish children and adolescents aged 8 to 18 years (Cabanas-Sánchez et al., 2018) and was shown to have acceptable reliability and validity. Participants reported the average daily time spent on various sedentary activities during the previous week, including both weekdays and weekends, outside school hours. The items included sedentary screen media activities such as watching TV/videos/DVDs, playing video/PC games, and surfing the Internet for fun. The response options were as follows: none, 30 minutes, 1 hour, 2 hours, 3 hours, 4 hours, and 5 hours or more. A cut-off point of two hours of average daily screen time was used to determine whether participants met the recommended daily screen time (Tapia-Serrano et al., 2022).

Procedure

This study is part of a broader project conducted between 2021 and 2023, aimed at assessing the effectiveness, sustainability, and impact on schoolchildren's healthy lifestyles in the Valencian Community's Active schools. The materials and procedures used were previously approved by the Ethics Committee of the University of Valencia (code: 2091171) and the Regional Secretariat for Education and Vocational Training. During data collection, current ethical and legal standards for research involving human subjects and data protection were strictly adhered to. All the participating schools obtained approval from their respective governing councils to conduct this study. Informed consents were required from participants aged 16 years and older and from family members or guardians of those under 16 years of age prior to administering the questionnaires.

The research team followed the protocol established for the project, ensuring that students were given guidance in completing the questionnaires and had the opportunity to address any questions or concerns that arose during the process.

Data analysis

Data codification, processing, and analysis were completed using IBM SPSS statistical software (Version 28). A multivariate analysis of the variance (MANOVA) was first carried out with continuous variables, with the appropriate ANOVA follow-ups, to detect whether there were any significant differences in the PA and sedentary screen media patterns according to gender (girls and boys), educational stage (Primary Education, Compulsory Secondary Education and Post-Compulsory Secondary Education), and type of school (Active and Non-Active). Bonferroni post-hoc test was used for examining statistical differences among the three educational stages. Further analyses were then carried out to test the hypotheses for the samples used to compare the different categorical variables (% of PA and screen media guidelines accomplishment) through Chi-square tests of independence, with Cramer's V also being used to measure the effect size. These tests were used with a 95% confidence interval and a $p < .05$ level of statistical significance.

Results

The global mean for the whole sample in PA was 2.55 points ($SD = 0.74$), with only 40% being physically active, and the daily mean dedicated to sedentary screen activities was 2.8 hours ($SD = 1.47$) and only 26.2% of the participants accomplished the < 2h/day guideline.

To detect any significant differences in the active and sedentary behaviour according to the participants' socio-demographic profile, a MANOVA 2 x 3 x 2 (gender, educational stage, type of school) was carried out for the PA score and screen media time. The multivariate analysis revealed a significant main effect in relation to gender (Wilks' lambda = .07; $F_{(2,683)} = 53.87$; $p < .001$; $\eta^2 = .136$), educational stage (Wilks' lambda = .85;

Table 2

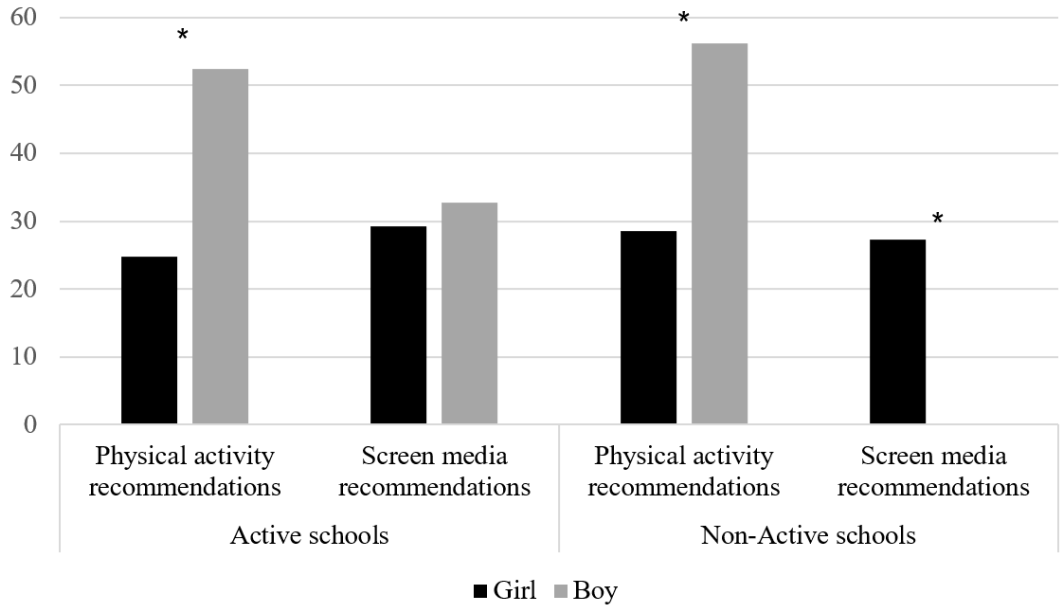
Physical activity score and screen media time by students according to sociodemographic variables

	PAQ score		Screen media time (h/day)	
	M ± *SD*	*p*	*M* ± *SD*	*p*
Gender				
Girls	2.29 ± 0.7	<.001	2.54 ± 1.34	<.001
Boys	2.82 ± 0.68		3.14 ± 1.54	
Educational stage				
Primary Education	2.85 ± 0.65		2.60 ± 1.56	
Compulsory Secondary Education	2.50 ± 0.68	<.001	2.97 ± 1.42	<.001
Post-compulsory Secondary Education	1.90 ± 0.7		3.04 ± 1.27	
Type of school				
Active school	2.49 ± 0.77	.176	2.75 ± 1.46	.019
Non-Active school	2.64 ± 0.69		2.94 ± 1.47	

Note. *M* ± *SD*: Mean ± Standard Deviation.

Figure 1

Percentage of PA and screen time guidelines accomplishment by gender and type of school



*$p < .05$.

$F_{(4,1366)} = 29.11$; $p < .001$; $\eta^2 = .08$), and type of school (Wilks' lambda = .99; $F_{(2,683)} = 4.11$; $p = .017$; $\eta^2 = .012$). The interaction effects were not significant.

The results of the follow-up ANOVAs (Table 2) showed significant differences according to gender in the PAQ score ($F_{(1,684)} = 78.24$; $p < .001$; $\eta^2 = .103$) and screen media time ($F_{(1,684)} = 23.18$; $p < .001$; $\eta^2 = .033$). Girls participated less than boys in both PA and sedentary use of technological media, while significant differences were found in relation to the educational stage for PA ($F_{(2,684)} = 52.66$; $p < .001$; $\eta^2 = .133$) and screen media time ($F_{(2,684)} = 10.76$; $p < .001$; $\eta^2 = .031$). According to the results of the Bonferroni post-hoc test, there were significant differences between all the educational stages for PA with the levels declining as the educational stage advanced ($p < .001$). However, primary students were the ones who engaged the least in screen media compared to the adolescents in Compulsory and Post-Compulsory Secondary Education ($p < .05$). Significant differences in the type of school emerged only for screen time ($F_{(1,684)} = 5.54$; $p < .001$; $\eta^2 = .008$), in which the students who went to Non-Active schools engaged more in screen time activities than those who attended an Active school ($p < .05$).

Significant differences were found for PA accomplishment in the percentage of the subjects' guideline accomplishment by gender and type of school (Figure 1), with more boys achieving the recommendations than girls in both Active ($\chi^2_{(1)} = 35.08$; $p < .001$; $V = .28$) and Non-Active schools ($\chi^2_{(1)} = 22.78$; $p < .001$; $V = .28$). Significant differences were also found for engagement in screen media by gender, but only in students who attended a non-Active school ($\chi^2_{(1)} = 8.07$; $p < .001$; $V = .37$), where any boy dedicated < 2 hours per day to screen media.

A significant reduction in meeting the recommendations were found for PA accomplishment as the educational stage advanced in both the Active ($\chi^2_{(2)} = 46.72$; $p < .001$; $V = .33$) and Non-Active schools ($\chi^2_{(2)} = 21.35$; $p < .001$; $V = .27$) (Figure 2). In both cases, the corrected standardised residuals indicated that the differences emerged between students from Primary Education and Post-Compulsory Secondary Education (difference of 42.7 and 46.3 percentage points on Active schools and Non-Active schools respectively). Screen time guideline accomplishment also declined as the educational stage advanced, both for the Active ($\chi^2_{(2)} = 15.68$; $p < .001$; $V = .19$) and Non-Active school students ($\chi^2_{(2)} = 7.32$; $p < .001$; $V = .16$). The corrected standardised residuals indicated that the differences in Active schools existed between Primary Education and Compulsory Secondary Education students (difference of 35.4 percentage points), while in the Non-Active schools, the differences were only found for Primary Education students.

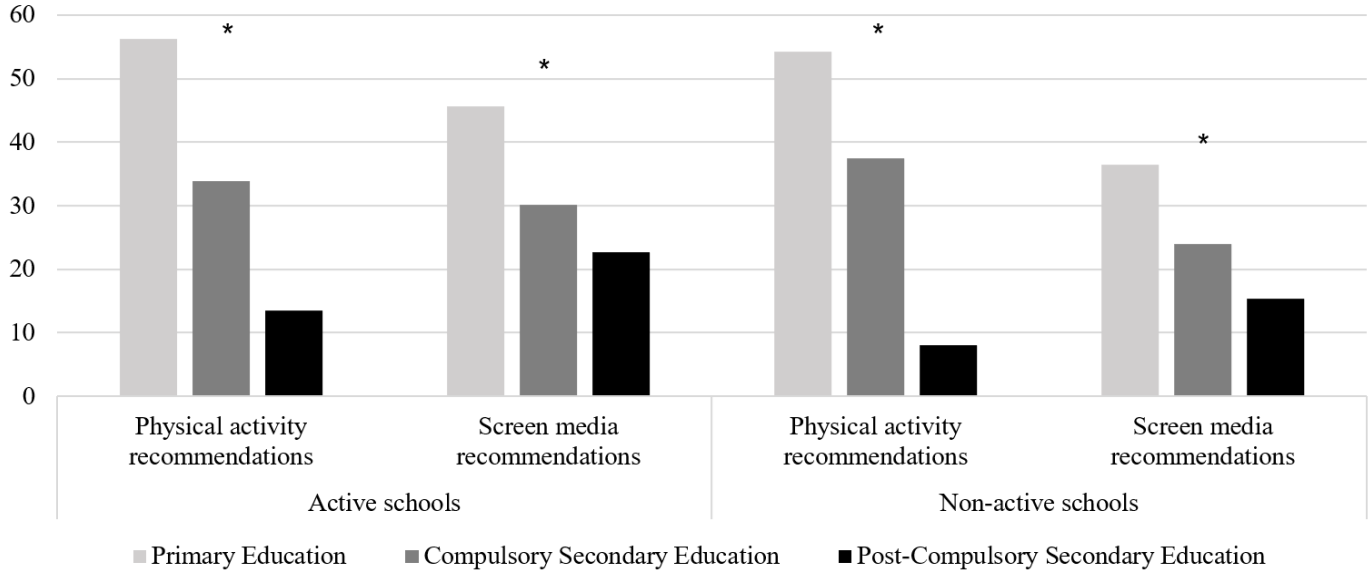
Discussion

The authors consider that this is the first study to compare the lifestyle habits related to PA and sedentary behaviour of children and adolescents attending Active and Non-Active schools in the Valencian Community (Spain), identifying the possible differences in gender and educational stage.

The first hypothesis was fully supported. The results indicate that boys reported higher PA levels and accomplished the recommendations more than girls in the study sample, in line with previous international and national research studies (Guthold et al., 2020; Moreno et al., 2020; Sevil-Serrano et al., 2017). This difference could be due to social norms, access to resources, or environmental variables and policies (García-Vázquez et al., 2009; Sallis et al., 2006). According to Van Sluijs et al. (2021), the strongest barriers to girl's participation in PA may lie "closer" to the

Figure 2

Percentage of PA and screen time guidelines accomplishment by educational stage and type of school



*$p < .05$.

individual, such as the values and support of family and friends, perceptions of safety in a built-up environment, and opportunities to be active within school, including inclusive quality physical education. However, in the present study, belonging to an Active school does not contribute to reducing gender inequalities in PA levels or to increased compliance with the PA recommendations. Therefore, it is imperative to address these differences to promote equitable PA opportunities for all genders and foster healthier lifestyles among adolescents (Van Sluijs et al., 2021).

Regarding sedentary behaviour, significant differences were also found, with boys spending more time on screens than girls, as found in previous studies (Stiglic & Viner, 2019), but only in Non-Active schools. While 27.3% of the girls met the screen media recommendations, none of the boys in Primary Education stage (8-11 years) dedicated less than 2 hours per day to this type of behaviour. However, we found a promising result in that no gender differences were found in the compliance with screen recommendations in Active schools. In this regard, and in line with other studies (Beck et al., 2021; García-Vázquez, 2017), the effectiveness of Active or health-promoting schools continues to be questioned.

The second hypothesis was also confirmed. There was a decline in PA and an increase in the time engaged in screen media devices as the educational stages advanced. Notable differences in PA guidelines accomplishment were observed between Primary Education and Post-Compulsory Secondary Education students. This trend aligns with international findings (Iannotti & Wang, 2013), suggesting that as students advance in their education, their participation in PA tends to decrease due to factors such as increased academic workload, shifting priorities, lack of time, study-related sedentary behaviour, and changes in the social environment. In this regard, differences in screen media usage by educational stage were observed in both types of school, with Primary Education students being more likely to meet the < 2 h/day criteria. This phenomenon is confirmed by other studies that found a positive correlation between a child's age and screen time (Shalani et al., 2021), indicating that older children are more likely to use screen media devices than younger children. Promoting PA and non-sedentary habits from both school and families is paramount. Some studies highlight the importance of multicomponent approaches to reduce screen time in youth (Ahmed et al., 2022), as well as sustainable interventions (more than seven months), including health-promoting curricula or counselling (Wu et al., 2016). It is therefore essential to foster collaboration between the various stakeholders, families, and schools from an early age to achieve optimal outcomes. This should be a primary objective in the intervention programmes, given that children's habits are influenced by a multitude of factors (Katz et al., 2008), including their parents, peers, environments, and policies used. Practices and interventions are most effective when they incorporate these components (Sevil et al., 2020).

Finally, the third hypothesis was partially rejected as there were inconsistent results relating to active and sedentary behaviour and attending Active schools. It is worth noting that no significant differences were found in PA levels between students from Active and Non-Active schools, a finding that contradicts previous studies that defended the effectiveness of health-promoting schools (Langford et al., 2014; St. Leger & Nutbeam, 2009), while they agree with those that question that these schools are fulfilling their mission (Beck et al., 2021; García-Vázquez, 2017). However, an encouraging result emerged, as the students who did not attend an Active school engaged more in sedentary screen time than those who did attend one, so that there is a significant difference in screen use between children who attend schools with extracurricular PA programmes (Active schools) and those who do not. In this sense, Active

schools positively influence students to spend less time in sedentary activities than their counterparts. In the same vein and in regard to compliance with the recommendations, Active schools can be expected to achieve a higher level of PA adherence and screen time recommendations (Kriemler et al., 2011; Van Slujis et al., 2007). However, we found that the percentage of PA and screen time compliance were similar for the students in both types of school, highlighting the importance of considering the context, the barriers, and any possible limitations of active lifestyle programs (Jago et al., 2013; Jones et al., 2020).

Practical implications

The findings of the present study have significant theoretical and practical implications. It is evident that a health-promoting approach is necessary to improve children's healthy lifestyles. As a social institution, the school should lead this campaign by addressing its students' health inequalities (i. e., gender, age, or socio-economic status, among others). However, it is also clear that several other factors can contribute to the limited effectiveness of health promotion initiatives. These include a lack of long-term funding, rapid staff turnover, and poor integration of the curriculum in the interventions (Herlitz et al., 2020), as well as a lack of institutional support, inadequate resources and ongoing training, adaptation to the context, community involvement, evaluation, and continuous feedback (Lleixà et al., 2015, Ramos et al., 2013), considered key factors in ensuring the effectiveness and sustainability of school programs (Cassar et al., 2019, Van Sluijs et al., 2007). For example, Talavera (2008) identified difficulties such as lack of time, recognition, support and coordination between teachers, lack of materials and resources, educational and family involvement precisely in the Valencian schools' health-promoting approach. In reference to the context, Jago et al. (2023) propose that in the school's immediate context, the design of their interventions should be considered key factors in health-promoting schools, both in their planning and subsequent evaluation.

The literature emphasises the importance of a holistic and collaborative approach to the design, implementation, and evaluation of school-based interventions in health-promoting schools (Lleixà et al., 2015; Sevil-Serrano et al., 2020). This approach involves using multi-component, multi-level, and multi-behavioural programs (Daly-Smith et al., 2020; WHO, 2021), which have been identified as the most promising methods of improving and sustaining young people's healthy behaviour, while emphasizing the importance of stakeholder engagement.

This study has several limitations that should be pointed out. First, the Non-Active schools only provided participants from the third year of Primary Education to the first year of Post-Compulsory Secondary Education. Secondly, the participants in the sample were from a specific region of the Valencian Community, so that the results may not represent the entire autonomous community. Thirdly, the effects of belonging to an Active school may not only impact daily PA or sedentary time, but it may also be of interest to study how they affect PA levels according to the day of the week, socio-economic status, or other health-related factors (active commuting, sleep, diet, addictions, etc.) and how these PA programs and settings are developed (active breaks, active homework, active learning or active transport, sports programs, etc.).

In the light of these findings, there is a need for continued improvement in the multi-element strategies as regards context and curriculum. The findings also underscore the importance of implementing effective strategies to reduce screen time and promote PA, particularly among schoolchildren and adolescents. It is clear that health-promoting strategies should consider the subjects' age, gender, and educational differences to mitigate the risks associated with inactive and sedentary lifestyles and improve overall well-being. Due to the specific conditions of individual schools and locations, the results cannot be generalised to other contexts, so that future studies should build on previous research and broaden the sample to include different experiences and strategies.

Conclusions

The results of this study indicate that overall differences in PA and screen media usage by gender and educational level are slightly influenced by attending an Active school. We also focused on adhering to international PA and screen media recommendations and found that less than half the students met the MVPA guidelines (1h/day), while less than a third complied with the screen time recommendations (< 2 h/day).

Gender inequalities were identified in compliance with PA recommendations in both Active and Non-Active schools, while gender-based differences in average screen time were found only in Non-Active schools. Boys engaged in more PA and screen time than girls regardless of the type of school attended. There was also a notable decline in complying with PA and screen time guidelines as students progressed through the different educational levels in both types of school. While PA declines, screen media time increases with age in both types of school. However, students in non-Active schools engaged in more sedentary screen time than those in Active schools although there were no differences in PA by type of school.

Author contributions

Conceptualization: A.V.P., L.S.F., C.C.R.
Methodology: A.V.P., L.S.F., C.C.R.
Software: A.V.P., C.C.R.
Validation: A.V.P., L.S.F., C.C.R.
Formal analysis: A.V.P., L.S.F., C.C.R.
Research: L.S.F., C.C.R.
Resources: A.V.P., C.C.R.
Visualization: A.V.P., L.S.F.
Supervision: A.V.P.
Project administration: A.V.P.
Acquisition of funds: A.V.P.
Data curation: A.V.P., C.C.R.
Writing – original draft: L.S.F., C.C.R.
Writing – Review & editing: A.V.P., L.S.F., C.C.R.

Funding

This work was supported by the Conselleria d'Innovació, Universitats, Ciència i Societat Digital (Comunitat Valenciana, Spain) under grant number AICO/2021/342.

Declaration of interests

The authors declare that there is no conflict of interests.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

References

Ahmed, K. R., Kolbe-Alexander, T., & Khan, A. (2022). Effectiveness of a school-based intervention on physical activity and screen time among adolescents. *Journal of Science and Medicine in Sport*, *25*(3), 242-248. https://doi.org/10.1016/j.jsams.2021.10.007

Antonovsky, A. (1979). *Health, stress and coping.* The Jossey-Bass Social and Behavioral Science Series Inc.

Bailey, R., Ries, F., & Scheuer, C. (2023). Active schools in Europe. A review of empirical findings. *Sustainability, 15*(4), Article 3806. https://doi.org/10.3390/su15043806

Beck, H., Tesler, R., Barak, S., Moran, D. S., Marques, A., & Harel Fisch, Y. (2021). Can health-promoting schools contribute to better health behaviors? Physical activity, sedentary behavior, and dietary habits among Israeli adolescents. *International Journal of Environmental Research and Public Health*, *18*(3), Article 1183. https://doi.org/10.3390/ijerph18031183

Benítez-Porres, J., Alvero-Cruz, J.R., Sardinha, L.B., López-Fernández, I., Carnero, E.A. (2016). Cut-off values for classifying active children and adolescents using the Physical Activity Questionnaire: PAQ-C and PAQ-A. Nutrición Hospitalaria, 33(5), 1036-1044. http://dx.doi.org/10.20960/nh.564

Biddle, S. J., Atkin, A. J., Cavill, N., & Foster, C. (2011). Correlates of physical activity in youth: A review of quantitative systematic reviews. *International Review of Sport and Exercise Psychology*, *4*(1), 25-49. https://doi.org/10.1080/1750984X.2010.548528

Biddle, S. J., Gorely, T., Pearson, N., & Bull, F. C. (2011). An assessment of self-reported physical activity instruments in young people for population surveillance: Project ALPHA. *International Journal of Behavioral Nutrition and Physical Activity, 8*(11), Article 1. https://doi.org/10.1186/1479-5868-8-1

Borde, R., Smith, J. J., Sutherland, R., Nathan, N., & Lubans, D. R. (2017). Methodological considerations and impact of school-based interventions on objectively measured physical activity in adolescents: A systematic review and meta-analysis. *Obesity Reviews: an Official Journal of the International Association for the Study of Obesity, 18*(4), 476-490. https://doi.org/10.1111/obr.12517

Brazo-Sayavera, J., Aubert, S., Barnes, J. D., González, S. A., & Tremblay, M. S. (2021). Gender differences in physical activity and sedentary behavior: Results from over 200,000 Latin American children and adolescents. *PLoS One, 16*(8), Article e0255353. https://doi.org/10.1371/journal.pone.0255353

Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., Carty, C., Chaput, J.-P., Chastin, S., Chou, R., Dempsey, P. C., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C. M., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P. T., … Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine, 54*(24), 1451-1462. https://doi.org/10.1136/bjsports-2020-102955

Cabanas-Sánchez, V., Martínez-Gómez, D., Esteban-Cornejo, I., Castro-Piñero, J., Conde-Caveda, J., & Veiga, Ó. L. (2018). Reliability and validity of the Youth Leisure-time Sedentary Behavior Questionnaire (YLSBQ). *Journal of Science and Medicine in Sport, 21*(1), 69-74. https://doi.org/10.1016/j.jsams.2017.10.031

Cassar, S. Salmon, J., Timperio, A., Naylor, P., Van Nassau, F., Ayala, A. M., & Koorts, H. (2019). Adoption, implementation and sustainability of school-based physical activity and sedentary behaviour interventions in real-world settings: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 16*(1), Article 120. https://doi.org/10.1186/s12966-019-0876-4

Cooper, A. R., Goodman, A., Page, A. S., Sherar, L. B., Esliger, D. W., van Sluijs, E. M. F., Andersen, L. B., Anderssen, S., Cardon, G., Davey, R., Froberg, K., Hallal, P., Janz, K. F., Kordas, K., Kreimler, S., Pate, R. R., Puder, J. J., Reilly, J. J., Salmon, J., Sardinha, L. B., Timperio, A., & Ekelund, U. (2015). Objectively measured physical activity and sedentary time in youth: The International Children's Accelerometry Database (ICAD). *International Journal of Behavioral Nutrition and Physical Activity, 12*(1), Article 113. https://doi.org/10.1186/s12966-015-0274-5

Cope, E.C., & Bailey, R. (2017). *A review of research and evidence on factors that impact on children's sport and physical activity behaviours and attitudes*. Sport England.

Crocker, P. R., Bailey, D. A., Faulkner, R. A., Kowalski, K. C., & McGrath, R. (1997). Measuring general levels of physical activity: Preliminary evidence for the Physical Activity Questionnaire for Older Children. *Medicine & Science in Sports & Exercise*, *29*(10), 1344-1349. https://doi.org/10.1097/00005768-199710000-00011

Daly-Smith, A., Quarmby, T., Archbold, V., Corrigan, N., Wilson, D., Resaland, G., Singh, A., & Chalkley, A. (2020). Using a multistakeholder experience-based design process to co-develop the Creating Active Schools Framework. *International Journal of Behavioral Nutrition and Physical Activity, 17*, Article 13. https://doi.org/10.1186/s12966-020-0917-z

García-Vázquez, J. (2017). Effects of the School for Health network on students' behaviour in Asturias (Spain). *Health Promotion International, 32*(2), 271-279. https://doi.org/10.1093/heapro/dau076

García-Vázquez, J., Blanco, A. G., García, N., García, M., Álvarez, T., Rodríguez-Vigil, L., Martín, R., Valdeón, E., López, C., González, E., & Del Río, L. (2009). Evaluación de las escuelas promotoras de salud en Asturias (España). *Global Health Promotion, 16*(3), 96-106. https://doi.org/10.1177/1757975909339772

Generalitat Valenciana (2023). *Guia Centre Educatiu Promotor de l'Activitat Física i l'Esport (CEPAFE). Projecte d'Esport, Activitat Física i Salut (PEAFS).* Direcció General d'Esport.

González, K., Fuentes, J., & Márquez, J. L. (2017). Physical inactivity, sedentary behavior, and chronic diseases. *Korean Journal of Family Medicine, 38*(3), 111-115. https://doi.org/10.4082/kjfm.2017.38.3.111

Graham, D. J., Wall, M. M., Larson, N., & Neumark-Sztainer, D. (2014). Multicontextual correlates of adolescent leisure-time

physical activity. *American Journal of Preventive Medicine*, *46*(6), 605-616. https://doi.org/10.1016/j.amepre.2014.01.009

Guthold, R., Stevens, G., Riley, L., & Bull, F. (2020). Global trends in insufficient physical activity among adolescents: A pooled analysis of 298 population-based surveys with 1.6 million participants. *Lancet Child & Adolescent Health, 4*(1), 23-35. https://doi.org/10.1016/S2352-4642(19)30323-2

Hahnraths, M., Willeboordse, M., & Van Schayck, C. P. (2023). Challenges in evaluating implementation and effectiveness in real-world settings: Evaluation proposal for school-based health-promoting intervention. *Health Promotion International, 38*(1), Article daac185. https://doi.org/10.1093/heapro/daac185

Herlitz, L., MacIntyre, H., Osborn, T., & Bonell, C. (2020). The sustainability of public health interventions in schools: A systematic review. *Implementation Science, 15*, Article 4. https://doi.org/10.1186/s13012-019-0961-8

Hynynen, S., van Stralen, M. M., Sniehotta, F. F., Araujo-Soares, V., Hardeman, W., Chinapaw, M. J. M., Vasankarif, T., & Hankonen, N. (2016). A systematic review of school-based interventions targeting physical activity and sedentary behaviour among older adolescents. *International Review of Sport and Exercise Psychology, 9*(1), 22-44. https://doi.org/10.1080/1750984X.2015.1081706

Iannotti, R. J., & Wang, J. (2013). Trends in physical activity, sedentary behavior, diet, and BMI among U.S. adolescents, 2001-2009. *Pediatrics, 132*(4), 606-614. https://doi.org/10.1542/peds.2013-1488

Inman, D., Van B., K., LaRosa, A., & Garr, D. (2011). Evidence-based health promotion programs for schools and communities. *American Journal of Preventive Medicine, 40*(2), 207-219. https://doi.org/10.1016/j.amepre.2010.10.031

Jago, R., Salway, R., House, D., Beets, M., Lubans, D. R., Woods, C., & De Vocht, F. (2023). Rethinking children's physical activity interventions at school: A new context-specific approach. *Frontiers in Public Health, 11*, Article 1149883. https://doi.org/10.3389/fpubh.2023.1149883

Janz, K. F., Lutuchy, E. M., Wenthe, P., & Levy, S. M. (2008). Measuring activity in children and adolescents using self-report: PAQ-C and PAQ-A. *Medicine & Science in Sports & Exercise*, *40*(4), 767-772. https://doi.org/10.1249/mss.0b013e3181620ed1

Jones, M., Defever, E., Letsinger, A., Steele, J., & Mackintosh, K. A. (2020). A mixed-studies systematic review and meta-analysis of school-based interventions to promote physical activity and/or reduce sedentary time in children. *Journal of Sport and Health Science, 9*(1), 3-17. https://doi.org/10.1016/j.jshs.2019.06.009

Joyce, C., Honey, E., Leekam, S. R., Barrett, S., & Rodgers, J. (2017). Anxiety, intolerance of uncertainty, and restricted and repetitive behaviour: Insights directly from young people with ASD. *Journal of Autism and Developmental Disorders, 47*, 3789-3802. https://doi.org/10.1007/s10803-017-3027-2

Katz, D. L., O'Connell, M., Njike, V. Y., Yeh, M. C., & Nawaz, H. (2008). Strategies for the prevention and control of obesity in the school setting: Systematic review and meta-analysis. *International Journal of Obesity, 32*, 1780-1789. https://doi.org/10.1038/ijo.2008.158

Kowalski, K. C., Crocker, P. R. E., & Faulkner, R. A. (1997). Validation of the physical activity questionnaire for older children. *Pediatric Exercise Science, 9*(2), 174-186. https://doi.org/10.1123/pes.9.2.174

Kretschmer, L., Salali, G. D., Andersen, L. B., Hallal, P. C., Northstone, K., Sardinha, L. B., Dyble, M., Bann, D., & International Children's Accelerometry Database (ICAD) Collaborators. (2023). Gender differences in the distribution of children's physical activity: Evidence from nine countries. *International Journal of Behavioral Nutrition and Physical Activity, 20*, Article 103. https://doi.org/10.1186/s12966-023-01496-0

Kriemler, S., Meyer, U., Martin, E., Van Sluijs, E. M. F., Andersen, L. B., & Martin, B. W. (2011). Effect of school-based interventions on physical activity and fitness in children and adolescents: A review of reviews and systematic update. *British Journal of Sports Medicine, 45*(11), 923-930. https://doi.org/10.1136/bjsports-2011-090186

Kuzik, N., Da Costa, B. G. G., Hwang, Y., Verswijveren, S. J. J. M., Rollo, S., Tremblay, M. S., Bélanger, S., Carson, V., Davis, M., Hornby, S., Huang, W. Y., Law, B., Salmon, J., Tomasone, J. R., Wachira, L.-J., Wijndaele, K., & Saunders, T. J. (2021). School-related sedentary behaviours and indicators of health and well-being among children and youth: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 189*, Article 40. https://doi.org/10.1186/s12966-022-01258-4

Langford, R., Bonell, C., Jones, H., Pouliou, T., Murphy, S., Waters, E., Komro, K., Gibbs, L., Magnus, D., Campbell, R., & Synnot, A. (2014). The World Health Organization's Health Promoting Schools framework: A Cochrane systematic review and meta-analysis. *BMC Public Health, 14*, Article 1222. https://doi.org/10.1186/1471-2458-14-1222

Lleixà, T., González, C., Monguillot, M., Daza, G., & Braz, M. (2015). Indicadores de calidad para los centros escolares promotores de actividad física y deportiva. *Apunts. Educación Física y Deportes, 120*, 27-35. https://doi.org/10.5672/apunts.2014-0983.es.(2015/2).120.04

Manchola-González, J., Bagur-Calafat, C., & Girabent-Farrés, M. (2017). Fiabilidad de la versión española del cuestionario de actividad física PAQ-C. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte, 17*(65), 139-152.

Martínez-Gómez, D., Martínez-de-Haro, V., Pozo, T., Welk, G. J., Villagra, A., Calle, M., Marcos, A., & Veiga, O. (2009). Fiabilidad y validez del cuestionario de actividad física PAQ-A en adolescentes españoles. *Revista Española de Salud Pública, 83*, 427-439.

Ministerio de Sanidad, & Ministerio de Educación, Formación Profesional y Deportes. (2023). *Guía de escuelas promotoras de salud*. Ministerio de Sanidad; Ministerio de Educación, Formación Profesional y Deportes.

Moraleda-Cibrián, M., Albares-Tendero, J., & Pin-Arboledas, G. (2022). Screen media use and sleep patterns in Spanish adolescents during the lockdown of the coronavirus pandemic. *Sleep and Breathing*, *26*, 1993-2000. https://doi.org/10.1007/s11325-021-02558-y

Moreno, C., Ramos, P., Rivera, F., Sánchez, I., Jiménez-Iglesias, I., Moreno-Maldonado, C., Paniagua, C., Villafuerte-Díaz, A., Cria-Barreiro, E., Morgan, A., & Leal-López, E. (2020). *La adolescencia en España: Salud, bienestar, familia, vida académica y social. Resultados del Estudio HBSC 2018*. Ministerio de Sanidad. https://www.sanidad.gob.es/areas/promocionPrevencion/entornosSaludables/escuela/estudioHBSC/2018/resultados.htm

Morgan, A., & Ziglio, E. (2007). Revitalising the evidence base for public health: An assets model. *Promotion & Education, 14*(2), 17-22. https://doi.org/10.1177/10253823070140020701x

Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J. P., Janssen, I., Katzmarzyk, P. T., Pate, R. R., Connor, S., Kho, M. E., Sampson, M., & Tremblay, M. S. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied*

Physiology, Nutrition, and Metabolism, 41(6), 197-239. https://doi.org/10.1139/apnm-2015-0663

Ramos, P., Pasarín, M. I., Artazcoz, L., Díez, E., Juárez, O., & González, I. (2013). Escuelas saludables y participativas: Evaluación de una estrategia de salud pública. *Gaceta Sanitaria, 27*(2), 104-110. https://doi.org/10.1016/j.gaceta.2012.04.002

Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). An ecological approach to creating active living communities. *Annual Review of Public Health, 27*(1), 297-322. https://doi.org/10.1146/annurev.publhealth.27.021405.102100

Sevil-Serrano, J., Abarca-Sos, A., Abadías-Granado, J., Calvo-Ferrer, D., & García-González, L. (2017). Cumplimiento de las recomendaciones de práctica de actividad física y percepción de barreras en estudiantes de Bachillerato. *Cultura, Ciencia y Deporte, 12*(36), 183-194.

Sevil-Serrano, J., Abós, A., Aibar, A., Simón-Montañés, L., & García-González, L. (2020). Orientaciones para la comunidad científica sobre el diseño, implementación y evaluación de intervenciones escolares sobre promoción de comportamientos saludables. *Cultura, Ciencia y Deporte, 15*(46), 507-517. https://doi.org/10.12800/CCD.V15I46.1601

Sanders, T., Noetel, M., Parker, P., Del Pozo Cruz, B., Biddle, S., Ronto, R., Hulteen, R., Parker, R., Thomas, G., De Cocker, K., Salmon, J., Hesketh, K., Weeks, N., Arnott, H., Devine, E., Vasconellos, R., Pagano, R., Sherson, J., Conigrave, J., & Lonsdale, C. (2024). An umbrella review of the benefits and risks associated with youths' interactions with electronic screens. *Nature Human Behaviour, 8*, 82-99. https://doi.org/10.1038/s41562-023-01712-8

Shalani, B., Azadfallah, P., & Farahani, H. (2021). Correlates of screen time in children and adolescents: A systematic review study. *Journal of Modern Rehabilitation, 15*(4), 187-208. https://doi.org/10.18502/jmr.v15i4.7740

St. Leger, L., & Nutbeam, D. (2009). A model for mapping linkages between health and education agencies to improve school health. *Journal of School Health, 70*(2), 45-50. https://doi.org/10.1111/j.1746-1561.2000.tb07239.x

Stiglic, N., & Viner, R. M. (2019). Effects of screentime on the health and well-being of children and adolescents: A systematic review of reviews. *BMJ Open*, *9*(1), Article e023191. https://doi.org/10.1136/bmjopen-2018-023191

Talavera, M. (2008). *Estudio de las dificultades para desarrollar la educación para la salud en la red de escuelas promotoras de salud de la Comunidad Valenciana* [Doctoral dissertation, Universitat de València].

Tapia-Serrano, M. A., Sevil-Serrano, J., Sanchez-Miguel, P. A., Lopez-Gil, J. F., Tremblay, M. S., & Garcia-Hermoso, A. (2022). Prevalence of meeting 24-Hour Movement Guidelines from pre-school to adolescence: A systematic review and meta-analysis including 387,437 participants and 23 countries. *Journal of Sport and Health Science*, *11*(4), 427-437. https://doi.org/10.1016/j.jshs.2022.01.005

Valencia-Peris, A., Devís-Devís, J., & Peiró-Velert, C. (2016). Involvement in sedentary activities and academic performance in adolescents: Differences according to sociodemographic variables. *Culture and Education*, *28*(2), 301-327. https://doi.org/10.1080/11356405.2016.1158451

Van Sluijs, E. M., Ekelund, U., Crochemore-Silva, I., Guthold, R., Ha, A., Lubans, D., Oyeyemi, A. L., Ding, D., & Katzmarzyk, P. T. (2021). Physical activity behaviours in adolescence: Current evidence and opportunities for intervention. *The Lancet, 398*(10298), 429-442. https://doi.org/10.1016/S0140-6736(21)01259-9

Van Sluijs, E. M., McMinn, A. M., & Griffin, S. J. (2007). Effectiveness of interventions to promote physical activity in children and adolescents: Systematic review of controlled trials. *BMJ*, *335*(7622), Article 703. https://doi.org/10.1136/bmj.39320.843947.BE

Velázquez-Romero, M. J., Padilla-Moledo, C., Segura-Jiménez, V., Sánchez-Oliva, D., Fernández-Santos, J. R., Senín-Calderón, C., & Graó-Cruces, A. (2021). Trends of sedentary time and domain-specific sedentary behavior in Spanish schoolchildren. *Research Quarterly for Exercise and Sport*, *92*(3), 460-468. https://doi.org/10.1080/02701367.2020.1749538

Wang, X., Li, Y., & Fan, H. (2019). The associations between screen time-based sedentary behavior and depression: A systematic review and meta-analysis. *BMC Public Health*, *19*, Article 1524. https://doi.org/10.1186/s12889-019-7904-9

Warburton, D., & Bredin, S. S. D. (2017). Health benefits of physical activity: A systematic review of current systematic reviews. *Current Opinion in Cardiology, 32*(5), 541-556. https://doi.org/10.1097/HCO.0000000000000437

WHO & UNESCO. (2021). *Making every school a health-promoting school: Implementation guidance*. World Health Organization. https://www.who.int/publications/i/item/9789240025073

Wu, L., Sun, S., He, Y., & Jiang, B. (2016). The effect of interventions targeting screen time reduction: A systematic review and meta-analysis. *Medicine, 95*(27), Article e4029. https://doi.org/10.1097/MD.0000000000004029

Alexandra Valencia-Peris, Lucia Sanchis-Francés,
Carlos Chinchilla-Ramírez

The influence of health-promoting schools on the students' active and sedentary behaviour
Influencia de las escuelas promotoras de salud en las conductas activas y sedentarias de los escolares

Psychology, Society & Education
vol. 17, no. 1, p. 1 - 10, 2025
Universidad de Córdoba,
ISSN: 2171-2085

DOI: https://doi.org/10.21071/psye.v17i1.17384