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Original article. Do Spanish minors, in their free time, prefer electronic devices or physical activity? Vol. 6, Issue 2; p. 347-364, may 2020. A Coruña. Spain ISSN 2386-8333

¿Los menores españoles, en su tiempo libre, prefieren dispositivos electrónicos o actividad física?

Do Spanish minors, in their free time, prefer electronic devices or physical activity?

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Resumen

Las nuevas generaciones viven expuestos diariamente a estímulos provenientes de dispositivos electrónicos y diversos instrumentos de ocio que llevan asociado su uso al mantenimiento de una conducta sedentaria. Hasta el momento no se han explorado las posibles relaciones existentes entre los diferentes componentes del estilo de vida en una muestra representativa de la población de menores españoles. Por ello, se diseñó la presente investigación con los objetivos de examinar el grado de exposición a pantallas de los niños españoles e identificar posibles relaciones en su estilo de vida entre dicho aspecto y otros hábitos como la práctica de ejercicio y las horas de descanso, así como, determinar si alguno de ellos influye en su salud mental. Los resultados obtenidos mostraron que la exposición a pantallas de los niños españoles es de 15 horas semanales, y que su estilo de vida, aunque mejorable, entra dentro de los estándares de salud en cuanto a horas de descanso y hábitos de actividad física. Las políticas preventivas de abuso de dispositivos electrónicos en menores en España deberían poner especial énfasis en el sector que peores resultados en las variables de salud mental obtuvieron en la presente investigación: niños menores de 7 años y con malos hábitos de descanso nocturno y/o más horas de exposición a pantallas.

Palabras clave

Tiempo libre; Psicología infantil; Actividad física; Estilos de vida; Videojuegos; niños.

Abstract

The new generations live exposed daily to stimuli from electronic devices that are associated with maintaining sedentary behavior. So far, the possible relationships between the different components of lifestyle have not been explored in a representative sample of the population of Spanish minors. For this reason, this research was designed with the objectives of examining the degree of exposure to screens of Spanish children and identifying possible relationships in their lifestyle and other habits such as exercising and resting hours, as well as determining whether some of them influence your mental health. The results obtained showed that the exposure of Spanish children to screens is 15 hours a week, and that their lifestyle, although it could be improved, falls within health standards in terms of hours of rest and physical activity habits. The preventive policies of abuse of electronic devices in minors in Spain should place special emphasis on the sector with the worst results in the variables of mental health obtained in the present investigation: children under 7 years of age and with poor night-time rest habits and / or more hours of exposure to screens.

Key words

Free time; Child psychology; Physical activity; Lifestyles; Video games; children.

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Introduction

Today, electronic devices are present in a multitude of everyday tasks and items such as mobile phones, tablets, computers and, of course, televisions are communication, work and leisure tools for the adults with whom children interact directly and indirectly (Brown and Smolenaers, 2018). Although research to date has shown uncertain results in its effects on children, the available evidence prioritises its risks over possible benefits: increased incidence of obesity due to the sedentary nature of electronic device use, reduced ability to concentrate and reduced development of social-emotional skills (Lissak, 2018; Livingstone and Franklin, 2018; Nightingale et al., 2017).

At the same time, it is estimated that the prevalence of child overweight will reach 20% for the under-school population by 2020 (De Onis, Blössner, and Borghi, 2010; Wang and Lim, 2012). At the same time, childhood obesity has been shown to correlate with adulthood and premature mortality (Reilly and Kelly, 2011). The practice of physical activity (PA) involves a series of physiological reactions, among which is the segregation of neurotransmitters and hormones that facilitate intellectual development by facilitating the generation of new neurons and multiplying and strengthening existing neuronal connections between encephalic areas related to memory and learning (Alfonso-Rosa, 2016; Erickson et al., 2011; Gearin and Fien, 2016). These phenomena, present throughout life, take on special relevance in children, in whom PA practice leads to improvements in basic intellectual skills such as emotional control, memory or the ability to adapt to different tasks and environments that are essential for optimal academic and emotional development (Arufe-Giráldez, 2019; Gómez-Pinilla and Hillman, 2013; Hillman et al., 2014; Portolés-Ariño and González-Hernández, 2016).

In the current context, both phenomena (use of electronic devices and sedentariness) are converging and interacting with each other, feeding back into each other (Nightingale et al., 2017; Sánchez-Zafra, 2019). Finally, and simultaneously, to the described scenario we must add the increased incidence of emotional disorders such as oppositional defiant, attention deficit hyperactivity disorder or emotional deregulation (Monsalve-Robayo, Mora-Caro, Ramírez-López, Rozo-Hernández, and Rojas Puerto, 2017; Ruiz and Castañeda, 2016).

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However, the possible relationships between the different lifestyle components (use of electronic devices, PA habits and nightly rest) have not been explored in sufficiently large and representative samples. Therefore, the present study was designed to examine the degree of exposure to screens of Spanish minors and to identify possible relationships in their lifestyle between this aspect and other habits such as PA practice and hours of rest, as well as to determine whether any of these habits influence their mental health. The initial hypothesis was that minors are exposed to electronic devices, that this habit has a direct influence on the time invested in PA practice and, in turn, that it also affects the state of mental health of Spanish children.

Material and methods

Experimental design

This empirical study was based on data drawn from the 2017 Spanish National Health Survey (2017) conducted by National Statistics Institute (NSI) and the Ministry of Health, Consumer Affairs and Social Welfare of the Spanish Government. The survey was developed by systematic sampling and equiprobability of being selected on their census records from 37500 homes all across the country between October of 2016 and October of 2017.

Sample

This study used data from 3799 surveys answered by an adult living with a child over 5 years old. Minors below this age were excluded because the quantification of PA in minors of this age without objective monitoring or direct observation lacks reliability (Oliver, Schofield, & Kolt, 2007). Of the total sample, the distribution by sex was 50.8% of men and 49.2% of women, and the mean age was 9.8 ± 2.9 years.

Study's variables

The following dependent variables were considered:

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- Frequency of physical activity performed by the minor in their free time: The result was the answer to the question *Which of these possibilities best describes how often you do some physical activity in your free time?* The answer options were: (a) no exercise; (b) some physical activity or occasionally; (c) several times a month; o (d) several times a week.

- The frequency of screen use during the week and at the weekend: These variables were operationalised with the following questions: *How long are you in front of a screen (computer, tablet, TV, videos, video games, mobile phone...) on a weekday?* (SFWD) and *How long are you in front of a screen (computer, tablet, TV, videos, video games, mobile phone...) on a weekend day?* (SFWE). The answer options were: (a) little or nothing; (b) less than an hour; or (c) an hour or more.

- The number of hours per day of screen use during the week and at the weekend: operated through the questions *What is the number of hours per day that you are in front of a screen from Monday to Friday?* (SHWD) and *What is the number of hours per day you are in front of a screen on Saturday and Sunday?* (SHWE) Both were recorded on a continuous number scale.

- The number of hours of rest (HR): by directly asking *How many hours of sleep do you usually get per day?* The number of hours that the child usually rests was recorded as a continuous numeric variable.

- Five variables offered by the NHS regarding children's mental health that assess the prevalence of risk of poor mental health in that population. For this purpose, the NHS included in its questionnaire the sub-module Strengths and Difficulties Questionnaire (Goodman, 2001). With the time frame being the last six months, the adult of reference assessed the behaviour that the minor had had concerning: (a) emotional symptoms; (b) behavioural problems; (c) hyperactivity; (d) problems with peers; and (e) prosocial behaviour. The score for these variables can be between 0 and 10 points, with 0 being the best score and 10 the worst. However, this scale is different for the score corresponding to prosocial behaviour, where 0 indicates the worst possible score and 10 the best.

The study independent variables were: (a) sex; (b) age (years); (c) weight (kg); (d) Body Mass Index (BMI) (kg/m^2), calculated from the weight and height reported by the adults, this variable was divided into five categories: infra-weight, normal weight, overweight and obesity. These categories were made following the recommendations of the *World Obesity Federation* (Cole, Flegal, Nicholls, & Jackson, 2007).

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Statistical analysis

For the analysis of the results, the sample of children was divided into three age groups: G1 de entre 5 and 7 years old (n = 977), G2 between 8 and 10 years old (n = 1093) and G3 between 11 and 14 years old (n = 1729).

To characterise the sample descriptive measures were taken (frequencies, percentages, mean, standard deviation and 95% confidence interval). The proportion test chi-square was used to perform tests on the equality of proportions using large. Observations with missing values were dropped automatically by the statistical software.

T-tests were used to determine differences among genders for continuous variables and ANOVA test to determine differences among age groups. Pearson's test was performed to assess correlations between the continuous dependent variables.

All statistical analysis was made with Stata for macOS, 12th version. Statistical significance was always set a value of $p < 0.05$.

Ethical aspects

This study was conducted on an unidentified publicly available dataset, with all data kept anonymous. This dataset has been developed by the Ministry of Health, Consumer affairs and Social welfare in collaboration with the NSI. According to Spanish legislation, it was not necessary to obtain the approval of an ethics committee.

Results

Sample characteristics

The study sample, made up of data from 3799 minors, had a gender distribution of 50.8% men and 49.2% women and a mean age of 9.8 ± 2.9 years. The participants as a whole

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(regardless of the age group to which they belonged) presented normal weight (Table 1). Analysing both sexes separately, within each age group, no significant differences were found concerning their BMI in G1 and G3. On the contrary, in G2, differences in BMI ($p = 0.023$) and weight ($p = 0.009$) were found. With respect to weight and height, differences between sexes were found in G3, ($p = 0.01$) and ($p = 0.002$) respectively.

Table 1.
Descriptive statistics of the study sample [data given: mean ± standard deviation (95% confidence interval)]

	Children (n = 3799)						
	All	**G1** (n = 977)		**G2** (n = 1093)		**G3** (n = 1729)	
		Boys	Girls	Boys	Girls	Boys	Girls
Age	9.8 ± 2.9 (9.7-9.9)	6 ± 0.8 (6-6.1)	6 ± 0.8 (5.9-6.1)	9.1 ± 0.8 (9-9.2)	9 ± 0.8 (8.9-9.1)	12.5 ± 1.1 (12.4-12.6)	12.5 ± 1.1 (12.4-12.6)
Weight	38.5 ± 14.4 (38-39)	23.8 ± 5.5 (23.3-24.3)	23.8 ± 5.9 (23.2-24.4)	35.3 ± 8.9 (34.5-36.1)	33.8 ± 8.5** (33.1-34.5)	50.1 ± 12.9 (49.2-51)	48.7 ± 10.5* (48-49.4)
Height	142 ± 19.5 (141-143)	118.1 ± 11.7 (117-119)	118.1 ± 11.2 (117-119)	137.3 ± 11.6 (136-138)	136.6 ± 10.4 (136-138)	158.1 ± 12.3 (157-159)	156.5 ± 9.8** (156-157)
BMI	18.8 ± 4.1 (18.7-18.9)	17.4 ± 5.4 (16.9-17.9)	17.2 ± 4.4 (16.8-17.6)	18.6 ± 3.9 (18.3-18.9)	18.1 ± 3.5* (17.8-18.4)	19.9 ± 3.6 (19.6-20.2)	19.9 ± 3.5 (19.7-20.1)
SHWD	2.1 ± 1.2 (2.1-2.1)	1.9 ± 1 (1.8-2)	1.8 ± 0.9*b# (1.7-1.9)	2.1 ± 1.1 (2-2.2)	1.8 ± 0.9** (1.7-1.9)	2.3 ± 1.2 (2.2-2.4)	2.4 ± 1.3b# (2.3-2.5)
SHWE	2.9 ± 1.4 (2.9-3)	2.6 ± 1.2 (2.5-2.7)	2.4 ± 1.1**a#b# (2.3-2.5)	2.9 ± 1.4 (2.8-3)	2.6 ± 1.2**a#c# (2.5-2.7)	3.1 ± 1.4 (3-3.2)	3.2 ± 1.5b#c# (3.1-3.3)
HR	9.2 ± 1 (9.2-9.2)	9.7 ± 1 (9.6-9.8)	9.7 ± 1 a#b# (9.6-9.8)	9.4 ± 0.9 (9.3-9.5)	9.4 ± 1a#c# (9.3-9.5)	8.8 ± 0.9 (8.7-8.9)	8.8 ± 1b#c# (8.7-8.9)

G1: between 5 and 7 y.o.; G2: between 8 and 10 y.o.; G3: between 11 and 14 y.o.
Age (years); Weight (kg); Height (cm); BMI: Body Mass Index (kg/m^2); SHWD: hours in front of a screen on a weekday (hours); SHWE: hours in front of a screen on a weekend day (hours); HR: hours of nightly rest (hours).
a = G1 vs. G2; b = G1 vs. G3; c = G2 vs. G3.
*$p < 0.05$, t-test; ** $p < 0.01$, t-test; #$p < 0.001$, ANOVA

With regard to the hours of exposure to screens (Table 1), differences were identified for SHWD between G1 and G3 ($p < 0.001$); and for SHWE and HR between all groups ($p < 0.001$, for both variables). Regarding the use of screens, G3 was the one that used the most electronic devices both during the week and at weekends. Conversely, in the hours of rest, a decrease could be seen as age advanced ($p < 0.0001$). Among these variables, only SHWD and SHWE were correlated ($r = 0.6$; $p = 0.0001$).

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Relationship between age and screen time frequency

The SFWD data reflect that boys, on the whole, make greater use of electronic devices than girls (Table 2). However, as age increased, so did screen exposure (especially among girls).

Table 2.
Descriptive statistics of screen usage frequency [data given: n (percentage)]

	G1 (n = 976)		**G2** (n = 1092)		**G3** (n = 1725)		**Total** (n = 3793)	
SFWD	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Little or nothing	33 (37.1)	28 (32.9)	28 (31.5)	27 (31.8)	28 (31.5)	30 (35.3)	89 (51.1)	85 (48.9)
Less than an hour	82 (29.9)	87 (29.9)	102 (37.2)	96 (33)	90 (32.8)	108 (37.1)	274 (48.5)	291 (51.5)
An hour or more	410 (26.2)	336 (22.5)	439 (28.1)	400 (26.8)	714 (45.7)	755 (50.6)	1563 (51.2)	1491 (48.8)
Total	525 (27.3)	451 (24.2)	569 (29.5)	523 (28)	832 (43.2)	893 (47.8)	1926** (50.8)	1867** (49.2)
SFWE	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Little or nothing	19 (31.7)	25 (35.7)	22 (36.7)	14 (20)	19 (31.7)	31 (44.3)	60 (46.2)	70 (53.8)
Less than an hour	47 (35.6)	36 (31.9)	43 (32.6)	39 (34.5)	42 (31.8)	38 (33.6)	132 (53.9)	113 (46.1)
An hour or more	458 (26.4)	389 (23.1)	504 (29.1)	470 (27.9)	771 (44.5)	824 (49)	1733 (50.7)	1683 (49.3)
Total	524 (27.2)	450 (24.1)	569 (29.6)	523 (28)	832 (43.2)	893 (47.9)	1925* (50.8)	1866* (49.2)

G1: between 5 and 7 y.o.; G2: between 8 and 10 y.o.; G3: between 11 and 14 y.o.
SFWD: Screen frequency on a weekday; SFWE: Screen frequency on a weekend day.
*p < 0.05; **p < 0.01

After the chi-square test, the alternative hypothesis of dependency between age group and SFWD was assumed (x^2 = 45.5; p < 0.001) for the sample as a whole; for boys (x^2 = 23; p < 0.001); and, for girls (x^2 = 24.3; p < 0.001).

For the SFWE variable, the chi-square test only had significant results for the total sample (x^2 = 24.2; p < 0.001). The SFWD and SFWE have not correlated HRs in any sample subgroup or for the sample as a whole.

Relationship between age and mental health punctuation

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Table 3.
Descriptive statistics of mental health variable scores of the study sample [data given: mean ± standard deviation (95% confidence interval)]

	G1 (n = 974)		**G2** (n = 1090)		**G3** (n = 1720)		Total
	Boys	Girls	Boys	Girls	Boys	Girls	
ES	1.7 ± 1.9 (1.5-1.9)	1.4 ± 1.6** (1.3-1.6)	1.5 ± 1.7 (1.4-1.6)	1.6 ± 1.8 (1.5-1.8)	1.6 ± 1.8 (1.5-1.7)	1.6 ± 1.8 (1.5-1.7)	1.6 ± 1.8 (1.5-1.7)
BP	1.7 ± 1.6 (1.6-1.8)	1.4 ± 1.5**a#b## (1.3-1.5)	1.5 ± 1.5 (1.4-1.6)	1.2 ± 1.5**a# (1.1-1.3)	1.4 ± 1.5 (1.3-1.5)	1.3 ± 1.5b## (1.2-1.4)	1.4 ± 1.5 (1.4-1.5)
HA	4.4 ± 2.6 (4.2-4.6)	3.6 ± 2.5**a##b## (3.4-3.8)	3.9 ± 2.6 (3.7-4.1)	3.1 ± 2.4**a##c## (2.9-3.3)	3.5 ± 2.6 (3.3-3.7)	2.8 ±2.4**b##c## (2.6-3)	3.5 ± 2.6 (3.4-3.6)
PP	1.1 ± 1.5 (1-1.2)	1 ± 1.2 (0.9-1.1)	1 ± 1.3 (0.9-1.1)	0.9 ± 1.3 (0.8-1)	1.1 ± 1.5 (1-1.2)	1.1 ± 1.4 (1-1.2)	1.1 ± 1.4 (1.1-1.1)
PB	8.8 ± 1.5 (8.7-8.9)	9.2 ± 1.4** (9.1-9.3)	9 ± 1.4 (8.9-9.1)	9.3 ± 1.2** (9.2-9.4)	9 ± 1.4 (8.9-9.1)	9.2 ± 1.4* (9.1-9.3)	9.1 ± 1.4 (9-9.1)

G1: between 5 and 7 y.o.; G2: between 8 and 10 y.o.; G3: between 11 and 14 y.o.
ES: Emotional symptoms; BP: Behavioural problems; HA: Hyperactivity; PP: Problems with peers; PB: Prosocial behaviour.
*p < 0.05, t-test; **p < 0.01, t-test; #p < 0.05, ANOVA; ##p < 0.001, ANOVA.

In the variable *Emotional symptoms* only significant differences were found between both sexes in G1 (p = 0.002), with the boys having the worst scores (Table 3).

The score related to *Behavioural problems* was, together with *Hyperactivity*, the one that showed more differences between age and sex subgroups. In "Behavioural problems", differences were found between both sexes in G1 (p = 0.005) and G2 (p = 0.008), as a consequence of the worst scores of boys in all age subgroups. The *Hyperactivity* item was the worst score among the five mental health variables in both sexes. In this section, boys also had worse scores with significant differences in all age subgroups (p < 0.001), with G1 having the worst scores and girls in G3 having the best (2.8 points out of 10) (Table 3).

The *Prosocial behaviour* variable presented the best results. Gender differences were significant in all subgroups (p < 0.0002 in G1 and G2 and p = 0.03 in G3). Girls in G2 and G3 had the best scores, with 9.3 and 9.2 out of 10, respectively.

In relation to the item *Problems with peers*, it was the only one who showed no difference between sexes within each age subgroup or for the total sample (Table 3).

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In the correlation analysis, the variables SHWD, SHWE and HR were significantly associated with all mental health variables ($0.05 < r > 0.1$; $p < 0.0001$), except *Hyperactivity* which was not associated with HR.

Relationship between physical activity frequency and screen time

The first trend that could be observed is the increase in the frequency of exposure to screens as the frequency of PA also increases, with the percentage of boys who do not perform PA and use screens for more than one hour a day on weekdays being 10.5%, compared to 38.1% of children who perform PA several times a week (Table 4). In girls, the difference was not so pronounced, with 18.7% of all those who used screens for more than one hour a day on weekdays not doing PA and 29.2% doing it several times a week.

Table 4.
Distribution of physical activity frequency according to screen usage [data given: n (percentage)]

	Physical Activity Frequency								
SFWD	**No exercise**		**Occasionally**		**Monthly**		**Weekly**		**Total**
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
Little or nothing	14 (15.7)	17 (20)	10 (11.2)	16 (18.8)	29 (32.6)	29 (34.1)	36 (40.4)	23 (27.1)	174 (100)
Less than an hour	26 (9.5)	39 (13.4)	33 (12)	73 (25.1)	103 (37.6)	88 (30.2)	112 (40.9)	91 (31.3)	565 (100)
An hour or more	164 (10.5)	279 (18.7)	304 (19.4)	369 (24.7)	500 (32)	407 (27.3)	595 (38.1)	436 (29.2)	3054 (100)
Total	204 (5.4)	335 (8.8)	347 (9.1)	458 (12.1)	632 (16.6)	524 (13.8)	743 (19.6)	550 (14.5)	3793* (100)
SFWE	**No exercise**		**Occasionally**		**Monthly**		**Weekly**		**Total**
Little or nothing	8 (13.3)	14 (20)	23 (38.3)	22 (31.4)	13 (21.7)	20 (28.6)	16 (26.7)	14 (20)	130 (100)
Less than an hour	17 (12.9)	29 (25.7)	19 (14.4)	28 (24.8)	59 (44.7)	30 (26.5)	37 (28)	26 (23)	245 (100)
An hour or more	178 (10.3)	292 (17.3)	305 (17.6)	409 (24.3)	560 (32.3)	474 (28.2)	690 (39.8)	508 (30.2)	3416 (100)
Total	204 (5.4)	335 (8.8)	347 (9.2)	458 (12.1)	632 (16.7)	524 (13.8)	743 (19.6)	550 (14.5)	3791** (100)

SFWD: Screen frequency on a weekday; SFWE: Screen frequency on a weekend day.

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*p < 0.05; **p < 0.01

The chi-square test result of independence between the two variables was x2 = 14.8 (p = 0.02) for boys, x2 = 7.7 (p = 0.02) for girls, and x2 = 14.3 (p = 0.02) for the total sample. In the SFWD and SFWE variables, differences in behaviour throughout the week were found only in those boys and girls who performed PA several times a week and fewer used the screens that, during the weekend, increased the time exposed to them (p < 0.0001) (Table 4).

Discussion

The objectives of the present investigation were to examine the degree of exposure to screens of Spanish minors and to identify possible relationships in their lifestyle between this aspect and other habits such as PA practice and sleep time, as well as to determine if any of these habits influence their mental health. In the light of the results obtained, no association between HPLV and HPSD with HD was detected in the Spanish child population, but there were worse results in variables related to mental health and PA habits.

Specifically, concerning the lack of association between SHWD and SHWE with HR, although it contradicts the general advice to avoid the use of screens to facilitate the rest of minors (Abalde-Amoedo, and Pino-Juste, 2015; Twenge, Hisler, and Krizan, 2019); It should be noted that this recommendation has been established based on minors who had screens in their room (i.e., with totally free and individual access to them) and, especially, on portable devices (mobile phones and tablets) (Duggan, Taveras, Gerber, Horan, and Oreskovic, 2019), a differentiation that is not made in the Spanish NHS. At the same time, it should be noted that the associations made between the use of digital screens and fewer hours of night-time rest have been made with the study of smaller populations that reported an average use of devices with screens of more than 30 hours per week (Emond and Benjamin-Neelon, 2019) (compared to the average of 15 hours per week for Spanish children).

In the gender-differentiated analysis, boys showed greater exposure to screens in all the age groups studied. Although the difference between sexes was reduced as the age of the participants increased. This is consistent with previous research that also identified worse lifestyle habits in boys compared to girls (Keane, Kelly, Molcho, and Gabhainn, 2017). And,

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as in the results obtained by Keane et al. (2017), boys also showed worse scores on mental health variables than girls. Specifically, boys are more sensitive to the development of behavioural problems and hyperactivity, especially when they are younger (under the age of seven).

Among the predisposing factors to the development of behavioural problems were HD and hours of screen exposure, following previous research (Castro-Sanchez, Linares-Manrique, Sanromán-Mata, and Pérez Cortés, 2017; Sezen et al., 2016; Tandon et al., 2019). However, no relationship was found between altered mental health and reduced PA practice, another association commonly found in the existing literature already mentioned. Probably, in this case, as the children who practised more exercise were also those who spent more hours in front of a screen, this study has served to discern which of the two variables has a direct effect on the development of behavioural problems.

To PA habits, the most controversial results were found, since the more exercise was practised, the more frequently screens were used in general and, above all, during the weekend. This association, especially strong in the subgroup of boys, does not attend to previously established theoretical justifications but can be explained by considering that the use of screened devices can be used at home as a positive reward or reinforcement for the compliance of positive behaviours such as PA. It should be noted that, although most of the publications available to date support the inverse relationship between time spent practising PA and time exposed to screens, Maher et al. (2019), recently, also did not find such a relationship in a study that included more than 1000 children.

Therefore, after all of the above, it should be noted that (a) Spanish children's exposure to screens is much lower than that detected in other populations (Brown and Smolenaers, 2018; Duggan et al, 2019; Emond and Benjamin-Neelon, 2019; Hale and Guan, 2015); (b) that this phenomenon is consistent with the identification of their weight as normal (with no evident prevalence of overweight and obesity due to the lack of a high number of hours spent in a hospital in comparison with electronic devices); and (c) that their lifestyle, although

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improvable, is within the standards of health in terms of HR and PA habits (World Health Organization, 2019).

Study's strengths and limitations

This study has limitations that must be recognized. As the main limiting factor, the results and surveys from they were get were not carried by this study's researchers. They come from the collaborative work between the NSI and Ministry of Health, Consumer Affairs and Social Welfare of the Spanish Government. Firstly, self-reported information on the study's variables was used instead of being measured by an expert evaluator. Secondly, the exclusively Spanish population limits the generalization of our results to other countries. Third, the PA performed was also self-reported instead of being measured objectively in terms of quantity, frequency and intensity with pedometer or accelerometer.

Despite these limitations, there are also significant strengths. This is a population-based study that, cautiously, is representative of the Spanish population and a real reflection of the current screen time and physical activity habits of the new generations. Simultaneously, it is the first time that direct relations between the minors' lifestyle and the development of alterations on their mental health. Some variables and associations behave like in other populations, with some particularities on the Spanish side.

Conclusions

Regardless that the use and abuse of screens during childhood is a behaviour dependent on multiple factors such as the age, sex and lifestyle of the parents, its use during school-age until it is confirmed that it is innocuous for the correct psychomotor development of children should be restricted giving priority to the use of free time in the practice of PA (whose development benefits are fully contrasted).

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Besides, Public Health policies should be applied as soon as possible to reduce the incidence of alterations in the mental health of minors. Those interventions should have as target population children under 7 years of age and with poor night-time rest habits and/or more hours of exposure to screens.

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