

Equipment and use of Information and Communication Technologies (ICTs) in Spanish homes during the period of confinement. Association with the social habits, lifestyle and physical activity of children under 12 years old

Equipamiento y uso de Tecnologías de la Información y Comunicación (TIC) en los hogares españoles durante el periodo de confinamiento. Asociación con los hábitos sociales, estilo de vida y actividad física de los niños menores de 12 años

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How to cite this article / Standardized Reference (Following the 7th style guide APA)

Arufe Giráldez, V., Cachón Zagalaz, J., Zagalaz Sánchez, M^a. L., Sanmiguel-Rodríguez, A. & González-Valero, G. (2020). Equipment and use of Information and Communication Technologies (ICTs) in Spanish homes during the period of confinement. Association with the social habits, lifestyle and physical activity of children under 12 years old. *Revista Latina de Comunicación Social*, 78, 183-204. <https://www.doi.org/10.4185/RLCS-2020-1474>

ABSTRACT

Introduction: ICTs are present in many homes establishing changes in social communication and lifestyle. In 2020, a state of alarm was declared in Spain with a significant period of confinement due

to the appearance of a new global pandemic: COVID-19. Through this work, an X-ray of the equipment and use of ICT in Spanish homes with children under 12 years of age during the period of confinement and how this period and ICTs have influenced children's social habits, their style, and level of physical activity is carried out. **Methodology:** A quantitative investigation was carried out with a non-experimental design, descriptive, comparative, and correlational character, with a single measurement in a single group. The sample was made up of 837 Spanish children under 12 years of age. **Results:** The results confirm an important number of electronic devices in homes, different times of use for each device and the existence of various correlations between ICTs and children's social and lifestyle habits. **Discussion:** Other works confirm similar values of electronic devices in homes as well as the overuse of some of them to the detriment of physical activity. **Conclusions:** The period of confinement has caused notable changes in the children's lifestyle and their social habits. The presence of a greater or lesser number of ICTs in the home and their use can influence other activities carried out by children.

KEYWORDS: ICTs; Lifestyle; children; physical activity; COVID-19; confinement: social habits.

RESUMEN

Introducción: Las TIC están presentes en muchos hogares estableciendo cambios en la comunicación social y estilo de vida. En el año 2020 se ha declarado en España el estado de alarma con un importante periodo de confinamiento debido a la aparición de una nueva pandemia mundial: COVID-19. A través de este trabajo se realiza una radiografía del equipamiento y uso de las TIC en los hogares españoles con niños menores de 12 años durante el periodo de confinamiento y cómo ese tiempo y las TIC han influido en los hábitos sociales de los niños, su estilo de vida y nivel de actividad física. **Metodología:** Se realizó una investigación cuantitativa con un diseño no experimental, de carácter descriptivo, comparativo y correlacional, con una única medición en un solo grupo. La muestra estuvo compuesta por 837 niños españoles menores de 12 años. **Resultados:** Se confirma un número importante de dispositivos electrónicos en los hogares, tiempos de uso diferentes para cada uno y la existencia de diversas correlaciones entre TIC y hábitos sociales y de estilo de vida de los niños. **Discusión:** Otros trabajos confirman valores similares de dispositivos electrónicos en los hogares, así como el sobreuso de algunos de ellos en detrimento de la actividad física. **Conclusiones:** El periodo de confinamiento ha provocado cambios notables en el estilo de vida de los niños y sus hábitos sociales. La presencia de un mayor o menor número de TIC en el hogar y su uso puede influir en otras actividades realizadas por los niños.

PALABRAS CLAVE: TIC; estilo de vida; niños; actividad física; COVID-19; confinamiento: hábitos sociales.

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Translation by **Carlos Javier Rivas Quintero** (University of the Andes, Mérida, Venezuela)

1. Introduction

1.1. Information and Communications Technologies (ICTs)

Information and Communication Technologies (ICTs) have evolved notably over the past recent years. The term ICT can refer to any electronic device capable of creating a communication channel or storing, managing or providing data linked to information. Some authors such as Marqués, P. (2012) assign up to 9 different functions to ICTs: a medium of expression, a communication channel, an instrument for data processing, an open source of information, a management instrument, a diagnostic tool, a didactic medium, a generator of new educational environments, and a ludic medium for cognitive development.

Televisions, mobile phones / smartphones, tablets, computers or video game consoles, and other devices, can be included in this concept. ICTs are present in the lives of millions of people and in multiple contexts; going from educational ones, to family, corporate or the health sector. Their wide-ranging use, and occasionally, abuse, has motivated different authors to establish research instruments that can detect addictions, or behavioral problems, as the result of ICTs' overuse, with the purpose of defining prevention and swift action plans (Chamarro Luser *et al.*, 2014; Cuesta Cambra, Cuesta Díaz, Martínez, & Niño González, 2020; Hernández Pérez, 2019; Justicia Justicia & Villadangos González, 2010; Lloret Irlés & Morell Gomis, 2016; Lloret Irlés, Morell Gomis, Marzo Campos, & Tirado González, 2018; Lozano Sánchez *et al.*, 2019; Tejeiro, 2001). Even international organizations such as The World Health Organization (WHO) published, for the first time in their history, a report warning about visual display devices abuse in child population ranging from 0 to 5 years old and insufficient physical activity in these ages, advising people to make a responsible use of these technological devices and to prevent children under 2 years of age from using them (Guthold, Stevens, Riley, & Bull, 2018). Ortiz, M.A. *et al.* (2019) underscore the important role a family plays as mediator of electronic visual display devices' consumption during childhood.

Technological devices have flourished in current society invading the homes of many children through televisions, tablets, computers, video game consoles, and mobile phones. According to data from the National Statistics Institution (INE), in 2019, 9 out of 10 Spanish homes had Internet access, 8 out of 10 had computers, 5.6 out of 10 had tablets, 9.8 out of 10 had mobile phones, and 9.9 out of 10 had television (National Statistic Institutions, INE, 2019). It is a digital era leading to different changes in personal and social communication patterns (Lucas Marín, 2006), as well as in prominent fields such as politics (Solito & Sorrentino, 2018) or education (Gil-Quintana & Cano Alfaro, 2020; Sánchez López, Pérez Rodríguez, & Fandos Igado, 2019).

1.2. Social habits, lifestyle and physical activity of children under 12 years of age

Everyday life of most children exhibits a common pattern regarding their social habits, lifestyle and physical activity. In Spain, almost all the children under the age of 12 go to school every morning, staying in it until the first hour of the afternoon, or in some cases, until noon. By 16 years old, post-compulsory education theoretical age, the enrolment rate decreases falling to 92%, according to the data in the latest education report (Ministry of Education and Professional Training, Spain, 2019). Afternoons for children tend to be busy with multiple activities, which influence their social, emotional, psychological and physical development. In general, with school population percentages ranging from 58 to 87%, several studies confirm that minors under 12 years old do a minimal amount of physical activity with friends at sports schools (Barja Fernández, Pino Juste, Portela Pino, & Leis Trabazo, 2020; Torres Moreno, Solera Albero, Sahuquillo Martínez, & Tárraga López, 2020; Zueck, Ramírez García, Rodríguez Villalobos, & Irigoyen Gutiérrez, 2020). However, these practical

physical activity levels, in many cases, are far from the amount of physical activity recommended by different institutions for the acquisition of a healthy lifestyle (Piercy *et al.*, 2018; WHO 2019). Specifically, the WHO (2010) states that children and teenagers from 5 to 17 years of age must invest, at least, 60 daily minutes in moderate-vigorous intensity physical activities. More than 60 daily minutes of physical activity will result in an even greater benefit to health, and it should be, for the most part, aerobic. Likewise, it would be positive to incorporate, at least three times a week, vigorous intensity activities to strengthen muscles and bones in particular. Another set of social activities children do during their spare time is free play, either on the street or at the park, with a recent study confirming participation percentages in minors under 12 of 23% of children (Jover Olmeda, Camas Garrido, Martín-Ordanza Santos, & Sánchez Serrano, 2018).

Homework, regardless of whether it is considered as duty or pleasure by children, is part of the routine acquired by almost every student; being there various works that have addressed this matter (Valle *et al.*, 2019). Even some recent international studies confirm greater commitment to duties and time spent on homework in children with parents who have a higher socio-economic status (Nakamura, Yamashita, Akabayashi, Tamura, & Zhou, 2020). Spain is the fifth country of the Organization for Economic Co-operation and Development (OECD) in which children spent a higher amount of hours on homework at home; 6.5 per week compared to the mean 4.8 hours of the other countries (Salinas, 2014). But they also have time to make use of and enjoy the different technological devices in their homes (Boente Antela, Leirós Rodríguez, & García Soidán, 2020).

In addition to these social habits, there are also others that have been studied in literature, which are acquired by minors to a lesser extent, such as participating in household chores, with the influence of the gender-based factor for its distribution (García, 2017; Paterna Bleda & Martínez Martínez, María del Carmen, 2009; Rodríguez Hernández & Santana Bonilla, 2006; Scarafoni, 2016), and some studies confirming that when children take part in home economy, develop certain skills that contribute to the maintenance of a lifestyle centered on the management of local resources (Remorini, Teves, Palermo, Jacob, & Desperés, 2019). Another investigation conducted with a sample of children ranging from 6 to 10, confirmed that their efficiency to complete everyday tasks improves throughout their middle childhood, and this performance can be predicted by their attention to instructions and their executive function (Perone, Anderson, & Youatt, 2020).

Another routine established in many children's lifestyle is reading habit, with percentages of frequent child readers of 72%. Although it is true that the readings they do are often assigned as mandatory from school (Yubero Jiménez & Larrañaga Rubio, 2010). A study points out that the reading habit and hobby exhibit optimal values in 9- to 13-year-old children, decreasing between ages 14 and 16, and going up again in Baccalaureate (Fiz Poveda, Olea Aisa, Goicoechea Tabar, & Ibiricu Díaz, 2000).

In some cases they spend time learning how to play an instrument, with recent studies providing very positive results of the relation between leaning music in childhood and the improvement of cognitive functions and academic performance, especially when it comes to instrumental music (Capistrán Gracia, 2020; Guhn, Emerson, & Gouzouasis, 2020).

One of the activities with a marked social character is family playtime, although there are currently different factors that reduce the amount of time for playing with family, such as: a rushed lifestyle, changes in the family structure and more attention to academic activities (Ginsburg, and Committee on Communications, & and Committee on Psychosocial Aspects of Child and Family Health, 2007) or the preference for spending more free time on using technological devices (Fumero, Marrero, Bethencourt, & Peñate, 2020). Family playtime arises as a very enriching habit for both children and

parents. Several studies affirm a clear association between families' happiness levels and the time they spend playing with their children. That way, 9 out of 10 families who spend more than five hours playing together every week, describe themselves as happy (Christiansen, 2018). Free play is also important to enhance different skills, such as thinking process or creativity, especially if there is a certain amount of optimal physical activity involved during free play (Piya-Amornphan, Santiworakul, Cetthakrikul, & Srirug, 2020). Cognitive functions are also improved with free play (Barker *et al.*, 2014), pointing out in this later study that children whose parents plan and structure all their daily activities without offering them time for this type of play have a poorer development of their cognitive capacities, less initiative and problem solving. Another work also confirms that the opportunity for and promotion of free play in childhood significantly predict some indicators of social success in adulthood (Greve, Thomsen, & Dehio, 2014).

Due to all these reasons, we can verify that children's lifestyle, although it may be different in one another, has very similar patterns regarding the possible activities and tasks that can be incorporated in their daily routines. These differences will be established according to the choice of tasks and the time invested on each of them. But this lifestyle might be disturbed if children are deprived of freedom, of being able to go out. Therefore, it is deemed important to address this novel context of the period of confinement established by the Spanish Government, which caused alterations in children's lifestyle.

1.3. The period of confinement in Spain in 2020

Spain and a significant number of countries lived an exceptional situation at the beginning of 2020. Previously, specifically on January 5, 2020, the World Health Organization (WHO) published their first Disease Outbreak News on the new virus; a flagship technical publication to the scientific and public health community as well as global media (World Health Organization, 2020). Two months later, on March 14, the Spanish Government declared the state of alarm in all the Spanish territory due to the pandemic registered after the appearance of a new virus; coronavirus COVID-19 (Spanish Government, 2020). This event brought all the Spanish people's daily activities and communication to a standstill and important changes to their lifestyle and working life.

As the result of the state of alarm's declaration, a period of confinement "quarantine" was established, paralyzing the social life of all Spanish families, being obliged to be confined in their homes with no possibilities of going outside, except for exceptional cases. It is, without any doubt, a period that most of the population had never lived or experienced before.

There has been an increase in the use of ICTs during "quarantine", not only for the enjoyment of people during their leisure time, but as a medium that seeks to satisfy different needs; from keeping in touch with other people, to being able to accomplish work duties through telecommuting or accessing all the information emerging globally. A recent study conducted by Lázaro-Rodríguez, P. and Herrera-Viedma, H. (2020) confirms a high increase in the amount of news since the state of alarm declaration, almost tripling the number of pieces of news in comparison with the periods before said decree. Thus considering the protagonist role of digital media in the dissemination of 2019-nCoV and COVID-19 news. This has caused an increase close to 40% of Internet traffic with unprecedented traffic spikes in specific locations, such as the Madrid case where 500 Gbit/s have been outstripped. Telefonica Foundation, in cooperation with other landline and mobile telephone service providers, published a press release appealing for a responsible use of the Web and announcing that the use of mobiles had increased by 50% in voice and 25% in data. This same press release also pointed out that instant messaging, such as WhatsApp, had multiplied 5 times during the first days of the confinement period (Fundación Telefónica, 2020).

Some authors who have analyzed ICT's impact on society affirm that the majority of these studies address mainly two areas; the working field and the educational field (Hernández Prados, López Vicent, & Sanchez Esteban, 2014), being there few works addressing the personal or family fields. But it is important to highlight that any change produced in the information society will also provoke changes in both personal and family fields, with some influence on changes or adaptations in people's lifestyle.

In addition to the possible influence of ICTs on children's social and lifestyle habits, the Spanish society has been exposed to a new social situation. The confinement period has deprived many children from continuing with their lifestyle and social habits, thus affecting different spheres of their development, from the social to the psychological one. Many of them went from having their entire day organized with different tasks to not being allowed to go outside, and not knowing what to do during this spare time. Given the aforementioned reasons, through this study we intend to know how have the social and lifestyle habits, and physical activity of children under 12 living in Spain been during the confinement period caused by the COVID-19 coronavirus pandemic (from March 15 to May 2), through a descriptive and correlational analysis to quantify the number of devices linked to ICTs, their time of use and their correlation with different habits and tasks that children used to undertake daily.

2. Objectives

This work's objective was to analyze the number of devices linked to ICTs, present in the Spanish households with children under 12 years old, the time children spent using them during the confinement period and to study their relation with social habits, lifestyle, and daily physical activity. The goal is to know whether a higher number of technological or visual display devices and/or their time of use have influenced either positively or negatively on the periods devoted to physical activity, household chores, reading, homework, artistic or musical activities, sleeping hours or family playtime.

3. Methodology

3.1. Study design and participants

To fulfill this study's objectives a quantitative investigation was carried out with a non-experimental design, descriptive, comparative, and correlational character, with a single measurement in a single group. The study population was the Spanish families with children under 12 years of age. A sample made up of 837 Spanish children was obtained from this population, with ages ranging from 0 to 12 ($M = 6.22$; $S.D. = 3.366$). The sampling distribution was homogeneous based on the participants' sexes, being 50.2% ($n = 420$) boys and 49.8% ($n = 417$) girls. A convenience sampling was used to select the participants, inviting those families who had sons and daughters in their infant and early life stages to participate during the period of confinement.

3.2. Instrument for data collection and variables

The validated survey about Equipment and Use of Information and Communications Technologies in Homes (TIC-H2019) elaborated by the National Statistics Institution (INE) was used as instrument for data collection, following the recommendations given by the European Statistical Office (EUROSTAT), in addition to the creation of a self-administered *ad hoc* questionnaire meant for children's parents to provide the data corresponding to the different variables subject of study.

The variables listed in the questionnaire were related to social, cultural and personal aspects, such as: age, sex, number of ICTs in the home, time of use, time spent on reading, free play, etc. For this analysis, our investigation focuses on these two variables:

- 1. Resources and use of technological means:** This variable was included with the purpose of knowing the technological means families had available during confinement, as well as the use children under 12 years old made of them. The families participating in this study provided the number of televisions, video game consoles, computers, mobile phones, and tables they had in their homes. Likewise, they indicated the daily time (in minutes) children spent on them.
- 2. Daily activities in the home/ lifestyle:** This variable refers to all those actions that can be carried out in the home during confinement. To this end, the families indicated the daily time (in minutes) spent on everyday activities such as doing physical activity, homework, playing instruments, performing artistic activities, household chores, playing with family, reading, and free play. Therefore, weekly physical activity was categorized as “Does not do it”, “Does it 2-3 times a week”, “Does it 4-5 times a week”, and “Does it 6-7 times a week”.

3.3. Process

To reach out to the population subject of study, we disseminated the questionnaire through social networks (with the following public segmentation: families living in Spain with children under the age of 12) and through contact with different professionals in education who were close to a broad segment of families to ensure the proper dissemination of the questionnaire in the different Regional Communities. The questionnaire was disseminated over 45 days, from March 23 to May 6, 2020, within the confinement period established by the Spanish Government, Royal Decree-Law 463/2020, of March 14 (Government of Spain, 2020).

Throughout the data cleansing, 76 entries were eliminated since they were not properly filled or because they did not belong to the educational stages of this study.

3.4. Ethical aspects

The ethical principles embodied in different documents and official treaties on research ethics were taken into account throughout this whole investigation, thus ensuring participants' anonymity, the confidentiality of the data provided through the questionnaires and other ethical considerations related to educational research (American Psychological Association, 2020; Sañudo, 2006).

3.5. Analysis of data

The SPSS statistics software package v.25.0 (IBM Corp, Armonk, NY, USA) was used for data analysis and treatment. In the descriptive analysis of this study, the participants' characteristics were determined through the mean (M), standard deviation (DT) and frequencies (%). The normality and homogeneity of the variance in the variables was established with the Kolmogorov-Smirnov test. The ANOVA test was utilized to establish the differences between variables. The differences between participants were determined with the Pearson's chi-squared test. Likewise, a bivariate Pearson correlation at a significance level of $p < 0.05^*$ and $p < 0.01^{**}$ was conducted. These were interpreted as weak ($r < 0.29$), moderate ($r = 0.3-0.49$) and strong ($r = 0.5-1$) correlations.

4. Results

The basic descriptive coefficients about the quantity and use of devices linked to ICTs in the home during confinement are shown in table 1. These results revealed that the devices with higher presence in the home are televisions (M = 1.98; S.D. = 1.02), followed by computers (M = 1.81; S.D. = 1.08), tablets (M = 1.32; S.D. = 1.00) and video game consoles (M = 0.88; S.D. = 1.44). As for daily time, in minutes, children spent in front of digital visual display devices during confinement, the highest values were for television (M = 80.38; S.D. = 61.59), followed by the use of tablets (M = 28.47; S.D. = 46.43), computers (M = 18.98; S.D. = 44.56), video game consoles (M = 18.78; S.D. = 42.86), and mobile phone (M = 14.58; S.D. = 39.83).

Table 1. Basic descriptive coefficients regarding technological devices during confinement

Variables	Minimum	Maximum	Mean	SD
Televisions in the home	0	6	1,98	1,02
Video game consoles in the home	0	14	0,88	1,44
Computers in the home	0	7	1,81	1,08
Tablets in the home	0	7	1,32	1,00
Mobile phones used by children under 12 years old	0	1	0,09	0,28
Daily use of video game consoles	0	300	18,78	42,86
Daily time watching television	0	600	80,38	61,59
Daily use of computers	0	420	18,98	44,56
Daily use of tablets	0	300	28,47	46,43
Daily use of the Mobile Phone	0	360	14,58	39,83

Source: Authors' own creation

Regarding Internet access, the study found that 99% of the homes had Internet access (70.1% through optical fiber, 22.2% through ADSL, and 7.5% through other types of connections), and only 0.1% did not have it.

The number of technological devices present in the Spanish homes with children under 12 years of age, stratified into three age bands, are shown hereunder:

Table 2. Basic descriptive coefficients regarding technological devices during confinement classified by age bands

Age band		Number of televisions in the home	Number of video game consoles in the home	Number of computers in the home	Number of tablets in the home
0-to-2-year-old children	N	202	202	202	202
	Mean	1,78	,59	1,70	1,12
	SD	0,926	1,067	0,927	0,955
	Minimum	0	0	0	0
	Maximum	5	12	7	7
	% of children who have at least one unit	98,5%	42,1%	97,5%	78,5%
3-to-6-year-old children	N	260	260	260	260
	Mean	1,96	0,67	1,65	1,23
	SD	1,005	1,220	0,973	,867
	Minimum	1	0	0	0

	Maximum	6	11	6	4
	% of children who have at least one unit	100%	43,5%	94,6%	81,2%
7-to-12-year-old children	<i>N</i>	375	375	375	375
	Mean	2,11	1,19	1,99	1,48
	SD	1,062	1,694	1,200	1,094
	Minimum	0	0	0	0
	Maximum	6	14	7	7
	% of children who have at least one unit	99,5%	69,1%	98,4 %	85,1%
			p = 0,001	p = 0,000	p = 0,000

Source: Authors' own creation

A descriptive analysis of the percentage of children classified into 3 age groups who do the minimum amount of daily physical activity recommended by different international entities and the mean values of physical activity per day during the confinement period was conducted in table 3.

Table 3. Basic descriptive coefficients regarding levels of physical activity during confinement classified by age bands

Age band		% who do daily physical activity (minimum of 60 minutes)	Mean time of physical activity per day
0-to-2-year-old children	<i>N</i>	202	202
	Value	12,4%	M=30,86 SD=42,59
3-to-6-year-old children	<i>N</i>	260	260
	Value	15,0%	M=37,26 SD=36,01
7-to-12-year-old children	<i>N</i>	375	375
	Value	12,0%	M=38,95 SD=30,25

Source: Authors' own creation

The relations between the number and use of visual display technological devices according to the physical activity performed during confinement were established in the following table. Statistically significant results were found among these associations ($p < 0.05$). A higher weekly frequency of physical activity (6-7 days a week) was related to a higher presence of computers ($M = 2.07$; $S.D. = 1.75$) and tablets ($M = 1.58$; $S.D. = 1.18$) in the home, against those who did not do any ($M = 1.63$; $S.D. = 0.95$ and $M = 1.17$; $S.D. = 0.90$). In this sense, children who spent more time in front of tablets' screens ($M = 37.51$; $S.D. = 52.62$) did physical activity 4-5 days a week. However, those who claimed not to do weekly physical activity exhibited the highest amounts in the use of video game consoles ($M = 26.48$; $S.D. = 55.82$), television ($M = 84.63$; $S.D. = 70.68$), computers ($M = 84.63$; $S.D. = 70.68$) and mobile phones ($M = 18.43$; $S.D. = 47.69$).

Table 4. *Technological variables according to the amount of weekly physical activity during confinement*

Variable	Weekly PA	M	SD	S. Error	F	X ²
Televisions in the home	Does not do it	1,92	0,97	0,05	1,517	0,209
	2-3 days	2,01	1,08	0,06		
	4-5 days	2,10	0,95	0,07		
	6-7 days	1,89	1,05	0,10		
Video game consoles in the home	Does not do it	1,00	1,70	0,10	1,004	0,390
	2-3 days	0,83	1,52	0,09		
	4-5 days	0,82	1,05	0,08		
	6-7 days	0,80	0,91	0,08		
Computers in the home	Does not do it	1,63	0,95	0,05	7,600	0,000
	2-3 days	1,77	0,98	0,05		
	4-5 days	2,04	1,18	0,09		
	6-7 days	2,07	1,35	0,12		
Tablets in the home	Does not do it	1,17	0,90	0,05	6,202	0,000
	2-3 days	1,27	0,86	0,05		
	4-5 days	1,48	1,19	0,09		
	6-7 days	1,58	1,18	0,11		
Daily time use of video game consoles	Does not do it	26,48	55,82	4,35	2,751	0,044
	2-3 days	15,14	37,69	2,28		
	4-5 days	18,78	40,78	2,39		
	6-7 days	16,34	36,69	3,51		
Daily time watching television	Does not do it	84,63	70,68	4,14	5,132	0,010
	2-3 days	83,31	63,04	3,81		
	4-5 days	72,18	42,44	3,31		
	6-7 days	74,03	54,83	5,25		
Daily time use of computers	Does not do it	84,63	70,68	4,14	2,901	0,041
	2-3 days	83,31	63,04	3,81		
	4-5 days	72,18	42,44	3,31		
	6-7 days	74,03	54,83	5,25		
Daily time use of tablets	Does not do it	28,89	53,51	3,13	3,191	0,023
	2-3 days	23,74	35,94	2,17		
	4-5 days	37,51	52,63	4,11		
	6-7 days	25,56	37,08	3,55		
Daily time use of mobile phones	Does not do it	18,43	47,69	2,79	4,963	0,018
	2-3 days	14,75	39,03	2,36		
	4-5 days	10,52	25,52	1,99		
	6-7 days	10,00	35,58	3,40		

Source: Authors' own creation.

The correlations between technological resources and daily use of digital visual display devices in relation to children's social and lifestyle habits adopted during confinement in their homes are shown in the following table. The daily time spent doing physical activity (TSPA) was directly related with the number of computers ($r = 0.150^*$) and tablets ($r = 0.269^{**}$), although it was indirectly related with the number of video game consoles ($r = -0.232^{**}$) and the daily use of mobile phones ($r = -0.270^{**}$). The time spent on homework (TSH) was directly associated with the number of televisions ($r = 0.227^{**}$), video game consoles ($r = 0.178^*$) and tablets ($r = 0.194^{**}$), being that association with the daily use of video game consoles ($r = 0.346^{**}$), televisions ($r = 0.344^{**}$), computers ($r = 0.421^{**}$), tablets ($r = 0,317^{**}$) and mobile phones ($r = 0,322^{**}$) moderate. The time spent on artistic activities (TSART) was positively associated with the daily time spent watching television ($r = 0.240^{**}$), although it was negatively associated with the number of televisions ($r = -0.189^{**}$), video game consoles ($r = 0.191^{**}$), computers ($r = -0.206^{**}$) and daily use of video game consoles ($r = -0.245^{**}$).

Household chores (TSHCH) were directly related with the daily use of video game consoles ($r = 0.206^{**}$), television ($r = 0.246^{**}$) and tablets (0.189^*), being moderate with the use of computers ($r = 0.307^{**}$) and mobile phones ($r = 0.317^{**}$).

In this sense, the number of televisions ($r = -0.214^{**}$) and video game consoles ($r = -0.172^*$), as well as the daily use of video game consoles ($r = -0.267^{**}$), computers ($r = -0.269^{**}$), tablets ($r = -0.181^*$) and mobile phones ($r = -0.172^*$) was indirectly related with the time spent on family playtime (TSFAM), although watching television ($r = 0.170^*$) was directly related. The time spent on reading (TSR) associated negatively with the number of televisions ($r = -0.188^*$), however, it exhibited a moderate and positive correlation with the use of computers ($r = 0.332^{**}$). Similarly, the time spent on children's free play (TSFP) was negatively related with the number of televisions ($r = -0.200^{**}$), video game consoles ($r = -0.193^{**}$) and their use ($r = -0.262^{**}$), use of computers ($r = -0.278^{**}$) and mobile phones ($r = -0.188^*$).

Table 5: Correlation of technological devices and daily use of digital screens according to everyday aspects in the home during confinement

	NVC	NPC	NTB	DUVGC	DUTV	DUPC	DUTB	DUMP	TSPA	TSH	TSINS	TSART	TSHCH	TSFAM	TSR	TSFP
NTV	0,365**	0,020	0,209**	0,280**	0,204**	0,037	0,231**	0,209**	0,041	0,227**	-0,056	-0,189**	-0,031	-0,214**	-0,188*	-0,200**
NVGC	1	0,237**	0,250**	0,375**	-0,014	0,168*	0,190**	-0,001	-	0,178*	0,023	-0,191**	-0,016	-0,172*	0,038	-0,193**
NPC		1	0,470**	0,067	-0,178*	0,358**	0,043	-0,020	0,150*	0,058	0,065	-0,206**	-0,033	-0,053	0,034	-0,014
NTB			1	0,201**	-0,055	0,041	0,376**	-	0,269**	0,194**	0,018	-0,047	0,035	-0,035	0,059	-0,049
DUVGC				1	0,054	0,265**	0,221**	0,187*	-0,006	0,346**	-0,011	-0,245**	0,206**	-0,267**	0,043	-0,262**
DUTV					1	0,198**	0,176*	0,321**	-0,015	0,344**	0,012	0,240**	0,246**	0,170*	0,044	0,039
DUPC						1	0,017	0,271**	0,006	0,421**	0,052	-0,031	0,307**	-0,269**	0,332**	-0,278**
DUTB							1	-0,057	0,031	0,317**	0,002	-0,010	0,189*	-0,181*	-0,024	-0,015
DUMP								1	-	0,322**	-0,003	-0,006	0,317**	-0,172*	0,034	-0,188*
TSPA									1	0,220**	0,038	0,241**	0,246**	0,068	0,251**	0,198**
TSH										1	0,045	0,186*	0,334**	-0,284**	0,381**	-0,196**
TSINS											1	0,053	0,233**	0,046	0,190**	-0,015
TSART												1	0,399**	0,351**	0,316**	0,326**
TSHCH													1	0,194**	0,410**	0,012
TSFAM														1	0,224**	0,473**
TSR															1	0,174*
TSFP																1

Note 1: Number of televisions in the home (NTV); Number of video game consoles (NVGC); Number of computers in the home (NPC); Number of tablets in the home (NTB); Daily use of video game consoles (DUVGC); Daily use of television (DUTV); Daily use of computers (DUPC); Daily use of tablets (DUTB); Daily use of mobile phones (DUMP); Daily time spent on physical activity (TSPA); Daily time spent on homework (TSH); Daily time spent on playing instruments (TSINS); Daily time spent on artistic activities (TSART); Daily time spent on household chores (TSHCH); Daily time spent on family playtime (TSFAM); Daily time spent on reading (TSR); Daily time spent on free play (TSFP);

Note 2: Bivariate Pearson correlation at a significance level of $p < 0.05$ (*) and $p < 0.01$ (**)

Source: Authors' own creation

5. Discussion

This study analyzed the number of ICTs and other visual display technological devices present in the Spanish homes with children under the age of 12 and the time these minors spent using each one of these devices during the confinement period caused by the COVID-19. Additionally, these two aspects have been correlated with different variables linked to children's social habits, lifestyle and physical activity.

The results reveal that the Spanish families with children under 12 years of age who participated in this investigation have spent the confinement period surrounded by a significant number of ICTs in their homes. This datum confirms the results of the study conducted by the Association for Media Research [ES: *Asociación para la Investigación de Medios de Comunicación* (AIMC)] suggesting the existence of a high amount of technological equipment in the homes of children under 13 years old, confirming a mean of 7 technological devices, and 4 of them being the average used by the youngest in homes (*Asociación para la Investigación de Medios de Comunicación*, 2018). Televisions were the most frequent devices in households with children under 12 years of age, with a mean close to two units per family. The results of the latest survey conducted by the INE (2019) exhibit similar figures by pointing out that televisions are the most frequent devices present in the Spanish homes with a percentage of 99.5% in homes of couples with children. Also, the recent study conducted by the AIMC on a sample of 5190 Spanish children points out that televisions are the most used devices by them to watch televised content (91%) (*Asociación para la Investigación de Medios de Comunicación*, 2018). Other works have also confirmed the presence of an important multi-display context in Spanish children's homes, thus classifying child population as hyper-connected as of the age of 7, being intensified at the age of 10, and pointing out parents to be the main accountable ones for children's use of visual display devices (Torrecillas Lacave, Vázquez Barrio, Suárez Álvarez, Suárez Álvarez, & Fernández Martínez, 2020).

It is important to highlight that in this study 99% of Spanish homes had Internet access, a similar figure collected by the INE (2019) with 99.8% of couples' homes with children having Internet access in Spain. In the latter work, it is indicated that those homes that do not have Internet service pointed out as main reasons for such situation: not needing the Internet (75.5%), not knowing how to use it (51.3%), and the high cost of the equipment (28.0%).

Computers and tablets were the second most present group of devices in the homes, with mean values of 1.81 and 1.32, respectively. The 2019 INE survey confirmed that 93.1% of families with children have these devices in their homes. Video game consoles were the least present electronic visual display devices in the homes with children under 12 years of age, with a mean value of 0.88 per home. However, in one case, this device reached the maximum value of all the devices analyzed, with 14 video game consoles existing in a single home. The AIMC (*Asociación para la Investigación de Medios de Comunicación*, 2018) study observed that 39% of children surveyed owned a tablet, 34.7% a video game console, and 27.1% a smartphone. Through our study we confirmed that within the 7- to 12-year-old age band, 69.1% of children have at least a video game console in their homes, and 85.1% a tablet.

Regarding children's lifestyle during the period of confinement and its correlation with the number and use of technological devices, first, it is important to point out that their limited range of actions and the reduced space of many homes have caused changes in the lifestyle of all family members. As for levels of physical activity in children under 12 years of age recommended by different international entities (Piercy *et al.*, 2018; OMS, 2019), they have become a major challenge for many families. Typical levels of physical activity in Spanish children have not been relatively high, with

some studies showing percentages of 70% of boys and 88% of girls ranging from 2 to 10 years old who do not fulfill the 60 minute daily physical activity recommendations (Nutritional Research Foundation [EN: *Fundación para la Investigación Nutricional*, 2016]). Another study conducted on a sample made up of 3598 children between ages 10 and 14 demonstrated that 64.3% of students did not fulfill the physical activity recommendations (Herazo-Beltran *et al.*, 2019). This confinement period entailed a greater obstacle for children to engage in physical activity, thus confirming that only less than 13.1% of children did fulfill the daily physical activity recommendations, implying that 86.9% did not fulfill such recommendations, a higher figure than the one confirmed by several studies about levels of physical activity in children.

But to what extent could have the presence and use of the different technological devices found in homes during the period of confinement influenced on these levels. In this sense, a correlation between the time of use of different devices and the absence of physical activity was found. Parents who affirmed that their children did not do any physical activity during the period of confinement, indicated higher values in the use of video game consoles (M = 26.48; S.D. = 55.82), television (M = 84.63; S.D. = 70.68), computers (M = 84.63; S.D. = 70.68) and mobile phones (M = 18.43; S.D. = 47.69). Low levels of physical activity and a great amount of time spent in front of visual display devices was also demonstrated in other countries (Maher *et al.*, 2019). A study conducted on a sample of 267 children in their first year of primary school confirmed the necessity of promoting a healthy overall lifestyle, which includes nutrition, time spent on physical activity and videogames comprehensively, since its authors found higher probabilities of poor adherence to a healthy diet in children who played videogames for more than an hour per day (Buja, Grotto, Brocadello, Sperotto, & Baldo, 2020).

On another note, the time spent on homework during the confinement period was directly associated to the number of televisions, video game consoles and tablets; being that association moderate with the daily use of video game consoles, televisions, computers, tablets, and mobile phones. The time spent on artistic activities, such as painting, drawing, photographing, etc., was positively associated to the daily use of television, although it did negatively with the number of televisions, video game consoles, computers, and daily use of video game consoles. Household chores were directly related to the daily use of videogame consoles, television, and tablets, being moderate with the use of computers and mobile phones.

Finally, the time spent on family playtime was associated to the time spent on watching television and indirectly to the number of televisions, daily use of video game consoles, computers, tablets, and mobile phones. In a recent study conducted on 946 young people between ages 11 and 18, preliminary correlations indicated that higher scores in anxiety, impulsiveness, hostility, and social skills deficit and lower scores in family functioning (interpersonal relations) and more time spent gaming were associated with video game addiction disorder. (Fumero *et al.*, 2020).

The time spent on reading was negatively associated to the number of televisions; however, it exhibited a moderate and positive correlation with the use of computers. Likewise, the time spent on children's free play was negatively related to the number of televisions, video game consoles and their use, the use of computers and mobile phones. Different habits or activities that should have greater presence in children's lifestyle are overshadowed by the time spent on video game consoles. This coincides with other authors' findings (Chacón Cuberos, 2018) pointing out that most of preteens had a video game console and more than half used to play with it at least once a week. They concluded that 15% of students claimed to have replaced other activities with playing with their video game consoles, and a third felt in a bad mood if they did not do so. The richness of a healthy lifestyle for a child lies in the possibility of performing different activities contributing to a better

development of their abilities and capacities, thus avoiding overshadowing some of these by the overuse of some visual display technological devices. In this sense, some authors recommend, in addition to teaching parents about the possible risks of the Web, teaching them about the use of ICTs with the purpose of establishing assertive communication with their children (Condeza, Herrada-Hidalgo, & Barros-Friz, 2019).

6. Conclusions

We concluded that during the period of confinement Spanish children under 12 years of age made an extensive use of ICTs, mainly due to a higher amount of time at home and especially due to the significant amount of visual display technological devices in the majority of homes. Televisions were the most present and most used device, even quadrupling the time spent on it against other devices, according to the studies reviewed because it is shared with the whole family, whereas the other devices are meant for a more individual use. Computers and tablets were also prominent, with computers being the second most present device in the homes, and tablets the second most used by children during confinement. Totalling the time spent on the different technological devices analyzed in this work, the mean value of ICTs' use was close to 3 hours per day in children under the age of 12.

Regarding the possible association between the use and number of ICTs and children's lifestyle, it is important to point out that different statistically significant associations were found between various children's social habits, daily activities, and time of use or presence of devices in the home. The time spent on gaming was negatively related to the time spent on physical activity, on learning how to play an instrument, on artistic activities, on family, and on free play. The time spent on free play, something essential for 0- to 2-year-old children, was negatively related to a significant amount of devices; televisions, video game consoles, computers, and mobile phones. On another note, during the confinement period, a very high percentage of children, 85% approximately, did not fulfill the minimum amount of physical activity recommended by international entities for a healthy lifestyle, which entails possible consequences for their health and physical, social, affective, and emotional well-being. This exceptional confinement situation, caused by the COVID-19 pandemic, entailed important alterations to the routines of Spanish children.

7. Recommendations and prospects

A mainly descriptive and correlational analysis of the number of electronic devices and their time of use by children under the age of 12 during the confinement period was conducted in this study. For the sake of future works, it would be advisable to analyze the possible educational use linked to the ICTs present in children's homes, analyzing whether their parents have sufficient training so that, in the case of new confinement periods, they can maximize the utilization of the educational possibilities offered by the different electronic devices. In the event of parents not having sufficient knowledge of the handling and use of ICTs, from an educational perspective, it would be advisable to train families about their use so that they can fulfill the minimum requirements of online education homework. In the face of these findings, it would be advisable to establish action guidelines and to train families to use ICTs on children properly, in order to handle situations such as this in the future, thus avoiding, to the extent possible, altering children's everyday life without overusing certain visual display technological devices that could be detrimental to the execution of other social, cultural, healthy and/or educational activities that contribute to the comprehensive development of every child.

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