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Use of mobile devices in the childhood: opportunities and risks

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Keywords

Children
Family role
Educational technology
Digital literacy

Abstract

There is a great scientific and social interest in analyzing the effects of the use of technological devices in childhood. The responsibility given to families in children digital education makes it essential to rely on their perceptions to understand this issue. Survey-based quantitative research was carried out to investigate families' perception on their children's use of mobile devices. A 15-item questionnaire (5-point Likert scale) was administered to inquire about the benefits and risks of devices use. A total of 241 families (73.4% mothers) with children aged 3 to 8 years (51.7% girls) attending Early Childhood and Primary Education participated. The results showed a higher appraisal of the risks, with access to inappropriate content standing out. Educational usefulness and entertainment were the most valued benefits. There was greater concern in families with children in Early Childhood Education. Parents' age correlated negatively with the appraisal of the benefits for parental control and educational usefulness, and children's age positively with concern about family and social isolation. Differences in terms of time spent online and the use of parental control mechanisms were found. Lastly, it points out the need to take preventive measures at school and at household level to optimize the benefits of the use of technology devices and reduce the risk associated with their use from an early age.

Uso de los dispositivos móviles en la infancia: oportunidades y peligros

Palabras clave

Niños/as
Rol familiar
Tecnología educativa
Alfabetización digital

Resumen

El análisis de los efectos del uso de dispositivos tecnológicos en la infancia suscita especial interés científico y social. La responsabilidad otorgada a las familias en la educación digital de la infancia hace imprescindible contar con sus percepciones para comprender este fenómeno. Se realizó una investigación cuantitativa, a través de la técnica de encuesta, en la que se indagó en la percepción de las familias acerca del uso que sus hijas e hijos realizaban de dispositivos móviles. Se aplicó un cuestionario compuesto por 15 ítems (escala Likert 5 puntos) sobre los beneficios y riesgos del uso de estos dispositivos. Participaron 241 familias (73.4% madres), con hijos/as de 3 a 8 años (51.7% niñas) escolarizados en Educación Infantil y Primaria. Los resultados mostraron una valoración más elevada de los riesgos, destacando el acceso a contenido inapropiado. La utilidad educativa y el entretenimiento fueron los beneficios más valorados. El nivel de preocupación fue mayor en familias con hijos/as en Educación Infantil. La edad de los progenitores correlacionó negativamente con la valoración de los beneficios para el control parental y su utilidad educativa, y la edad de los/as hijos/as positivamente con la preocupación por el aislamiento familiar y social. Hubo diferencias en función del tiempo de conexión y del empleo de mecanismos de control parental. Finalmente, se apunta la necesidad de tomar medidas preventivas de educación digital escolar y familiar que permitan optimizar los beneficios del uso de dispositivos y reducir los riesgos asociados a su uso desde edades tempranas.

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Technology has become particularly prominent in this changing, complex, uncertain world, where ease of connection and the spread of screens has shaped a computerized, hybrid, mobile, ubiquitous way of living. In a visionary article, Negroponte (1998) argued that the digital revolution would be over once technology became imperceptible, having permeated current practices and narratives. This was a basis for the articulation of the concept of the "post-digital society", calling for a liberating, critical view of development and its consequences, particularly in the field of education (Knox, 2019).

Against this background, various studies have examined the consequences of the prominence of technology in our society and its sudden expansion to all levels. From the standpoint of the level of use according to age, it has been shown that the spread and intensity of use is greater in young people and even in children. Studies in various countries have led to conclusions that we will outline below. Firstly, children's internet use has doubled compared to ten years ago (Smahel et al., 2020). In addition, mobile device use by children is almost universal as the study by Rideout and Roob (2020) indicated, in which 97% of children aged 0-8 years old had access from their homes and they use them at a younger age (Andrade et al., 2021; Kulakci-Altintas, 2020; Lee & Park, 2018). More specifically, Kulakci-Altintas (2020) noted that 82.4% of children aged 0-3 years old already used mobile devices. Studies have also confirmed that children have their own mobile devices when they are very young –Andrade et al. (2021) reported a mean age of 10.96 years old.

Studies about the use of mobile devices in childhood revolve around two poles. On the one hand, some address the risks children are exposed to and the negative consequences of use, particularly improper use. On the other hand, other studies note the possibilities, particularly in education, offered by digital technology. Both approaches include particular mention of the family and its responsibility in children's education, with two focuses: recognition of the difficulties of the current technologized situation and examination of digital education of children.

One of the starkest warnings has come from studies about the harmful effects of screen-time in children's first years, when the brain is still developing (Christakis et al., 2018; Madigan et al., 2019). Additional threats come from accessing inappropriate content (Pew Research Center, 2018) or how children's emotional balance –and that of the people around them– can be affected when there are high levels of dependence (Hansen, 2021). Studies have also shown how technological devices can generally interfere with family relationships (Hosokawa & Katsura, 2018), also depending on parents' attitudes, levels of use, education, and connection (Auxier et al., 2020; Son et al., 2020).

When it comes to educational use of the technology, although studies are not conclusive, some authors have warned of the negative effects of mobile phones on school performance (Kates et al., 2018) and other problems, such as those noted by the American Psychological Association (2019). Other studies (Criollo et al., 2021) have positively rated the benefits of learning supported by mobile devices, highlighting accessibility, motivation, and the ability to adapt to students' needs. The recommendations of international organizations and public educational policies are driving the use of technology in schools through various measures, including significant investment in equipment and digital skilling for teachers and students in order to make the most of these tools and minimize the associated risks. This should encourage not only formal educational processes, but also expanded and invisible learning and contribute to enriching what are known as learning ecologies (González-Sanmamed et al., 2019, González-Sanmamed et al., 2020).

Method

This was a quantitative study with a descriptive, transversal, correlational design, with the aim of examining families' perceptions around the use their children make of mobile devices. There were three specific objectives: (1) identify how families rate the perceived benefits and risks on their children's use of mobile devices, (2) determine the relationship between the families' perceived risks and benefits, and (3) assess whether those opinions vary according to certain parental characteristics and how the children use the devices.

Participants

A total of 241 families participated in the study. A forth (26.6%) were fathers and 177 were mothers (73.4%). The mean age of the participants was 39.4 years (SD = 6.84). Most were Spanish nationals (95.8%) and married (72.5%). Half (49.8%) were university graduates or equivalent, 31.5% had vocational training, and most (78%) were employed. Just over half of the children (n = 124; 51.7%) were girls, 116 (48.3%) were boys. They attended early childhood education (45%) or the first cycle of primary school (55%) in schools in the province of A Coruña (76.7% state funded, 18.8% independent, and 4.6% private).

Instrument

We used a questionnaire designed for this study about childhood mobile device use. It was made up of eight sections (sociodemographic information about the family and their children, identifying data about the use of mobile devices, time online, activity, use habits, parental control, and parental assessment of risks and benefits). During the design of the questionnaire, the content was validated by a panel of eight experts in methodology and educational technology from four countries (Brazil, Costa Rica, Ecuador, and Spain) who analyzed the unambiguity, relevance, and importance of each item. Their contributions helped us to improve the wording for various items and to restructure the initially proposed blocks.

The present study focused on analysis of the section related to Benefits (7 items) and Risks (8 items) of mobile device use, rated on a 5-point Likert scale (1 = *Never* and 5 = *Always*) which demonstrated excellent reliability (α = .885).

Construct validity was assessed using Exploratory Factorial Analysis (EFA) based on parallel analysis, a technique that uses the original correlation matrix, allowing common factors to be identified with eigenvalues that are greater than what would be

obtained at random (Lloret-Segura et al., 2014). The extraction method was Principal Axes, as the distribution did not exhibit normality ($p < .001$), with Oblimin oblique rotation, based on the intercorrelation between factors, have been shown to be one of the most appropriate modern options in social sciences (Lloret-Segura et al., 2014; López-Aguado & Gutiérrez-Provecho, 2019).

After confirming that the structure of the data was suitable for EFA (KMO = .81; Bartlett's Sphericity: $\chi^2_{136} = 874.08$, $p < .001$), we examined the factorial structure. Table 1 shows the solution extracted in two factors explaining 58.3% of the total variance (38.39% explained by Factor 1 and 19.41% explained by Factor 2). The results are presented ordered according to the pattern matrix, which shows the unique factor loadings on the variables, with loadings above .65 for Factor 1 and .5 for Factor 2. The structure matrix is also shown with the (zero order) correlations between factors and variables. There were no notable discrepancies between the two matrices. Loadings below .4 were removed, and there was no need to remove any items.

Procedure and data analysis

The questionnaire was applied during three months when the families came to the schools to drop off or collect their children. The aims of the study were explained to them, and they were assured of confidentiality and ethical guarantees, and that the data would only be used for the purposes of this study. After the explanation, and after any questions they had were answered, they were given a QR code with which they could download and complete the questionnaire on their own mobile phones.

We performed descriptive (central tendency and deviation) and inferential analyses. We used the *t* test (paired samples) to identify the families' ratings of the perceived risks and benefits of their children's mobile phone use. In addition, we examined the correlations between risks and benefits through Pearson's *r*. This test also allowed us to test the relationships and differences between benefits and risks according to time spent using the device and parental control. For the comparative analysis by educational stage, we used the *t* test (independent samples). Finally, we performed a Multivariate Analysis of Variance (MANOVA) to determine whether there were differences between the various benefits and risks and –with each acting as dependent variables– with respect to time spent using the device and parental control. We considered differences statistically significant at a 95% confidence level ($p < .05$).

Results

Descriptive analysis of the risks and benefits of using mobile phones

In general, the families rated the risks higher than the benefits (Table 2). The paired-samples *t* test showed that most of these comparisons were statistically significant ($p < .001$), with a large effect size for the comparisons between all of the risk variables and the benefit of "Parental control" ($d = .64$-$.95$), with the exception of "Economic costs", which had a small effect ($d = .36$). There were significant differences in the case of "More access to information" and the risk variables ($p < .001$) with a small effect size ($d = .22$-$.38$) in "Distorts reality" ($t_{235} = 2.13$, $p = .04$, $d = .14$), and in "Access to online games" ($t_{235} = 2.43$, $p = .002$, $d = .16$). "Economic costs" were rated significantly lower than "Better communication" ($t_{235} = -2.82$, $p = .005$, $d = .62$) and were not significantly different from the

Table 1

Factorial loadings for the dimensions

			Pattern matrix		Structure matrix	
	Initial	Extraction	F1	F2	F1	F2
R3: Family/social isolation	.777	.803	.903		.896	
R5: Commit/suffer cybercrimes	.803	.802	.9		.895	
R4: Addiction	.81	.812	.898		.901	
R7: Distorts reality	.769	.753	.879		.865	
R1: Lowers performance	.789	.767	.867		.875	
R2: Access inappropriate content	.782	.72	.843		.848	
R8: Access online games	.733	.708	.838		.841	
R6: Economic costs	.528	.441	.654		.663	
B4: Educational utility	.595	.589		.757		.766
B3: More access to information	.614	.556		.725		.741
B5: Socialization	.464	.497		.719		.693
B6: Useful resources	.387	.384		.593		.612
B2: Better communication	.448	.318		.573		.559
B7: Entertainment	.387	.384		.564		.573
B1: Parental control	.34	.264		.516		.514

ratings for the benefit, "Useful resources" ($t_{235} = 1.53, p = .127$), although the other risks were, with small to moderate effects ($p < .001$, $d = .25$-$.53$). "Educational utility" and "Entertainment" were rated significantly below almost all of the risk variables ($p < .001$) except "Distorts reality" (R7: $t_{235} = 1.59$, $p = .114$; R8: $t_{235} = 1.59, p = .113$) and "Access to online games" (R7: $t_{235} = 1.96, p = .051$; R8: $t_{235} = 1.89, p = .06$).

Looking at the Benefits factor, the parental control element was rated significantly higher than having "Better communication" ($t_{235} = 6.24$, $p < .001$, $d = .41$) and "Socialization" ($t_{235} = 1.49$, $p < .001$, $d = .1$), whereas it was rated significantly lower than the benefit of "More access to information" ($t_{235} = -9.57$, $p < .001$, $d = .62$), "Educational utility" ($t_{235} = -10.57, p < .001, d = .69$), the possibility of using "Useful resources" ($t_{235} = -7.685, p < .001, d = .5$), and even "Entertainment" ($t_{235} = -10.143, p < .001, d = .66$).

The respondents gave the lowest ratings to using mobile devices for "Better communication", which had a mean score below two points with a dispersion of responses of little more than one point. This item was rated significantly lower than all of the others in the factor ($p < .001$). "Educational utility" and "Entertainment" were rated significantly higher, followed by "More access to information". In fact, "Educational utility" was rated significantly higher than "Socialization" ($t_{235} = 14.68$, $p < .001$, $d = .95$) and the use of "Useful resources" ($t_{235} = 2.89$, $p < .001$, $d = .19$). "Entertainment" was rated significantly higher than "Educational utility" ($t_{235} = 0.11, p < .001, d = .001$), "Socialization" ($t_{235} = 15.01$, $p < .001$, $d = .98$), and the use of "Useful resources" ($t_{235} = 2.75, p < .001, d = .18$), whereas "Better access to information" was rated significantly higher than "Socialization" ($t_{235} = 12.63$, $p < .001$, $d = .82$) and the use of "Useful resources" ($t_{235} = 2.01$, $p < .001$, $d = .13$). The effect size between the items referring to educational utility, entertainment, and access to information was small, while for the others it was moderate to large.

In the Risk factors, there were statistically significant differences, with families placing "Access to inappropriate content" as a greater risk than "Reduces performance" ($t_{237} = 5.38$, $p < .001$, $d = .35$), "Family and social isolation" ($t_{237} = 5.88$, $p < .001$, $d = .38$), "Addiction" ($t_{237} = 3.09$, $p = .002$, $d = .2$), "Economic costs" ($t_{235} = 12.54$, $p < .001$, $d = .82$), "Distorts reality" ($t_{238} = 6.78$, $p < .001$, $d = .44$), and "Access to online games" ($t_{237} = 6.22$, $p < .001$, $d = .66$). The second-highest rated risk was "Commit or suffer from cybercrime", which was rated significantly higher than "Reduces performance" ($t_{237} = 2.81$, $p = .005$, $d = .18$), "Family and social isolation" ($t_{237} = 4.66$, $p < .001$, $d = .3$), "Economic costs" ($t_{235} = 12.24$, $p < .001$, $d = .8$), "Distorts reality" ($t_{238} = 6.72$, $p < .001$, $d = .44$), and "Access to online games" ($t_{237} = 5.95$, $p < .001$, $d = .39$). Similarly, "Addiction" was significantly more of a concern than "Family and social isolation" ($t_{237} = 3.33$, $p < .001$, $d = .22$), "Economic costs" ($t_{235} = 11.3$, $p < .001$, $d = .74$), "Distorts reality" ($t_{238} = 5.27, p < .001, d = .34$), and "Access to online games" ($t_{237} = 4.11, p < .001, d = .51$). Looking at the last three risks –rated significantly lower than the others ($p < .001$)–, "Access to online games" was significantly more of a concern than "Economic costs" ($t_{234} = 8.11, p < .001$, $d = .53$), but was significantly no different to "Distorts reality" ($p = .56$), which was rated significantly higher than the concern for "Economic costs" ($t_{235} = 7.9, p < .001, d = .51$).

Finally, Table 3 shows that there were weak, positive, significant correlations between some of the risks and benefits families considered about using mobile devices. In particular, families who gave a high rating to the use of mobiles to improve communication and as offering useful resources also thought that it could lead to lower performance, access to inappropriate content, family and social isolation, addiction, committing or suffering from cybercrime, and distortion of reality. In addition, they felt that the benefit of offering useful resources was associated with the economic costs of use.

Comparative analysis of the risks and benefits of mobile device use as perceived by families of children in early childhood and primary education.

Table 4 shows that, generally, the perceptions about benefits were slightly better in families of students in early childhood education than those with children in primary school. These differences were only statistically significant in relation to the potential for "Better access to information" ($p = .042$), with a small effect size ($d < 0.3$). In both groups, facilitating "Better communication" was not highly rated, with a greater dispersion in primary school children's families ($SD = 1.12$) than those in early childhood education ($SD = 1.05$).

Table 2

Descriptive data for benefits and risks

	N	*M*	*Md*	*SD*		*N*	*M*	*Md*	*SD*
B1: Parental control	236	2.38	2	1.4	R1: Lowers performance	238	3.84	4	1.4
B2: Better communication	237	1.86	1	1.09	R2: Access inappropriate content	239	4.12	5	1.24
B3: More access to information	237	3.38	4	1.37	R3: Family/social isolation	238	3.77	4	1.43
B4: Educational utility	238	3.45	4	1.24	R4: Addiction	239	3.95	5	1.34
B5: Socialization	238	2.23	2	1.17	R5: Commit/suffer cybercrimes	239	4.02	5	1.28
B6: Useful resources	238	3.21	3	1.35	R6: Economic costs	236	3.04	3	1.4
B7: Entertainment	236	3.47	3	1.14	R7: Distorts reality	239	3.64	4	1.39
					R8: Access online games	238	3.68	4	1.42

When it comes to the risks, the families of children in early childhood education generally demonstrated greater concern in all of the items. These differences were statistically significant in relation to "Reduces performance" (p = .48), "Access to inappropriate content" (p = .022), "Family and social isolation" (p < .001), "Addiction" (p = .007), and "Committing or suffering cybercrimes" (p = .046).

Examination of the relationships and differences between the families' perceived benefits and risks of mobile device use by children's and parents' ages, by time spent online, and by the exercise of parental control

Parents' ages had an impact on how they rated the benefits of mobile device use in terms of better "Parental control" (r = -.231, p > .001) and about the "Educational utility" of these devices (r = -.147, p = .025). The older the parent, the less they felt they could exercise such control, and the less educational utility they saw. We found no statistically significant correlations between children's age and the perceived benefits of using a mobile device. In terms of risks, we found that parents' age had no relationship to their ratings of these variables, whereas the children's age was related to the rating for risk of "Family and social isolation", with less worry in the family as children were older (r = .129). These relationships were weak, meaning the results should be considered with caution.

Box's M test for equality of covariance matrices showed that they were equivalent in the four groups analyzed in terms of weekly time spent using the device (Box's M = 108.561, p = .085). The MANOVA demonstrated differences in the

Table 3

Correlations between benefits and risks

	B1	B2	B3	B4	B5	B6	B7
R1	.135	.049	.262**	.2*	.036	.208*	.093
R2	.06	.027	.226**	.182*	.017	.163*	.162*
R3	.036	-.003	.216**	.138	-.015	.157*	.142*
R4	.091	.006	.236**	.15*	-.033	.164*	.128*
R5	.076	.101	.212*	.164*	-.005	.211*	.182*
R6	.177*	.154*	.07	.127	.08	.16*	.083
R7	.025	-.044	.176*	.113	-.075	.194*	.126
R8	.063	.069	.175*	.138	.019	.246**	.103

* p < .05; ** p < .001.

Table 4

Comparison of families' ratings of benefits and risks by educational stage

	Early Childhood Education			Primary Education			Contrast test		
	N	*M*	*SD*	*N*	*M*	*SD*	Student's *t*[a]	*df*	*d*
B1	109	2.52	1.36	127	2.25	1.44	1.48	234	
B2	109	1.85	1.05	128	1.86	1.12	-0.04	235	
B3	109	3.55	1.38	128	3.24	1.34	1.74*	235	.23
B4	109	3.59	1.23	129	3.34	1.25	1.52	236	
B5	109	2.32	1.21	129	2.16	1.13	1.1	236	
B6	109	3.14	1.38	129	3.28	1.33	-0.8	236	
B7	109	3.55	1.09	127	3.39	1.18	1.05	234	
R1	109	4.01	1.36	129	3.71	1.42	1.67*	236	.22
R2	109	4.29	1.1	130	3.97	1.34	2.02[b]*	237	.26
R3	109	4.06	1.31	129	3.53	1.48	2.83[b]**	236	.37
R4	109	4.12	1.17	130	3.76	1.44	2.45[b]*	237	.32
R5	109	4.17	1.21	130	3.89	1.34	1.7*	237	.22
R6	109	3.07	1.36	127	3.02	1.45	0.31	234	
R7	109	3.77	1.27	130	3.53	1.48	1.33[b]	237	.17
R8	109	3.81	1.37	129	3.58	1.46	1.22	236	

Note: [a] H_a μ Early Childhood Education > μ Primary Education

[b] The significant Levene's test (p < .05) suggests that the variances are not equal.

* p < .05; ** p < .001.

ratings given to benefits as a function of time spent using the device (Wilks' Lambda = 0.844, F(21, 638) = 1.85, p = .012), with a small effect size (η^2 =.057). More specifically, considering the values of the inter-subject effects test, time spent using the device each week had an effect on the ratings related to "Parental control", "Better communication", and "Entertainment". Post hoc testing with Bonferroni's correction indicated that there was "Better parental control" (p = .024) and "Better communication" (p = .033) when the child used the device for less than one hour per day compared to no use, as well as "Better communication" when the time spent using the device was more than one hour per day compared to sporadic use (p = .04). Using the device for "Entertainment" was considered more beneficial when the it was used for less than one hour per day compared to no use (p = .016) or sporadic use (p = .035).

In the case of weekend device use, the matrices were not equivalent in the test groups (Box's M = 166.79, p > .001), meaning we used Pillai's trace to analyze the multivariate significance of the main effects. The results were significant, with a small effect size (Pillai's trace = .25, F(21, 654) = 2.77; p < .001; η^2 = .091). The inter-subject effects test showed the presence of an effect of weekend device use on all of the benefits evaluated, except "Parental control". More specifically, we found lower ratings in the no-use group than the one hour or more groups for "Better communication" (p = .017), "Better access to information" (p = .002), "Educational utility" (p < .001), "Socialization" (p = .018), and "Entertainment" (p < .001). In addition, there were worse ratings from those whose children did not use devices than those who used them for less than one hour in the whole weekend in "Better access to information" (p = .006), "Educational utility" (p < .001), "Socialization" (p = .027), and "Entertainment" (p = .034).

Looking at the risks according to time spent on the mobile device per week, Box's M test showed the absence of equality of the covariance matrices in the groups analyzed (Box's M = 222.97, p < .001), hence the data were examined using Pillai's trace (value = 0.108, F(24, 669) = 1.04, p < .405), which indicated that time of use had no significant effect on the ratings of risks. Looking at weekend use, it was also not possible to verify equality of the covariance matrices (Box's M = 337.87, p < .001). In this case, Pillai's trace showed that the results were significant, with a small effect size (Pillai's trace = .185, F(24, 651) = 1.78; p = .013; η^2 = .066). The inter-subject effects test showed that the effect of time spent on the mobile device on the risks referred solely to "Access to online games", with this being rated higher when devices were used for less than one hour over the whole weekend than when the use was sporadic (p = .05).

Finally, we examined the effect of exercising parental control on the perceived benefits and risks. Looking at the benefits, the absence of equality in the matrix of covariances (Box's M = 92.18, p = .022) meant we used Pillai's trace to test the information (Pillai = 0.112, F(14, 444) = 1.87, p = .027, η^2 = .06), which showed that there was a statistically significant effect of parental control on the perception of benefits, albeit with a small effect. More specifically, the effect was seen in relation to the benefits "Parental control" (p = .01), "Better access to information" (p < .001), and "Educational utility" (p = .003). In each case the ratings were higher in families who reported exercising parental control that children complied with.

Table 5

Benefits and risks of mobile device use by time spent using it during the week and at weekends

	Time spent during the week											Time spent during weekends										
	No use (n = 52)		*Sporadic use (n = 76)*		*<1h/day (n = 60)*		*1h or more/day (n = 44)*		*Inter-subject effects tests*			*No use (n = 13)*		*Sporadic use (n = 74)*		*<1h/day (n = 35)*		*1h or more/day (n = 104)*		*Inter-subject effects tests*		
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	MC	F	η^2	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	MC	F	η^2
B1	2.04	1.22	2.16	1.46	2.80	1.45	2.68	1.31	8.11	4.27*	.05	1.62	1.33	2.12	1.39	2.31	1.39	2.63	1.35	6.26	3.35	
B2	1.56	0.98	1.71	1.02	2.07	1.1	2.27	1.19	5.49	4.83*	.06	1.08	0.28	1.73	1.01	1.89	1.08	2.03	1.16	4.07	3.56*	.05
B3	3.06	1.43	3.29	1.41	3.57	1.2	3.73	1.37	4.46	2.42		2.23	1.09	3.12	1.41	3.66	1.28	3.64	1.29	10.67	6.11**	.076
B4	3.31	1.21	3.25	1.35	3.75	1	3.64	1.18	3.66	2.52		2.23	0.93	3.15	1.3	3.8	1.13	3.72	1.08	12.65	9.42**	.113
B5	2.06	1.13	2.16	1.05	2.38	1.2	2.48	1.36	1.97	1.45		1.38	0.65	2.04	1.04	2.54	1.15	2.39	1.26	6.05	4.61*	.059
B6	3.04	1.5	3.22	1.31	3.32	1.36	3.25	1.24	0.77	0.42		2.31	1.44	3.05	1.38	3.54	1.31	3.34	1.27	5.97	3.41*	.044
B7	3.19	1.21	3.2	1.17	3.73	0.97	3.89	1.1	7.15	5.73**	.07	2.23	1.09	3.05	1.05	3.57	1.07	3.88	1.04	17	15.52**	.173
R1	3.86	1.41	3.83	1.41	3.82	1.41	3.91	1.4				3.5	1.7	3.96	1.35	3.5	1.61	3.98	1.3	2.89	1.49	
R2	4.18	1.3	4.03	1.29	4.16	1.19	4.14	1.52				3.93	1.44	4.22	1.14	3.89	1.56	4.18	1.15	1.19	0.77	
R3	3.68	1.36	3.88	1.41	3.69	1.58	3.84	1.31				3.5	1.56	3.93	1.36	3.72	1.56	3.77	1.37	0.93	0.47	
R4	4.04	1.36	4.01	1.27	4.02	1.34	3.73	1.42				3.79	1.48	4.06	1.26	4	1.49	3.96	1.29	0.33	0.19	
R5	3.98	1.41	4.12	1.24	3.95	1.32	4.07	1.15				3.36	1.69	4.17	1.19	3.97	1.48	4.09	1.15	2.69	1.7	
R6	3.18	1.42	3.14	1.49	2.93	1.39	2.84	1.29				2.57	1.56	3.38	1.52	3.08	1.3	2.90	1.33	4.35	2.22	
R7	3.66	1.32	3.7	1.41	3.57	1.44	3.66	1.36				3.36	1.55	3.9	1.31	3.56	1.42	3.60	1.36	2.1	1.13	
R8	3.64	1.5	3.69	1.44	3.56	1.42	3.84	1.32				3.43	1.51	3.94	1.4	3.22	1.53	3.70	1.5	4.5	2.28*	.03

Looking at the risks, we again used Pillai's trace due to not finding equality in the covariance matrix (Box's M = 184.55, $p < .001$). This indicated the presence of a statistically significant effect for parental control on the perception of risks (Pillai = 0.161, F(16, 442) = 2.42, $p = .002$). The inter-subject effects test showed that these effects occurred in the risks associated with "Reduces performance" ($p = .005$), "Commit or suffer from cybercrime" ($p = .025$), "Addiction" ($p = .006$), "Economic costs" ($p = .003$), and "Access to online games" ($p = .015$). In each case, the parents gave a higher rating in families who exercised parental control than those who did not.

Discussion and conclusions

Considering the vital role of the family in children's education, this study collected their assessments around childhood mobile device use. The first thing to stress is that the ratings were much higher in the items about risks than about benefits, demonstrating the level of concern and the need for prevention, as noted by authors such as Livingstone and Blum-Ross (2020).

The most highly rated benefits were entertainment and educational utility, followed by better access to information. This recognition of using technology to support learning ($M = 3.59$ in early childhood education and $M = 3.34$ in primary education) opens up possibilities for incorporating mobile devices in teaching, concurring with the positions maintained by Criollo-C et al. (2021). The most highly rated risks were access to inappropriate content and the possibility of committing or suffering from cybercrime, confirming what other studies have found (Radesky et al., 2020). This worry was particularly noted amongst families with children in early childhood education (along with the risk of addiction to the devices), but they were also the families who recognized greater benefits from appropriate device use (such as better access to information and better communication), as noted by Smahel et al. (2020).

Time spent using a device is one of the variables that has had most emphasis placed on it when it comes to identifying negative effects of use, as previous studies such as Tamana et al. (2019) have shown. Our results confirmed that families that allow their children to use their devices for an hour or more per day do so considering the benefits, which include parental control. And accordingly, we found that families that permitted sporadic use or did not allow their children to use mobile devices did not find such benefits, hence their reluctance. Taken together with the results about the risks, this shows that there were two types of families: those who allowed their children to use mobile devices and who believe they offer benefits, without ignoring the possible risks (e.g., accessing online games, especially at weekends); and those who were more averse to using them as they put the risks ahead of the benefits.

Older parents were found to give lower ratings to the possibility of exercising parental control and the consideration of educational utility, perhaps because of greater ignorance about what tools are available or due to potential difficulties in their own abilities for using these devices effectively.

The families that used parental control mechanisms seemed to have greater awareness of the implications of using mobile devices and their positive and negative effects, as indicated by Kulakci-Altintas (2020). In our study, they gave higher ratings to the benefits devices offer as well as the risks.

A general conclusion we can draw from our study is that, like other studies (Besoli et al., 2018; Ochoa & Reich, 2020),

Table 6

Effects of parental control on perceived benefits and risks of mobile device use

	No control (n = 25)		*There is control which is complied with (n = 188)*		*Control is not followed or not monitored (n = 17)*		*Inter-subject effects tests*		
	M	*SD*	*M*	*SD*	*M*	*SD*	MC	F	η^2
B1	1.6	1	2.47	1.44	2.53	1.28	8.61	4.49*	.038
B2	1.56	0.92	1.91	1.12	1.88	1.05	1.39	1.17	
B3	2.4	1.26	3.51	1.33	3.41	1.33	13.62	7.75**	.064
B4	2.72	1.28	3.57	1.2	3.24	1.03	8.39	5.83*	.049
B5	1.88	1.09	2.29	1.16	2.29	1.36	1.85	1.35	
B6	2.32	1.55	3.31	1.3	3.35	1.17	10.98	6.34*	.053
B7	3.16	1.18	3.49	1.14	3.71	1.16	1.71	1.3	
R1	3.04	1.72	3.97	1.32	3.71	1.45	9.81	5.19*	.044
R2	3.68	1.52	4.21	1.18	3.82	1.43	3.89	2.53	
R3	3.32	1.68	3.87	1.39	3.41	1.28	4.6	2.3	
R4	3.36	1.68	4.1	1.26	3.35	1.27	9.5	5.55*	.047
R5	3.32	1.73	4.15	1.18	3.94	1.25	7.78	4.98*	.042
R6	2.24	1.62	3.21	1.34	2.53	1.23	12.84	6.88**	.057
R7	3.2	1.63	3.74	1.34	3.35	1.37	4.12	2.19	
R8	2.96	1.7	3.8	1.36	3.29	1.4	9.17	4.69*	.04

it shows that there is no shared perspective amongst families about the advantages and drawbacks associated with children using these devices. This same disparity can also be seen in an analysis of the scientific literature because, despite significant research efforts, there is still no clear, definitive evidence on the impact of using mobile devices in early childhood. Furthermore, the constant development of technology and its uses demand that analytical frameworks be continually updated, meaning more empirical studies on this complex reality and its effects will continue to be needed, especially in the young population, in such a way as to ensure their digital wellbeing (European Commission, 2022).

In any case, the available results are compelling when it comes to recommending digital literacy for all and making families and educators aware so that they can educate, guide, and advise children as they make their way in the technological world and begin to shape their digital identities.

Despite the interesting results and their importance for action at family and school level, from a research standpoint we must recognize the limitations inherent in a quantitative study of this nature and the desirability of expanding it, both in terms of a larger sample to improve the representativeness and of complementing it with a qualitative approach that would improve identification of the situations and perceptions of those involved.

Authors contribution

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Conflict of interest

The authors declare that there is no conflict of interest.

Data availability statement

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