



## SCIENTIFIC LETTER

## Characterization of the free Android™ applications for parental control of smartphones



### Caracterización de aplicaciones Android™ para el control parental en smartphones

Dear Editor:

Screen time has become a central aspect of daily life for today's 'digital natives', as reflected by the growing number of hours that children and adolescents spend using digital devices.<sup>1,2</sup> Moreover, the age at which children in Europe or the United States get their first smartphone has decreased progressively to between 8 and 15 years.<sup>3</sup>

These patterns of digital device usage are not free of risks or harmful effects, such as stalking and different types of cyberbullying. Excessive screen time has also been linked to reduced sleep quality, obesity, poor stress regulation, and changes in brain activity, particularly in the reward system.<sup>4</sup>

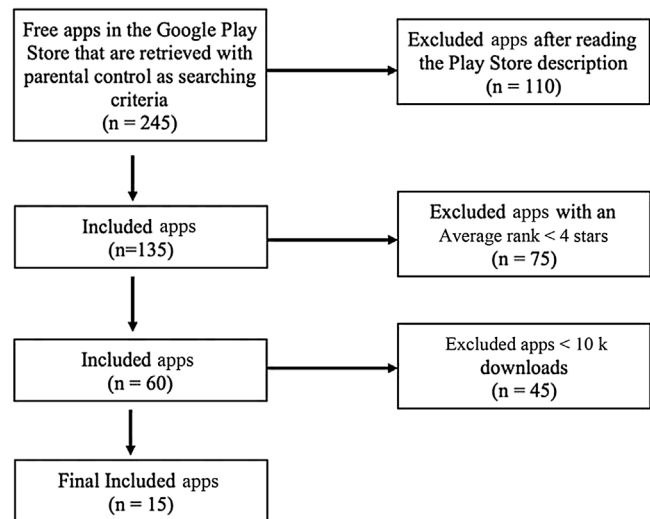
Public concern about these effects is growing. In the United States, 41 states have filed a federal complaint<sup>5</sup> against Meta (formerly known as Facebook), alleging that the features integrated in Facebook and Instagram promote addictive behaviors in minors through variable reward mechanisms, while collecting data on their behavior.

Although many *apps* have been designed to foster healthier digital habits,<sup>6</sup> to the best of our knowledge, there is limited evidence characterizing the parental control applications available in the Android market. The aim of our study was to review the free Android parental control applications available in the Play Store (Fig. 1).

We searched for applications using "parental control" as the main search term in the Google Play Store in September 2023. We selected the applications used by parents to monitor the digital activity of their children (Table 1).

We defined two iterations of thirty minutes, each including all the parental control applications. Each of the iterations was performed with two Android devices, one representing the parent and the other the child.

We collected data on dichotomous (yes/no) variables for the following key points: (1) promoting and suggesting



**Figure 1** Flow diagram of the search and selection of parental control applications.

healthy habits; (2) parental reports; (3) reports for the child; (4) chronology reports; (5) restriction settings; (6) notifications to parent; and (7) other: parental approval needed for use, ranking of use for registered children, location sharing, community comparison, and synchronization of notifications with parental device.

We conducted a pilot study before data collection to assess the feasibility of using the checklist and to standardize the data collection sheet, as well as to analyze the degree of agreement between two individuals in collecting information.

The final sample included 15 applications. Thirteen provided usage statistics (86.7%): 12 reported the total usage time (80%), 1 reported the first use of the day (6.7%), and 2 reported the last use (13.3%). Only 2 offered activity reports to the child (13.3%). Three included usage time (20%), and one included both first and last use (6.7%).

Ten applications allowed setting content restrictions (66.7%). Four notified parents of attempts to access restricted content (26.7%).

Twelve applications allowed setting schedule restrictions (80%); one allowed blocking access during lunch (6.7%) and two during school hours (13.3%). Eight allows synchronization of notifications in the child's and the parent's devices.

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**Table 1** Results of each variable of the final 15 applications analyzed.

	n (%; 95% CI)
<b>General</b>	
Free	10 (66.7%; 95% CI, 79.6%–100%)
Total Free	10 (66.7%; 95% CI, 41.7%–84.8%)
Requires account	11 (73.3%; 95% CI, 48%–89.1%)
<b>Promoting and suggesting healthy habits</b>	
Healthy diet suggestions	0 (0%; 95% CI, 0%–20.4%)
Healthy sleeping habits suggestions	2 (13.3%; 95% CI, 3.7%–37.9%)
Avoid sedentary habits	1 (6.7%; 95% CI, 1.2%–29.8%)
Encourage reading	0 (0%; 95% CI, 0%–20.4%)
Suggest social activity	0 (0%; 95% CI, 0%–20.4%)
<b>Reports</b>	
Reports for parents	13 (86.7%; 95% CI, 62.1%–96.3%)
Daily reports to parents	13 (86.7%; 95% CI, 62.1%–96.3%)
Weekly reports to parents	10 (66.7%; 95% CI, 41.7%–84.8%)
Monthly reports to parents	6 (40%; 95% CI, 19.8%–64.3%)
Reports use time to parents	12 (80%; 95% CI, 54.8%–93%)
Reports clics to parents	0 (0%; 95% CI, 0%–20.4%)
Reports first use to parents	1 (6.7%; 95% CI, 1.2%–29.8%)
Reports last use to parents	2 (13.3%; 95% CI, 3.7%–37.9%)
Reports for children	2 (13.3%; 95% CI, 3.7%–37.9%)
Reports use time to children	3 (20%; 95% CI, 7%–45.2%)
Reports first use to children	1 (6.7%; 95% CI, 1.2%–29.8%)
Reports last use to children	1 (6.7%; 95% CI, 1.2%–29.8%)
Reports use by schedule	0 (0%; 95% CI, 0%–20.4%)
Reports use during meals	1 (6.7%; 95% CI, 1.2%–29.8%)
Reports use during school hours	2 (13.3%; 95% CI, 3.7%–37.9%)
Reports by app	11 (73.3%; 95% CI, 48%–89.1%)
<b>Restrictions, alerts of content and social media</b>	
Schedule restrictions	12 (80%; 95% CI, 54.8%–93%)
Reports on social media use	12 (80%; 95% CI, 54.8%–93%)
Ask for parental approval for registration	0 (0%; 95% CI, 0%–20.4%)
Ask for parental approval for installation	1 (6.7%; 95% CI, 1.2%–29.8%)
Ranking of use	8 (53.3%; 95% CI, 30.1%–75.2%)
Location sharing	13 (86.7%; 95% CI, 62.1%–96.3%)
Community comparison	1 (6.7%; 95% CI, 1.2%–29.8%)
Synchronizes notifications	8 (53.3%; 95% CI, 30.1%–75.2%)
Alerts for restricted content access	4 (26.7%; 95% CI, 10.9%–52%)
Alerts for pornographic content access	1 (6.7%; 95% CI, 1.2%–29.8%)
Alerts for higher PEGI app access	0 (0%; 95% CI, 0%–20.4%)
Alerts for online gambling content access	1 (6.7%; 95% CI, 1.2%–29.8%)
Content restrictions	10 (66.7%; 95% CI, 41.7%–84.8%)
Restricting access to pornographic content	3 (20%; 95% CI, 7%–45.2%)
Restricting access to applications with higher PEGI	1 (6.7%; 95% CI, 1.2%–29.8%)
Restricting access to online gambling	10 (66.7%; 95% CI, 41.7%–84.8%)

Abbreviation: PEGI, Pan European Game Information.

Social media usage reports were provided to parents by 12 of the applications (80%).

No applications tracked use during specific times like meals, school, or sleep. None promoted healthy diet habits, offline reading, or suggested replacing digital time with in-person social time. However, two promoted better sleep in children by suggesting locking the phone during scheduled sleep time (13.3%), and one promoted daily step targets (6,67%).

Our review found that most free Android parental control apps in the Play Store focused solely on monitoring, offer-

ing parents limited usage reports (typically just screen time graphics). Critical details, such as the time of first use or nighttime activity, are often missing, and content-specific data is rare.

Another significant feature identified in some apps was the possibility for parents to remotely access the child's screen, microphone or camera without their knowledge. This is a clear violation of privacy and can cause anxiety due to the feeling of being constantly watched. Our study focused on Android applications, so it would be helpful for future studies to review all the apps available for

the iOS market. Future research should explore tools that enable children to monitor their own activity, promoting autonomy in responsible use rather than relying on parental control.

In conclusion, our study has highlighted the deficiencies of the free and most downloaded parental control applications, and the need for tools not just to inform parents, but to redirect screen time toward healthier habits and activities. Public health entities should promote the investigation and development of such balanced digital parenting tools.

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- J. Andrés Borrallo-Domínguez<sup>a,b</sup>, Sonia de Paz-Cantos<sup>b,c</sup>, Adrián González-Marrón<sup>b,c</sup>, Ivan Vergel Sánchez<sup>a,b,c</sup>, Cristina Lidón-Moyano<sup>b,c</sup>, Jose M. Martínez-Sánchez<sup>a,b,\*</sup>
- <sup>a</sup> *Grupo de Evaluación de Determinantes de la Salud y Políticas Sanitarias, Universidad de Extremadura, Mérida, Badajoz, Spain*  
<sup>b</sup> *Center for the Study of Healthy Use (Kenko Lab), Spain*  
<sup>c</sup> *Grupo de Evaluación de Determinantes de Salud y Políticas Sanitarias, Departamento de departamento de medicina, Universitat Internacional de Catalunya, Sant Cugat del Vallés, Barcelona, Spain*
- \* Corresponding author.  
 E-mail address: [jmmartinezs@unex.es](mailto:jmmartinezs@unex.es)  
 (J.M. Martínez-Sánchez).