



Perceptions of the Uses of Cell Phones and Their Impact on the Health of Early Adolescents in Barcelona: a Qualitative Study

Marc Olivella-Cirici^{1,2} · Esther Sánchez-Ledesma¹ · Xavier Contente^{1,3,4} · Catrina Clotas¹ · Glòria Perez^{1,2,3,4}

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Abstract

The use of cell phones and video games has transformed rapidly in adolescents, posing a challenge for the scientific community. Using qualitative methodology and a socioconstructivist perspective, we identified perceptions and beliefs about the different uses of cell phones and video games and their relationship with the health and wellbeing of the adolescent population of Barcelona. From an analysis of discussion groups among early adolescents ($n = 66$ students aged 13–14 years, segmented by gender and socioeconomic level of the school neighborhood), information was obtained on (i) digital devices and their uses, (ii) the determinants of the uses of cell phones and video games, and (iii) the relationship between possible problematic uses and health and wellbeing. Responsible and problematic uses were identified. Problematic use was associated with compensation for social deficits and sometimes with dependency on the device. Differences were identified by gender (boys preferred video games and girls' social networks). The adolescents were aware of the possible negative impacts on their health associated with problematic use of cell phones and video games and highlighted a lack of critical education in digital skills.

Keywords Qualitative methods · Cell phone use · Behavior · Addictive · Adolescent · Mental health · Habits

Introduction

Digital and electronic devices have become an indispensable part of everyday life for people around the world. Devices with screens provide the population with fast and frequent access to many sources of information, communication, and entertainment (Anderson et al., 2016). This is especially important for adolescents, given their intimate integration in their habits and lifestyles (Bailin et al., 2014). This carries both risks and benefits for the health and wellbeing of adolescents (Bailin et al., 2014). Some studies indicate that inappropriate use of these devices can encourage the appearance of mental health problems such as anxiety, chronic stress, and depression (Augner & Hacker, 2011). Problematic cell

phone use is highly prevalent (approximately 50%) among youth in Barcelona (Santamariña-Rubio et al., 2017). A recent study confirmed that there are contextual and individual factors such as impaired family relationships and poor mental health that are associated with problematic cell use, with a greater magnitude among girls (Olivella et al., 2020).

The study of the problematic cell phone use is a major concern among public health professionals worldwide (Van Velthoven et al., 2018). It has even been postulated as the most important socioaddiction of the twenty-first century (Shambare, 2012), although, currently, only pathological gambling or gambling disorder is recognized by the scientific community (American Psychiatric Association (APA), 2017). The absence of other similar disorders is explained by insufficient scientific evidence (American Psychiatric Association (APA), 2017). This entails the use of alternative terms to “addiction” or “disorder” such as “problematic use” or “dependency” (Griffiths, 2014) or the creation of new terms to describe the dependence on cell phones such as “nomophobia,” which is the fear of being out of cell phone contact, also called “fear of missing out (FOMO)” (Abdullah, 2017). The lack of uniformity in the definition carries a risk of pathologization and stigmatization of common behaviors and daily leisure activities in the adolescent

✉ Glòria Perez
gperez@aspb.cat

¹ Barcelona Agency of Public Health, Barcelona, Spain

² Department of Experimental and Health Sciences, University Pompeu Fabra, Barcelona, Spain

³ Biomedical Research Institute Saint Pau, Barcelona, Spain

⁴ CIBER of Epidemiology and Public Health (CIBERESP), Madrid, Spain

population (Abdullah, 2017). In addition, for individuals outside the at-risk population, the behavior can provide various benefits for both mental health and socialization (Kardefelt-Winther et al., 2017; Liu et al., 2015).

Knowledge of excessive and repetitive behaviors is currently restricted within the theoretical boundaries of substance addictions (Kardefelt-Winther et al., 2017), focusing on individual effects and ignoring contextual factors (Anderson et al., 2016). For example, the academic and socioeconomic context must be considered because many uses depend on academic and/or social demands (Panova & Carbonell, 2018). At home, multiscreen environments and the influence of socioeconomic conditions can aid family reconciliations, but at the same time as they can become a source of conflict and concern (Michavila et al., 2018). Some studies have highlighted how the values of certain cultures are reflected and expressed in digital behavior (Khattab & Love, 2008). Thus, analysis of the social construct should include motivations and behaviors rather than solely focusing on the biological components of the addiction (Abdullah, 2017; Panova & Carbonell, 2018).

Quantitative studies to date do not identify causes of disordered use of cell phones or video games (Fargues et al., 2009) due to limitations related to the specific responses given to surveys (Scharkow, 2016). These findings highlight the need to use a qualitative methodology that overcomes the limitations of the quantitative analyses carried out so far.

This study aimed to identify and describe knowledge of the different uses of cell phones and video games and to explore possible determinants in early adolescents aged 13–14 years and segmented by gender. The relationship between perceptions of the problematic use of cell phones and video games and health and wellbeing was also analyzed.

Methods

Design, Sampling, and Recruitment Strategy

We conducted a qualitative explanatory study from a socio-constructionist perspective (Dew, 2007). Explanations on the uses of cell phones and video games are social and were collectively generated by holding discussion groups as a technique for information collection. The discourse of the study groups generated a construct with multiple meanings and realities, which was interpreted by considering the context and an interpretive generative theory based on the internal meaning of language (Berenguera et al., 2014). We also analyzed the social meanings that may or may not question the dominant culture and the social conventions assumed by adolescents.

To select the four participating public schools, we conducted convenience sampling stratified by the socioeconomic status (SES) of the neighborhood. Half of the schools were from advantaged SES and a half from disadvantaged SES, which are neighborhoods with a higher index of socioeconomic deprivation. The inclusion criteria of the groups were girls and boys in the 8th grade in the 2019–2020 academic years who were willing to participate and who signed an informed consent document. Four schools from the city of Barcelona participated. Participants were recruited through key informants from each educational center (coordinators of the educational center and tutors). To achieve variety and discursive diversity, gender was considered a segmentation variable within each school. The maximum possible heterogeneity was prioritized within the discussion groups.

Information Collection and Data Analysis

Eight discussion groups were held (two in each school, one for boys and one for girls). In each group, interaction between participants was facilitated by a study volunteer to explore a variety of topics. A total of 66 early adolescents (56.1% girls and 48.5% with disadvantaged SES) divided into groups of between 7 and 11 students participated in the discussion groups. The characteristics of the groups are presented in Table 1.

The groups were held for approximately one hour and were moderated by the same facilitator (MO) together with a non-participating observer, who differed among groups. The discussion guide (see Appendix 1) was semi-structured and open to incorporating new topics that might arise from group discussions. All groups were audio-recorded for later literal transcription. The transcripts were completed with a contextualization of the conversations (spaces, relationships between the participants and beliefs related to the ideas, stereotypes and prejudices of the interactions). Subsequently, we performed a thematic analysis of the content of the discourse of the discussion groups. The category generation

Table 1 Description of the sample

Group	Gender	Socioeconomic status of the school neighborhood	Participants
1	Male	Disadvantaged	7
2	Female	Disadvantaged	9
3	Male	Advantaged	8
4	Female	Advantaged	11
5	Female	Disadvantaged	9
6	Male	Disadvantaged	7
7	Female	Advantaged	8
8	Male	Advantaged	7
Total			66

process was mostly inductive. Three people from the working group (MO, GP, ES) carried out the triangulation of the results and the content analysis. This study was approved by the *Research Ethics Committee with medicines from the Parc de Salut MAR*, code no. 2020/9410).

Results

Three thematic categories were obtained from the adolescents' discourse: (i) digital devices and their uses, (ii) the determinants of cell phone and video game uses, and (iii) problematic cell phone and video game use, health, and wellbeing. The main results, obtained from the adolescents' perceptions and beliefs, are presented in Table 2. The results and discussion of the additional topic "addressing problematic cell phone and video game use" are shown in Appendix 2.

Topic 1: Digital Devices and Their Uses

Digital Devices Are Part of the Daily Lives of Early Adolescents

Participants highlighted the communicative, educational, and entertainment uses of digital devices, through different

applications, connected to the Internet and designed for social interaction. Instagram, TikTok, WhatsApp, Twitter, and YouTube were identified as social networks that perform an important social function, placing users in a social hierarchy (e.g., "People believe that your Instagram accounts defines who you are. For example, if you have 150 followers, then they'll call you a loser, but if you have 1000 or 2000 then you are popular" boy, disadvantaged SES). Through social networks, adolescents can express themselves, make their experiences public, meet other people, learn, or even get a job. Participants believed that digital devices were an indispensable part of their lives, especially among some of the girls from disadvantaged SES neighborhoods. The use of devices for different purposes was a normalized behavior and formed a greater or lesser part of participants' daily lives.

There Are Good and Bad Uses of Digital Devices That Differ by Gender

All adolescents agreed that cell phone and video game use differed by gender, reflecting real-life roles, although they hoped that, one day, this phenomenon would be reversed. Most girls reported that they tended to use social media to interact with other people and gossip. They stated that they wanted to have control, a return from their investment in

Table 2 Main results of the perceptions and beliefs of adolescents about cell phone and video game use, distributed by topic

Topic 1: digital devices and their uses

Cell phones are mainly used for communication, education, and entertainment

Social networks are applications that can rank users in a social hierarchy

Cell phones and video game use is ubiquitous in adolescent life and is even indispensable for some girls from disadvantaged backgrounds

Use differs by gender: boys tend to play video games and girls tend to use social networks

Problematic use can be due to excessive viewing or misuse of the device's content

Responsible use is feasible with good management of viewing hours and considered use of the device

Topic 2: the determinants of cell phone and video game uses

Individual determinants such as an affective deficit or poor mental health can explain the use of cell phones or video games for social and emotional compensation

Boredom and poor free time management can lead to cell phone and video game use

Idols or "influencers" encourage social and gender pressure and create false expectations regarding cell phone and video game use

Family socialization and educational factors at school may be related to future problematic use

Large companies have economic interests and use intrinsic mechanisms of the devices that promote cell phone and video game use

Topic 3: problematic use of cell phones and video games, health, and well-being

Cell phone and video game use can have a (negative) impact on the health and well-being of the young population

Conflicts created by problematic use are frequent and may be encouraged by the virtual barrier

Adolescents can change their habits with a tendency to give up domestic, social, academic, and sports activities

Problematic use can lead to changes in personality and mood, which can affect adolescents' mental health or lead to highly serious situations such as cyberbullying

Trying to follow "influencers" can affect the self-esteem of the adolescent population, favor the appearance of eating disorders, promote self-harm, and even lead to suicide attempts

Blindness, headache and/or back pain, problems due to a sedentary lifestyle, or accidents may be due to problematic use

There can be a feeling of compulsive dependence on cell phones and video games, similar to use of addictive substances

virtual activity or a reward, and were concerned about what was said about them on the networks (e.g., “You have to spend hours being connected to collect the “fruits” of what you are posting” girl, advantaged SES). Girls reported that they were more glued than boys on applications such as TikTok and Instagram, although some believed that their use of digital devices was more varied than that of boys. Many girls stated that they sought to increase their social acceptance and popularity through networks and also used them to flirt and follow fashions. Boys, in contrast, spent hours in front of screens playing video games, which they believed were designed for them because they claimed to be more competitive than girls. Some participants from disadvantaged backgrounds stated that boys and girls naturally had different priorities and points of view. Finally, for many girls, carrying a cell phone increased their safety when they were not at home.

Adolescents believed that problematic use of cell phones and video games took two main forms: (i) excessive viewing of series and social networks for entertainment or abusive use of video games, which were closely related to boredom “addiction,” and (ii) the misuse of the content of the device, for example, playing aggressive or highly competitive video games. Some participants believed that gossiping and watching movies or pornography were examples of problematic uses, as well as using social media to feign and “pose” (e.g., “People use networks as a fake life, just to pretend to be something that they are not” girl, disadvantaged SES). Another example was violating the privacy of third parties or offending people with sensitive content that could provoke confrontation or controversy.

Adolescents also believed that cell phones and video games could be used responsibly, with good screen time management. As examples of good uses, they mentioned storing memories and experiences, doing homework and studying, looking for information, listening to songs to learn languages, engaging in stress control, making money, improving personal skills, interacting socially, and enjoying communicating with relatives who lived abroad, especially among adolescents from disadvantaged environments.

“Using it well means not being like this all day [staring at the cell phone]. But only using it occasionally and doing things that seem useful” (girl, advantaged SES).

Topic 2: Determinants of Mobile Phone and Video Game Uses

Boredom, Social Compensation, and Avoidance of Reality Through Screens

Adolescents believed that problematic use can be determined by various individual factors. Screen use could compensate

for an affective deficit or low levels of emotional wellbeing, by providing social or emotional contact.

In some cases, screen use was an attempt to avoid reality and its associated problems. In others, it was to fulfill a need for contact with others or entertainment and fun. Screen use was often prompted by boredom, and participants were aware of their difficulty in managing their free time, in which cell phones and video games were usually their preferred option. They also believed that altering their routines could be the first step in developing problematic use:

“I admit it, that in summer, since I have no obligations, I change my schedule and during the day I sleep, I’m like an owl, during the day I sleep and at night I play” (boy, disadvantaged SES).

Influencers Create False Expectations Among Early Adolescents

According to adolescents, an idol is a person who may be known—such as their own friends—or not—such as famous people, YouTubers, or “influencers”—who affect their preferences, making them want to be more popular, famous, or earn money (e.g., “I think there are idols who can be famous, friends or whoever. People tend to be equal to them and want to do the same to be able to say they have done it and this ends with a bad habit or addiction” boy, advantaged SES). Influencers were mostly female figures in social networks and male figures in video games, perpetuating different use by gender and a social norm that was difficult for participants to question. They believed that there was social pressure to be permanently connected to their peers (e.g., “If I now meet someone and that person has their cell phone on them, I’ll also use it. It’s like a pressure to be constantly viewing the screen” girl, advantaged SES). Some participants from a more advantaged background recognized that the effect of this social pressure differed by gender, socially promoting those people whose uses were expected according to their gender.

Education and the Family Environment as Determining Factors in Device Use

Participants believed that educational factors, such as family socialization, were related to problematic use of cell phones and video games (e.g., “If we see that our parents are very addicted, we’ll see that this is normal and when we grow up we’ll normalize this. Therefore, we’ll be very addicted too” boy, advantaged SES). In addition, participants from an advantaged environment believed that this led to differences in use by gender, with families having a responsibility to bring up their offspring in an inclusive way. They also believed that easy access at home and the use of cell phones

and video games use in childhood encouraged the development of future problematic use:

“If I’m a child and I see my father fixing something with a hammer, later I’ll like it more. If I’m a girl and I see my mother or my sister putting on makeup, then I’ll do the same. As you get older, you copy what the grown-ups do” (boy, advantaged SES).

Structural Factors Behind Cell Phone and Video Game Use in Early Adolescents

Some adolescents from a more advantaged environment were aware of the existence of companies behind the screens, promoting their use despite knowing about problematic behaviors. The pressure of fashion and the lack of information on how to engage in responsible use were explained by interests and economic factors (e.g., “The people who sell the devices don’t say how to use them properly because they want us to be more and more absorbed” boy, advantaged SES). According to these adolescents, the devices contain intrinsic devices to provoke dependent behaviors, rewarding the most loyal users with a better virtual and social position.

Topic 3: Problematic Use of Cell Phones and Video Games, Health, and Wellbeing

Early Adolescents Have Strong Awareness of the Possible Negative Impact of Problematic Use

In general, participants were self-critical, recognizing that their behavior was sometimes negatively changed in the absence of cell phones and video games. In addition, they stated that seeing aggressive content could lead them to develop more aggressive and competitive behaviors with the people around them, creating conflicts, sometimes highly frequent, and that could be related to a false sense of protection, accentuated by the virtual barrier. The causes of conflicts could be diverse: sending compromised photographs to third parties, losing a video game, misunderstandings through chats, or the expression of different opinions on the network. The participants believed that it was easier to reach agreements in person than virtually and that these conflicts could harm family relationships and friendships.

Not knowing who was behind the screen provoked insecurities and participants believed that it encouraged a loss of privacy, scams, identity theft, and false rumors, which could lead to cyberbullying situations and even cases of pedophilia:

“You post a photo in the school and a person who follows you and who has made a false account already knows where you study ... you post a photo in the park

and he or she already knows what you do on Fridays (...)” (girl, advantaged SES).

Problematic Use Can Impact Habits and Interfere with Academic Life

Many adolescents associated problematic use with a change in their routine and a loss of time control, a tendency to forget personal care, loss of autonomy, or discontinuation of domestic and care work. Some used cell phones and video games to the detriment of other activities, thus encouraging social isolation, loss of quality of personal relationships, a sedentary lifestyle, and lack of sleep:

“There’s no time to stop, you can stay there a whole night without sleep and the next day be like a zombie” (boy, disadvantaged SES).

In the academic environment, participants reported that, because cell phone use requires almost no effort, in the academic setting, their ability to reason and concentration, among other skills and abilities, was limited, leading to academic failure and dropping out.

Possible Disturbances in Emotional Wellbeing Related to Problematic Use

Some adolescents believed that problematic use could lead to changes in personality and mood, provoking anger, sadness, or frustration when something does not go according to plan, as well as stress and anxiety. Likewise, bad experiences, such as public humiliation or finding little social acceptance in the networks, could negatively impact mental health.

Participants believed that social networks could also affect self-esteem in adolescents seeking to be equal to influencers or to follow implicit beauty ideals, encouraging the appearance of eating disorders, especially among girls. In the most serious cases, it could lead to self-harm and suicide attempts.

“People say ‘oh, what a pretty girl!’ and I’m not like that ... anorexics are because they see a lot of people who are pretty and delicate [on social networks] and they want to be like that, they stop eating, they feel bad and self-harm and things like that, by wanting to be what they’re not” (girl, disadvantaged SES).

In addition, participants linked problematic use with health problems such as blindness and even epilepsy. They also believed that screen use could lead to headaches and/or back pain and problems due to a sedentary lifestyle. In addition, they pointed out that the distraction of cell phones and video games could lead to accidents. Some participants

believed that the waves emitted by the devices were harmful to health.

Dependence on Devices and Similarities and Differences with Other Addictions

Another concern of study participants, especially girls, was the feeling of dependence on some content on cell phones and video games that could cause obsessive and compulsive use and resulted from deficient time management (e.g., “I swear that I have a problem, because there are times when I’m with my cell phone and I get bored with it. And I don’t care, I keep using it!” girl, advantaged SES). In some cases, the adolescents used the concept of “addiction” to define a problematic relationship with social networks, video games, and online shopping or gambling. These participants admitted that their cell phone was their main source of fun and that they often did not realize they had a problem until they had a bad experience.

Some adolescents identified certain similarities between substance addiction and problematic cell phone and video game use, but also differences. For example, they believed that drugs were more difficult to give up and that they served no useful purpose, unlike electronic devices, which they believed to have good uses as well as bad. Another difference was in education because, unlike substance addition, problematic uses of cell phones and video games were not addressed in class, which led to ignorance about their effects on health and wellbeing. Finally, at a structural level, drug-taking is penalized with laws and regulations, but cell phone and video game use is encouraged, highly accessible and socially acceptable:

“Cell phones and video games are more legalized than drugs. And you can order or buy a cell phone but you cannot legally buy drugs” (boy, advantaged SES).

Discussion

The results of this study allowed us to identify in greater depth the uses of cell phones and video games and their determinants. The relationship between problematic use and the health and wellbeing of early adolescents in an urban setting was also described. The boys and girls participating in the study stated that cell phones and video games were becoming an increasingly important part of their daily lives. Their uses could be responsible and appropriate, with various benefits, but could also become problematic. According to the participants, problematic use of cell phones and video games was related to psychosocial factors such as social deficits or low levels of emotional wellbeing. Other factors, such as the effect of

influencers, social pressure—which differed by gender—family socialization and economic interests, also influenced cell phone and video game uses. The participants were aware of the impact of problematic use on their health and wellbeing. They reported that it could change their behavior and habits, encourage conflicts, affect their self-esteem and mental health, and harm their academic performance and relationships with the environment, among other effects. They even compared compulsive dependence on some screen content with use of addictive substances.

Integration of the Cell phone and Video Games Use in Adolescent Life

Male participants reported that they played more video games and watched more videos while girls more frequently used social networks to interact with their peer group or share experiences. Previous qualitative (Godsell & White, 2019) and quantitative (Lee & Kim, 2018) studies identified the different use of cell phones and video games by gender as a reflection of the psychophysiological, psychological, and social development demands of each gender (Punamäki et al., 2007).

The adolescents in this study believed that responsible use of the cell phone and video games was feasible as they could be useful for many aspects of their lives. Most girls reported that moderate use of social networks to communicate with their friends was harmless and could even provide benefits. In this regard, there is currently no evidence showing that moderate Internet use is detrimental to the adolescent brain (Mills, 2014). Some boys stated that video games could provide advantages. Evidence suggests that playing action video games produces a small improvement in neuropsychological performance (Bisoglio et al., 2014; Powers et al., 2013). Generalizations about video games are often not helpful because cooperative multi-player games are becoming more common, and research suggests that these types of games may favor socially beneficial behaviors (Granic et al., 2014). This benefit was also detected by some of our participants. Thus, the type of content viewed and mode of play is important for the potential for emotional and behavioral influence of video games (Bell et al., 2015).

However, adolescents believed that there were two main types of problematic use: (i) overuse and (ii) misuse of device content, such as playing aggressive or highly competitive games. There is evidence of a small and transitory increase in aggressive thoughts and behaviors when viewing certain video games (Anderson et al., 2010), although there is still debate about the quality of the evidence supporting this claim (Elson & Ferguson, 2014).

Social Determinants of Problematic Use of Cell Phones and Video Games

The adolescents in this study believed that the roots of problematic use may lie in a social compensation mechanism due to an intense need to interact with their peers. Greenfield (2018) states that we are programmed for social connection, and when deprived of it, we tend to consume a drug or behavior that “medicates” this need. Previous studies have proposed that social isolation is strongly associated with the appearance of behavioral disorders, with virtual communication being a “pseudo-connection” with the environment (Alexander, 2012). This was echoed by some participants in this study since, despite spending many hours connected to the Internet, they reported that the communication experience was worse than in face-to-face relationships. The use of smartphones for games and social networks has been described as a risk factor for problematic use; in contrast, maintaining strong friendships, both in the face-to-face and virtual environments, can be a protective factor (Fischer-Grote et al., 2019).

In this study, adolescents highlighted the figure of idols or “influencers,” users of social networks who become role models (Ratwatte & Mattacola, 2019). These figures gained the trust and friendship of their followers by designing visual content focused on an ideal body shape with specific communication and advertising techniques (Pilgrim & Bohnet-Joschko, 2019). Thus, adolescents identify with the roles and ideals shown on social networks, and their needs are modulated, creating a relationship of dependency between influencers and their followers (Pilgrim & Bohnet-Joschko, 2019).

The adolescents in this study believed that the development of problematic use often depended on the characteristics of each person. In this regard, the risk of problematic use seems to be increased by low self-esteem and poor self-control and to be reduced by academic motivation and success at school (Fischer-Grote et al., 2019). In this study, adolescents believed that the family and educational environment significantly influenced their cell phone and video game use, with observable differences by gender and access. Ease of access to devices has been shown to activate the mesolimbic brain pathways that promote compulsive use impulses (Griffiths et al., 2016).

Adolescents from a more advantaged environment were aware of the economic interests behind screens. In their opinion, companies sought to gain their permanent attention by promoting social reward mechanisms to the most loyal users. This could create a compulsive need for validation, especially on social media and video games. This use is associated with an excessive release of dopamine in the mesolimbic system, causing disinhibition in the user and, consequently, more compulsive use (Brand et al., 2014). The boys

and girls participating in this study also identified overinformation and the use of notifications as an intrinsic attraction strategy by devices. This combination of factors causes a synergistic amplification stimulating cortisol release, which generates stress in the user and triggers a “self-medication” response to interact with the device (Kaess et al., 2017). The consequent dopamine release has been shown to be stronger with anticipation of the reward caused by notifications than with the reward itself after consulting the device (Bibbey et al., 2015).

Some Cell Phone and Video Games Uses Can Impact Early Adolescents’ Health and Wellbeing

Study participants reported a high degree of awareness of the risks of problematic use to their health and wellbeing. Opinions varied about what best defined problematic use: (i) the number of hours of viewing digital content or (ii) the way devices were used. The evidence shows that both factors—both intensity and modality of device use—can influence the causal pathways leading to mental health problems in university students (Višnjić et al., 2018). In this study, some girls from advantaged backgrounds questioned the link between the amount of time the adolescent population spends in front of screens and impairment of their general wellbeing. One study has correlated screen viewing with the health of the user (Twenge et al., 2020a, b) while, in contrast, another has questioned the link (Orben & Przybylski, 2019).

For the participating boys and girls, the screen acted as a barrier that allowed them to develop an alter-ego state, enabling them to dare to express themselves and experience various functions. This may be due to the anonymity perceived by the user (Greenfield, 2018) and, in part, to less access to the functions of the orbitofrontal area of the brain where the inhibitory circuits are located, producing a disinhibiting effect in the user (Griffiths et al., 2016).

Adolescents in this study identified various changes in their daily habits due to problematic use: time distortion, in which use for entertainment hindered their ability to manage time, and produced lifestyle changes and behavior deficits (Greenfield, 2018). One of the consequences reported by the study participants was a sedentary lifestyle. Low levels of physical activity associated with passive cell phone and video game use have been linked to obesity and diabetes (Saunders et al., 2014), as well as to elevated cortisol levels, hypertension, deep vein thrombosis, and electrolyte imbalances (Bibbey et al., 2015; Reed et al., 2015).

Study participants reported that their sleeping habits were negatively affected, which they associated with greater fatigue during waking time. Previous studies have reported that cell phone and video game use before going to bed was associated with shorter sleep duration and lower quality (Contiente et al., 2016; Thomée, 2018). This alteration

has been associated with perceived poor health (Punamäki et al., 2007) and with problematic cell phone use (Olivella et al., 2020). A common obstacle to sleeping is distractions from screens. Godsell and White (2019) reported that some girls had an anxious dependence on cell phones at night and that families played a key role in creating rules to ensure healthy sleep. It has also been shown that a strong predictor of high-stress levels is keeping the cell phone less than 1 m away during sleep (Višnjić et al., 2018).

Other consequences reported in this study that have been described in previous studies (Greenfield, 2018) were intolerance to boredom, stress due to constant alertness, social isolation, and attention deficits.

Participants believed that academic impairment could also occur if cell phones and video games were not used properly. One study has reported that, when people know they can access information through search engines, they are less likely to remember the content (Sparrow et al., 2011). For video games, it has been reported that impaired school performance can be explained by displacement of after-school activities with academic value (Weis & Cerankosky, 2010). Problematic use can also impact motivation, reward, memory, and various aspects of psychological functioning (Greenfield, 2018).

The dependence on influencers that, in turn, affected adolescents' beliefs and expectations led them to identify diet and exercise as factors that needed to be controlled for bodily perfection. They reported that these figures had the ability to change their habits and even their expectations and their view of themselves. The concept "Fitspiration" has been used to describe problematic behaviors that negatively impact the health and wellbeing of people who follow "fitness" and beauty models (Raggatt et al., 2018). Optimizing appearance is seen as the key to happiness (Pilgrim & Bohnet-Joschko, 2019). According to the adolescents in this study, this leads to eating disorders and other mental health problems and, in extreme cases, to suicide, a finding also reported in a previous study (Twenge et al., 2020a, b).

Most of the participating boys and girls believed in the existence of behavioral addiction to cell phones and video games. The existence of addiction has been reported in some studies (Griffiths et al., 2016) but questioned in others (Zendle & Bowden-Jones, 2019), and there have been proposals to move away from the concept of addiction for the study of this phenomenon (Panova & Carbonell, 2018). To date, the WHO and the American Psychological Association (APA) do not accept the inclusion of this addiction (World Health Organization, 2020; American Psychiatric Association (APA), 2017).

The discourse of the girls in this study showed more problematic use than that of the boys, which is consistent with the evidence (Fischer-Grote et al., 2019). In Barcelona, 3.2% of boys and 4.7% of girls in the 8th grade reported engaging

in frequent problematic cell phone use (Olivella et al., 2020; Santamarina-Rubio et al., 2017). In this study, we detected broad expansion of the problem, which was becoming highly normalized in groups from disadvantaged environments.

Unlike substance addictions, there is little consensus on how to measure a possible addiction to cell phones or video games and the specific threshold to be used in the assessment of hypothetical patients (Andreassen, 2015), since the ubiquitous use of devices in the lives of adolescents could produce numerous false positives (Maraz et al., 2015). Additionally, problematic use is accepted within adolescent digital culture and society in general, which could further exacerbate denial of a potential disorder. Cell phones and video games are seen as a vital social and personal accessory and can be personified as a digital member of the family (Greenfield, 2018).

Strengths and Limitations

To our knowledge, this is one of the first studies that addresses cell phone and video game use in early adolescents from a socioconstructionist approach in Barcelona and Spain. Unlike other studies, a pathologizing view of common behaviors in adolescents has been avoided. This has allowed the collection and interpretation of the concerns, needs, beliefs, and perceptions of early adolescents, from different backgrounds, in relation to cell phone and video game use from a comprehensive approach, including the conceptualization of this phenomenon and its determinants and description of the impact of problematic use on their health and wellbeing. In addition, the groups were segmented by gender and the SES of the neighborhood where the school was located. Another strength is that the performance and observation of the discussions were carried out by young people, which may have facilitated the emergence of discourse due to the generational proximity. In addition, focusing the discussion on adolescents in the 8th grade (13 and 14 years old) provided us with valuable information to design preventive interventions on the responsible use of cell phones and video games that were designed with young people in mind.

This study also has some limitations. The breadth of the topics addressed during the groups and the still imprecise conceptualization of the phenomenon prevented us from dealing in depth with some critical issues, such as cyberbullying and other uses that could lead to problems such as shopping and betting online or viewing pornography. These issues should be addressed in more detail in future studies. However, each discussion group had some freedom and flexibility to focus their discourse on the topics that seemed most relevant to participants. Another limitation is that the facilitator was a man, which may have represented a barrier in the groups of girls regarding the expression of certain discussion topics. However, this fact could have also boosted group discussions in the group of boys.

Conclusions

Cell phone and video game use is a normalized and ubiquitous behavior in the daily lives of early adolescents. It has been described how responsible use has its benefits. Nevertheless, there are also problematic uses, which differ by gender: boys are more likely to abuse video games and videos while girls more frequently have problems associated with social networks. The opinions collected in this study could help determine the border between normal behavior and a possible behavioral disorder. Various factors such as low levels of emotional wellbeing, the influence of idols, social pressure—which differs by gender, family socialization, and the economic interests of large companies—are related to the problematic use of cell phone and video games. These factors can alter the behavior and habits of early adolescents and even cause conflicts that affect their self-esteem and life prospects. Early adolescents are highly aware of the impact of problematic use on their relationships and their academic performance, as well as on their health and wellbeing. The results of this study show the importance of taking into account the youth perspective in the design and application of health policies and interventions that are more in line with the perceptions of early adolescents and are less influenced by institutional paternalism. Thus, future interventions should take as a starting point the needs and beliefs of cell phone and video game users.

Ethical Considerations

To guarantee the confidentiality of the informants of the discussion groups, in this study, the databases were anonymized based on the Organic Law on Protection of Personal Data (LO 3/2018). To participate in the discussion groups, the families of the participating boys and girls signed an informed consent form in which the study was reported, and explicit consent was given for the authorization of the audio recording and its transcription. Participation in the discussion groups was completely voluntary, and the participants could leave the session at any time. The narrative data obtained has only been processed for the purpose of the study objectives. This study was approved by the *Research Ethics Committee with medicines from the Parc de Salut MAR* (code no. 2020/9410).

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Declarations

Conflict of Interest The authors declare no competing interests.

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