

Hyperconnected: children and adolescents on social media. The TikTok phenomenon

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ABSTRACT

Network communication digital platforms have revolutionized the way we communicate, get information, and entertain ourselves; they have had a major impact on the new generations.

The pandemic has increased consumption patterns at all ages and its consequences: a sedentary lifestyle, obesity, sleep, psychological, cognitive, memory/attention, and academic performance disorders, problematic behaviors, and risks of cyberbullying.

The activity of the new generations on TikTok –a platform that allows them to create, view, share videos and viral challenges– has affected their behavior. Their posts lead to likes, comments, and followers; this stimulates the dopaminergic reward system, which is the basis of addictive behaviors. Pediatricians should be aware of these behaviors in order to recommend good practices.

The objective of this narrative review, based on the bibliography from PubMed Central, SciELO, national and international recommendations, is to provide information and an update to health care providers on TikTok, its characteristics, and the recommendations for safe use.

Key words: social media; adolescent; behavior problem; addictive behavior.

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INTRODUCTION

From birth, human beings are part of a network or group called society. Within this structure, humans communicate and share bonds; and in these relationships with others, they become nourished and develop. Socialization is in human nature: humans form networks, seek groups of belonging according to their emotions, needs, and interests.

In 1997, with the emergence of Six Degrees –considered the world’s first social networking site–, a transcendental change occurred in the way people related to each other. Through a list of friends, Six Degrees made it possible to locate other members of the network, based on the theory of the six degrees of separation, which affirms the possibility of connecting with any other person in the world in just six steps.

Since their inception, network communication digital platforms (social networking services) have revolutionized the way we communicate, relate, get information, and entertain ourselves, from family ties to social and work relationships.

Although each platform has its characteristics, all of them are based on the distribution of information through contact networks and interaction through digital identities, where the user is at the center of the creation and dissemination of content in different formats.¹

The emergence of Web 2.0 in 2004 introduced the possibility of interacting, creating content and, above all, being part of virtual communities, making the user an active member and the lead character for the first time. This phenomenon had an impact on the new generations, especially on the most recent ones, called Gen Z and Gen Alpha (purely digital natives).²

Digital natives can develop their technological competencies as well as their analog skills. For them, it is difficult to establish a boundary between the physical and virtual worlds. Children play online, whereas adolescents entertain themselves, express themselves, and interact in the virtual world. In this way, they define and reinforce their identity, exchange information (personal data, images, news, comments, preferences, friendships, opinions, and sensitive data), and leave an indelible digital footprint that outlines their reputation.³

A survey conducted in several countries by AVG Internet Security (2010) to 2000 mothers showed that the “digital birth” of babies occurs at approximately 6 months of age; it found that 81% of children under 2 years old have some kind of

profile or digital footprint, with their images posted online, and 25% of them start their footprint with the prenatal ultrasound image uploaded by their parents.⁴

In times of the pandemic, digital tools and social media have allowed us to maintain communications, entertainment, education, and work. This has definitely changed consumption patterns across all ages.⁵

In turn, excessive screen use may have important side effects: digital sedentary leisure or physical inactivity, overweight or obesity (exposure to unhealthy food advertising), sleep disturbances (due to the negative effects of blue light on melatonin secretion), impairment of cognition, memory, attention, and poor academic performance in relation to sleep deprivation and multitasking.⁶ In addition, cyberbullying and problematic behaviors may be facilitated.⁷ This has a strong impact on daily tasks with a marked deterioration in the personal, family, social, and academic settings.

Pediatricians play a privileged role in the periodic contact with families, which represents a great opportunity to intervene and prevent harmful effects.

The activity of the new generations on TikTok –a platform that allows them to create, view, share videos and viral challenges– has affected their behavior. Their posts lead to likes, comments, and followers; this stimulates the dopaminergic reward system, which is the basis of addictive behaviors. Pediatricians should be aware of these behaviors in order to recommend good practices.

The objective of this narrative review is to provide information and an update to health care providers on TikTok, its characteristics, and the recommendations for safe use among children, adolescents, and adult caregivers.

The methodology consisted in searching the PubMed Central and SciELO databases, national and international recommendations, and the statistics of social media use and tendencies for the past 5 years. The search key words included tiktok, adolescents, social media, addictive behaviors, effects.

SOCIAL MEDIA USE AT PRESENT: A PARADIGM SHIFT

According to the Digital Report 2022, there are 4620 million social media users worldwide (58% of the population), which accounts for a growth of more than 10% compared to the year before the pandemic.⁸ Social media took up most of

online time during 2021; on average 2 hours and 27 minutes more per day than the previous year.⁸

Facebook is the most used social platform worldwide, followed by YouTube (growing twice as fast as Facebook) and WhatsApp in the third place. They are followed by Instagram, WeChat, and TikTok (fifth with 1 billion users worldwide), 45% more than in 2021.⁸

TikTok is the international version of the Douyin app created in 2016 in China and launched for iOS and Android in 2017. After Musical.ly merged with Douyin in 2018, TikTok is now available in more than 150 countries.⁹ According to Cocktail Marketing, 20% of users are under 19 years, and mainly young people between 13 and 18 years are the most active on this platform.¹⁰ According to a forecast by eMarketer and Insider Intelligence, during 2022, TikTok will position itself as the third social media behind Facebook and Instagram.¹¹

THE TIKTOK PHENOMENON

The reasons for using this rapidly growing app include entertainment, communication, and self-expression. It allows people to view, create, and share videos about any topic with a short duration (from 15 seconds to 3 minutes), which has recently been extended to 10 minutes. It also allows designing viral challenges (dances, songs, challenges, pranks), which are shared with other users.⁸

These posts generate a large number of likes, comments, and followers that help users, or tiktokers, feel valued and accepted.¹² For example, a 19-year-old Filipina girl lip-syncing to a Jvke song surpassed 52 million likes.

Such social recognition stimulates the dopaminergic reward (pleasure) system, which is the basis of addictive behaviors and is what creates a strong incentive to repeat these actions.^{12,13}

As a distinctive feature of its development, TikTok contents can be downloaded and/or shared throughout the digital ecosystem.

Its artificial intelligence (AI) algorithm is specially developed to be addictive because it is able to obtain more information than other apps in a very short time according to the user's activity and thus effectively recommend content and personalize ads.¹⁴ The device permissions required by TikTok include access to the camera, microphone, Wi-Fi connection, contact list, and user location, so it can obtain information from multiple sources and apps.

The platform's dynamics, its vertical swipe navigation, is a curiosity trap and, then, tiktokers scroll down to find the successive but not automatic reproduction of short videos adjusted to their interests by AI.^{9,13} In this way, TikTok retains users, who interact actively and passively with an algorithmized version of themselves and in turn with other users, which makes it increasingly attractive.

TikTok's interface offers 2 options: the For You feed, with videos posted by strangers (selected by AI according to the user's activity), available for people older than 16 years, and the section with a feed of videos posted by followers.

In turn, the AI contributes to marketing by continuously providing information according to the user's interests.⁹

It is common for children and adolescents to set up their public profiles as older than 16 years (the account for minors is private by default) in order to gain unrestricted access to all content on the platform.¹⁵ In this way, they may be exposed to inappropriate content and language and, in turn, display their privacy, which increases the risk of cyberbullying.

It is a common practice to share unverified or unedited content in order to get more followers.⁷ User may also expose themselves to dangerous challenges, such as the "blackout challenge" (holding their breath until they lose consciousness), the "Benadryl challenge" (uploading a video under the effects of this antihistamine), or the "coronavirus challenge" (licking a public toilet).

ARTIFICIAL INTELLIGENCE, MECHANISMS, EFFECTS, AND HIGH ADDICTIVE POWER

TikTok delivers personalized content to users, retains them and thus provides feedback to its recommendation engine; this contributes to problematic behavior.¹⁸

The notion of addiction cannot be restricted only to chemical substances, since there are behavioral habits that may generate dependence and seriously interfere with people's daily lives: these are called behavioral addictions.^{12,13}

A study conducted in China in 3036 adolescents revealed that excessive TikTok use may lead to memory impairment, increased symptoms of depression, and anxiety. Among young people with problematic use, a poorer performance in remembering sequences of numbers and deficit in working memory were recorded.¹⁷

Another longitudinal study examined the effects of excessive time using social media among adolescents and sleep quality; and this in relation to the moderating role played by parents in limiting Internet use 1 hour before bedtime and the presence of devices in the bedroom. These rules contributed to improving sleep quality, mainly among youth who did not show a problematic social media use.⁸

Another study verified the onset of motor or vocal tics after watching videos of influencers suffering from or mimicking Tourette syndrome. These are the so-called TikTok tics, which could be a warning sign about its use and its effects on behavior, increasingly common among young tiktokers. Many of the adolescents diagnosed with tics during the pandemic had a history of anxiety or depression, and isolation could have acted as a triggering factor.¹⁸

The choice of TikTok may be explained by the use and rewards theory, where users seek to satisfy their needs: entertainment, interpersonal relationships (surrogate companionship), personal identity, and surveillance of the environment, in reference to keeping updated and informed and the “fear of missing out.”^{12,19}

The TikTok search engines have a great filtering and compiling capacity based on the platform’s own objectives and those of the brands that advertise on it.¹⁶ Such information filtering causes what are known as filter bubbles, where users see only content of interest to them and lose the power of choice or autonomy; the information they receive increasingly captures their attention, generates more dopaminergic stimulation and, consequently, prevents them from discontinuing the app use.¹⁶ As a result, an echo chamber is produced, where only a filtered fraction of content is replicated and different views are not represented. Therefore, interactions and viralizations occur only among users with the same preferences.¹⁶

In relation to inappropriate content, the TikTok engine can recognize and analyze it, but lacks the ability to justify its analysis.¹⁶ So, filtering failures occur and extreme content of hate speech, racism, discrimination, and promotion of anorexia may be displayed.¹⁶

Regarding the issues of data protection, privacy, security, and content moderation, the scope of the algorithms of this platform is not clear. This has aroused suspicions in some countries –including India, Australia, and the United States– due to the way TikTok uses data,

in addition to the fact that it is the social media of choice for the youngest users.

In the midst of these controversies, TikTok updated its privacy and security policies regarding the protection of minors in June 2021.⁹

- Children under 13 years of age cannot post or comment on videos, and content is selected for this age group.⁹
- Default privacy setting for accounts of children aged 13-15 years. Only their friends can comment and they cannot duet with other users. The duet feature is only enabled for public accounts and allows users to post their video side-by-side with a video from another user.⁹
- TikTok also offers parental controls, which can be activated from the child’s account or from the adult’s account with the family pairing feature.⁹

These are the current rules, although the problem lies in the fact that, generally, children younger than 16 years open their accounts providing false data, such as date of birth, because there is no system in place to verify them. In this way, they access the adult account option without asking for their parents’ consent and without restrictions.¹⁵

As a relevant fact, Common Sense Media recommends this application for teenagers as of 15 years old due to privacy concerns and to avoid adult content.¹⁵

RECOMMENDATIONS FOR SAFE TIKTOK USE

Although these recommendations are based on TikTok, they may be extended to other social media for the purpose of safe browsing.

- Avoid social media use before the age of 13 years (terms and conditions).⁹
- Accompany children and adolescents in the setting of privacy and security (user settings and secure passwords).²⁰
- Limit access to images and information to users closest to children.²⁰
- Avoid disclosing sensitive data in posts and comments, especially those concerning racial, ethnicity, religious and/or political opinions, health information, and sexuality. In Argentina, Law no. 25326 for the Protection of Personal Data recognizes and guarantees these rights.²⁰
- Educate children about their digital footprint in social media, since it shapes their digital identity and is public and permanent.²⁰
- Help children develop a critical opinion about

the information received through this platform due to the circulation of misleading advertising and avoid exposure to inappropriate content and cyberbullying.²⁰

- Provide support, education, and tools to protect them from these risks. Recognizing these situations may help with reporting and blocking malicious users or asking for help from an adult.²⁰
- Activate the platform's parental controls. In this way, parents and legal guardians may open an account on TikTok and link it with that of children through the family safety mode, which offers multiple options (within the Digital Wellbeing feature).⁹ Options include the possibility of establishing a maximum of 2 hours of use per day. At the end of this period, the system requests a code to be able to restart it. This code must only be known by the responsible adult to allow access.
- Explore other options for setting up controls from your mobile device, such as Google Family Link. Its features allow to monitor activity, manage apps, set time limits, lock your device, and know your location (https://families.google.com/intl/es-419_ALL/familylink/).
- Promote a balance between sleeping hours, physical activity, and social media use according to the guidelines proposed by the World Health Organization on physical activity and sedentary habits (WHO guidelines on physical activity and sedentary behavior: at a glance).
- Avoid use 1 hour before bedtime and during lunch or dinner, keep devices away from the bedroom during the night. Adults should lead by example and create technology-free spaces at home. Families may check the Family Media Use Plan, a tool to achieve appropriate use (<https://www.healthychildren.org/Spanish/media/Paginas/default.aspx>).
- Encourage outdoor activities and social gatherings.
- Prioritize educational content and communication with the family and friends when using social media.

It is advisable that the rules for using TikTok and other social media be agreed upon as a family, prioritizing and understanding the interests and characteristics of children and adolescents, the context in which they are used and, above all, the content they access and share.²¹ It is

essential to establish agreements until they reach autonomy so as to prevent them from opening hidden accounts, which implies greater risks.

We must recognize the potential benefits of TikTok: it can be used for educational and teaching purposes to reach a large number of users in a short time. In the midst of the pandemic, for example, videos on hand washing or mask use went viral to mitigate the spread of COVID-19.

Lastly, the UNICEF's report *The State of the World's Children 2017: Children in a Digital World* includes recommendations to protect children and states that we must provide them with high-quality access, protect their privacy and identity, prevent online harm, provide digital literacy, and put them at the center of digital policy.

CONCLUSIONS

This update provides pediatricians with tools to help children and adolescents safely use TikTok, one of the most widely used social media, with a high addictive power and which, despite its privacy and child protection policies, still requires adult supervision.

We can conclude that exposure to certain content on social media and its consequences are part of a high-impact phenomenon in the pediatric population that requires further research. ■

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