



## Problematic use of TikTok and mutism in an adolescent with Down syndrome: Case report and Literature Review

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### Article Info

**ISSN (online):** 2582-7138

**Volume:** 05

**Issue:** 05

**September-October 2024**

**Received:** 25-07-2024

**Accepted:** 02-09-2024

**Page No:** 722-725

### Abstract

Problematic use of social media by adolescents, including TikTok, generates several negative consequences in the short and in the long term. This article reports the case of an adolescent who makes excessive and problematic use of social media, especially TikTok, and the development of aggressive behavior, mutism silence, and tics-like movements. During adolescence, social media is important for the development of cognitive and socio-emotional skills. However, problematic use has negative repercussions in several areas, including a higher incidence of depression, anxiety, impulsivity, psychological or sexual abuse, and recently, an increase in tics and Tourette syndrome associated with excessive use of TikTok has been described. In regards to that, it is important to raise awareness among the population on such subject, especially those who deal with adolescents, so that they can adopt strategies to limit use in order to enjoy the benefits of this technology and to minimize negative impacts on physical and mental health.

**DOI:** <https://doi.org/10.54660/IJMRGE.2024.5.2.722-725>

**Keywords:** adolescent behavior; down syndrome; internet addiction disorder; mutism

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### Introduction

TikTok is considered a virtual platform for publishing, photography and sharing content, created in 2016. It has a reach of more than 150 countries and 75 languages, and was considered the most copied application in more than 40 countries and regions. Two years after its creation, this platform already had 250 million active users per day <sup>[1]</sup>. In 2023, estimates rose to more than 1 billion monthly active users, with the majority in the age range between 10 and 19 years old <sup>[2]</sup>.

The platform allows you to create, watch, and share videos and challenges quickly and widely, creating opportunities for sharing, bonding, and belonging. During adolescence, social media is used as a means of expression, self-promotion, sharing ideas, and interacting with peers. This social interaction, whether in person or in a virtual environment, is essential as a tool for developing emotional and social skills. Thus, social media, including TikTok, has a direct and indirect influence on neuropsychological social development and identity consolidation <sup>[4, 5, 6]</sup>.

While *Online* interaction is important for improving socio-emotional skills, excessive and problematic use of social networks is related to several negative consequences, including *cyberbullying*, psychological or sexual abuse, higher incidence of depression, anxiety, impulsivity, attention and sleep disorders <sup>[7, 3]</sup>.

Given the increase in access to this global network, especially among teenagers, understanding the reasons and implications that lead to its use, as well as the current and future repercussions on the physical, emotional and social health of users, has become a target of scientific interest <sup>[3]</sup>. There are few studies, especially regarding TikTok, about the short and long-term interferences of problematic use. Given the above, this work is justified with the objective of reporting the case of an adolescent with Down syndrome who makes problematic use of social media, mainly TikTok, and addressing its socio-emotional consequences. The description of the case was based on the physical and electronic medical records of the institution under monitoring from August 2019 to November 2023 and the bibliographic review on the PubMed, Scielo and Google Scholar Platforms. Such work was approved by the Research Ethics Council number 3524696.

### Case Report

FSS, female, 17 years old, diagnosed with Down syndrome, congenital heart disease surgically corrected at 11 months and tonsillar hypertrophy with tonsillectomy. Currently, she is obese, has controlled asthma and depression and is being monitored by nutrition, endocrinology, otorhinolaryngology and cardiology team as a continuous treatment. She began being monitored at adolescent outpatient clinic due to her mother's complaint of aggressive behavior and use of "swear words", that she associated with watching videos with aggressive content on her mobile phone, especially on TikTok platform. The teenager also reported being "dating" a digital influencer, detailing his physical characteristics and content on the network, while her mother denied any physical or virtual interaction with this person.

This "relationship" on the part of the patient, associated with excessive time spent on social media, especially watching violent videos, were factors that resulted in a worsening of her behavior, a drop-in performance in daily activities and negatively influenced her interpersonal relationships.

In 2021, the mother reported that the school "prohibited" the teenager from attending in-person classes because she "offered a risk to other classmates" due to her aggressive speech and behavior, and that her school activities would be kept remote. That same year, the mother decided to take away the teenager's mobile phone, which led to her developing mutism and depressed mood after being deprived of access to the internet, which also led to worsening aggression and the development of tics and stereotypes.

Given the situation, speech therapy, psychological and medical care were intensified, an essential factor in resuming the patient's speech, approximately nine months after the beginning of the interventions. When she resumed using her mobile phone, the mother was given instructions on limiting screen time and greater control over the content, despite the difficulty in respecting the requested limits.

After interventions in different areas, the teenager regained her speech, reduced her tics and stereotypes, improved her depressed mood and reduced her consumption of violent videos, however she still maintains a unilateral relationship (on the part of the patient) with the digital *influencer*. For the team of assistant professionals, the challenges of harm reduction remain, but the multidisciplinary work continued assiduously, trying as much as possible to develop other skills in the teenager to distance herself from screens, in addition to maintaining her physical and mental integrity, given the

vulnerabilities applied to the context.

### Discussion

We will begin the discussion by making a quote to contextualize adolescence and individuals with Down syndrome, beginning the reflection on the peculiarities of adolescence in its subjectivities and, in this context, discuss the influence of addiction to social media such as TikTok:

"Thinking about the adolescence as a young person with Down syndrome is, above all, thinking about the adolescence as a subject. The implication of psychoanalysis becomes important in this context because it allows the creation of a space not limited by a single signifier. Psychoanalysis intervenes so that the subject emerges in places where he has not yet been called, that is, conditions are created for the autonomy of the adolescent with Down syndrome. Seeing and listening to the subject beyond his organic condition is the first step and also the most fundamental movement in dealing with the adolescence of a young person with Down syndrome. When we consider adolescence as a phenomenon of a psychic nature, the importance of dealing with the constitution of the subject beyond the reality of the body becomes clear" Zachelo *et al.*, p. 472.

The TikTok platform emerged in 2016 in China by Zhang Yiming, initially named Musically and changed to TikTok a year later <sup>[3]</sup>. In just two years of existence, it reached global media networks, increasing from 20% to 60% of monthly active users. Compared to the others, Facebook needed four years to achieve this growth, while Instagram took six years <sup>[11]</sup>. With the onset of the pandemic in 2020, the reach of this network increased due to the need for social isolation, when digital media became an important means of human socialization, including for people with intellectual or developmental disorders, virtual communication became an important measure for the feeling of well-being <sup>[12, 13]</sup>.

TikTok's greatest popularity is among teenagers, with an estimated 69% of users between the ages of 13 and 24 in 2020 <sup>[14]</sup>. A 2023 Pew Research study ranked TikTok as the second most popular social network among teenagers aged 13 to 17, used by 63% of them, behind only YouTube with 93% <sup>[15]</sup>.

TikTok's great popularity among teenagers is due to a number of factors, including the fact that the algorithm used is faster at cross-referencing information about the user's interest based on the content liked, and that the search tools have a good capacity to filter data according to the platform's objectives and deliver topics that attract attention <sup>[3, 6]</sup>. Ferreira dos Santos (2022) highlights that videos offer vivid, spontaneous, and emotional content, being more versatile in terms of transmissibility compared to photographs. In addition, posts have a wide sharing network, with high interaction through likes and comments, constituting an important means of socialization and identification with groups, fundamental aspects for the construction of identity and socio-emotional maturity <sup>[11]</sup>.

During adolescence, several functional and structural changes occur in the brain that are influenced by experiences, whether live or virtual, and subcortical regions related to emotional processing are closely associated with peer interaction, especially on social media. A 2018 review study on brain development and media use by adolescents showed that after feeling rejected or excluded in the virtual environment, there was an increase in activity in areas also involved in stress, anger and depression, while feelings of acceptance such as likes or comments activated brain regions

related to pleasure and the reward system <sup>[16]</sup>.

Brain maturation in adolescence occurs initially through the limbic system, which is related to emotions and pleasure. Thus, individuals tend to be more affected by the emotional response of approval or disapproval, in addition to showing greater concern for the opinion of their peers, as social groups are very important in the process of searching for identity and belonging <sup>[1, 16]</sup>. Furthermore, the vivid, fast-paced, and highly interactive content offered by TikTok stimulates the dopaminergic system, including feedback of pleasure and reward, generating incentives to stay on the platform for longer and longer <sup>[6]</sup>. Associated with this, the maturation of the prefrontal cortex, which is related to analytical thinking and self-regulation capacity, occurs later in adolescence <sup>[4,17]</sup>, making this group more likely to develop addictions and problematic use of social media <sup>[8, 16]</sup>.

Few studies address the use of social media by individuals with cognitive or developmental impairments. A study by Morris (2023) <sup>[13]</sup> evaluated the use of technology by people with Down syndrome and found a lower proportion of social media use between the ages of 5 and 12 (12.1%) compared to individuals without this syndrome (55% between the ages of 5 and 15). It also highlights that the use of technology can be beneficial for prosocial behaviors, especially for people with communication limitations, as it offers an easier means of interaction and sharing information, increasing the feeling of autonomy and belonging to a group.

Sha and Dong (2021) <sup>[9]</sup> highlight the effect of "TikTok use disorder" as a mediator of depression, anxiety, stress, and memory loss. The study involved 3,036 Chinese first- and second-year high school students who were active TikTok users. It was concluded that the more problematic the use of the Internet, the more intense the depression, anxiety, and/or stress, the latter disorders being positively related to each other and intrinsically related to memory loss.

Some factors that contribute to addiction are poor parental supervision, emotional instability, unlimited access and weak social rules, in addition to individual elements including psychological and personality nuances <sup>[1, 8, 9]</sup>.

Problematic use of social media is characterized by some markers such as salience, concern with always staying connected, tolerance and desire to use more and more, mood changes, deprivation with suffering, nervousness and restlessness when its use is limited or prohibited, conflict and functional impairment, in addition to relapse or loss of control <sup>[8, 18]</sup>.

Among the harmful consequences resulting from the problematic use of social media, Aksoy (2018) <sup>[5]</sup> describes three categories: "socialization problems", including communication and escape from loneliness; "resilience problems" and "lack of problem-solving skills", including deficiencies in analysis and decision-making and disorganization in planning. Oktarini *et al.* (2022) <sup>[19]</sup> highlight other negative aspects of the abusive use of TikTok by Generation Z during the pandemic, including sexual harassment, syndromes associated with long-term use, "hoax" (referring to erroneously disseminated content), hate speech, due to the lack of content selection filters, *bullying* and *cyberbullying* (electronic communication with the intention of belittling, intimidating, or insulting another user). In the case described, the teenager did not suffer sexual harassment, but she puts herself in a vulnerable situation, since she is unilaterally involved with someone who does not know her. This is associated with the creation of a

hypothetical relationship that can lead to emotional and behavioral disorders related to expectations and frustrations. The withdrawal of access to social networks, mainly TikTok, caused the teenager to develop symptoms of depression, anxiety and aggressive behavior, progressing to mutism and aphasia. She also presented social problems at school due to excessive swearing and aggressiveness, increasing the risk of being bullied or committing *bullying*, requiring school leave. The extent to which the negative consequences of problematic media use can take on is clear, as well as the possibility of worsening, with long-term repercussions if there is no appropriate intervention.

During COVID-19 pandemic, there was an intensification of some disorders related to social media, such as Tourette Syndrome and *tic* disorders, also called "TikTok tics". According to Olvera *et al.* (2021) <sup>[20]</sup>, associated with the increase in social media consumption, there was also an increase in the severity of tics and behaviors similar to functional tics. In addition to mutism silence, during *follow-up appointments*, the adolescent also presented body movements similar to tics, with improvement after a specific therapeutic approach.

Since the excessive use of social media, including TikTok, is widespread and has a huge influence on adolescents' lives, it is essential to develop tools to manage this use. Clark, Raphael, and McGuire (2018) <sup>[21]</sup>, suggest following a similar approach to substance abuse in Primary Care, as a way to work on education on media use, stratify risk, raise awareness about the risks and repercussions of problematic use, and whenever possible, expand the dialogue on the emotional effects caused by screen use and early interventions for patients at greater risk. Morris (2023) <sup>[13]</sup> showed that most parents and caregivers feel they need more information about social media and, especially, about its impact on mental health. In the case cited, it is also evident that the educational system is unprepared to deal with behaviors related to social media addiction, choosing to prohibit the adolescent from attending school.

Some strategies that can be implemented by caregivers or parents include avoiding the use of social media before the age of 13, activating parental control tools available on the platform or on the cell phone itself, such as Google Family Link. In addition, it is important to have an open dialogue to also listen to children and adolescents regarding the emotional aspects involved and encourage critical opinions regarding the information. Other resources include activating the time of use of applications, not forgetting to encourage the practice of other activities that do not involve screen time, encouraging the practice of physical activity and enabling adequate sleep hygiene, avoiding screen time at least one hour before bedtime <sup>[6]</sup>.

## Conclusion

The rise of TikTok among social media, especially among adolescents, has an important influence on *neuro psycho emotional* development, especially in this life cycle. However, excessive and problematic use can generate distinct risks and vulnerabilities with potentially serious consequences in the short and long term. Therefore, a support network is needed to screen adolescents at risk of addiction to TikTok and other social media networks, as well as to provide greater information to the general population on the subject so that they can take advantage of protection tools and encourage users to be more critical of content, in order to

enjoy the positive aspects related to this technology and avoid its problematic use.

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