

# USE OF TECHNOLOGY AND DISRUPTIVE BEHAVIORS IN SECOND CHILDHOOD AND ADOLESCENCE. A SYSTEMATIC REVIEW

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## Abstract

### Introduction/objective

The use of information and communication technology (ICT) has become an integral part of the daily lives of children and adolescents. However, ICT exposure can have negative effects on the behavior and mental health of young people, including disruptive behavior. The study explores the effects of technology's disruptive behavior, affecting the mental health of children and adolescents.

### Methods

In this qualitative, descriptive, and exploratory study, we conducted a systematic review of the literature to explore the relationship between the use of ICT and disruptive behavior in children and adolescents.

### Conclusions

In the review of the studies, it was not possible to determine whether disruptive behaviors in children and adolescents were caused exclusively by the use of technology or whether other factors could also play a role. Due to the correlational nature of the included studies, a definitive causal relationship cannot be established.

Furthermore, most of the studies used in this review were cross-sectional, meaning that they could not determine whether ICT used precedents for disruptive behavior or vice versa. Further, longitudinal studies are needed to determine the direction of the relationship and better understand the underlying mechanisms that explain the relationship between ICT use and disruptive behavior. Parents, educators, and health professionals should be aware of both the benefits and potential both the benefits and possible negative effects of ICT use, and implement strategies at home, in educational and health environments to avoid excessive screen time, misuse of electronic devices, and generate healthy interactions with peers and adults, which contribute to the healthy development of children and adolescents.

**Keywords:** Information technology, children, adolescents, disruptive behavior, violence, social skills.



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## Resumen

### USO DE LA TECNOLOGÍA Y LAS CONDUCTAS DISRUPTIVAS EN LA SEGUNDA INFANCIA Y ADOLESCENCIA. UNA REVISIÓN SISTEMÁTICA

#### Introducción/objetivos

El uso de las tecnologías de la información y la comunicación (TIC) se ha convertido en parte integral de la vida cotidiana de niños y adolescentes. Sin embargo, la exposición a las TIC puede tener efectos negativos en el comportamiento y la salud mental de los jóvenes, incluido el comportamiento disruptivo. El estudio explora los efectos de la tecnología en el comportamiento disruptivo, afectando la salud mental de niños y adolescentes.

#### Metodología

En este estudio cualitativo, descriptivo y exploratorio, realizamos una revisión sistemática de la literatura para explorar la relación entre el uso de las TIC y el comportamiento disruptivo en niños y adolescentes.

#### Conclusiones

En la revisión de los estudios no se pudieron determinar si las conductas disruptivas en niños y adolescentes fueron causadas exclusivamente por el uso de la tecnología o existen otros factores que también pudieron influir. La naturaleza correlacional de los estudios incluidos, no se puede establecer una relación causal definitiva. Además, la mayoría de los estudios utilizados en esta revisión fueron transversales, lo que significa que no pudieron determinar si las TIC utilizaron precedentes para el comportamiento disruptivo o viceversa. Se necesitan más estudios longitudinales para determinar la dirección de la relación y comprender mejor los mecanismos subyacentes que explican la relación entre el uso de las TIC y el comportamiento disruptivo. Padres, educadores y profesionales de la salud deben conocer tanto los beneficios como los posibles efectos negativos del uso de las TIC, e implementar estrategias en el hogar, en los entornos educativos y de salud para evitar el tiempo excesivo en pantalla, el mal uso de los dispositivos electrónicos y generar interacciones saludables con sus pares y adultos, que aporten a un desarrollo saludable de niños y adolescentes.

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**Taxonomy:** : Conceptualización: todos los autores, Curación de datos: AP, KM, Análisis formal: JM, MC, Investigación: todos los autores, Metodología: JM, MC, Administración del proyecto: AP, KM, Recursos: todos los autores, Visualización: todos los autores, Redacción - borrador original: todos los autores, Redacción - revisión y edición: todos los autores.

**Palabras clave:** Tecnologías de la información, niños, adolescentes, conductas disruptivas, violencia, habilidades sociales.

## INTRODUCTION

The COVID-19 pandemic led all countries to adopt extreme measures to prevent the spread of the virus. The closure of schools, colleges, and universities surprisingly and radically changed the activity of teachers, students, and families; in a few weeks, the educational systems had to change and adapt <sup>(1)</sup>. The best alternative to being able to continue with the academic processes was the use of information and communication technologies (ICTs). A study carried out by Poenitz, Bustillos and Quintero <sup>(2)</sup> showed that, in the period above as mentioned above, 54.3% of adolescents had little or no contact with the school environment; 76.3% presented demotivation towards learning; 72% associated their state of health with negative emotions; and 61% defined an improvement in family relationships. In conclusion, the pandemic severely affected learning, breaking with an educational

structure that reaffirms the fruitful interrelationships of students with their teachers, peers, and school.

Once the pandemic was over, and, over time, the students returned to the classroom as usual, having acquired by that time technological tools and related skills <sup>(3)</sup>. However, various studies have begun to report that students already familiar with the use of technology present behaviors that distance them from the family environment and affect their social skills to the point of presenting disruptive behaviors with parents and classmates <sup>(4)</sup>.

The National Institute of Mental Health<sup>(5)</sup> mentions that disruptive mood dysregulation disorder (DMDD) is a condition characterized by persistent irritability and anger in children or adolescents, accompanied by frequent and intense episodes of bad temper. The associated symptoms exceed the usual manifestations of a “short temper” and are considered severe. Children suffering from this disorder often face significant difficulties in their family and school environment and their relationships with their partners. In addition, it is common for them to require mental health care, including frequent medical consultations and even hospitalization in some cases. These children are also at high risk of developing disorders such as anxiety and depression later in life.

In recent years, excessive use of technology has emerged as a factor that may influence the development of disruptive behaviors in children. Prolonged exposure to electronic devices may contribute to decreased emotional regulation, difficulties in handling frustration, and reactive behavior patterns. This literature review aims to identify, evaluate, and synthesize individual studies on the subject through a strict analysis protocol based on an integrative, observational, and retrospective information model. This rigor is based on the study of valuable and consolidated sources of information that seek, through a process of exhaustive rigor, to minimize documentary bias.

## OBJECTIVE

To determine the effects of technology on the disruptive behaviors of young people through an exhaustive scientific search.

## METHODOLOGY

In this systematic review, the term “technological media” has been contemplated as a set of tools, devices, and systems designed to facilitate communication, access to information, education, and entertainment. These include electronic devices such as computers, smartphones, tablets, and video game consoles; digital platforms such as social networks, instant messaging services, and video-conferencing systems; educational technologies such as interactive applications and online learning resources; and means of accessing information, such as search engines and digital libraries.

This documentary research has an exploratory scope (someone discussed general information regarding a little-known phenomenon or problem, identifying possible variables to study in the

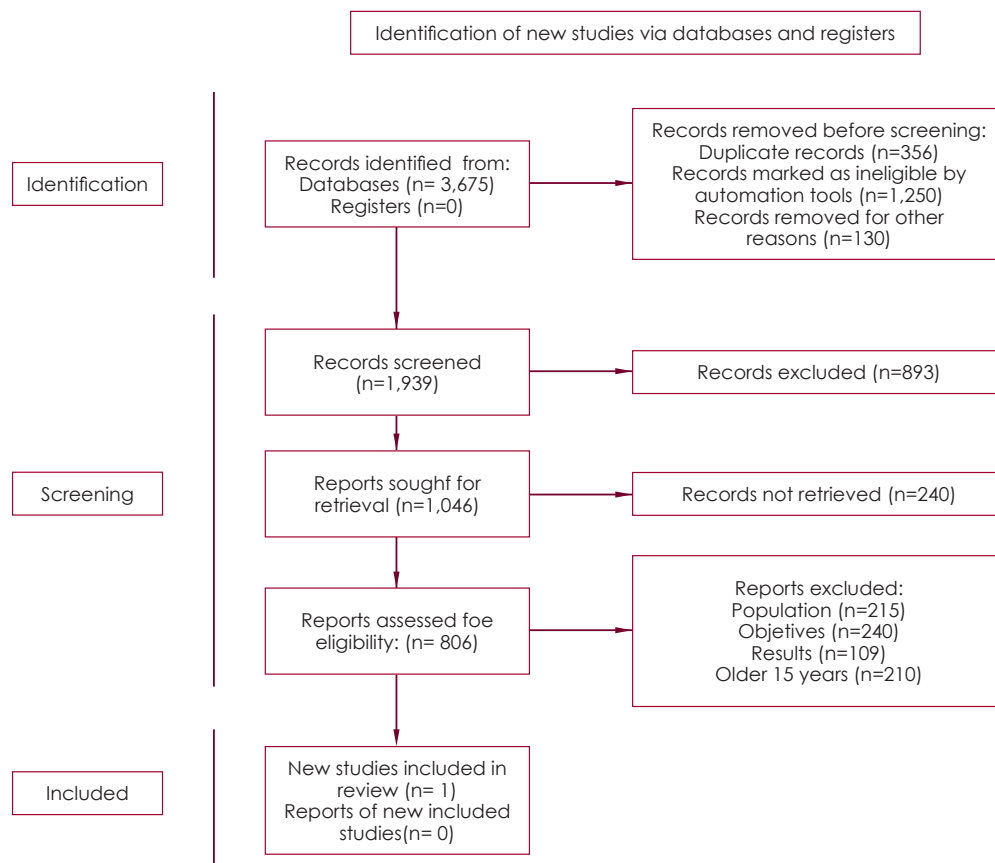


Figure 1. Flow chart for study selection based on PRISMA 2022 guidelines

future) and a descriptive scope (it sought to generate detailed information regarding a phenomenon or problem to describe its dimensions).

The researchers proposed a qualitative approach for this research., whose fundamental characteristic is to use five similar and interrelated phases<sup>(6)</sup>.

- a. They carry out observation and evaluation of phenomena.
- b. They establish assumptions or ideas due to the observation and assessment carried out.
- c. They test and demonstrate the degree to which assumptions or ideas are supported.
- d. They revise such assumptions or ideas based on evidence or analysis.
- e. They propose new observations and evaluations to clarify, modify, support, and substantiate assumptions or ideas or generate others.

PubMed Central<sup>®</sup> electronic database using the following keywords: "technology or use of technology"; "disruptive behaviors" or "challenging behaviors" or "aggressiveness"; and "children. Including the criteria as mentioned earlier: a) published in the last 15 years; b) reviews, meta-analyses, and systematic reviews. c) articles in Spanish and English. d) articles older than 15 years and articles that did not report the study method and results<sup>(6)</sup>.

The search yielded 3675 articles in the last 15 years, of which 33 met the necessary criteria. In the development of the review, the information is organized according to the theme. Finally, the results of the available evidence have been summarized and interpreted in the "results" section.

## RESULTS

A recent UNICEF<sup>(7)</sup> report concluded that 1 in 3 Internet users is under 18. Along the same lines, another study revealed that 175,000 children connect to the Internet for the first time every day<sup>(8)</sup>.

The technologies associated with information and communication have allowed humanity to find itself within a new revolution, one that brings people who are far away closer to meeting social needs, brings tangible goods closer through online commerce, but also brings intangible goods, like knowledge, closer. It can be that we are in an era in which all the knowledge of the world can be found in the palm of our hands through mobile devices<sup>(9)</sup>. However, numerous studies allege people's dependence on mobile devices and the risk of their excessive use. It is common to find that many children and adolescents are permanently exposed to content and interactions that are not suitable for them, and insufficient control could lead to problems of various kinds, both legal cognitive, and behavioral<sup>(10)</sup>. The presence of disruptive behaviors, as an observable manifestation of social cognition, is a critical factor in cognitive performance. Poenitz and Román<sup>(11)</sup> point out that numerous studies identify social cognition as a mediating variable between neurocognition and social functioning<sup>(12)</sup>, the existence of a spe-

cific neural substrate of social cognition<sup>(13)</sup>, and the relationship between the deficit in the perception of affect and the solution of cognitive-social problems<sup>(14)</sup>. In another investigation, Poenitz, Meneses and Rogel<sup>(15)</sup> confirmed that social cognition ability is an indicator of healthy neurocognitive development in children and adolescents since it is related to other cognitive abilities such as attention, processing speed, and executive functions, which are necessary to adaptively respond to the sociocultural environment.

### Boys, girls, adolescents, and technologies

Technological devices have characteristics that make them attractive to children and adolescents. Ospina, Mayorga and Villota<sup>(16)</sup> point out that one of these attractions starts from the fact that they find a way out of parental control through this medium, creating interpersonal relationships far from adult supervision.

Immersion in new technologies for children and adolescents has changed their routines and generated a new social order in which information circulates that enables and provides opportunities, but also represents risks and exposure to criminal situations, practices that range from cyberbullying up to the sale of narcotic drugs or child pornography<sup>(17)</sup>, and may even lead to the development of symptoms compatible with depression, anxiety, behavior changes, and other related psychological problems<sup>(18)</sup>.

Molina et al.<sup>(19)</sup> conclude that communication between family members is seriously affected by the inappropriate use of technologies and the Internet, mainly due to the decrease in quality time that families spend together. In the published research, parents expressed concern about the increasing difficulty of communicating with their children, with the repeated occurrence of aggressive responses to parental remarks.

After consulting the teaching staff, the research by Díaz et al.<sup>(20)</sup> showed that the rates of concern about the number of hours that children and adolescents spend connected to the Internet have increased since they consider it excessive and that it is the most evident and widespread cause of decreased academic performance and social isolation. The authors report that 17% of young people use ICT to distract themselves in class.

Another study by Ferguson and Kilburn<sup>(21)</sup> suggests that there is no clear relationship between the use of violent video games and violent behavior in young people. However, the researchers noted that exposure to violent content in video games may be related to increased aggressiveness and

hostility. In 2009, Twenge and Campbell<sup>(22)</sup> found that increased use of technology, including the internet and video games, was associated with an increased risk of disruptive and antisocial behavior in youth. For its part, a study by Rosen et al.<sup>(23)</sup> suggests that the excessive use of mobile devices, such as smartphones and tablets, may be related to an increased risk of disruptive behaviors and attention problems in young people.

Jara's<sup>(24)</sup> studies confirm that the unsupervised use of technology and the Internet influences perceptual, cognitive, sensory, volitional, aesthetic, pragmatic, and communication skills. Studies carried out on children and adolescents in educational institutions in Murcia report that more than 60% of students use ICTs without supervision and that they are dependent on these devices<sup>(25)</sup>. Children and adolescents who spend too much time using the Internet without supervision are also affected by various forms of violence and aggression, such as cyberbullying, exposing them to risks that are ignored by themselves and their parents<sup>(26)</sup>.

Flores<sup>(27)</sup> describes that cyberbullying is a phenomenon that has increased in recent years due to various factors, including the high availability of new technologies (Internet, mobile, etc.), the progressive importance of cyberspace in people's lives as a space for socialization that complements the context of home, school, or the community; the lower perception of the damage caused (victim and aggressor are not in a "face-to-face" situation); the harasser's feeling of impunity due to the anonymity that it allows and the consequent lack of retaliation by the victim and those around them; and the ease of reproduction and dissemination of audiovisual content.

### Use of technology and its influence on disruptive behaviors of children and adolescents in Latin America

In its globalization process, Latin America has opened up the introduction of new technologies that may cause similarities between the study of cases of aggressive and challenging behavior and its relationship with the use of technology between continents and more countries. However, the widespread use of technology was accompanied by the need for contact due to the confinement and isolation measures that were taken by governments during the COVID-19 pandemic<sup>(28)</sup>. Castillo<sup>(29)</sup> found in his study carried out in Guatemala that exposure to technology generates addiction without a chemical substance due to a poor distinction between the use and abuse of devices and social networks. This symptomatology worsens over time due to the lack of parental control, and like any addiction, it generates behavior changes in the form of aggressiveness disorders and defiant behavior<sup>(30)</sup>.

Capulian<sup>(31)</sup>, in her study in Peru, finds that the use of technologies is essential for the child's development in the current world context; however, excessive use generates dependency, which produces emotional detachment of the child from the family. This detachment presents challenging behavior problems in the minor and other associated disorders.

Andrade<sup>(32)</sup> found in her study in Ecuador that the excessive use of mobile devices is leading students to adopt disruptive behaviors, especially in the attempt to control the time of use,

generating conflicts both inside and outside the classroom.

Bringas et al.<sup>(33)</sup>, in their article Electronic media and antisocial behavior in adolescents, based on a sample of 331 subjects, confirm that the influence of electronic media on disruptive behaviors is mediated by factors belonging to the characteristics of the adolescents themselves. This, along with media consumption, age, personality traits - such as a higher level of responsibility, extraversion and sociability -, motivational values - such as stimulation, universalism and power -, and situational variables, like the father's profession, influences conflictive and transgressive behavior at a predictive level.

It is important to note that most of these studies suggest an association between the use of technology and violent or disruptive behaviors but do not demonstrate a direct causal relationship. In addition, each study has its limitations, and it is necessary to continue research on this topic to obtain more solid and specific conclusions.

## CONCLUSIONS

The systematic review addressing the use of technology and its implication for disruptive behavior in children and youth indicates that there is a relationship between both variables; however, the correlational nature of the studies cannot establish a definitive causal relationship. Furthermore, most of the studies used in this review were cross-sectional, which means that they could not determine whether ICT use precedes disruptive behavior or vice versa. Further, longitudinal studies are recommended to detect the influence of technology on behavior.

Some studies show positive effects, pointing out that the appropriate use of technology can help develop social and emotional skills, improve academic performance and foster creativity, as well as stimulate curiosity and the desire to explore. In contrast, studies find negative effects, such as increased sedentary lifestyles, exposure to inappropriate content, and emotional dependence on technology, which negatively affects the behavior of young people. The discrepancy in the effects of technology use demonstrates that there are other factors at play in qualifying ICT exposure as positive or negative. Based on this, a third set of research analyzes how moderating factors (such as age, gender, amount and type of technology used) can make a difference in the impact of technology use on child development, mentioning that violent and hostile content may be related to aggressive behavior at an early age. Parental controls and the quality of

family and social relationships play a substantial role in the frequency and intensity with which children and adolescents are exposed to screens. This aspect reinforces the importance of environmental and psychosocial factors in regulating the use of technology by avoiding or allowing overexposure.

An important aspect of analysis is social cognition, understood as the understanding of and response to social cues. Social cognition plays a crucial role in mediating between neurocognitive abilities and social adaptability. A deficit at this level may be related to dysfunctions in the brain regions that control impulses and decision making, affecting systems related to attention, language and behavior regulation. These changes may result in addictive, aggressive and impulsive behaviors

and social disengagement, a situation that places children and adolescents exposed to ICT in a vulnerable state.

In short, it has not been possible to establish a direct causality between ICT use and disruptive behavior in children and adolescents. It is known that their use can have positive and negative consequences in cognitive, behavioral, and emotional aspects, consequences that are mediated by demographic and psychosocial factors, which determine the degree and nature of the impact on child development.

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