

EFFECTS OF THE USE OF SCREENS IN PEDIATRIC PATIENTS: A REVIEW OF THE CONSEQUENCES ON PHYSICAL, BEHAVIORAL AND COGNITIVE HEALTH

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Abstract: Goal: Evaluate the effects of screen use on the mental health of pediatric patients, including behavioral and cognitive changes, as well as identify and discuss measures that can be adopted to reduce negative impacts. **Methodology:** Bibliographic review prepared according to the PVO strategy, through searches in the PubMed and Scielo databases. A total of 1660 articles were found and selected, after applying the inclusion and exclusion criteria, 16 studies to compose the collection. **Results:** The various studies analyzed point to negative impacts related to excessive use of screens, such as delay in the learning process and acquisition of child development milestones, sleep disorders, anxiety, depression and behavior problems, as well as childhood obesity and sedentary behaviors. Thus, it is based on the need to define limits regarding the time of use of screens, encourage participation in social activities and promote physical activities. **Final considerations:** It is necessary to expand studies on the adverse effects of indiscriminate use of screens by children, as well as effective measures for their prevention, in order to avoid the negative impact on the behavioral and cognitive development of these patients. **Keywords:** Child development; Screens; Technology; Cognitive development.

INTRODUCTION

In recent years, on the world stage, there has been a progressive evolution of technology parameters, a fact that consequently boosted the increase in the number of individuals who have access to various digital media. In this sense, people of different age groups are frequently exposed to screens and the technological possibilities they provide, becoming a contemporary habit. This way, due to changes in the current logic regarding the intense use of digital media, children have become an increasingly early target of

technology and its effects (FINK K., et al., 2019).

By this logic, the greater exposure to screen time by pediatric patients has a multifactorial character. The early introduction of electronic devices such as smartphones, video games, television and other technologies for children is mostly favored by family agreement, and this fact may be related to the globalization scenario, in which parents generally have accelerated and exhausting routines, having a reduced time for contact with the children and the strengthening of interpersonal relationships. As a consequence, there is a stimulus for the search for electronic devices as a recreational means for leisure and fun on the part of the child population, in view of the easy handling of these means and their attractive potential. In addition, factors such as insecurity in urban centers, ease of access to digital media and the influence of the social group can contribute to a change in the children's lifestyle and consequent enhancement of the use of screens. In this regard, leisure activities involving high energy expenditure are reduced (FINK K., et al., 2019; PROVIDELLO C. F., et al., 2017).

The most analyzed repercussions of the effects of prolonged use of screens by pediatric patients are related to possible delays in the development of speech and language, since the child passively receives the exposed content, reducing the interactions necessary for social development and communicative skills. With this issue, there are several studies that suggest a relationship between the intense use of screens and nutritional disorders, attention deficit, cognitive delays, emotional problems and other aspects of child development. Therefore, it is essential to understand this relationship, since child development is the most important period for the general growth of the child and depends on multiple characteristics, such as environmental issues,

stimuli and approaches that the child receives during the life of his parents, guardians and caregivers (PROVIDELLO C. F, et al., 2017).

Faced with this gap, it is essential to seek to understand the influence of the external environment and its stimuli in childhood, with the aim of promoting guidelines and strategies capable of spreading the negative aspects that the inappropriate use of screens by the pediatric population triggers in the children's health process. Thus, the objective of this bibliographic review is to evaluate the effects of screen use on the mental health of pediatric patients, including behavioral and cognitive changes, as well as to identify and discuss measures that can be adopted to reduce negative impacts.

METHODOLOGY

This is a literature review study prepared according to the PVO strategy, which represents population or research problem, variables and outcome. The research is guided by the question: "How can the use of screens in pediatric patients impact mental health, including behavioral and cognitive changes, and what measures can be adopted to reduce the negative effects of these screens?". The research population or problem refers to the effects of screen use on the mental health of pediatric patients, including behavioral and cognitive changes, as well as identifying and discussing measures that can be adopted to reduce negative impacts. The searches were carried out in the PubMed and Scientific Electronic Library Online (SciELO) databases using the descriptors "child development", "technology", "child", "cognitive development", "infant development", "technology", "child", and "cognitive development" in combination with the Boolean term "AND". A total of 1660 articles were found, which were submitted to the selection criteria. The inclusion criteria were: articles published in Spanish, English

and Portuguese between 2018 and 2022 and that addressed the themes proposed for this research, systematic review type studies and cross-sectional studies available in full. Exclusion criteria were duplicate articles, abstracts that did not directly address the studied proposal and that did not meet the other inclusion criteria. After applying the inclusion and exclusion criteria, 10 articles were selected from the PubMed database and 6 articles from Scielo, totaling 16 studies to compose the collection.

RESULTS

COGNITIVE EFFECTS

The study by Madigan et al. (2020) states that a high time of exposure to screens, such as television, is related to a lower level of child language, especially when the start of use is early. Indiscriminate access to screens delays the learning process and acquisition of child development milestones, associated with reduced physical activity and poor school performance. However, the use of high-quality screens for educational purposes can bring benefits to language, as long as it is moderate and does not replace individual and family activities that are important for the proper development of the child.

Although the American Academy of Pediatrics contraindicates the use of screens before 18 months of age, it is well known that this process has been occurring at an early age. Ferreira et al. (2020) report that 85% of children under 2 years of age who participated in a study were exposed to screens daily, despite parents recognizing the recommended time limitation. This habit imposes on children an increased risk of sedentary lifestyle, excessive weight gain and impairs the acquisition of fundamental skills for development, such as creativity and self-regulation. An association was also observed between increased use of

screens and the emergence of inattention disorders in preschoolers, confirming the relationship between early exposure and symptoms of Attention Deficit Hyperactivity Disorder (ADHD).

A study conducted by Arabiat et al. (2022) aimed to assess the impact of technology use on child development, especially in cognitive domains. The results were not consistent when concluding the influence of prolonged use of screens on language impairment, as reported in the literature. However, they highlight the debate between the use of screens as an educational medium and the short-term positive effects on the development of visual processing skills, attention, improvement in executive functions, literacy and numeracy skills. Guedes et al. (2020), in their studies with patients between 2 and 18 years old, did not find an effective impact of media use on improving cognitive development, and estimates showed little or no effect on motor function and language.

On the other hand, Carson and Kuzik (2019) identified that 95% of the interaction between parents and children was compromised due to the influence of technological means, especially the use of cell phones. This is reflected in the result of the study, which demonstrated that, on average, technology interferes 12 to 16 times in a daily conversation between parents and children, as well as interrupting activities carried out. This digital influence interference is associated with early childhood underdevelopment, lower ability to perform lower executive functions, impaired socio-emotional response, and externalizing and internalizing behavioral problems in the pediatric population.

In the study by Guedes et al. (2020), the authors discuss the development of an index that showed, through high-quality evidence, that the use of interactive media, with parental or guardian supervision, in

relation to time, content and purpose of use, can influence positively child development. However, other quality reviews confirmed that interactive media is not superior to other interventions in terms of cognitive and language development outcomes. Therefore, it is necessary to evaluate the advantages and disadvantages of interactive media use in language development and in cognitive and motor skills through further studies, with a larger sample, to prove this hypothesis.

BEHAVIORAL EFFECTS

Screen use can have a significant impact on the behavioral health of pediatric patients, including sleep disturbances, anxiety, depression and behavior problems. These effects tend to worsen with increasing exposure time to electronic devices (ROCHA B.; NUNES C., 2020). The excessive use of technologies also interferes with the time dedicated to other physical and cognitive activities.

According to Rocha B. and Nunes C. (2020), screen exposure time is directly related to the family's profile and needs. While using screens in specific situations, such as doctor appointments or travel, can be helpful, there is a risk of developing problems related to children's ability to deal with their emotions, as recognized by the American Academy of Pediatrics.

Cognitive decline in children is associated with a reduction in gray/white matter volume in several areas of the brain (RICCI R. C. et al., 2022). This decline is directly related to excessive use of screens during children's developmental period, which affects their performance in activities.

In addition to cognitive decline, excessive use of screens can also lead to obesity. The practice of playing video games is related to poor eating habits, such as insufficient consumption of fruits and vegetables,

preferring foods rich in carbohydrates, which can lead to obesity problems (STIGLIC N.; VINER R. M., 2019).

It is important to emphasize that children's brain undergoes functional and structural changes until adolescence, and the duration, mode and activities carried out through the use of technology influence its development (GUEDES S. C. et al., 2020). Early childhood and adolescence are critical periods when experiences have a significant impact on brain growth and reorganization. Therefore, the use of meshes during the first years can affect neuroplasticity, resulting in alterations that can be temporary or permanent (LIMONE P.; TOTO G. A., 2021).

Although some benefits of prolonged use of technology have been found, such as the possibility of socialization, especially for children with difficulties in this regard, it is important to consider the previously mentioned negative impacts (RICCI R. C. et al., 2022).

STRATEGIES TO REDUCE THE NEGATIVE IMPACTS OF USING SCREENS

Several studies emphasize the need to define limits regarding screen usage time. Stiglic and Viner (2019) observed an association between high levels of screen time and health damage, such as adiposity, unhealthy diet, depressive symptoms and poor quality of life in children. Santos et al. (2020) highlight the importance of parents or guardians monitoring the use of media by children, ensuring that access is controlled and that the contents are suitable for healthy development.

In addition to setting limits, promoting physical activity is an essential strategy to mitigate the negative effects of excessive screen use. Jones et al. (2021) indicate that excessive screen time is associated with childhood obesity and sedentary behaviors.

In this sense, Nobre et al. (2018) suggest that increased time spent in physical activity can counterbalance the negative effects of screens, promoting better physical health and overall well-being. Promoting alternative social interactions to screens, such as encouraging participation in social activities such as games, group games and face-to-face conversations, is essential for the healthy development of children. These interactions provide opportunities for learning, social interaction and relationship building, contributing to a healthy balance between technology use and child development.

According to recent studies, cognitive behavioral therapy has been widely recognized as an effective approach in treating problematic screen use in children. In a study published by Gentile et al. (2020), it has been shown that cognitive-behavioral therapy provides a therapeutic framework aimed at identifying and modifying dysfunctional thinking patterns associated with excessive screen use. When working with children, therapists apply specific techniques, such as training in self-regulation skills and healthy coping strategies, in order to promote a balanced relationship with technology. This approach has shown promising results in helping children develop time constraints, balancing screen use with other activities, and also addressing underlying emotional factors that can contribute to problematic screen use, such as anxiety and low self-esteem.

While cognitive-behavioral therapy is a valuable intervention, it is important to note that treating screen use in children requires a multidisciplinary approach. According to a study by Kardefelt-Winther (2018), the participation of parents and educators plays a crucial role in establishing healthy boundaries and promoting an environment conducive to the balanced use of screens. In addition, addressing social and cultural

factors is critical. For example, parents can benefit from guidance on the influence of advertising targeting children and the importance of limiting screen time at home. Educators, in turn, can promote enriching alternative activities, encouraging social interaction and the development of cognitive skills. By combining cognitive-behavioral therapy with the involvement of parents, educators and other health professionals, it is possible to adopt a comprehensive approach that meets children's needs, addressing both the emotional aspects and the social contexts involved in screen use.

FINAL CONSIDERATIONS

It is undeniable that the topic of screen use in childhood is widely discussed and studied today. It is already known that excessive and inappropriate exposure to these devices can have negative consequences on child development, causing problems such as language delay, socialization difficulties, sleep disorders and sedentary lifestyle, in addition to delaying the learning process and achievement of milestones. child development. In contrast, recent research has shown that screens can also be a valuable tool for education when used properly. Through interactive and didactic resources, children can develop important cognitive and socio-emotional skills, as long as the use is accompanied and mediated by adults. Setting time limits and monitoring usage, while promoting physical activity and social interaction, can potentially lessen the negative effects of such behavior. However, there is still a significant gap regarding the study of how to properly balance the use of screens, as well as understanding what are the ideal exposure limits for different ages and contexts. Such surveys are of paramount importance in providing clear guidelines for parents, educators, and policy makers. With this data in hand, it will be possible to establish

recommendations for use that maximize the benefits and minimize the risks associated with screens, thus ensuring the healthy and integral development of such children.

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