Volume 5, No. 1 Januari 2026
p-ISSN 2980-4868 | e-ISSN 2980-4841
https://ajesh.ph/index.php/gp

Scoping Review: Positive and Negative Impacts of Gadget Use on Child Development

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ABSTRACT:
The use of gadgets among children and adolescents has grown rapidly along with advancements in digital technology. Although gadgets provide various conveniences in daily life, their excessive and uncontrolled use can negatively impact children's growth and development. This study aims to examine the positive and negative impacts of gadget use on children's physical and mental health, focusing on various disorders that arise due to unhealthy use of gadgets. This study uses a scoping review method by reviewing relevant literature through systematic searches on PubMed, Scopus, and Google Scholar databases. Of the total 2,897 articles identified, ten met the inclusion criteria. The results of the analysis show that the use of gadgets can have positive impacts, such as improving cognitive abilities and providing wider access to education, but can also cause various physical and mental health disorders, such as headaches, vision impairments, obesity, stress, anxiety, insomnia, as well as problems with concentration and emotions. The lack of parental supervision, low digital literacy, and unfettered access to digital content exacerbate these negative impacts. This study suggests the need for more active parental supervision, education on the healthy use of gadgets, and time management to minimize negative impacts on children's growth and development.

Keywords: Positive Impact; negative impacts; Gadgets; Children; Growth and Development.

INTRODUCTION

The rapid development of digital technology has made gadgets an integral part of daily life, including for children (Tamsil, 2021). Smartphones, tablets, and computers have become common devices that attract children's attention because of the interactive and accessible content they offer (Yumarni, 2022; Yuniarni et al., 2023). However, the presence of gadgets in children's lives triggers debates about their positive and negative impacts on growth and development processes, which include physical, cognitive, emotional, and social aspects (Arifah & Maknun, 2024).

The use of gadgets at an early age, especially in elementary school-age children (6–12 years old), significantly affects children's physical and psychological development (Hidayatuladkia et al., 2021). Gadgets, as technological tools, have both positive and negative impacts, but research shows that negative impacts tend to be more dominant in children's development (Jalilah, 2021). This tendency is indicated by the potential for speech delays, concentration problems, and alarming radiation exposure (Setyarini et al., 2023).

Literature studies show that 95.8% of children under the age of two experience growth and developmental delays due to excessive gadget use (Nurmayanti et al., 2024). This fact underscores

the urgency to further examine how children's interaction with gadgets affects crucial aspects of their development, including motor skills, language, and social behavior (Azwi et al., 2022).

Further research also indicates that uncontrolled gadget use in toddlers can negatively impact children's social development due to reduced direct interaction with the surrounding environment and parents (Siregar, 2022). This often leads to children's preference for spending time with gadgets rather than playing with peers, which can then interfere with the development of their social and cognitive abilities (Noble et al., 2022). A survey in Indonesia shows that 80% of 5-year-olds have used gadgets, with 23% of parents admitting that their children like to use these devices and 82% often accessing social media at least once a week (Azwi et al., 2022).

The high tendency to use gadgets also raises concerns about negative impacts such as mental developmental disorders, speech delays, and aggressive behavior in children (Azamiah et al., 2023; Azwi et al., 2022). Therefore, parental participation is crucial in controlling and supervising gadget use, limiting screen time, and accompanying children to avoid these adverse impacts (Asmawati, 2021; Hidayatuladkia et al., 2021). Without proper supervision and mentoring, children can be exposed to age-inappropriate content or develop addictive gadget use habits, thus hindering social interaction and learning ability (Nugroho et al., 2022).

Therefore, this study aims to identify and synthesize scientific evidence regarding the positive and negative impacts of gadget use on children's growth and development, as well as outline effective mitigation strategies. This analysis will provide a comprehensive overview of the complexity of the relationship between technology and child development, while highlighting the importance of the parental role in facilitating responsible gadget use.

METHOD

This scoping review used the Arksey & O'Malley framework modified by Levac, and follows the PRISMA Extension for Scoping Reviews (PRISMA-ScR) reporting guidelines. This approach was chosen because the purpose of the study is to map widely scientific evidence related to the Positive and Negative Impacts of Gadget Use on Child Growth and Development, not to synthesize quantitative effects.

Population–Concept–Context

Here is a more compact version of the PCC framework:

1. Population (P): Children and adolescents.
2. Concept (C): The positive and negative impact of the use of gadgets on growth and development.
3. Context (C): Family and social environment, use of gadgets in daily life.

Literature Search Strategy

This study used a scoping review approach to identify, collect, and synthesize relevant literature on the impact of gadget use on children's growth and development (Huda & Fahira, 2025). This method was chosen for its ability to map key evidence from different types of studies,

identify research gaps, and provide a comprehensive overview of complex topics (Kurniawan & Nakhma'ussolikhah, 2025). This approach allowed the inclusion of various study designs, ranging from systematic reviews and quantitative research to qualitative research, to gain a comprehensive perspective on existing problems (Nugroho et al., 2022).

This review followed the Arksey and O'Malley framework, which involves five main stages: identification of research questions, identification of relevant studies, selection of studies, data mapping, and reporting of results (Asmawati, 2021). The first stage focused on formulating clear research questions to guide the literature search process, while the next stage involved a systematic search of various electronic databases using relevant keywords (Annisa et al., 2022).

The keywords used included combinations of "gadgets," "technology," "children," "growth and development," "positive impact," "negative impact," and their equivalents in English and Indonesian (Naufal & Wahyuni, 2022). This search strategy utilized Boolean operators to narrow or expand results and efficiently filter duplicate articles (Hunaifi et al., 2024). The search was limited to articles published in the last ten years (2014–2024) to ensure the relevance and currency of the information (Nugroho et al., 2022; Zulfahmi et al., 2022).

This search included various scientific platforms such as PubMed, Scopus, and Google Scholar, as well as gray literature to ensure broad and representative coverage (Setiadi et al., 2024). The application of Boolean operators such as AND, OR, and NOT refined the search results. Examples include:

(positive OR negative) impact AND (gadget OR technology) AND (child OR children) AND ("growth and development" OR "child development")

(gadget OR technology) AND ("child growth" OR "child development") NOT (stress OR stressed)

Inclusion and Exclusion Criteria

Publication restrictions were also applied to articles available in full-text format to ensure full access to relevant study data and methodologies (M, 2024; Juanamasta et al., 2023). Determination of these inclusion and exclusion criteria helped screen the literature, ensuring that only the most relevant and high-quality studies were included in this review (Hakim et al., 2023).

The studies included in this review encompassed research with various methodologies (quantitative, qualitative, mixed), published in scientific journals, conference proceedings, and research reports, both in Indonesian and English (Rukmana et al., 2023; Setiani, 2020). The main focus was on studies that explicitly discussed the impact of gadget use on aspects of children's growth and development, such as motor, cognitive, language, and social-emotional development (Ulya et al., 2025). Studies exploring interventions or mitigation strategies to manage the impact of gadgets were also considered (Zulfahmi et al., 2022).

In contrast, the exclusion criteria included studies that did not focus on children, were opinion- or editorial-based with no empirical data, and other literature reviews that did not present primary data (Dewi et al., 2025; Rambe et al., 2023). Articles that only displayed abstracts were

also excluded, as were articles with unclear information that could not be thoroughly evaluated (Rini & Huriah, 2020).

Study Selection Process

The initial records obtained from various databases are merged and duplicated. The first stage of screening was conducted based on the title and abstract referring to the PCC framework. Potentially relevant articles were then read in full-text, evaluated using inclusion-exclusion criteria, and the reasons for exclusion are recorded. The selection process is summarized in the PRISMA-ScR flow.

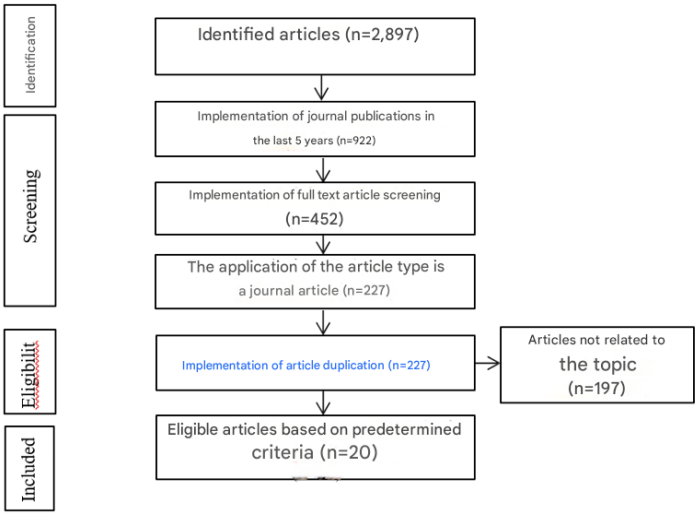

Figure 1. Flow Diagram Selection Articles for Research
Source: Author's analysis based on PRISMA-ScR guidelines

Data Extraction and Analytics

Data extraction was carried out using a standardized form that had been validated to collect key information from each selected study, including methodological details, sample characteristics, type of intervention (if any), and key findings related to the positive and negative impacts of gadget use on children's growth and development. The extracted information also included the research design, sample size, data collection methods, and significant outcomes related to cognitive, social-emotional, physical, and language development (Annisa et al., 2022).

This extraction process was carried out independently by two researchers to minimize bias and ensure data accuracy, with differences reconciled through consensus or mediation by a third researcher (Tavassoli et al., 2023). This stage was important to maintain the quality and integrity of the data to be analyzed, resulting in a robust and accountable synthesis (Andri et al., n.d.). The extracted data were then stored in an electronic worksheet, such as a spreadsheet, to facilitate further quantitative and qualitative analysis, in accordance with data extraction guidelines for systematic reviews (Sipahutar, 2023).

The analysis of the extracted data involved a thematic and narrative approach, where findings from various studies were grouped based on the similarity of impacts and areas of child development affected (Nugroho et al., 2022). This approach allowed for the identification of consistent patterns as well as variability in the existing literature, providing a comprehensive picture of the complexity of gadget impacts. Narrative synthesis was used to summarize key findings and explore relationships between different data, in order to present a holistic picture of the impact of gadgets on children's growth and development (Hunaifi et al., 2024).

It also included identifying gaps in the current literature that require further research in the future. The data analysis method involved data reduction, data presentation, and drawing conclusions, following the framework of qualitative data analysis (Nugroho et al., 2022)

RESULTS AND DISCUSSION

The thematic analysis of 20 articles produced several main themes of the Positive and Negative Impacts of Gadget Use on Children's Growth and Development, namely:

Table 1. Related Research

NO	Author (Year)	Journal Name	Country/Context	Method	Population And Sample	Focus Variable/PPC	Key Findings	Relevance For Children's Health
1	Abdim (2023)	Nurullita's Service	São Paulo	FGD	São Paulo	Counseling on the Dangers of Gadgets in Children and Adolescents	Knowledge about the impact of gadgets is increasing, especially in adolescents and the elderly.	Emphasizing the importance of counseling to increase understanding of the dangers of gadgets in children and adolescents.
2	Andini & Maulana (2023)	Journal of Adolescent Psychology	Jakarta State High School	Quantitative Correlation	Jakarta State High School	The Relationship between Gadget Use Intensity and Adolescent Emotion Regulation	There is a significant negative relationship between excessive gadget use and emotion regulation ability.	Highlighting the importance of good emotional regulation in adolescents in the context of gadget use.
3	Putri & Santoso (2023)	Public Health	SMK Batik 2 Surakarta	Descriptive Quantitative	SMK Batik 2 Surakarta	The Relationship between Gadget Use	Increased intensity of gadget use is related to dietary	Explain the relationship between poor diet and the

NO	Author (Year)	Journal Name	Country/Context	Method	Population And Sample	Focus Variable/PPC	Key Findings	Relevance For Children's Health
						Intensity and Nutritional Status	disorders and poor nutritional status.	intensity of gadget use in children.
4	Rahayu & Putri (2021)	Educational Psychology	SDN Jakarta 01	Quantitative Correlation	SDN Jakarta 01	The Relationship of Gadgets and Sleep Patterns in School Children	There is a significant relationship between gadget use and sleep disorders in schoolchildren.	Showed a significant relationship between gadget use and sleep disorders in schoolchildren.
5	Sari & Rahman (2022)	Adolescent Psychology	Jakarta State High School	Qualitative (In-Depth Interview)	Jakarta State High School	The Impact of Gadgets on Adolescent Emotions	Excessive use of gadgets causes emotional disorders such as anxiety, stress, and irritability in adolescents.	Reveals emotional disorders that arise in adolescents due to excessive use of gadgets.
6	Character (2023)	Community Service	Catholic Elementary School 1 Buah Hatis, Tomohon	Socialization of Learning	Catholic Elementary School 1 Buah Hatis, Tomohon	The Impact of Excessive Gadget Use on Elementary School Children	Children gain an understanding of the impact of gadgets, produce scientific reports and articles.	Provide understanding to children about the negative impact of using gadgets, as well as increase awareness of these dangers.
7	Gabriela (2021)	Excelsis Deo	Surabaya	Descriptive Qualitative (Literature Study)	Surabaya	The Impact of Gadget Use on Adolescent Behavioral Development	Gadgets cause negative behavioral changes in adolescents such as tantrums and individualistic traits.	Highlighting the adverse influence of gadgets on adolescent behavior changes.

NO	Author (Year)	Journal Name	Country/Context	Method	Population And Sample	Focus Variable/PPC	Key Findings	Relevance For Children's Health
8	Princess (2024)	Health Sciences	Mandira Tuban High School	Quantitative	Mandira Tuban High School	Gadget Use and Adolescent Behavior Change	Gadget use is associated with changes in negative behavior in adolescents.	Increase awareness about the influence of gadgets on behavioral changes in adolescents.
9	Irfan (2022)	Pedagogues: Journal of Education	Sape District, Sape Regency	Descriptive Qualitative	Sape District, Sape Regency	Strategies for Assisting Parents on the Impact of Gadgets on Children	Parents have an important role in controlling the use of gadgets so that they do not have a negative impact on children's development.	Realize the important role of parents in controlling the use of gadgets for healthier development in children.
10	Saniyyah (2021)	Educational: Journal of Education	Jekulo Village, Kudus	Qualitative Case Studies	Jekulo Village, Kudus	The Impact of Gadget Use on Children's Social Behavior	Children are less sensitive to the surrounding environment, although they are still polite and helpful.	Showing the negative impact of gadgets on children's social behavior and the importance of parental supervision.
11	- Shawn O'Neill (2025)	Journal Indonesian Journal of Empirical Nursing Science	Malang, Indonesia	Quantitative Correlation	75 Primary School Students	Children's Use of Gadgets and Diets	There is a significant relationship between the intensity of gadget use and difficult eating behavior.	Increase understanding of the impact of gadget use on children's diet.
12	Stevanus & Parida (2023)	International Journal of Online and Biomedical Engineering	Jakarta, Indonesia	Mixed-methods	251 elementary school students	The Influence of Gadget Use on Children's Social and Linguistic Development	The use of gadgets improves social and linguistic development in elementary	Provide insight into the influence of gadgets on children's social and linguistic

NO	Author (Year)	Journal Name	Country/Context	Method	Population And Sample	Focus Variable/PPC	Key Findings	Relevance For Children's Health
							school students.	development.
13	Wa Ode Nurl Ainun Asgaf (2024)	Indonesian Health Promotion Publication Media	Baubau, Indonesia	Observational Analytics	77 Early Childhood	The Effect of Gadget Use on Children's Speech and Language Development	The use of gadgets is related to delays in speech and language development in children.	Highlighting the importance of supervision of gadget use in early childhood.
14	Mahbubur Rashid et al. (2021)	Health Science Reports	Bangladesh	Cross-sectional	1803 High School Students	Gadget Use and Its Impact on Physical and Mental Health	Excessive use of gadgets causes physical and mental health problems in students.	Identify the impact of gadget use on children's health in secondary school.

Source: Data compiled and analyzed from selected studies, 2025

Study Characteristics

Based on a systematic search, a number of relevant articles have been identified and grouped by year of publication, research design, and the main focus of the impact of gadget use on children (Ulya et al., 2025). This analysis aims to provide a comprehensive overview of the available literature, highlighting research trends and areas that require further exploration. The findings of eight relevant articles, comprising international journal articles and national journal articles, show a varied focus on methodology and findings, but collectively present a framework for thematic synthesis (Pangarti & Yaswinda, 2023).

Analysis of Positive Impact Findings

Based on the literature review, it can be identified that the positive impact of gadget use on children's growth and development includes cognitive, adaptive, and social-emotional aspects, with the potential for increased motivation to learn and the development of skills of the 21st abbot (Fuaody et al., 2024; Hidayatuladkia et al., 2021). For example, interactive educational apps can facilitate the understanding of abstract concepts, while digital collaborative platforms allow children to engage in group projects that transcend geographical boundaries (Ardiansyah & Rejeki, 2024).

The development of critical thinking and problem-solving skills is also increasingly honed through rich visual and auditory stimulation from various educational digital content. In addition, gadgets can be an effective means of expanding children's knowledge of cultural and social diversity through access to various global information media (Hidayatuladkia et al., 2021).

Gadgets also support children to develop independent learning, allowing them to determine the rhythm and learning method that best suits their respective cognitive styles (Huda & Fahira, 2025).

Thus, the adoption of technology in learning can encourage pedagogical innovation and create a learning environment that is more dynamic and responsive to the individual needs of children. However, a disproportionate approach to digital technology can erode traditional values and direct social interactions, which are essential for character formation and children's self-esteem. Therefore, a careful balance is needed between the use of technology and traditional social interaction to ensure the holistic development of children (Fuaody et al., 2024).

An integrated approach, which combines technology-based learning with physical activity and face-to-face social interaction, is crucial to optimizing the positive potential of gadgets while minimizing their negative risks. Effective time management and consistent parental guidance are crucial factors in overcoming the potential negative impact of gadget use, while ensuring that moral and spiritual values remain firmly embedded in children (Anwar & Cholimah, 2023).

In fact, with targeted supervision and use, gadgets can be a significant tool in developing children's adaptive skills in accordance with the demands of the digital age (Hidayatuladkia et al., 2021). The implementation of policies that regulate digital content and strict supervision from schools and parents are essential to direct children to the wise and productive use of gadgets (Munarun et al., 2025; Rojak, 2024).

The role of parents and educators in directing the positive use of technology is very vital, considering that gadgets can enrich children's vocabulary in both common and foreign languages and support cognitive development and hand-eye coordination (Annisa et al., 2022). In addition, through various applications and interactive features, gadgets are also able to introduce children to other cultures and new things, which indirectly shape their global understanding (Annisa et al., 2022).

Based on the findings of various evaluation literature findings regarding the negative impact of system use on children and adolescents, it is very clear that excessive use of machines can have a significant impact on intellectual health, language development, social interaction, and physical health. Research shows that children who are overexposed to devices tend to experience delays in speech skills, as well as difficulties in communicating with the surrounding environment. This can lead to emotional problems, such as anxiety and stress, which have the potential to interfere with their learning process (Kamaruddin, 2023; Siti Aisyah, 2023). In addition, children who use the system too often also show a tendency to become more individualistic, reduce social skills, and increase the risk of aggressive behavior (Gabriela, 2021; Alisyahbana, 2023).

Thus, it is important to carry out preventive efforts that start with the child's immediate environment, which includes the family and school. Parents have a very important role in regulating the duration and type of use of the system that is appropriate for the child's age. In this context, education about the dangers of excessive use of devices is crucial. By providing the right information and guiding children to understand the risks that exist, parents can help them make better choices regarding the use of technology (Jalilah, 2021). In addition, implementing a balanced daily schedule between study, active play, and rest is also an important step that can be

taken to prevent dependence on digital devices. By establishing a routine that includes a variety of activities, children will not only reduce the time spent in front of screens, but will also engage in more rewarding social and physical activities (Kamaruddin, 2023).

The school environment also has a big responsibility in overcoming this problem. Teachers can take an active role in integrating digital literacy into the learning curriculum, which not only improves students' digital skills but also teaches them how to use technology in a healthy and productive way. By providing examples of good system use, teachers can help students understand that technology can be a positive tool if used wisely (Iftaqul, 2023). In addition, parental assistance and strict supervision of the use of machines by children are very necessary. Parents must be active in supervising and limiting the time they use the system, as well as providing alternative activities that are interesting and educational. Effective supervision methods, such as setting time limits and encouraging children to engage in physical activity, will help them develop healthier and more balanced habits (Sugiarti, 2022).

The implementation of the four solutions, such as regulating the duration and type of gadget use, implementing a balanced daily schedule, integrating digital literacy in schools, and parental mentoring and supervision are strategic steps that can be implemented to minimize the negative impact of gadget use. With this comprehensive approach, it is hoped that children can grow and develop better in an environment that supports their cognitive, social, and emotional development. This is important to ensure that children are not only skilled in using technology, but also able to interact healthily with their environment, so that it can prepare them for future challenges.

Negative Impact Findings Analysis

However, excessive use of gadgets without adequate supervision can cause various significant negative impacts on children's growth and development, including physical health risks, social-emotional development delays, and academic problems (Asmawati, 2021; Hidayatuladkia et al., 2021). Parents often face challenges in limiting the time they use their children's gadgets, which is ideally around 3-4 hours per day, and diverting their children's attention to more educational activities (Nugroho et al., 2022).

Lack of parental supervision due to busy work can cause children to trust themselves too much in gadgets, making them vulnerable to negative impacts (Hidayatuladkia et al., 2021). What's more, without proper guidance, children can be exposed to age-inappropriate content, ignore parental commands, become addicted, and experience decreased learning concentration (Azwi et al., 2022; Hidayatuladkia et al., 2021).

This negative impact is also exacerbated by a lack of direct social interaction, which has the potential to hinder the development of empathy and the child's ability to understand social cues (Najwa, 2021). In addition, excessive exposure to screens can disrupt children's sleep patterns, trigger behavioral problems, and increase the risk of mental health disorders such as anxiety and depression (Handayani et al., 2020). Therefore, the role of parents in supervising and guiding the use of gadgets is crucial to prevent these negative impacts (Hidayatuladkia et al., 2021; Nugroho et al., 2022).

Parents must play the role of a mentor to ensure the use of gadgets that are healthy and in accordance with children's developmental needs, helping them develop digital literacy and manage time well (Yunita et al., 2025). Furthermore, the implementation of time limits on use, the selection of educational content, and the offer of alternative physical activities and social interaction are important strategies that must be implemented by parents to mitigate these risks (Afidah et al., 2022; Arifah & Maknun, 2024; Nugroho et al., 2022). Research shows that careful and prudent management of children's use of gadgets is indispensable to avoid negative impacts (Hanipudin et al., 2023).

This proactive surveillance includes not only screen time restrictions, but also age-appropriate selection of apps and content, as well as encouraging balanced non-digital activities (Hidayatuladkia et al., 2021). Dependence on gadgets, especially without parental assistance, can cause negative impacts such as significant addiction in children (Nugroho et al., 2022). Addiction to these gadgets can interfere with children's cognitive and social development, as well as trigger behavioral and physical health problems (Asmawati, 2021).

For example, children who are excessively exposed to gadgets tend to be less involved in physical activity, which can contribute to obesity and other health problems (Yuniarni et al., 2023). In addition, the lack of direct interaction due to intensive use of gadgets can also hinder the development of children's social and emotional abilities, making them more focused on themselves (Zulfahmi et al., 2022). Therefore, parents need to limit the use of gadgets in children, choose safe and age-appropriate content, and accompany children when playing gadgets to prevent more serious negative impacts (Nugroho et al., 2022; Shofa, 2022).

In fact, several studies indicate that uncontrolled use of gadgets can cause eye health disorders, sleep problems, and affect children's emotional stability leading to tantrums and difficulty focusing (Ruminem et al., 2020; Sumarni, 2022). Behavioural changes, including increased aggressiveness and dependence, demonstrate the urgency of digital education that supports healthy social interactions, while also highlighting the need for a "no screen before bed" policy to address serious sleep pattern disruption (Nahdiyah et al., 2024).

The importance of the role of parents in supervising and guiding children in using gadgets is very crucial, including in setting time limits for use and ensuring that content accessed is age-appropriate and does not negatively impact their growth and development (Hanipudin et al., 2023; Hidayatuladkia et al., 2021). Limiting the time of device use and the type of content that children can access are important efforts that parents must make to prevent these adverse impacts (Jufrida et al., 2021).

Factors Influencing Impact

Various factors, both internal and external, also affect the extent to which gadgets have a positive or negative impact on children's growth and development, including the child's age, the context of use, and the quality of interaction with adults (Nugroho et al., 2022). For example, the duration of use of gadgets and the type of content accessed have a significant role in shaping the outcome of child development (Arifah & Maknun, 2024). Research shows that excessive exposure

to gadgets, especially at an early age, can negatively affect children's cognitive and social-emotional abilities (Hadi & Sumardi, 2023; Nugroho et al., 2022).

On the other hand, the use of measurable and targeted gadgets for educational purposes can support the learning process and the development of certain skills (Hidayatuladkia et al., 2021). This is reinforced by the fact that children who spend too much time with unsupervised gadgets tend to have difficulty developing speaking and empathy skills, as well as exhibiting individualistic behavior (Annisa et al., 2022). However, on the other hand, gadgets can be an effective tool to improve digital literacy and problem-solving skills in children if used wisely and with the right assistance (Yumarni, 2022).

In addition, parental parenting plays a crucial role in shaping the impact of gadget use on children, where less supportive parenting can hinder the development of children's emotional intelligence and social interaction (Nugrahanani et al., 2025). Studies show that active and directed parental supervision can significantly reduce the risk of negative impacts of gadget use, while increasing its potential educational benefits (Asmawati, 2021; Miranti & Putri, 2021). Parents who provide time limits and accompany children when using gadgets tend to have children who avoid negative impacts, especially in aspects of social development (Annisa et al., 2022; Azamiah et al., 2023).

CONCLUSION

A comprehensive analysis of the literature reveals that gadget use in children exerts a bimodal impact on their growth and development—positive when managed wisely through limited duration, high-quality educational content, and strong parental supervision, but predominantly negative otherwise, affecting language, motor, social-emotional, and cognitive domains with risks like addiction, impaired emotional/social skills, and physical/mental health issues. While gadgets can enhance cognitive abilities and provide broad information access as effective educational tools, their unchecked use often leads to developmental delays. Optimizing benefits requires comprehensive policies emphasizing parents' pivotal role in moral, religious, and societal guidance. For future research, longitudinal studies tracking gadget use from early childhood through adolescence in diverse Indonesian contexts would clarify long-term causal effects and effective interventions.

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