

Literature Review: The Impact of Gadgets on Early Childhood Emotional Regulation

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Article Info	Abstract
Article History Submitted, 2026-04-12 Accepted, 2026-05-19 Published, 2026-06-30	The use of gadgets in early childhood continues to increase along with the rapid development of digital technology. Excessive screen exposure has the potential to inhibit the development of emotion regulation, which is a crucial foundation for a child's social-emotional intelligence and mental health in the future. Although the duration of screen time has been extensively researched, studies that integrate internal mechanisms such as parent-child relationship mediation factors and peer relationship moderation are still limited. The purpose of this literature review is to synthesize holistically the mechanistic pathways, mediating factors, and protective factors that link the duration of screen time with the ability to regulate early childhood emotions in the digital age. The research method used was a literature review using a systematic search on Google Scholar, PubMed, Science Direct, IJM, and Proquest databases. A total of six articles were examined in depth after being selected using the PICO method according to the inclusion criteria: national and international journals with full texts in Indonesian or English published in the period of 2021 to 2026. The results of the review of the six articles consistently show that the intensity of gadget use or high screen time is significantly related to the low ability to regulate emotions in early childhood. This relationship is mediated by the quality of the parent-child relationship (co-regulatory failure due to technofence) and moderated by peer relationships as well as active parental supervision as protective factors. In conclusion, excessive and uncontrolled use of gadgets has been shown to worsen children's emotional regulation capacity which is characterized by increased tantrums, irritability, and decreased frustration tolerance. Children's socio-emotional development interventions must combine screen time restrictions (maximum 1 hour per day for ages 2–5 years according to WHO standards) with strengthening the quality of parent-child interpersonal relationships and direct social stimulation. Parents, educators, and policymakers are expected to collaborate in optimizing active mentoring, emotional validation, and the preparation of guidelines based on developmental suitability and quality of digital content.
Keywords: Gadgets, emotion regulation, early childhood, screen time	

Introduction

Globally, child development monitoring is carried out through the Early Childhood Development Index (ECDI). Data from (UNICEF, 2023) shows that on a global average, around 25% to 30% of children aged 3-4 years in developing countries have not reached minimum developmental milestones in all aspects of development. Key issues highlighted by the World Health Organization (WHO, 2024) is an increased risk of delayed social interaction due to excessive exposure to digital media (sedentary screen time), where more than 40% of

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early childhood children worldwide are exposed to screens exceeding the recommended 1 hour per day.

Based on national data from the Central Statistics Agency (BPS), the use of gadgets and the internet among early childhood in Indonesia has increased quite significantly in recent years. Based on the results of the National Socio-Economic Survey (Susenas) in March 2024, as many as 39.71% of children aged 0-6 years old have used mobile phones and 35.57% of them have accessed the internet. This prevalence increases sharply with age: only 5.88% of children under the age of 1 use mobile phones (4.33% access the internet), compared to 37.02% of children aged 1-4 years (33.80% for the internet) and 58.25% of children aged 5-6 years (51.19% for the internet). This figure shows a considerable increase compared to 2022, where only 33.44% of children aged 0-6 years used mobile phones, with details of 25.5% in the age group of 0-4 years and 52.76% in the age group of 5-6 years (Central Statistics Agency, 2024).

This national statistical data confirms that exposure to gadgets in Indonesian children begins at a very early age and increases significantly as children enter preschool age. This increasing trend underscores the importance of understanding the mechanisms that link early exposure to gadgets with the regulation of children's emotions, while reinforcing the relevance and urgency of this literature review.

The rapid development of digital technology in the past decade has fundamentally changed the way children interact with the world around them (Louwise & Lie, 2024). Gadgets that include smartphones, tablets, computers, and televisions are now an integral part of modern family life, even from a very early age (Ridanti & Suryana, 2024). Global data shows that 98% of preschool-aged children have been exposed to at least one type of electronic media before the age of four, with most starting exposure as early as the age of one (Xu & Qiao, 2025). Even more worrying, children in high-income countries spend an average of 2.8 hours per day in front of screens by the age of three, a figure that exceeds the WHO's recommended limit of 136% (Yiyun, 2026).

Early childhood development (range from 0 to 6 years) plays a crucial role as the foundation of an individual's future. Known as the golden age, this period is characterized by a rapid surge in cognitive, motor, social, and emotional functions. One of the vital competencies highlighted in developmental psychology is emotional regulation, which is the child's ability to understand and control his emotional responses so that he remains adaptive to the environment. Given that this regulatory system has not been fully developed in early childhood, the internalization process is highly dependent on consistent parenting, habituation, and mentoring from the adults around him (Rahmayunita, 2026)

Emotional regulation is the foundation of almost all aspects of healthy child development. Children who have good emotional regulation skills tend to be more likely to build positive social relationships, have higher learning readiness, and show better mental health in adulthood. In contrast, difficulties in the regulation of emotions known as emotional dysregulation are associated with increased impulsive behavior, aggressiveness, difficulties in social adjustment, and the risk of various psychiatric disorders later in life (Rahmayunita, 2026).

The crucial question that arises then is how does the increasingly massive use of gadgets at an early age affect the development of children's emotional regulation? A number of studies have begun to identify a link between digital screen exposure and various emotional development problems. However, a comprehensive understanding of the mechanisms, mediating and moderation factors, and their practical implications still requires a systematic synthesis of the various existing studies.

Although the previous literature has explored the relationship between the duration of screen time and the dynamics of early childhood emotional development, studies that comprehensively synthesize the internal mechanisms linking the two variables are still very limited. In particular, the integration of mediating factors such as the quality of parent-child relationships and moderation factors such as the role of peer relationships and active parental supervision have not been integratively mapped. Therefore, this literature review is here to provide a holistic evidence-based synthesis to unravel the mechanistic pathways and protective factors that affect children's emotional regulation ability in the age of digital.

Methods

The research method used in this study was a literature review (Literature Review) which analyzes the impact of gadget use on early childhood emotion regulation. The literature review method is a method that is structured in stages to identify, evaluate and synthesize the findings of previous research (Gusti, 2025). Where in this study will discuss the impact of gadgets on the regulation of early childhood emotions.

The unit of analysis for this study is national and international journals that talk about the impact of gadgets on the regulation of early childhood emotions. This literature review used a systematic search. From relevant journals on Google Scholar, PubMed, Science Direct, IJM, and Proquest with the keywords "gadgets", "emotional regulation", "early childhood", "screen

time". The selection of this article meets the inclusion and exclusion criteria. The inclusion criteria that have been set are national journals and international journals published in a period of 5 years (2021-2026). For the exclusion criteria themselves, journals that use foreign languages other than English and Indonesian and articles whose full text cannot be accessed. The search results obtained 20 articles, then selected using the PICO method, so that 6 articles were obtained to be studied in depth. The articles obtained are then reviewed and compiled systematically to conduct a comparative analysis between the literature, then the findings are discussed in depth by integrating supporting literature to produce a valid and relevant synthesis.

Results and Discussion

Table 1. Results of Journal Analysis

No	Research	Method	Results
1.	Digital screen exposure and emotional symptoms in preschool children : mediation by parent – child relationship and moderation by peer relationship (Xu & Qiao, 2025)	This study used a questionnaire survey of 6,623 valid responses, parents, preschoolers with a quantitative approach.	There was a positive association between digital screen exposure and emotional symptoms in preschoolers ($\beta = 0.2351$, $p < 0.0001$).
2.	Emotional dysregulation in preschool age predicts later media use and gaming disorder symptoms in childhood (Paulus et al., 2021)	Longitudinal studies with quasi-experimental design.	The results of the study showed that children with emotional dysregulation at preschool age had a longer time using media and a higher score of gaming disorder symptoms at school age compared to children without emotional dysregulation. ($p = 0.51$).
3.	The impact of screen-based media exposure on infant and toddler development : A systematic review of psychological and behavioural domains (Yiyun, 2026)	Systematic scoping review method	Based on research on children and toddlers aged 0-36 months, excessive exposure to screen-based media tends to have a negative impact on children's development. The impacts include sleep disturbances, delayed language development, decreased cognitive and attention abilities and reduced social interaction and socio-emotional abilities. Therefore, the use of screen media in babies and toddlers needs to be accompanied by parents or caregivers.
4.	Dampak Kecanduan Gadget Pada Kemampuan Regulasi Emosi Anak Usia 4 – 5 Tahun (Kamilla & Putri, 2025)	Qualitative research methods with case study types.	This study concludes that gadget addiction in children aged 4-5 years has a negative impact on children's ability to regulate emotions. Children who use gadgets too often tend to have difficulty controlling emotions, reducing interaction with peers and inhibiting children's emotional development. On the other hand, children who receive parental assistance and restrictions on the use of gadgets show better emotional regulation.
5.	Analisis Dampak Penggunaan Gadget Terhadap Kemampuan Regulasi Emosi Pada Anak Usia Dini (Studi Kasus Pada Kb Mekar Abadi Desa Dadapan) (Endang Susilowati, 2026)	This research uses a qualitative approach with a case study design type.	This study found that the use of high-intensity gadgets makes early childhood children have difficulty controlling emotions such as irritability, crying, and difficulty receiving directions when gadgets are stopped and lack of interaction with peers, so that supervision and restrictions are needed from gadgets to show better emotion regulation capabilities.
6	Hubungan Durasi Screen Time Dan Regulasi Emosi Anak Usia 3-6 Tahun Di Pusat Perawatan Anak Sehat Universitas	This study uses a quantitative approach with a cross-sectional correlational design.	The results showed that the majority of children had excessive screen time duration, namely 23 children (62.2%) compared to 14 children (37.8%) with normal duration. In line with that, most children also showed low emotion

Padjadjaran (Winanda, 2024)	regulation, namely 24 children (64.9%) compared to 13 children (35.1%) with good emotion regulation. The Spearman's rho correlation test showed a significant relationship between the two variables ($p = 0.003$, $\rho = 0.476$), with sufficient correlation strength and negative direction, meaning that the higher the duration of screen time, the lower the child's ability to regulate emotions. However, because the strength of the relationship is only "enough" (not strong), screen time is not the only determining factor; Parenting, parent-child interaction, and family environment also play a role.
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Based on Table 1, it can be affirmed that all six articles without exception found a significant relationship between gadget/screen time use and early childhood emotion regulation. The difference lies only in the methodological approach (quantitative vs. qualitative), the scale of the research, and the age range of the sample, but the direction of the relationship is consistent, namely the higher the intensity of gadget use, the lower the child's ability to regulate emotions.

Clarification of Age Restrictions in Early Childhood Constructs This literature review includes studies with a variety of terms and a wide range of sample ages, ranging from infant/toddler (0-36 months), children aged 3-5 years, to the general category of preschool. Although terminological may seem varied, all of these age groups scientifically fall under the umbrella of a single definition of early childhood. Based on the official classification of the World Health Organization (WHO, 2020) and the National Association for the Education of Young Children (NAEYC, 2022) The Early Childhood phase stretches from the birth period of age 0 to the age of 8. Therefore, the grouping of developmental sub-phases in the articles studied such as toddler (1-3 years) and preschool (3-6 years) is an integral part of the inseparable continuum of early childhood growth. The integration of all these age sub-phases (0-6 years) into a single review analysis is crucial because the child's emotional regulatory capacity is not formed instantaneously, but rather through a continuous neurological developmental process from infancy. In infant/toddler (0-3 years), the child's emotional regulation system is still external (co-regulation) and highly dependent on the response of the environment/parents. As they grow older to the preschool phase (3-6 years), children begin to internalize these abilities towards self-regulation. By synthesizing articles that contain an age spectrum from 0 to 6 years, this review is able to present a complete developmental map of how exposure to gadgets intervenes in the foundation of emotion regulation from the early formation stage (infant) to the stabilization stage (preschool).

Xu & Qiao. (2025) which discusses screen exposure and emotional symptoms on a large scale. Xu & Qiao. (2025) A quantitative study was conducted with a questionnaire survey of 6,623 parents of preschoolers, making it the largest sample study in this study. The results of the analysis showed a significant positive relationship between exposure to digital screens and emotional symptoms in preschoolers ($\beta = 0.2351$, $p < 0.0001$). Furthermore, this study identified that the quality of parent-child relationships mediated these relationships, while the quality of peer relationships acted as moderators that could weaken the negative impact of screen exposure.

Paulus et al. (2021) Explain about emotional dysregulation as a predictor of media use. Paulus et al. (2021) Using a quasi-experimental longitudinal design of 80 children to observe the relationship between emotional dysregulation in preschool age and media behavior in school age. The results showed that children with emotional dysregulation at preschool age (average 4 years) used the medium for an average of 148 minutes per day when they reached school age (average 9 years), compared to 85 minutes in children without emotional dysregulation. Children with such emotional dysregulation also showed higher gaming disorder symptom scores. These findings reveal that dysfunctional cycles, namely emotional dysregulation at an early age, are a significant predictor of excessive use of gadgets later in life.

Yiyun. (2026), systematically review the impact of screens on infants and toddlers. Yiyun. (2026) presents the most comprehensive evidence in this study through a systematic scoping review that synthesized 158 studies in children aged 0-36 months. The results of the review showed that excessive exposure to screen-based media had a multidimensional negative impact on children's development, including sleep disturbances, delayed language development, decreased cognitive and attention skills, and most relevant to this study reduced social interaction and socio-emotional abilities. This study concludes that the use of screen media in

infants and toddlers needs to be accompanied by parents or caregivers, because the context and quality of mentoring play an important role in moderating these negative impacts.

Kamilla & Putri. (2025), in this study discusses gadget addiction in 4-5 year old children. Kamilla & Putri. (2025) using a qualitative approach with a case study type on two children aged 4-5 years. This study concludes that gadget addiction in children aged 4-5 years has a negative impact on children's ability to regulate emotions. Children who use gadgets too often tend to have difficulty controlling their emotions and experience decreased interaction with peers, which in turn hinders the child's overall emotional development. In contrast, children who received parental assistance and restricted gadget use consistently showed better emotional regulation confirming the crucial role of parental involvement as a protective factor.

Susilowati. (2026), with the topic of gadget intensity and difficulty controlling emotions. Susilowati. (2026) conducting qualitative research with a case study design on children in Mekar Abadi Family Planning. This study found that the use of high-intensity gadgets makes early childhood have difficulty controlling emotions, such as irritability, crying, and difficulty receiving directions when gadgets are stopped, as well as showing a lack of interaction with peers. These findings confirm the need to monitor and restrict the use of gadgets, because children with consistent restrictions show better emotional regulation abilities than children without restrictions.

Winanda et al., (2024), correlation evidence of screen time and emotion regulation. Winanda et al., (2024) provided the most direct and measurable quantitative evidence through a correlational study of 37 children aged 3-6 years at the Healthy Child Care Center (PUSPA) of Padjadjaran University. The results of statistical tests showed a significant relationship between the duration of screen time and the child's emotion regulation ($p = 0.003$, $\rho = 0.476$), with the direction of the negative relationship, namely the higher the duration of the child's screen time, the lower the ability to regulate emotion. The value of the correlation coefficient indicates the strength of the relationship at a moderate level, confirming that screen time is one of the though not the only factors that contribute to the child's emotional regulation capacity.

The synthesis of the six articles identified four main mechanisms that explain how gadgets affect children's emotional regulation, the displacement of gadget playtime replacing social activities that are essential to train emotion regulation, the dependence on instant stimulation decreases children's frustration tolerance to real-life situations, the neurobiological impact of excessive screen time is related to changes in the integration of brain tissues, especially the limbic system and prefrontal cortex, Decreased quality of parent-child relationships mediated 24.6% of the association between screen exposure and emotional symptoms (Xu & Qiao, 2025).

Through the lens of Attachment Theory, children's emotional regulation does not grow automatically but is built through consistent, sensitive, and responsive interactions with caregivers through serve-and-return or co-regulation mechanisms (Bowlby, 1982; Shanker, 2016). However, excessive exposure to screen time can damage this crucial foundation through three main psychological pathways: Co-Regulation Failure due to Technoference: Gadget interference or technoference reduces direct interactions such as eye contact, touch, and parental response sensitivity that children urgently need in the process of emotional co-regulation (McDaniel & Radesky, 2018). As a result of this loss of sensitive emotional feedback, children experience significant obstacles in the formation of mature emotional regulation skills (Yang & Kim, 2024).

Gadgets as Insecure Hideouts: When the quality of attachment with parents is stretched, children no longer use their parents as a secure base, but instead divert their emotional escape to gadgets or virtual hideouts when they feel depressed (Bowlby, 1988; Hiniker et al., 2016). Instead of learning to recognize and resolve emotional conflicts in the real world, they are used to distracting those negative emotions through instant stimulation from the screen (Asma Ejaz et al., 2025).

Formation of Insecure Attachment Style: In the long term, the high duration of screen time in childhood has been shown to be negatively correlated with the level of secure attachment (Asma Ejaz et al., 2025). On the other hand, excessive screen exposure actually reinforces the formation of insecure attachment styles, such as anxious or avoidant types, which clinically increases the risk of difficulty regulating emotions into adulthood (Asma Ejaz et al., 2025; Shawcroft et al., 2025).

In addition to the above mechanisms, two protective factors were found that consistently moderate the negative impact of gadgets, strong peer relationships significantly reduced the impact of screen time on emotional symptoms, as shown both quantitatively (Xu & Qiao, 2025) and qualitative (Kamilla & Putri, 2025), active supervision of children's parents with consistent gadget restrictions has better emotion regulation (Susilowati, 2026; Kamilla & Putri, 2025), and (Yiyun, 2026) asserts that screen time is not inherently negative of appropriate content and that adult active mentoring can moderate its impact substantially.

Practical implications, parents limit screen time as recommended WHO, (2019) (max. 1 hour/day for children 2-5 years old), actively accompany, and be a good model of emotion

regulation. Educators apply emotional validation strategies and increase direct social interaction between children. Policymakers are developing guidelines based on content quality rather than just duration and digital content assessment systems that consider developmental appropriateness.

Conclusion

This literature review aims to synthesize the evidence holistically regarding mechanistic pathways, mediating factors, and protective factors that link the duration of screen time with the ability to regulate early childhood emotions in the digital age. Based on the results of the research from the six articles, it can be concluded that excessive and uncontrolled use of gadgets has been consistently demonstrated an association to consistently worsen children's emotional regulation capacity, which is characterized by increased tantrums, irritability, and decreased frustration tolerance. The implications of these findings underscore the importance of a holistic approach in maintaining children's socio-emotional development; Interventions should not only focus on restricting the duration of digital screens, but must be combined with strengthening the quality of parent-child interpersonal relationships and providing direct social stimulation.

Based on this, it is recommended that parents limit screen time to a maximum of one hour per day for children aged 2-5 years according to WHO standards while providing active assistance. In addition, educators are expected to optimize direct social interaction in the classroom, while policymakers need to formulate educational guidelines based on developmental suitability and quality of digital content to support early childhood mental health.

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