

The Relationship Between Intensive Screen Exposure And Parental Self-Regulation On Selective Attention In Early Childhood

Rikha Surtika Dewi¹, Iswinarti², Ni'matuzahro³, Nita Anggi Purnama⁴, Aim Abdul Karim⁵

¹ University of Muhammadiyah Tasikmalaya, Indonesia

² University of Muhammadiyah Malang, Indonesia

*Corresponding author: rikha.surtika@umtas.ac.id

Abstract: The increasing use of digital media in various aspects of life has an impact not only on adult behavior but also on young children. One example is the increased use of screens, which impacts their selective attention capacity. Parental self-regulation, as a parenting factor, also plays a role in shaping children's digital environments. This study aims to analyze the relationship between intensive screen exposure and parental self-regulation on young children's selective attention, both simultaneously and partially, using a Systematic Literature Review (SLR) approach. The study method followed the PRISMA guidelines, with a search conducted in the Google Scholar, SINTA, and Scopus databases spanning the years 2021–2025. Of the 87 identified articles, 10 met all inclusion criteria and were analyzed using a thematic-comparative approach. The study results indicate that intensive screen exposure is negatively correlated with children's selective attention through mechanisms involving the weakening of emotional regulation and interference with the development of executive functions. Parental self-regulation was found to be a proximal predictor that significantly moderates the negative impact of screen exposure on children's attention. Simultaneously, the combination of high screen exposure coupled with low parental self-regulation creates the highest-risk condition for the development of selective attention in young children. In conclusion, interventions need to be designed in an integrated manner, prioritizing the strengthening of parents' digital parenting capacities as the primary strategy for protecting children's cognitive development.

Keywords: Early childhood, screen exposure, selective attention, self-regulation, screen time.

1 Introduction

The penetration of digital technology into modern household life is occurring at a pace far exceeding families' ecological readiness, particularly those with young children. This situation is not only related to the length of digital device use in early childhood, but also touches on a more fundamental dimension: how the brains of young children, who are in a phase of rapid development, are required to respond to various visual stimuli continuously and to what extent their selective attention capacity is formed, or whether it experiences suboptimal situations in a screen-saturated environment. Selective attention is defined as an individual's ability to consciously direct cognitive focus on a specific stimulus while simultaneously ignoring distracting stimuli. This ability is a fundamental skill that initiates the development of executive function, academic readiness, and emotional regulation. The ages of 0–6 are the most crucial period in individual development, where, among other things, the formation of neurological networks that will support a child's ability to focus attention occurs.

Several research data indicate that three out of four

children under the age of two are exposed to screens, despite health concerns that this is strictly prohibited (Sticca et al., 2024). In Indonesia, more than 70% of preschool-aged children in urban areas are suspected of having screen usage habits that exceed the daily screen usage threshold, and there is minimal parental guidance. Digital Kids Asia-Pacific (Widiputera & Perdana, 2021) describes the phenomenon that Indonesia is currently among the countries in Southeast Asia with the fastest rate of screen exposure, especially among young children. These findings ultimately place Indonesian children at risk for significant intensive screen exposure. Several recent, relevant studies consistently demonstrate that screen exposure exceeding the threshold, especially in early childhood, is closely linked to the possibility of reducing children's ability to maintain focus and attention. A systematic review by Santos et al. (2022) concluded that high screen exposure duration is significantly associated with attention deficits in typically developing children. Meanwhile, another longitudinal study published in *Frontiers in Psychology* found that over a 22-month period, accumulated exposure to various forms of media, including background TV and ac-

tive gadget use, significantly reduced children's focused attention capacity as they entered toddlerhood (Almeida et al., 2023). This focused attention is considered a key prerequisite for the development of executive function in later childhood, making preschool a critical window that cannot be ignored.

The role of parents is crucial here, as they determine whether or not there are rules for digital media use at home, such as determining the duration and selecting the content consumed by children, as well as providing guidance during digital screen use. Parental self-regulation is crucial, encompassing the ability to consistently control or regulate their own digital behavior patterns, as this has been shown to indirectly influence the quality of children's attention. Fitzpatrick et al. (2022) suggest that parents with low effortful control tend to be more tolerant and permissive regarding screen exposure, potentially creating a cycle of interconnectedness between parental self-regulation, children's screen time, and inattentive symptoms. Furthermore, Almeida et al. (2023) explain that children exposed to intensive screen time are likely to experience problems with verbal and non-verbal communication with their parents, which in turn impacts their ability to control their attention. Another related finding is that these conditions of decreased attentional abilities can worsen when parents experience high psychological stress, as they are likely to become more permissive and fail to provide children with coping strategies for controlling the urge to continue using digital screens (Brauchli et al., 2024).

Findings from previous research on these two variables in Indonesia indicate that each variable has been studied separately, and no research has combined them as simultaneous predictors of selective attention in early childhood. Most previous research has used this research gap serves as both the starting point and the scientific justification for the proposed study. There are at least three unanswered gaps: first, no study in Indonesia has measured the relative contributions and interactions between intensive screen exposure and parental self-regulation on children's selective attention simultaneously; second, the construct of parental self-regulation as a moderator or mediator of the screen-attention relationship has not been adequately explored in a rigorous quantitative design; third, measurement instruments for selective attention adapted to the context of Indonesian early childhood remain very limited. The novelty of this study lies in positioning parental self-regulation not merely as a control variable, but as an independent variable on par with screen exposure within a predictive framework for children's selective attention a perspective that has never been empirically tested in the Indonesian context. Furthermore, this study makes a methodological contribution by integrating observational measurements of children's attentional behavior with a con-

textually adapted parental self-regulation scale.

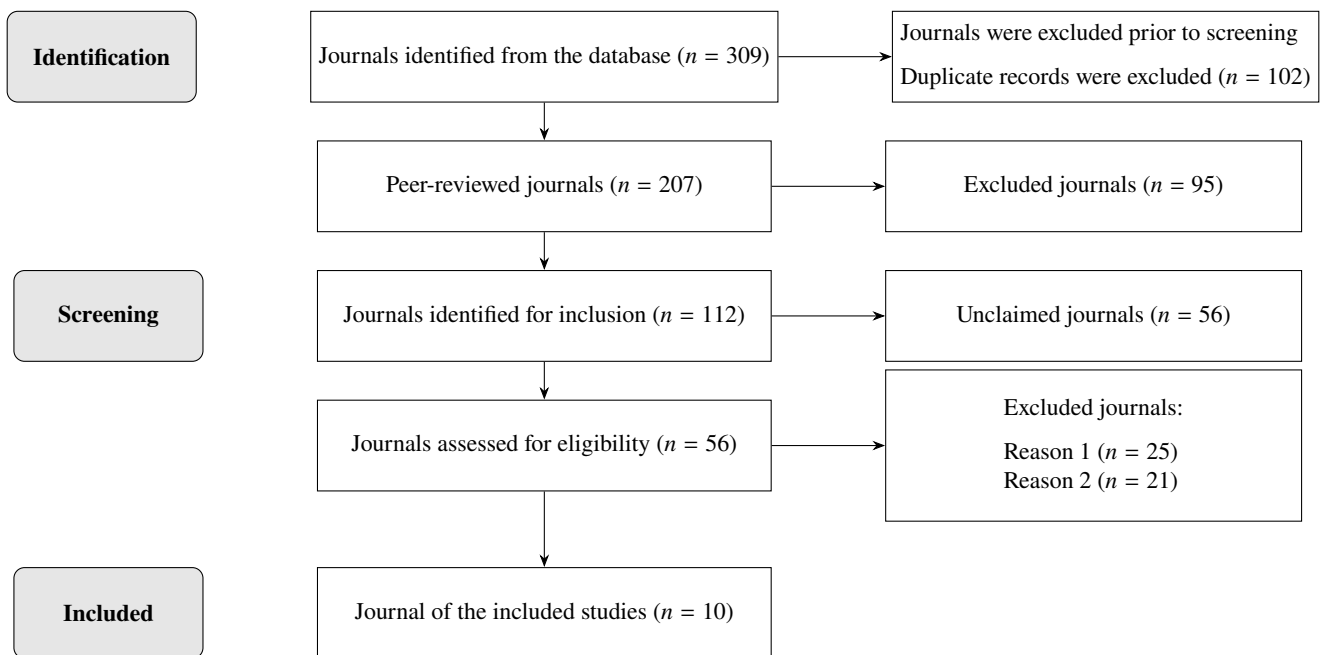
Based on the above, the research questions are: (1) What is the relationship between screen exposure intensity and selective attention in early childhood? (2) What is the relationship between parental self-regulation and selective attention in early childhood? (3) Do intensive screen exposure and parental self-regulation jointly contribute significantly to selective attention in early childhood?. This study aims to analyze the relationship between intensive screen exposure and parental self-regulation on selective attention in early childhood, both partially and simultaneously. Theoretically, the results of this study are expected to enrich the literature on children's cognitive development in the context of the digital age, particularly regarding the mechanisms of attention as a fundamental cognitive process. It is hoped that the results of this research can be developed into a family-based intervention program and serve as a guide for parenting and support for parents of young children. Furthermore, it can be developed into a policy regarding appropriate support for parents in this digital age.

2 Method

The approach used in this study was a Systematic Literature Review (SLR) guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (1) as a standardized reporting framework. The SLR-PRISMA method was chosen based on the consideration that this method can minimize selection bias and can increase transparency in the synthesis process (Page et al., 2021). A systematic literature search was conducted in three reputable databases: Google Scholar, SINTA (Science and Technology Index), and Scopus, using a combination of structured keywords: "screen time," "screen exposure," "selective attention," "parental self-regulation," "parental self-regulation," and "early childhood." The search timeframe was limited to the period 2021–2025 to ensure the relevance and currency of the empirical findings analyzed. The article selection process was conducted in four stages in accordance with the PRISMA flowchart.

During the identification stage, a total of 87 articles were identified from the three databases. Following the screening process based on titles and abstracts, 47 articles were excluded for being irrelevant to the main topic, specifically: 28 articles did not specifically address screen exposure variables or parental self-regulation in early childhood (Exclusion Reason 1), and 19 other articles used a population outside the 0–6-year-old age range or focused on adolescents and adults (Exclusion Reason 2). Of the 40 articles that advanced to the eligibility stage, a full-text assessment was conducted; 30 articles were subsequently excluded for failing to meet minimum methodological criteria, such as not specify-

Figure 1: PRISMA Flowchart



ing valid measurement instruments, having unverifiable research designs, or not being available via open access. Thus, a total of 10 articles were selected as the final sample meeting all inclusion criteria and used as the basis for analysis in this review (Liberati et al., 2009).

Inclusion criteria included: (1) articles published in indexed journals between 2021 and 2025; (2) addressing at least one of the two main variables intensive screen exposure or parental self-regulation in relation to attention development or cognitive function in early childhood; (3) using quantitative, qualitative, or mixed-methods approaches with designs amenable to critical evaluation. After selecting several articles that were deemed suitable, they were then analyzed thematically and comparatively to identify various patterns of findings, consistency of results, and the possibility of research gaps that are relevant to the Indonesian context.

3 Results

Based on the specified research topic in table (1), 10 articles were selected that met all criteria. All articles were published between 2024 and 2025, sourced from journals indexed by Google Scholar, SINTA, and Scopus, using a variety of research methods, including quantitative and qualitative approaches, and literature reviews. The following is a synthesis table of the articles analyzed.

The synthesis table above shows that of the 10 articles analyzed, eight consistently demonstrated a negative relationship between unstructured screen exposure and various aspects of early childhood development, including emotional regulation, behavior, and attentional capacity. One article (Arifah et al., 2025) found a posi-

tive contribution of directed screen time to child compliance, while another article (Azizah et al., 2025) found no significant direct relationship between screen time and developmental delays, findings that ultimately provide a significant impact on strengthening parents' self-regulation skills.

4 Discussion

4.1 The Relationship Between Intensive Screen Exposure and Selective Attention in Early Childhood

The results obtained from this literature review are that the intensity of screen exposure that exceeds the recommended threshold has a negative relationship with the selective attention capacity of early childhood. Dai and Ouyang (2025) reported that four or more hours of screen exposure per day increases the risk of ADHD symptoms by 21% a condition clinically characterized by deficits in selective attention and the ability to sustain cognitive focus. Jolanda et al. (2025) reinforce these findings by demonstrating that 83.7% of children in their sample exceeded WHO limits and significantly exhibited emotional-behavioral problems directly correlated with attention dysfunction ($p < 0.05$).

From a mechanistic perspective, Hasanah et al. (2025) explain that screen exposure without temporal limits impairs emotional regulation in children aged 5–6 years, a component that neuropsychologically overlaps with selective attention within the framework of executive function. Children exposed to excessive screen time exhibit calm, ambivalent emotional responses while us-

Table 1: Synthesis of Journal Findings

No	Author& Year	Title	Method % Subject	Key Finding	Implication/Relevance
1	(Aprilia & Thaib, 2024)	The Impact of Excessive Screen Time on Early Childhood Language Development	Literature review; children aged 0–6 years	Negative correlation between screen exposure and language development; parental interaction is more significant	Relevant: parental regulation as a protective factor for attention
2	(Dai & Ouyang, 2025)	Excessive Screen Time Is Associated with Mental Health Problems and ADHD	Kuantitative/SEM; 50,231 children aged 6–17 years	Screen time 4 hours/day increases ADHD risk (aOR=1.21); mediated by physical activity and sleep	Relevant: ADHD symptoms related to inattention due to intensive screen exposure
3	(Jolanda et al., 2025)	The Relationship of Screen Time and Emotional-Behavioral Problems in School-Aged Children	Cross-sectional; 92 parents of elementary school students	83.7% of children exceeded WHO recommendations; excessive screen time was significantly associated with behavioral problems ($p < 0.05$)	Relevant: behavioral problems reflect deficits in attention regulation
4	(Arifah et al., 2025)	The Relationship Between YouTube Screen Time and Children’s Situational Compliance	Causal quantitative; 13 children in Grade B RA	Screen time directed toward learning contributed 49.5% to children’s compliance ($t=3.283$; $sig.=0.007$)	Relevant: digital parenting guidance moderates the impact of screen time
5	(Hasanah et al., 2025)	The Meaning and Impact of Screen Time on Emotional Regulation in Children Aged 5–6 Years	Descriptive qualitative; 6 parents of 5–6-year-old children	Unrestricted excessive screen time weakens emotional regulation; screen management minimizes negative impacts	Relevant: emotional regulation is directly linked to selective attention capacity
6	(Wulandari & Sary, 2024)	The Influence of Screen Time on Emotional and Language Development in Early Childhood	Descriptive qualitative; parents of children aged 3–6 years	70% of parents agree that screen time affects the emotions and language of young children	Relevant: parental perceptions influence self-regulation patterns in screen time limits
7	(Jarar & Widyasari, 2025)	Mindfulness Practices and Attention Control in Early Childhood	Narrative review; studies 2013–2024	Mindfulness strengthens neural pathways for executive function and selective attention in children	Relevant: confirms selective attention as an environmentally modifiable construct
8	(Musyaffa et al., 2025)	Factors Influencing Screen Time Use Among Preschool Children in Urban and Rural Areas	SLR-PRISMA; Indonesian preschool children	Parents’ screen habits and access to digital devices as dominant factors in children’s screen use	Relevant: parental self-regulation proven as a predictor of children’s screen behavior
9	(Rayani et al., 2025)	The Role of Parents in Regulating Screen Time for Young Children	Qualitative case study; 22-month-old child	Consistent parental involvement results in active speech development and freedom from gadget addiction	Relevant: active parental regulation protects children’s cognitive development and attention
10	(Azizah et al., 2025)	The Relationship Between Screen Exposure Duration and Developmental Delays in Young Children	Quantitative; 121 children aged 1–3 years	No significant direct relationship between screen duration and developmental delays ($p>0.05$)	Relevant: suggests the role of mediating factors such as parenting styles in the screen–development relationship

ing screens, yet become reactive and struggle to focus when screen use is discontinued. Jarar and Widyasari (2025) confirm that selective attention is a neurological construct highly responsive to environmental modifications, including the intensity of digital stimulation, so that mindfulness-based interventions have been shown to strengthen neural pathways of attentional function in early childhood. Aprilia and Thaib (2024) and Wulandari and Sary (2024) add the dimension that unstructured screen exposure directly displaces meaningful verbal interaction time between children and their environment a displacement mechanism that indirectly hinders the development of focused attention capacity. Azizah et al. (2025) note that screen time duration alone does not produce a significant direct effect on developmental delays, suggesting that the impact of screen exposure on selective attention is non-linear and mediated by content quality and the context of its use.

4.2 The Relationship Between Parental Self-Regulation and Selective Attention in Early Childhood

Parental self-regulation has been shown to be a proximal variable that decisively shapes a child's digital ecosystem, and in turn influences the quality of selective attention developing in early childhood. Rayani et al. (2025) empirically documented that consistent parental involvement in limiting and guiding screen use results in children with active speech skills, a relatively rich vocabulary, and freedom from signs of gadget dependency three indicators that implicitly reflect healthy and focused attention capacity. Musyaffa et al. (2025) further identified parents' digital habits as the dominant factor predicting preschoolers' screen time, affirming that parental self-regulation operates as an upstream determinant in the causal chain between screen exposure and children's cognitive development.

Aprilia and Thaib (2024) and Wulandari and Sary (2024) simultaneously conclude that direct parental interaction going beyond mere screen time restrictions is the most significant developmental stimulus for young children. Parents with high self-regulation not only limit screen access but actively replace it with meaningful activities that organically develop children's attention capacity. Arifah et al. (2025) add that structured digital parenting can transform screen exposure from a risk factor into a tool for fostering positive behavior, with a measurable contribution of 49.5% toward children's compliance and situational focus. Hasanah et al. (2025) reinforce this argument by finding that screen management strategies implemented by parents including setting time limits, defining usage goals, and considering the child's actual condition effectively minimize the negative impact of screen time on children's emotional regulation and attention. The findings of Azizah et al. (2025), which did not find a direct effect of screen duration

on developmental delays, further solidify the position of parental self-regulation as a critical explanatory variable: without considering the quality of digital parenting, duration alone cannot adequately explain variations in children's attention development.

4.3 The Simultaneous Contribution of Intensive Screen Exposure and Parental Self-Regulation to Selective Attention in Early Childhood

Parental self-regulation and intensive screen exposure, studied simultaneously, form an interactional dynamic that mutually reinforces or weakens each other in influencing children's selective attention. In their study, Dai and Ouyang (2025) found that the influence of intensive screen exposure in early childhood is influenced by various variables, including parenting patterns, sleep patterns, and physical activity habits. Jolanda et al. (2025) demonstrated that interventions to monitor and reduce screen exposure, essentially parental regulatory measures, are the most effective strategy for protecting children's psychosocial well-being and attention.

Musyaffa et al. (2025) found that parental digital device usage patterns and access to digital devices at home were the strongest predictors of early childhood screen use. This suggests that the intensity of children's screen exposure and parental self-regulation skills are not independent variables but rather interconnected within a dynamic family system. Arifah et al. (2025) added that when parental regulation is high, screen exposure can actually function as a medium that supports the formation of children's focus and compliance, proving that the effect of screens on selective attention is conditional, depending on the quality of parental guidance. Aprilia and Thaib (2024) and Rayani et al. (2025) emphasized that when parents regulate themselves in digital device patterns or behavior, they can create a potential environment to support child development, especially related to the formation of selective attention skills in early childhood.

5 Conclusion and Recommendations

A systematic review of ten scientific articles published between 2024 and 2025 yielded three main conclusions. First, intensive screen exposure exceeding WHO recommendations is negatively correlated with selective attention in early childhood through mechanisms such as weakened emotional regulation, interference with the neural development of executive functions, and a shift away from meaningful interaction activities. Second, parental self-regulation has been shown to be a proximal determinant variable; parents with high regulatory capacity are able to transform the digital environment from a risk factor into an ecosystem conducive to the develop-

ment of selective attention in children. Third, these two variables do not operate independently, but contribute simultaneously and interact with each other: high screen exposure combined with low parental self-regulation forms the riskiest combination for early childhood attention development, while structured digital support has been shown to significantly moderate the negative impact of screen exposure on children's selective attention.

Based on the above conclusions, several recommendations can be made. Parents need to increase awareness of the importance of self-regulation in the digital context, including setting consistent screen limits and replacing them with interactive activities that train children's attention. Early childhood education units (PAUD) are advised to integrate digital parenting literacy programs into routine parenting activities to equip parents with evidence-based screen management strategies. For future researchers, quantitative studies with longitudinal designs that explicitly examine the simultaneous contribution of these two variables to children's selective attention in the Indonesian context are needed, given that the majority of available research is still partial and cross-sectional.

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