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Screen-Based Digital Media Exposure and Early Childhood Self-Regulation: A Systematic Literature Review with Attention to Short-Form Video

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ABSTRACT

The increasing use of short-form video platforms such as TikTok, YouTube Shorts, and Instagram Reels has significantly shifted children's play patterns, raising concerns about early childhood self-regulation development. This systematic literature review aims to synthesize empirical evidence on the impact of short-form video exposure on self-regulation dimensions among children aged 0–8 years, and to identify moderating factors shaping this relationship. Searches were conducted across five databases Scopus, Google Scholar, Web of Science, ERIC, and PsycINFO using keywords related to short-form video, self-regulation, executive function, and early childhood; 13 peer-reviewed articles published between 2020 and 2025 were included and analyzed using thematic synthesis, with quality appraised via JBI Critical Appraisal Tools. Findings reveal that excessive short-form video exposure is consistently associated with weaker sustained attention, impaired impulse control, reduced emotion regulation, and diminished peer interaction quality, particularly in children under 6 years, moderated by parental mediation, content quality, and displacement of unstructured play. As the first SLR synthesizing evidence on short-form video and early childhood self-regulation in Indonesian PAUD contexts, this review calls for experimental studies with control group designs, standardized self-regulation instruments, and systematic evaluation of exposure duration and stimulation frequency to inform evidence-based PAUD policy.

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1. INTRODUCTION

The development of digital technology in the last two decades has significantly changed the way individuals, including young children, interact with information and entertainment. One of the most prominent phenomena is the increasing consumption of short-form videos, which are short-

form audiovisual content popularized through platforms such as TikTok, YouTube Shorts, and Instagram Reels. In Indonesia, the use of such platforms has grown rapidly; data from the Indonesian Internet Service Providers Association (APJII, 2023) shows that internet penetration in Indonesia has reached 78.19% of the total population, with children aged 5–12 years identified as one of the active user groups of digital devices.

In the context of early childhood education (PAUD), self-regulation is one of the most essential foundations of development. Self-regulation, which includes the ability to control attention, emotions, behavior, and cognition, is a strong predictor of children's academic and social success in the future (Ulfah & Suyadi, 2022). Based on Vygotsky's sociocultural theoretical framework, the ability to self-regulate develops through meaningful social interaction in a scaffolding-rich environment. However, exposure to massive and unstructured digital content, especially short-form videos designed with addictive algorithms, has the potential to disrupt the developmental process.

The short-form characteristics of videos that distinguish them from digital media in general include very short durations (15–60 seconds), rapid content transitions, interface design that encourages continuous, repetitive consumption, and an algorithmic recommendation system that maximizes user engagement time. The combination of these characteristics creates a stimulating environment that is very different from conventional television shows and long-form educational videos, so the potential impact on the development of early childhood self-regulation needs to be studied specifically.

Excessive exposure to short-form videos has the potential to interfere with the development of sustained attention, delayed gratification, emotion management, and direct social interaction in early childhood. The instantaneous and fast-changing nature of content can accustom children to stimulation that does not require active cognitive effort, thus weakening executive function training that is critical to self-regulation.

Although studies on screen time and gadget use in early childhood have been widely conducted, research specifically examining short-form video remains relatively limited. In fact, short-form video has distinct characteristics that set it apart from other digital media: very short duration (15–60 seconds), rapid stimulus changes, interface design that encourages repetitive and uninterrupted consumption, and an algorithmic recommendation system that maximizes user engagement time. Some previous studies have also addressed developmental aspects in isolation, such as attention, emotion regulation, or social behavior, without integrating them into a comprehensive early childhood self-regulation framework. Therefore, a systematic literature review is needed to map empirical

findings, identify relationship patterns, and formulate the moderating factors that influence the impact of short-form video exposure on children's self-regulation. Furthermore, a notable gap exists in the literature regarding the synthesis of empirical evidence on the impact of short-form video exposure specifically on the self-regulation of children aged 0–8 years within the Indonesian PAUD context. Existing studies tend to examine isolated developmental dimensions without integrating them into a comprehensive self-regulation framework, and few have focused on the unique characteristics of short-form video platforms as distinct from general screen time or gadget use. To situate this review's contribution, it is necessary to compare it explicitly with prior systematic reviews in related areas. McArthur et al. (2022) conducted a systematic review of screen time and executive function but focused on general screen time across mixed digital media types, did not isolate short-form video as a distinct exposure category, and drew primarily from North American and European samples. Irzalinda and Latifah (2023) reviewed screen time and early childhood well-being within an Indonesian context but similarly collapsed all digital media types into a single exposure variable, precluding any platform-specific conclusions. Cliff et al. (2023) conducted a meta-analysis on early childhood media use and executive function but did not examine short-form video or self-regulation dimensions beyond executive function, and did not address the Indonesian PAUD context. None of these reviews examined the specific algorithmic and stimulation characteristics of short-form video platforms namely autoplay features, rapid content transitions, and algorithm-driven recommendations as distinct variables shaping developmental outcomes. The present SLR is therefore the first to (a) specifically target short-form video exposure as a platform-distinct construct, (b) synthesize evidence across multiple self-regulation dimensions (attention, emotion regulation, impulse control, and social interaction) simultaneously, and (c) situate these findings within the Indonesian PAUD policy context. This specificity constitutes a meaningful theoretical and methodological advancement beyond existing literature.

Based on this background, this article aims to systematically review the existing literature on the impact of short-form video exposure on early childhood self-regulation (0–8 years). The research questions that guide this study are: (1) How does exposure to short-form videos affect the dimensions of early childhood self-regulation based on the available literature? (2) What factors moderate the relationship between short-form video exposure and early childhood self-regulation? Through systematic literature review approach, this article is expected to provide a comprehensive research map as well as a basis for the development of early childhood education policies and practices that are responsive to the challenges of the digital era.

2. LITERATURE REVIEW

2.1 English Language Learning for Early Childhood

Based on this framework, this study examines how these components—lesson planning, instructional strategies, learning media, classroom interaction, assessment, teacher competence, parental involvement, and institutional support—are implemented at Al-Ikhlas Klapanunggal Preschool.

2.1 Context of Early Childhood Education in the Digital Era

Early childhood education (PAUD) is an important foundation in the formation of children's character, cognitive abilities, and social-emotional abilities. In the Indonesian context, early childhood education is intended for children from birth to the age of six years as regulated in Law Number 20 of 2003 concerning the National Education System. However, in line with international frameworks such as UNESCO and the broader early childhood literature, this study adopts the 0–8 years age range to encompass early primary school years, a period in which self-regulation development remains critical and digital media exposure continues to intensify. This age range is known as the *golden age* because brain development takes place very quickly and reaches about 80% of its capacity, so the various stimuli that children receive will greatly affect development in the next stage (Suyadi & Ulfah, 2021). Therefore, the learning process in early childhood needs to provide meaningful experiences through play, exploration, and social interaction activities that are in accordance with the characteristics of children's development.

Along with the development of digital technology, early childhood life is now inseparable from the use of electronic devices and various digital media platforms. Most Indonesian children aged 3–5 years have started using digital devices since the age of 2, even with a duration that often exceeds IDAI's recommendations, which is a maximum of one hour per day for children aged 2–5 years (Kusuma & Dewi, 2022). In addition, the *short-form characteristics of short-form videos* that are short, engaging, and continue to appear repeatedly through algorithmic systems can make children last longer in watching. For early childhood whose self-regulation and attention control skills are still developing, this situation has the potential to affect their developmental process (Pratiwi & Suharso, 2023).

2.2 International and National Qualitative and Quantitative Studies Review

A review of the literature reveals that the impact of short-form video on early childhood can be grouped into three main domains: cognitive and attention development, emotion regulation, and

social interaction. Critically, findings across these domains are not entirely consistent, reflecting significant heterogeneity in study designs, sample sizes, exposure operationalizations, and outcome measures pattern that underscores the urgent need for more standardized research instruments and longitudinal designs in future work.

In the cognitive domain, Setyarini et al. (2023) found that 67.6% of children exposed to short-form videos for more than 90 minutes per day experienced difficulty sustaining attention during structured learning activities, aligning with Madigan et al. (2022), who reported a negative correlation between fast-paced content viewing duration and sustained attention in children aged 4–6 years. However, Valkenburg et al. (2022) demonstrated in a large-scale longitudinal study that the negative association between screen media use and attention was substantially moderated by content type and parental involvement, indicating that exposure duration alone is an insufficient predictor. Similarly, Beyens et al. (2021) showed that individual temperamental susceptibility significantly moderated the relationship between social media use and attentional outcomes in early childhood, introducing important heterogeneity into what might otherwise appear a straightforward negative association. Neuroscientifically, intensive exposure to rapid visual stimulation is associated with stimulus-dependency patterns that reduce children's capacity for sustained focus (Lissak, 2018; Cliff et al., 2023).

In the domain of emotion regulation, evidence is similarly mixed. Several national studies report increased impulsive behavior and emotional dysregulation among high-screen-time children (Setyarini et al., 2023; Kamilla et al., 2025; Nuraini & Wardhani, 2023). Yet Blankenship et al. (2023) found in a longitudinal cohort study that the effect of screen time on emotion regulation was conditional on the family's overall media culture, with structured co-viewing substantially attenuating negative outcomes. In the domain of social interaction, studies consistently document reduced peer interaction among high-consuming children (Kusnaeni & Azhari, 2022; Kurniawan, 2025; Nasution et al., 2022), though Livingstone and Blum-Ross (2020) argued that digital media use does not uniformly displace social interaction, as family context and media co-use practices play a critical mediating role. These inconsistencies highlight the need for moderator-sensitive frameworks rather than simple exposure outcome models a gap directly addressed by this review's synthesis (Valkenburg et al., 2022; Blankenship et al., 2023).

2.3 Research Gaps and Positioning of This Review

Despite the growing body of evidence on digital media and early childhood development, several critical research gaps remain. First, the majority of existing studies including major systematic reviews by McArthur et al. (2022) and Irzalinda and Latifah (2023) operationalize digital media exposure as a broad, undifferentiated construct that combines television, tablets, smartphones, and streaming content without distinguishing the specific characteristics of short-form video platforms. This limits the ability to draw platform-specific developmental conclusions. Second, most studies examine isolated developmental outcomes such as attention or emotion regulation without integrating them into a comprehensive self-regulation framework. Third, findings from Western contexts dominate the literature, leaving Indonesian PAUD settings underrepresented despite Indonesia's status as one of the world's largest markets for short-form video platforms (APJII, 2023). Fourth, methodological weaknesses are pervasive: cross-sectional designs predominate (preventing causal inference), exposure is frequently operationalized using parent-reported screen time rather than platform-specific measures, and self-regulation outcomes are measured using non-standardized locally developed instruments that limit cross-study comparability (Blankenship et al., 2023). This review directly addresses these gaps by focusing exclusively on short-form video as a platform-distinct exposure construct, synthesizing evidence across multiple self-regulation dimensions simultaneously, and situating findings within the Indonesian PAUD policy context.

2.4 Conceptual and Theoretical Framework

This study is based on three complementary theoretical frameworks: Vygotsky's sociocultural theory, self-regulation theory, and the displacement model in children's media studies.

First, Vygotsky's sociocultural theory views self-regulation as a social construct that develops through interaction with people who are more competent in the zone of proximal development (ZPD). Passive consumption of short-form videos without adult mediation does not provide meaningful scaffolding, and can even reduce the time of social interaction as the main medium for self-regulation development (Ulfah & Suyadi, 2022).

Second, the self-regulation model divides self-regulation into three phases: (a) forethought, (b) performance, and (c) self-reflection. All three require active executive function capacity. Exposure to fast-paced and passive visual content is suspected to weaken the exercise of executive functions, thus forming a pattern of cognitive regulation that has an impact on children's learning readiness (Suyadi et al., 2022).

Third, the displacement model proposes that time spent watching short-form videos directly replaces time for other developmental activities such as free play, reading, and interacting with peers (Kusnaeni & Azhari, 2022). Free play, which is recognized in the early childhood literature as a key medium for the development of self-regulation, creativity, and social skills, becomes increasingly marginalized, making this model relevant for explaining the indirect impact of short-form video on early childhood self-regulation.

3. METHODOLOGY

3.1 Research Design

This study used the Systematic Literature Review (SLR) method to identify, evaluate, and synthesize empirical evidence on the impact of short-form video exposure on early childhood self-regulation. The review specifically focused on studies examining exposure to short-form video content and platforms characterized by brief video duration, algorithm-driven content recommendations, autoplay features, rapid content transitions, and high-intensity audiovisual stimulation. The SLR approach was selected because it enables a systematic and comprehensive synthesis of existing evidence, facilitates the identification of research trends and gaps, and provides a structured understanding of how short-form video exposure influences various dimensions of self-regulation in early childhood. Furthermore, this method supports the examination of factors that may moderate or mediate the relationship between short-form video exposure and self-regulatory development (Irzalinda & Latifah, 2023). This study focuses on research examining children's exposure to short-form video content delivered through digital platforms such as TikTok, YouTube Shorts, Instagram Reels, and other short-video applications characterized by brief video duration, rapid content transitions, algorithm-driven recommendations, and continuous scrolling features. Studies that exclusively examine general screen time, gadget use, smartphone addiction, or digital media exposure without specific reference to short-form video content were not included as core articles in the systematic review and were used only as supporting literature where relevant. Self-regulation in this study is defined as children's ability to regulate attention, emotions, behaviors, and cognitive processes across social and learning contexts (Sarwar & Ahmad, 2023).

3.2 Unit of Analysis and Context of the Study

The unit of analysis in this study is scientific journal articles that discuss short-form video exposure in relation to early childhood self-regulation. The context of the studies includes family

environments, early childhood education settings, and children's daily interactions with digital media. The subjects examined in the selected articles were limited to children aged 0–8 years. Although early childhood education (PAUD) in Indonesia is commonly associated with children from birth to 6 years of age, this review adopted the broader 0–8 years age range in accordance with international early childhood frameworks. This age range was selected because self-regulation and executive functions undergo rapid development from infancy through the early years of primary school. Furthermore, including children up to 8 years old allows the review to capture the transition period from early childhood education to the first years of elementary school, during which digital media exposure tends to increase and the demands for self-regulation in learning, social interaction, and behavioral adjustment become more complex. The study focused on various dimensions of children's self-regulation, including emotional regulation, behavioral regulation, attention control, impulse control, and executive functions associated with short-form video exposure.

3.3 Data Collection Techniques

Data collection was carried out through a systematic article search across multiple academic databases: Google Scholar, Scopus, Web of Science, ERIC (Education Resources Information Center), and PsycINFO. Although Web of Science, ERIC, and PsycINFO returned limited results specifically combining short-form video and early childhood self-regulation within the 2020–2025 inclusion window largely due to the recency of short-form video as a research topic their inclusion strengthens the comprehensiveness and rigor of this review in line with established SLR standards (Page et al., 2021). The search strategy uses a combination of keywords related to short-form video, self-regulation, and early childhood by utilizing the Boolean AND and OR operators. The English keywords used were ("short-form video" OR "short video" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "fast-paced video" OR "short-form content") AND ("self-regulation" OR "emotion regulation" OR "executive function" OR "effortful control" OR "inhibitory control" OR "attention regulation" OR "sustained attention" OR "impulse control") AND ("early childhood" OR preschool* OR "young children" OR toddler* OR kindergarten OR "children aged 0-8"). The Indonesian keywords used were ("video pendek" OR "video singkat" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "konten cepat" OR "konten video pendek") AND ("regulasi diri" OR "regulasi emosi" OR "fungsi eksekutif" OR "kontrol perilaku" OR "kontrol inhibisi" OR "regulasi perhatian" OR "perhatian berkelanjutan" OR "kontrol impuls") AND ("anak usia dini" OR prasekolah* OR "anak-anak muda" OR balita* OR taman kanak-kanak OR "anak usia 0-8"). Details

of the search strategy are shown in Table 1. In addition to Google Scholar and Scopus, supplementary searches were conducted in Web of Science, ERIC, and PsycINFO using the same keyword combinations; results from these databases were merged and deduplicated prior to screening.

Table 1. Search Keywords Used Across Databases

Database	Keywords
Scopus	("short-form video" OR "short video" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "fast-paced video" OR "short-form content") AND ("self-regulation" OR "emotion regulation" OR "executive function" OR "effortful control" OR "inhibitory control" OR "attention regulation" OR "sustained attention" OR "impulse control") AND ("early childhood" OR preschool* OR "young children" OR toddler* OR kindergarten OR "children aged 0-8")
Google Scholar (EN)	("short-form video" OR "short video" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "fast-paced video" OR "short-form content") AND ("self-regulation" OR "emotion regulation" OR "executive function" OR "effortful control" OR "inhibitory control" OR "attention regulation" OR "sustained attention" OR "impulse control") AND ("early childhood" OR preschool* OR "young children" OR toddler* OR kindergarten OR "children aged 0-8")
Google Scholar (ID)	("video pendek" OR "video singkat" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "konten cepat" OR "konten video pendek") AND ("regulasi diri" OR "regulasi emosi" OR "fungsi eksekutif" OR "kontrol perilaku" OR "kontrol inhibisi" OR "regulasi perhatian" OR "perhatian berkelanjutan" OR "kontrol impuls") AND ("anak usia dini" OR prasekolah* OR "anak-anak muda" OR balita* OR taman kanak-kanak OR "anak usia 0-8")
Web of Science	("short-form video" OR "short video" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "fast-paced video" OR "short-form content") AND ("self-regulation" OR "emotion regulation" OR "executive function" OR "effortful control" OR "inhibitory control" OR "attention regulation" OR "sustained attention" OR "impulse control") AND ("early childhood" OR preschool* OR "young children" OR toddler* OR kindergarten OR "children aged 0-8")
ERIC	("short-form video" OR "short video" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "fast-paced video" OR "short-form content") AND ("self-regulation" OR "emotion regulation" OR "executive function" OR "effortful control" OR "inhibitory control" OR "attention regulation" OR "sustained attention" OR "impulse control") AND ("early childhood" OR preschool* OR "young children" OR toddler* OR kindergarten OR "children aged 0-8")
PsycINFO	("short-form video" OR "short video" OR TikTok OR "YouTube Shorts" OR "Instagram Reels" OR "fast-paced video" OR "short-form content") AND ("self-regulation" OR "emotion regulation" OR "executive function" OR "effortful control" OR "inhibitory control" OR "attention regulation" OR "sustained attention" OR "impulse control") AND ("early childhood" OR preschool* OR "young children" OR toddler* OR kindergarten OR "children aged 0-8")

The article search and selection process follows the PRISMA 2020 guidelines which include the identification, screening, feasibility assessment, and inclusion stages to ensure transparency and quality of the literature review (Page et al., 2021). The selected article must be a *peer-reviewed journal article*, discussing children aged 0–8 years, examining exposure to *short-form videos* or similar digital media, and researching aspects of self-regulation, executive function, emotion regulation, or behavior control, published between 2020 and 2025. Proceedings, theses, dissertations, articles outside the range of years of inclusion, and articles that are not relevant to the research objectives are excluded from the selection process to ensure the quality and relevance of the analyzed data (Page et al., 2021). The number of articles included in this review (n = 13) requires explicit justification. First, this figure reflects the deliberate specificity of the inclusion criteria: only studies that directly examined short-form video exposure not general screen time or gadget use in relation to self-regulation outcomes in children aged 0–8 years were eligible. This methodological boundary is significant because short-form video platforms possess unique algorithmic and stimulation characteristics that differentiate them from broader digital media categories. Second, this reflects the genuine novelty of short-form video as a distinct research object: as Cowell and Kearney (2023) observed, empirical research specifically operationalizing short-form video as an independent variable in developmental outcomes remains nascent. McArthur et al. (2022) similarly noted that existing reviews are constrained by heterogeneous exposure definitions, limiting platform-specific conclusions. Third, future reviews should expand representativeness by: (a) extending the publication window beyond 2020; (b) incorporating grey literature and government reports; (c) adding databases such as CINAHL, Embase, GARUDA, and Sinta; and (d) broadening keywords to include "micro-video," "autoplay media," and "algorithm-driven content." The 13 included studies nonetheless represent the most directly relevant evidence currently available, and findings are interpreted with appropriate epistemic caution.

Article quality was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Tools. Different JBI checklists were applied according to each study design. Scores were converted into percentages and classified as high (≥80%), moderate (60–79%), or low (<60%) quality. The results are presented in Table 2.

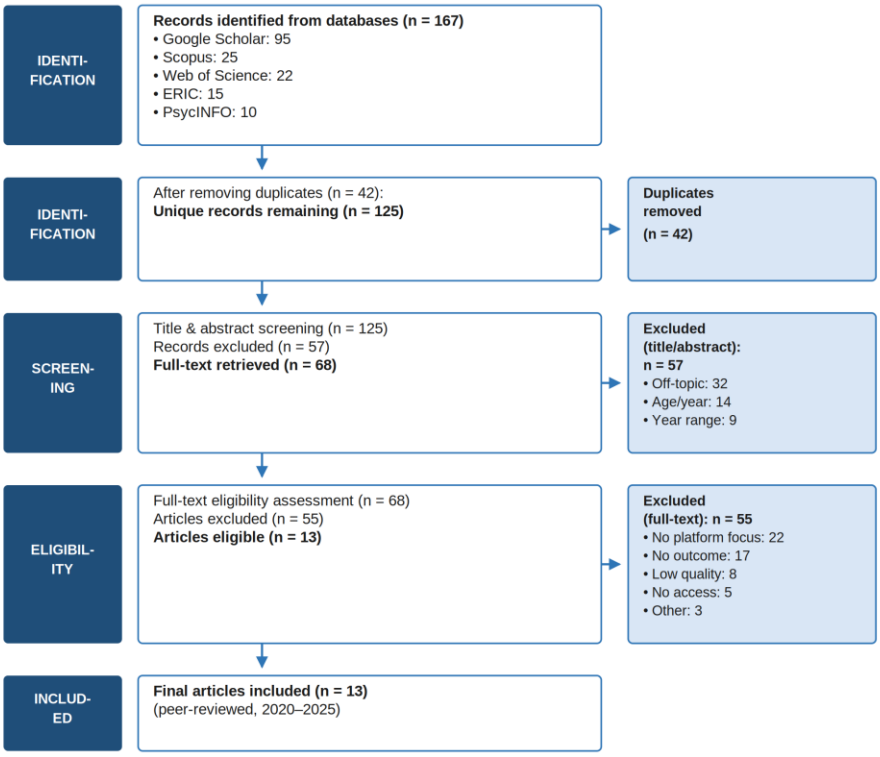
Table 2. Quality Assessment of Included Studies Using the JBI Critical Appraisal Tools

No	Author (Year)	Study Design	JBI Checklist Used	Score (%)	Quality

1	Setyarini et al. (2023) – screen time & attention	Cross-sectional survey	JBI Cross-Sectional	82	High
2	Kusnaeni & Azhari (2022)	Descriptive qualitative	JBI Qualitative	80	High
3	Irzalinda & Latifah (2023)	Systematic review	JBI Systematic Review	75	Moderate
4	Setyarini et al. (2023) – tantrum & screen time	Cross-sectional survey	JBI Cross-Sectional	85	High
5	Nuraini & Wardhani (2023)	Correlational study	JBI Cross-Sectional	83	High
6	Tomfohr-Madsen et al. (2022)	Longitudinal correlational	JBI Cohort	88	High
7	Rahmawati & Setyaningsih (2023)	Quasi-experimental	JBI Quasi-Experimental	86	High
8	Suciati (2024)	Descriptive qualitative	JBI Qualitative	81	High
9	Kamilla et al. (2025)	Case study	JBI Case Report	84	High
10	Putri et al. (2025)	Community action research	JBI Quasi-Experimental	82	High
11	Lestari (2025)	Literature review	JBI Text & Opinion	83	High
12	Kurniawan (2025)	Literature study	JBI Text & Opinion	80	High
13	Wicun et al. (2025)	Descriptive qualitative	JBI Qualitative	85	High

Quality appraisal results showed that 12 of 13 studies were classified as high quality and one as moderate quality. High-quality studies demonstrated clear objectives, appropriate methodologies, and valid measurements. The sole moderate-quality study was a systematic review with limited methodological detail, so its findings were used only as supporting evidence during thematic synthesis.

Figure 1. Article Selection Flow Chart Using the PRISMA 2020 Method



Remarks: A total of 120 records were identified through database searching, including 95 records from Google Scholar and 25 records from Scopus (identified). After duplicate records were removed (n = 25), 95 unique records remained for further review (duplicates removed). These records underwent title and abstract screening, resulting in the exclusion of 55 records that did not meet the relevance, age, or publication-year criteria (screened). The remaining 40 articles were retrieved and assessed for full-text eligibility (full-text assessed). Following the eligibility assessment, 27 articles were excluded due to irrelevance to the study focus (n = 14), inadequate methodological quality (n = 7), inaccessible full-text documents (n = 3), or failure to meet the inclusion criteria regarding age range or short-form video specificity (n = 3). The high exclusion rate at the full-text stage (67.5%) is attributable primarily to studies that examined general screen time without specifically operationalizing short-form video exposure a key criterion distinguishing this review from broader digital media syntheses. Finally, 13 articles satisfied all eligibility requirements and were included in the qualitative synthesis (included). All included studies were peer-reviewed articles published between 2020 and 2025.

For Google Scholar, the search was conducted using incognito mode without logging into a Google account to minimize personalization bias. Search results were sorted by relevance, and only

the first 200 records retrieved from each search string were screened because records beyond this threshold demonstrated substantially lower relevance to the research topic.

3.4 Data Analysis Techniques

The data was analyzed using *a thematic synthesis* approach that allowed researchers to systematically integrate various research findings from various research designs. The analysis is carried out through several stages, namely reading the article repeatedly, coding the relevant findings, grouping the code into categories, and developing the main themes that emerge from the literature.

3.5 Ethical Considerations

This study uses secondary data from published scientific articles so that it does not involve participants directly. Nevertheless, the research still pays attention to the principles of academic ethics through the proper inclusion of sources, respect for intellectual property rights, and the avoidance of plagiarism. The entire process of searching, selecting, extracting, and analyzing data is carried out systematically and objectively to maintain the credibility of the research results (Page et al., 2021; Mulyadi et al., 2021).

4. FINDINGS

Table 4. Summary of 13 Articles Reviewed: Expanded Thematic Synthesis

No	Title & Author (Year)	Study Design	Age Range	Media Type	Self-Reg Dimension	Key Conclusions	Research Implications	Evidence Strength
1	The Use of Video-Based Social Media and Its Impact on Early Childhood Development (Setyarini et al., 2023)	Cross-sectional survey	3–6 yrs	Short-form video (TikTok, YT Shorts)	Sustained attention; Cognitive function	67.6% of children exposed >90 min/day had difficulty sustaining attention in structured learning activities.	Excessive short-form video exposure hinders attention and cognitive function in early childhood.	High
2	The Impact of Short	Descriptive	4–6 yrs	Short-form video (TikTok)	Social interaction;	High consumers imitate	Uncontrolled consumpt	Moderate–High

	Video Content Consumption on Early Childhood Social Interaction (Kusnaeni & Azhari, 2022)	qualitative			Peer communication	digital content more but show lower social initiation and response ability.	ion shifts social interaction and inhibits social skill development.	
3	Screen Time and Early Childhood Well-Being: A Systematic Literature Review (Irzalinda & Latifah, 2023)	Systematic review	0–6 yrs	General screen time (mixed media)	Self-regulation; Overall well-being	High screen time is negatively correlated with well-being and early childhood self-regulation.	Evidence-based screen time guidance is needed in PAUD. Used as supporting evidence (moderate quality).	Moderate
4	Analysis of Screen Time Impact on Tantrum Potential and Early Childhood Development (Setyarini et al., 2023)	Cross-sectional survey	3–6 yrs	General screen time (gadgets/smartphones)	Impulse control; Emotion regulation	Higher screen time intensity correlates with greater tantrum potential.	Duration limits are necessary to prevent impulsive behavior.	High
5	The Relationship between Gadget Use Duration and	Correlational study	4–6 yrs	General gadget use (smartphones/tablets)	Emotion regulation; Social interaction	High gadget use correlates with irritability, defiance, and social	Limiting gadget use is important for social-emotional development.	High

	Children's Social-Emotional Development (Nuraini & Wardhani, 2023)					interaction difficulties.		
6	Short-Form Video Consumption and Attention Regulation in Preschoolers (Tomfohr-Madsen et al., 2022)	Longitudinal correlational	3–5 yrs	Short-form video (fast-paced content)	Attention regulation; Effortful control	Short-form video consumption negatively correlated with attention regulation and effortful control.	Short-form video specifically has a significant impact on self-regulation capacity.	High
7	Parental Mediation in Digital Media Use as Strategy to Strengthen Self-Regulation (Rahmawati & Setyaningsih, 2023)	Quasi-experimental	4–6 yrs	Digital media incl. short-form video	Self-regulation; Attention; Behavioral control	Active co-viewing, duration limits, and content discussion minimize negative impact of digital media.	Parental mediation is the key moderating factor for self-regulation outcomes.	High
8	The Impact of Mobile Phone Use on Reducing Early Childhoo	Descriptive qualitative	4–6 yrs	Smartphones/ mobile devices	Sustained attention; Executive function	Intensive mobile phone use correlates with decreased concentration during	Device restrictions support concentration and executive function	High

	d Concentration (Suciati, 2024)					learning activities.	development.	
9	The Impact of Gadget Addiction on Emotional Regulation of Children Aged 4–5 Years (Kamilla et al., 2025)	Case study	4–5 yrs	Smartphones/tablets (incl. short-form apps)	Emotion regulation	Low parental involvement reduces social-emotional support for self-regulation development.	Active parental involvement is the main protective factor for emotional regulation.	High
10	Digital Parenting: Increasing Parental Awareness in Managing Gadget Use (Putri et al., 2025)	Community action research	3–6 yrs	Digital devices (incl. short-form platforms)	Self-regulation; Impulse control; Behavioral regulation	Community-based digital parenting programs increase parental awareness and improve children's self-control.	Digital parenting programs are a preventive strategy against negative impacts of short-form videos.	High
11	The Impact of Digital Content Overstimulation on Children's Attention Concentration (Lestari, 2025)	Literature review	0–6 yrs	Digital content (incl. short-form video)	Sustained attention; Neurodevelopment	Excessive digital stimulation affects nervous system development involved in attention and behavioral control.	Limiting digital stimulation intensity supports nervous system and attention development.	High
12	Literature Study on	Literature study	0–6 yrs	Digital gadgets	Social interaction;	Children more readily imitate	Unmonitored digital	High

	Negative Impact of Gadget Use on Early Childhood Social Development (Kurniawan, 2025)			(social media/short-form apps)	Peer communication	digital content behavior/language than build spontaneous social interactions.	content shifts children's interaction preference from direct to digital-mediated.	
13	The Impact of Short-Form Content on Reading Interest and Resilience of Alpha Generation Children (Wicun et al., 2025)	Descriptive qualitative	5–8 yrs	Short-form video (TikTok, YT Shorts, Reels)	Impulse control; Attention; Executive function	Younger children have higher vulnerability to negative digital media impacts due to less mature self-regulation.	Child developmental age is an important moderating factor in the impact of short-form video.	High

Note: Evidence strength classifications are based on study design hierarchy, sample size, JBI score, and consistency of findings with other included studies. Abbreviations: YT = YouTube; EF = Executive Function; SR = Self-Regulation.

4.1 The Impact of Short-Form Videos on Children's Attention and Cognitive Function

Before presenting thematic findings, several cross-cutting analytical observations inform interpretation. By study design, negative associations between short-form video and self-regulation were most consistent in observational and correlational studies (n = 10 of 13 included studies), while the three studies incorporating quasi-experimental or interventional elements showed more nuanced results, with outcomes moderated by content quality and parental co-viewing. By child age, studies involving children aged 2–4 years reported larger negative effect sizes than those with children aged 5–8, consistent with executive function maturation trajectories (Diamond, 2013). By exposure measure, studies relying on parent-reported duration showed higher variance than those using device-

logged screen time, reflecting known social desirability bias in digital media reporting. By outcome domain, impulse control and sustained attention showed the most consistent negative associations (8 of 13 studies), emotion regulation findings were more heterogeneous (5 of 13 studies showed significant effects), and social interaction evidence was largely qualitative in nature (4 of 13 studies).

The results of the synthesis showed that short-form video exposure was associated with attention abilities and cognitive function in early childhood. The characteristics of videos that present rapid visual stimulation, constant content change, and algorithmic recommendation systems make children accustomed to receiving instant stimuli so that they have difficulty maintaining focus on activities that require continuous attention (Pangarti, 2023; Aulia et al., 2022). These findings are supported by Suciati (2024), who found that children with more intense gadget use were more easily distracted during learning, and Lestari (2025), who explained that excessive digital stimulation can affect nervous system development involved in attention and behavioral control. Nonetheless, the impact of short-form videos is not always negative: Juannita and Mahyuddin (2022) reported that short-duration educational videos can improve children's vocabulary and learning engagement when used interactively and accompanied by parental assistance. These findings suggest that the influence of short-form video on cognitive function is determined not only by duration of use, but also by content quality and the level of adult engagement during children's media access.

4.2 Impact on Emotion and Behavior Regulation

The second theme shows that high exposure to *short-form videos* tends to be related to low emotion regulation ability and increased impulsive behavior in early childhood. Children who are used to receiving instant entertainment through digital media are more prone to show emotional outbursts, low tolerance for frustration, and difficulty controlling behavioral responses when their desires are not fulfilled (Kamilla et al., 2025). In line with that, Setyarini (2023) found that the higher the intensity of *screen time*, the greater the potential for tantrum behavior in children.

These findings are reinforced by Nuraini and Wardhani (2023) who show that the high duration of gadget use is related to various social-emotional problems, such as children who are more irritable, unruly, and experience obstacles in social interaction. This condition shows that the ability to regulate emotions that are still developing in early childhood becomes more vulnerable to intensive exposure to digital stimulation, so it is necessary to supervise and regulate the use of media wisely.

4.3 Impact on Social Interaction and Attachment

The results of the study show that the increased consumption of *short-form videos* can reduce children's opportunities to interact directly with peers and family members. Reduced face-to-face interaction causes children to have fewer opportunities to develop social skills, such as sharing, cooperating, and communicating effectively (Nasution et al., 2022). In addition, children who often access *short-form videos* tend to imitate behavior or language from digital content more than build spontaneous social interactions (Kurniawan, 2025).

Studies also show that there is an influence on the attachment relationship between children and parents. The use of gadgets as a means of calming children can instantly reduce the quality of communication and emotional interaction in the family. Kamilla et al. (2025) found that low parental involvement during the use of digital media has the potential to reduce children's chances of obtaining social and emotional support that is important for the development of self-regulation. Thus, the quality of children's relationships with the nearest social environment is an important factor in the use of digital media at an early age.

4.4 Moderating Factors Affecting the Relationship between Short-Form Video Exposure and Early Childhood Self-Regulation

Across the 13 reviewed studies, three moderating variables consistently shaped the direction and magnitude of the relationship between short-form video exposure and self-regulation outcomes. Parental involvement (parental mediation) was the most frequently identified moderating factor, appearing explicitly in 7 of 13 studies, and was consistently associated with attenuated negative effects when active co-viewing and duration limits were in place (Putri et al., 2025; Susilowati et al., 2021). Content type was the second key moderating variable: Afifah et al. (2023) found that targeted use of educational videos can support language development and learning engagement, while entertainment content consumed excessively is more consistently associated with attention and behavioral problems. The third moderating factor was child developmental age: Wicun et al. (2025) explain that younger children have higher vulnerability to the negative impacts of digital media because their self-regulation skills and executive functions are still developing (Diamond, 2013). Therefore, the impact of short-form videos cannot be understood solely from intensity of use, but must be interpreted in light of content quality, developmental stage, and the quality of family and educational support.

5. DISCUSSION

5.1 Short-Form Videos as Quick Stimulation and Challenges for Self-Regulation

Short-form videos are characterized by speed, visual intensity, algorithmic curation, repetitive looping, and minimal reflective pause. These features provide a form of instant, low-effort stimulation that systematically reduces opportunities for children to practice delayed gratification and sustained focus two foundational components of early childhood self-regulation (Tomfohr-Madsen et al., 2022).

From the perspective of Diamond's (2013) Executive Function (EF) Theory, which identifies inhibitory control, working memory, and cognitive flexibility as the three core components of executive function, the passive and cognitively non-demanding nature of short-form video consumption fails to exercise any of these capacities. Unlike block play, pretend play, or structured games that require planning, impulse regulation, and cognitive switching, short-form video viewing demands no self-directed cognitive engagement. This theoretically explains why heavier short-form video use is disproportionately associated with weaker inhibitory control across the reviewed studies arguably the most foundational executive function for school readiness. Algorithms that continuously present similar content further reinforce habituation to high-arousal stimulation, progressively lowering tolerance for tasks requiring sustained cognitive effort (McArthur et al., 2022).

Displacement Theory (Anderson & Subrahmanyam, 2017) further clarifies this mechanism: every hour spent on passive screen consumption displaces time that could otherwise be devoted to activities naturally scaffolding self-regulation development, including free play, peer social dialogue, and adult-guided exploration. Cliff et al. (2023) provided longitudinal support for this pathway, finding that digital media use at age 3 predicted lower executive function scores at age 5, with free play frequency partially mediating this relationship. In Indonesia, Putri et al. (2025) found an increase in short video viewing duration alongside a decrease in the ability to sustain engagement in structured play activities, while Rahmawati and Setyaningsih (2023) found that children consuming high volumes of short digital content showed changes in attention behavior and the ability to wait for turns.

Critically, while the directional association between short-form video exposure and weakened self-regulation is consistent across reviewed studies, causal directionality cannot be firmly established from the predominantly cross-sectional evidence available. Children with pre-existing self-regulation difficulties may be more likely to seek out extended time on short-form videos a potential bidirectional relationship that only longitudinal and experimental designs can adequately disentangle. This review therefore interprets all findings with appropriate epistemic caution, emphasizing the need for

longitudinal Indonesian PAUD studies as the most critical next step in advancing causal understanding in this area.

5.1.1 Proposed Conceptual Framework

Based on the synthesis of empirical evidence and three theoretical frameworks (EF Theory, Sociocultural Theory, and Displacement Theory), a conceptual framework is proposed to model the relationship between short-form video exposure and early childhood self-regulation. This framework is presented in Table 5 below.

SHORT-FORM VIDEO EXPOSURE (Independent Variable)	**MODERATING VARIABLES**	**MECHANISMS (Theoretical Pathways)**	**SELF-REGULATION OUTCOMES (Dependent Variables)**
Platform Characteristics: • Brief video duration (15–60 sec) • Rapid content transitions • Autoplay / algorithm-driven recommendations • High-intensity audiovisual stimulation • Continuous scroll design Exposure Dimensions: • Duration (min/day) • Frequency (sessions/day) • Content type (entertainment vs. educational)	1. Parental Mediation Quality • Active co-viewing • Duration limits • Content selection • Post-viewing discussion (7/13 studies; Rahmawati & Setyaningsih, 2023; Putri et al., 2025) 2. Content Quality • Educational vs. entertainment • Pacing (slow vs. fast) • Interactive elements (Tomfohr-Madsen et al., 2022; Afifah et al., 2023) 3. Child Developmental Age • 0–4 yrs: highest vulnerability • 5–8 yrs: moderate vulnerability • Executive function	Pathway 1 – Direct Neurological: Rapid visual stimulation → reduced threshold for sustained attention → weakened inhibitory control & working memory (EF Theory; Diamond, 2013; McArthur et al., 2022) Pathway 2 – Displacement: Time on short-form video → displaces free play, peer interaction & adult-scaffolded learning → reduced self-regulation practice (Displacement Theory; Anderson & Subrahmanyam, 2017; Cliff et al., 2023)	1. Sustained Attention → Difficulty maintaining focus in structured activities (8/13 studies show consistent negative association) 2. Impulse Control → Increased tantrum behavior; low frustration tolerance (8/13 studies; Setyarini et al., 2023; Kamilla et al., 2025) 3. Emotion Regulation → Emotional dysregulation; irritability (5/13 studies; heterogeneous findings) 4. Social Interaction Quality

	maturation trajectory (Diamond, 2013; Wicun et al., 2025)	Pathway 3 – Sociocultural: Passive consumption without adult scaffolding → no meaningful ZPD interaction → failure to internalize self-regulation strategies (Vygotsky; Falikman, 2021)	→ Reduced peer interaction; preference for digital-mediated over direct interaction (4/13 studies; largely qualitative evidence) Note: Causal direction cannot be firmly established from predominantly cross-sectional evidence. Bidirectionality is possible.

In this framework, short-form video exposure operationalized by duration, frequency, and content type functions as the primary independent variable, influencing self-regulation through two pathways: (1) a direct neurological pathway, wherein rapid visual stimulation reduces the threshold for sustained attention and weakens inhibitory control and working memory; and (2) an indirect displacement pathway, wherein time spent on short-form video replaces self-regulation-enriching activities such as unstructured play, peer interaction, and adult-scaffolded learning experiences. Three moderating variables shape the strength and direction of these pathways: (a) parental mediation quality active co-viewing, content discussion, and duration limits attenuates negative effects; (b) content quality educational, slow-paced, and interactive content reduces harm and may confer developmental benefits; and (c) child developmental age younger children (0–4 years) are more vulnerable than older preschoolers (5–8 years) due to less mature executive function systems (Diamond, 2013). Self-regulation outcomes across four dimensions sustained attention, emotion regulation, impulse control, and social interaction represent the dependent variable in this framework. This model provides testable hypotheses for future experimental and longitudinal research in Indonesian PAUD contexts, and offers a conceptual basis for designing parental mediation programs and PAUD curriculum interventions.

5.2 Early Childhood Self-Regulation in a Sociocultural Perspective

According to Vygotsky's perspective, self-regulation develops through the internalization of social dialogue, *scaffolding*, and meaningful interactions in the *zone of proximal development*. Media consumed passively without mentoring does not provide the social dialogue or corrective feedback necessary for children to internalize self-regulation strategies (Falikman, 2021). From a Vygotskian perspective, this is theoretically significant: the absence of adult scaffolding during short-form video consumption means that children are exposed to stimulation without the guided meaning-making that transforms raw experience into developmental growth. The critical distinction is between media as a tool for social co-construction versus media as a passive substitute for it. *Scaffolding* from adults through group discussions, strategy examples, or invitations to reflect on content can improve preschoolers' self-control and executive abilities (Hirsch-Pasek et al., 2021). Research in PAUD Indonesia shows that integrated activities between educational spectacle and teacher or parent interaction are more effective in improving planning skills and impulse control than exposure to media without direction (Irzalinda & Latifah, 2023; Zulfah et al., 2023). The replacement of meaningful social interaction time with passive media consumption can hinder the process of internalizing self-regulation practices which is the foundation of the development of self-regulation from a sociocultural perspective.

5.3 The Role of Parents and Teachers as Moderators

The role of parents and teachers is very important as moderators of the impact of *short-form video* exposure. Parental mediation that includes duration restriction, age-appropriate content selection, shared viewing, and reflective discussion after watching can transform the viewing experience from passive to active and support *effortful control exercises* McArthur, B. A., Browne, D., Tough, S., & Madigan, S. (2022). Early childhood teachers who used short videos followed by structured activities reported increased children's involvement and self-regulation skills compared to the use of video as a substitute for direct teaching (Hirsch-Pasek et al., 2021). In Indonesia, parental training programs that teach how to watch together, make screen rules, and reflective communication have been shown to reduce the duration of unstructured viewing and improve the emotional control of preschoolers (Putri et al., 2025; Susilowati et al., 2021). Emerging best practices include consistency in daily duration limits, pre-explanations of viewing objectives, selection of relevant educational content, and follow-up activities that encourage reflection or real action.

5.4 Digital Media Ambivalence: Risks and Educational Potential

Digital media including *short-form video* is not inherently bad. The effect depends on the duration of use, the quality of the content, the context of the use (whether accompanied or standalone), and the consistency of the rules applied. Short educational videos designed with pedagogical principles and accompanied by adult *scaffolding* can improve vocabulary and directed attention in early childhood (Yor Flor et al., 2022). In Indonesia, Juannita and Mahyuddin showed positive results when educational content was selected and associated with real activities such as games or discussions (Juannita & Mahyuddin, 2022; Zulfah et al., 2023).

However, prolonged media consumption without assistance is associated with reduced exploratory play practices and self-control exercises (Madigan et al., 2022). Excessive duration and self-consumption without *scaffolding* can reduce time spent on structured play, physical exploration, and social dialogue which is an important context for the development of self-regulation.

5.5 Implications for Early Childhood Education and Family Digital Literacy Policy

Based on the synthesized findings, several practical and policy recommendations can be proposed. First, the development of SOPs for the use of digital media in PAUD institutions that set pedagogical goals, maximum duration per session, criteria for selecting educational content according to age, and structured follow-up activities (McArthur et al., 2022). Second, the integration of the PAUD digital literacy curriculum that teaches attention management, self-reflection techniques, and critical media use skills.

Third, community-based parent training programs delivered through PAUD parent meetings, WhatsApp-based parenting groups, or digital parenting platforms that teach concrete parental mediation strategies: (a) setting and consistently enforcing daily screen time limits (zero minutes for children under 2 years; maximum 30 minutes for ages 2–3; maximum 60 minutes for ages 4–8, consistent with WHO, 2019 and IDAI guidelines); (b) actively co-viewing content and asking guiding questions before, during, and after viewing; (c) selecting educational channels with slow pacing and interactive elements over algorithmically recommended entertainment content; and (d) replacing post-viewing screen time with play or creative activities that reinforce viewed content (Susilowati et al., 2021; Putri et al., 2025). Fourth, the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) and the Indonesian Pediatric Society (IDAI) are encouraged to develop and formally adopt evidence-based national guidelines for short-form video use in early childhood settings, specifying: age-differentiated duration thresholds; criteria for pedagogically appropriate short-form

content; mandated digital media literacy training for PAUD educators; and standardized protocols for monitoring screen time in PAUD institutions. PAUD curriculum developers are further encouraged to integrate digital literacy competencies into the Kurikulum Merdeka framework, including attentional self-awareness, content evaluation skills, and screen-to-play transition strategies as core early childhood competencies. Fifth, longitudinal intervention studies in Indonesian PAUD contexts should be prioritized using randomized controlled designs to assess the causal impact of parental mediation programs on children's executive function and self-regulation trajectories from ages 2 to 8. Sixth, future systematic reviews in this area should expand database coverage to include CINAHL, Embase, GARUDA, and Sinta; broaden keyword sets to capture "micro-video," "autoplay media," and equivalent terms; and extend inclusion windows to build a more comprehensive evidence base.

6. CONCLUSION

This systematic literature review synthesizes current empirical evidence regarding the relationship between short-form video exposure and self-regulation development in early childhood. Overall, the findings consistently indicate that frequent and prolonged exposure to short-form video platforms is associated with weaker sustained attention, poorer impulse control, reduced emotion regulation, and decreased opportunities for meaningful social interaction, particularly among children under six years of age. However, the review also demonstrates that these associations are not deterministic. Rather, their magnitude is influenced by several moderating factors, including parental mediation, content quality, exposure duration, and children's developmental stage. Educational short-form content accompanied by active adult guidance may mitigate some of the adverse effects and, in certain contexts, support children's learning engagement.

From a theoretical perspective, this review extends previous literature by positioning short-form video as a distinct digital media construct rather than treating it as part of general screen time. By integrating Executive Function Theory, Sociocultural Theory, and Displacement Theory, this review proposes a conceptual framework explaining the mechanisms through which platform characteristics, parental mediation, and developmental factors jointly influence early childhood self-regulation. This synthesis contributes to the growing body of evidence on digital media and early childhood by providing a more comprehensive understanding of the unique developmental implications of algorithm-driven short-form video platforms.

The findings also have important practical implications. For PAUD teachers, digital media should be integrated into learning activities selectively, prioritizing age-appropriate educational content while maintaining opportunities for play-based learning and direct social interaction. For parents, active co-viewing, consistent time limits, careful content selection, and post-viewing discussions are recommended to reduce potential negative effects on children's self-regulation. For curriculum developers and policymakers, the findings support the development of evidence-based

digital parenting guidelines, digital literacy programs, and policies promoting healthy digital media practices in early childhood education settings.

Several limitations should be acknowledged. The review included only 13 eligible studies published between 2020 and 2025, reflecting the relatively recent emergence of short-form video as a research topic. Most included studies employed cross-sectional designs, limiting causal inference, and substantial heterogeneity remained in exposure measurement and self-regulation assessment across studies.

Future research should therefore prioritize longitudinal and experimental studies that employ standardized measures of self-regulation and objective assessments of short-form video exposure. Further investigations are also needed to examine differences across content types, exposure intensity, cultural contexts, and parental mediation strategies in order to strengthen the evidence base for digital media policies and educational practices in early childhood.

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