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Mothers' Perceptions on the Impact of Early Childhood Development and Parenting: A Comparative Study of Screen Time Groups in Indonesia

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ABSTRACT

Introduction: The increased use of digital devices during childhood, both in urban and rural areas with high technology access, raises concerns about their impact on child development and health. This calls for evidence-based interventions that consider the balance between the benefits and risks of screen time. However, existing empirical evidence shows inconsistencies in linking screen time duration to sociodemographic factors, parenting practices, and various aspects of child development. This study comparative analyses sociodemographic variables, parenting practices, and maternal perceptions in relation to screen time.'

Methods: This cross-sectional study included 301 mothers of children aged 4-7 years in Bandar Lampung, Indonesia, using purposive sampling. A comparative analysis was conducted between the two groups based on screen time intensity. Ethical approval was obtained from the University Research Ethics Committee. The parenting practice instrument uses 'Parenting SOS' from Neshteruk, which has been modified and adapted. The screen time instrument and mothers' perceptions of the impact of child development use questionnaires from Rahmawati and Latifah, adapted and modified from Lauricella and Nikken & Schols. Statistical analyses (t-tests) compared key variables across screen time groups.

Results: Results showed that mothers (p=0.012) and fathers (p=0.020) in the low screen time group were significantly older, with more consistent parenting practices in terms of behavior control (p=0.005), monitoring (p=0.016), and positive modelling (p=0.006). Meanwhile, children in the high screen time group were more frequently exposed to television (p=0.045) and diverse digital content (p=0.012). The low screen time group also tended to have higher child development scores (67.2%) than the high screen time group (63.9%). The low screen time group had better maternal perceptions of the impact of gadgets on child development than the high screen time group (p=0.046).

Conclusion: This study contributes to family systems theory by identifying maternal age and parenting consistency as buffers against excessive screen time, and provides comparative evidence from Indonesia's urban-rural context. Findings support targeted parenting programs and age-appropriate content policies. This study makes a contextual contribution to the global literature through the local Indonesian context while supporting the development of culturally adaptive public health strategies.

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INTRODUCTION

Early childhood development is crucial for building a strong foundation in cognitive, social-emotional, and physical abilities(1,2,3,4). From Bronfenbrenner's ecological theory perspective, this development is influenced by the dynamic interaction between interconnected environmental systems, ranging from the microsystem (direct interactions, such as parenting patterns and parental perceptions), mesosystem (interactions between environments, such as school and family), exosystem (policies, access to technology), macrosystem (culture, social norms), to the chronosystem (changes in the times, such as digitalization)(5).

In the modern era, exposure to devices—television, tablets, and smartphones—has become an integral part of children's micro and macro environments(4). While digital technology offers educational potential, excessive and unguided screen exposure has been linked to negative outcomes in the socio-emotional, cognitive, and physical domains(6,7,8,9). Various studies have highlighted the association between excessive screen time and suboptimal child development outcomes. For example, studies show a negative correlation between screen time duration and language development, executive function, and emotional regulation(10,11,12). High screen exposure is believed to reduce children's opportunities to engage in direct social interaction, active play, and other activities important for their holistic development(8,13).

Bronfenbrenner emphasizes that parents' perceptions and attitudes within the microsystem act as the primary filter in regulating children's screen exposure(5,14). Studies show that mothers' perceptions of the benefits and risks of devices significantly influence screen time duration, the types of content accessed, and risk mitigation efforts(15,10). For example, mothers who view devices as educational tools tend to allow longer usage, while those concerned about negative impacts may impose strict controls(16). However, these perceptions do not form in a vacuum—exosystem facto15rs such as education level, access to information, and policy support, as well as macrosystem factors such as Indonesia's collective societal values, also shape how mothers assess the impact of devices(15,16). In low- to middle-income countries like Indonesia, disparities in digital literacy and access to guidelines for healthy gadget use can widen perception gaps between sociodemographic groups(17).

Previous research has identified that mothers often exhibit ambivalent perceptions: on the one hand, gadgets are seen as tools for learning and entertainment; on the other hand, concerns about sleep disturbances, delayed speech development, and digital addiction drive efforts to restrict their use(18). These perceptions are also linked to cultural beliefs, such as the notion that face-to-face interaction is more important for children's social development (macrosystem)(19). However, in the digital era's chronosystem, the pressure to adopt technology often clashes with traditional values, creating parenting dilemmas. For example, mothers in urban areas with high-tech access may be more tolerant of screen time compared to mothers in rural areas who still adhere to conventional parenting patterns(20).

Parenting practices are often associated with better child development outcomes, including in the context of media use(21). Parenting practices are also important in early childhood development and greatly influence children's media behavior. Constructs such as behavioral control, monitoring, and modeling play an important role in managing children's exposure to and behavior toward digital media(22,23). However, there are few empirical studies in Indonesia that examine how these practices are related to device usage time and developmental consequences(24).

Although research on the impact of screen time on child development has been extensively conducted in Western countries, the cultural and social context in Indonesia may yield different dynamics(17). Research on the relationship between screen time, parenting practices, and preschool-aged children's development in Indonesia remains limited. Therefore, this study aims to analyze screen time duration, dimensions of parenting practices (behavioral control, monitoring, modeling, and gadget exposure), and mothers' perceptions of the impact of gadgets on preschool-aged children's development in Bandar Lampung City, Lampung, Indonesia.

This research offers theoretical novelty by integrating Bronfenbrenner's ecological lens into a comparative analysis of Low Screen Time (LST) versus High Screen Time (HST) groups. This approach: (1) Reveals how parenting practices (microsystem) interact with gadget exposure (chronosystem) to shape child development; 2) examines patterns of gadget use and mothers' perceptions of the impact of gadgets on preschool children's development. The findings address the gap in understanding the complex interactions between these systems through empirical analysis of sociodemographic differences, parenting practices, gadget intensity, and mothers' perceptions. The strategic insights generated revise the framework for child protection policies in the digital age.

METHOD

Research Type

This study used a quantitative design with a cross-sectional approach, which aimed to analyzes comparatively to explore parenting practices and mothers' perceptions of the impact of gadgets on child development across different screen time groups. A purposive sampling recruited 301 early childhood aged 4–7 years in Bandar Lampung City.

Population and Sample

The population in this study was mothers with children aged 4 to 7 years. The number of respondents was 301 families who were willing to become respondents. Purposive sampling techniques were used for the following reasons: 1) geographical specificity by inclusively selecting parents residing in Bandar Lampung who represent the urban-rural transition environment; 2) homogeneous sample criteria, namely, children aged 4-7 years old who have siblings. The number of samples was determined based on the minimum sample size in quantitative social research, taking into account the level of measurement reliability and the effectiveness of statistical analysis.

Research Location

The study was conducted in Bandar Lampung City, Lampung Province, Indonesia, as a representation of urban areas with high levels of digital access in young families. The research implementation period was July-October 2024.

Instrument

Measurement of parenting practices was conducted using the Parenting SOS developed by Neshteruk, which has been contextualized for the Indonesian population(25). The questions were tested in the field to see how they fit the Indonesian context before the survey data was collected. Examples of questions included “parents monitoring their children's gadget use,” “parents offer gadget use time,” and “parents use gadgets to control behavior”. This instrument consists of 14 items covering four dimensions, namely behavior control, monitoring, gadget exposure, and modeling. The measurement scale used in each questionnaire is a Likert scale with four response options: 1 = strongly disagree to 4 = strongly agree. The Cronbach’s alpha value of the questionnaire is 0.688, indicating moderate reliability and still acceptable for initial exploration in the local context.

The measurement tool for children's screen time consists of measuring the frequency of gadget use and gadget access based on content. This measuring instrument was developed by Rahmawati and Latifah(21), from the theory of Lauricella(16), and Nikken and Schols(15). The measurement of the frequency of children's gadget use uses open-ended questions, which allow mothers to detail the daily duration of their children's gadget use, whether for entertainment, education, or social interaction purposes. Answers were converted into frequency categories for quantitative analysis. Content-based gadget access was measured based on children's exposure to games, videos, and social media, using an instrument consisting of 20 items. The measurement scale used a 4-point Likert scale: 1 (Never), 2 (Sometimes), 3 (Often), and 4 (Always). The Cronbach's Alpha value was 0.840, indicating a high level of reliability.

The measuring instrument for mothers' perceptions of the impact of gadget use on child development uses an instrument from Rahmawati and Latifah which has been modified. This instrument consists of 12 items with a scale of 1 (Never), 2 (Sometimes), 3 (Often), and 4 (Always). The Cronbach's Alpha value is 0.848, which indicates good internal consistency.

Data Analysis

Data were analyzed using descriptive analysis and t-test analysis. Descriptive analysis was used to describe data characteristics, including mean, standard deviation, minimum, and maximum for each research variable. The American Academy of Pediatrics defines the Low Screen Time (LST) category as less than 1 hour per day and the High Screen Time (HST) category as 1 hour or more per day(26). The categories of child development variables were low (≤ 50%), medium (51-75), and high (>75). T-test analysis was used to identify significant differences between the two groups (low vs high screen time), with a statistical significance threshold ($p \leq 0.05$). Statistical analysis was conducted using SPSS software and Microsoft Excel for data validation and supporting graphs.

Ethical Consideration

This study has obtained ethical approval from the IPB University Research Ethics Committee with ethics letter number: 1452/IT3.KEPMSM-IPB/SK/2024. All participants were given written informed consent before filling out the questionnaire. The data collected was guaranteed confidentiality and used only for academic purposes.

RESULTS

Child and Family Characteristics

The analysis (Table 1) revealed that the mean age of the respondents (LST=5.4 years; HST=5.4 years). The mean age of the respondent's father (LST=41.6 years; HST=38.9 years). The average age of the respondent's mother (LST=38.4 years; HST=35.7 years). Average years of education of the respondent's father (LST=11.7 years; HST=11 years). Average years of education of respondents' mothers (LST=11.7 years; HST=11.6 years). Average family income of respondents (LST=Rp 2,555,172; HST=Rp 3,668,661). There were significant differences between low screen time respondents and high screen time respondents in the variables of father's age and mother's age. This means that the average age of the father of the low screen time group is older than the age of the father of the high screen time group. In addition, the average age of mothers in the low screen time group is older than the age of mothers in the high screen time group.

Table 1. Sociodemographic, screen time, and parenting practices of the respondents

No	Category	LST (Mean ± Std)	HST Mean ± Std	p-value
1	Age of child (years)	5.4 ± 0.6	5.4 ± 0.5	0.802
2	Age of father (years)	41.6 ±5.4	38.9 ± 6.7	0.020**
3	Age of mother (years)	38.4 ± 5.1	35.7 ± 5.9	0.012**
4	Years of father's education (years)	11.7 ± 2.4	11.0 ± 2.9	0.215
5	Years of mother's education (years)	11.7 ± 2.9	11.6 ± 2.9	0.884
6	Family income	2,555,172 ± 1,872,085	3,668,661 ± 3,641,721	0.782

Note: LST= Low Screen Time; HST= High Screen Time; ** significant at $p \leq 0.05$

Screen Time

Frequency of Gadget Access by type of device

The analysis results (Table 2) state that the average respondent (LST= 1.79 times; HST= 1.83 times) has a screen time frequency of smartphone type. The average respondent (LST=0.39 times; HST=0.15 times) has a screen time frequency of tablet or iPad type. The average respondent (LST=1.41 times; HST=1.71 times) has a screen time frequency of television. The average respondent (LST=0.11 times; HST=0.13 times) has a screen time frequency of video games. There is a significant difference between the low screen time and high screen time groups in the types of tablet/iPad devices and television. This means that respondents in the low screen time group use Tablets/iPads more often than those in the high screen time group. In addition, high-screen-time group respondents watch television more often than high-screen-time group respondents.

Table 2. Type of device of the respondents

No	Category	LST (Mean ± Std)	HST Mean ± Std	p-value
1	Type of device (times/day)	3.4 ± 1.7	3.4 ± 1.6	0.771
	• Smartphone	1.79 ± 1.39	1.83 ± 1.46	0.799
	• Tablet/Ipad	0.39 ± 0.27	0.15 ± 0.63	0.059*
	• Television	1.41 ± 1.25	1.71 ± 1.36	0.045**
	• Video game	0.11 ± 0.45	0.13 ± 0.57	0.784

Note: LST= Low Screen Time; HST= High Screen Time; ** significant at $p \leq 0.05$

Screen time based on digital content

Based on the analysis results (Table 3), the average respondent (LST = 40.75%; HST = 37.90%) accesses screen time for game content type. The average respondent (LST=63.65%; HST= 60.99%) accesses screen time of video content type. The average respondent (LST=31.82%; HST= 29.57%) accesses instant messaging communication-based social media screen time. The average respondent (LST= 54.61%; HST= 51.07%) accesses screen time type of social media based on YouTube content sharing. The average respondent (LST= 7.34%; HST= 7.25%) accesses screen time based on Instagram content sharing. The average respondent (L=24.67%; HST= 19.89%) accessed screen time of social media types based on Instagram content sharing. There was no significant difference between the respondents of both groups on screen time based on digital content.

Table 3. Screen time based on digital content of the respondents

No	Category	LST (Mean ± Std)	HST Mean ± Std	p-value
1	Screen time content	36.3 ± 15.9	41.5 ± 13.9	0.012**
	• Game	40.75 ± 18.44	37.90 ± 19.59	0.199
	• Video	63.65 ± 19.24	60.99 ± 23.25	0.280
	• WhatsApp	31.82 ± 30.73	29.57 ± 33.25	0.551
	• YouTube	54.61 ± 32.06	51.07 ± 35.41	0.368
	• Instagram	7.34 ± 18.19	7.25 ± 16.76	0.966
	• TikTok	24.67 ± 31.18	19.89 ± 30.03	0.182

Note: LST= Low Screen Time; HST= High Screen Time; ** significant at $p \leq 0.05$

Parenting Practice

Data analysis (Table 4) showed that there was no significant difference in total parenting practice scores between the low screen time and high screen time groups (M = 65.7 ± 11.9 vs. 63.3 ± 11.6; p = 0.119). However, significant differences were found in specific dimensions. The low screen time group showed higher scores in behavior control (M = 58.3 ± 13.9 vs. 53.0 ± 14.9; p = 0.005) and monitoring (M = 84.8 ± 19.4 vs. 78.3 ± 22.5; p = 0.016), indicating more consistent supervision and control. Conversely, modeling of gadget use was higher in the high screen time group (M = 48.2 ± 26.1 vs. 39.5 ± 22.8; p = 0.006), indicating higher exposure of children to parental examples of device use. Direct gadget exposure did not show significant differences between groups (p = 0.186). These findings confirm that the dimensions of control, supervision, and modeling in parenting play a crucial role in distinguishing children's screen time duration, more so than the overall parenting practice score.

These findings support a theoretical approach that emphasizes the importance of external control and social regulation in shaping children's behavior, particularly in the context of technology use. In the context of lower-middle-income countries, resource constraints and socioeconomic pressures may impact parents' capacity to consistently monitor and control their children's behavior, as well as unconsciously model high levels of device use. These theoretical implications expand our understanding of how structural and cultural factors mediate the relationship between parenting practices and screen time, and support the importance of an ecological approach in parenting interventions that are contextual and sensitive to local socioeconomic realities.

Table 4. Parenting practices of the respondents

No	Category	LST (Mean ± Std)	HST Mean ± Std	p-value
1	Parenting Practices	65.7 ± 11.9	63.3 ± 11.6	0.119
	• Behavior Control	58.3 ± 13.9	53.0 ± 14.9	0.005**
	• Monitoring	84.8 ± 19.4	78.3 ± 22.5	0.016**
	• Gadget Exposure	59.8 ± 23.7	64.1 ± 25.8	0.186
	• Modeling	39.5 ± 22.8	48.2 ± 26.1	0.006**

Note: LST= Low Screen Time; HST= High Screen Time; ** significant at $p \leq 0.05$

Maternal Perception of Gadget Impact on Child Development

This study (Table 5) identified significant differences in mothers' perceptions of the impact of gadgets on child development between groups with low screen time and high screen time. More positive perceptions of the impact of gadgets were found in the low screen time group, which also quantitatively showed higher child development scores (M ± SD = 67.2 ± 14.4) compared to the high screen time group (M ± SD = 63.9 ± 14.8; p = 0.046). The distribution of developmental scores reinforces this finding, with a higher proportion of children in the high developmental category in the low screen time group (32.1%) compared to the high screen time group (24.7%). These findings suggest that parents' perceptions, particularly those of mothers, may play a role not only as empirical descriptions but also as mediating or moderating factors in the relationship between gadget use and child development. More negative perceptions may reflect parents' awareness of the risks of gadget use, which in turn may encourage more adaptive parenting practices, such as limiting screen time and increasing interactive engagement (15,27). In this context, mothers' perceptions have the potential to serve as a psychosocial pathway mediating the effects of digital exposure on development, while also reflecting values, knowledge, and parenting strategies that are contextualized with family experiences.

Table 5. Maternal perceptions of the impact of gadgets on child development of the respondents

No	Category	LST		HST		p-value
		n	%	n	%	
1	Low	10	12.8	39	17.5	
	Midlle	43	55.1	129	57.8	
	High	25	32.1	55	24.7	
	Mean ± Std	67.2 ± 14.4		63.9 ± 14.8		0.046*

Note: LST= Low Screen Time; HST= High Screen Time; ** significant at p ≤ 0.05

DISCUSSION

The results of the study indicate that several aspects of parenting practices have a significant relationship with the screen time levels of preschool-aged children. Overall, although the total parenting practice scores did not differ significantly between the low and high screen time groups, the analysis by dimension revealed meaningful relationships in the dimensions of behavioral control, monitoring, and modeling. The dimensions of behavioral control, monitoring, and modeling are particularly relevant in explaining these differences. For example, parental modeling behavior among Asian parents is proven to be important, where parents who spend more time in front of screens tend to allow their children to do the same(28,29). Additionally, parenting strategies such as setting rules regarding media usage time and serving as a good example are highly recommended to reduce children's screen time(30). Parenting that focuses on supervision and parental involvement in non-media activities also shows a positive association with reduced screen time in children(31). Therefore, an approach involving parental education and active involvement in regulating screen time is expected to have a positive impact on preschool children's screen time habits.

Research findings indicate that mothers of children with low screen time have higher scores in behavioral control and monitoring compared to mothers of children with high screen time. This underscores that parenting that enforces clear rules(14), positive discipline(23), and active supervision of children's activities plays a crucial role in reducing the duration of gadget use(30). The use of active monitoring methods, such as engaging in media activities together, is also emphasized by many studies showing that responsive parenting behaviors have a positive influence on controlling children's screen time(32). Additionally, parents' awareness of the impact of screen time on children's well-being also affects the effectiveness of screen time regulations(33,34). Enforcing strict rules regarding media use at home can significantly contribute to limiting screen time(35), which is particularly important in today's digital age(36).

Active monitoring in child-rearing has proven to be important in identifying children's digital activities more effectively, including the type of content consumed and the duration of use. Parents who actively monitor their children's media use can reduce overexposure to risky content and help set more appropriate limits(37). Effective monitoring methods, such as screen time limits and collaboration in media activities, can optimize children's digital

experiences and support healthy cognitive development(38). Additionally, parents' awareness of the type of content and duration of media use directly impacts their decisions to establish consistent rules, which in turn reduces children's screen time and contributes to their mental and physical well-being(39). Therefore, parenting strategies involving active monitoring should be prioritized in efforts to manage media use among preschool-aged children.

Modeling in parenting reflects the theory of digital behavior transmission between generations in early childhood, which is influenced by the behavior and attitudes of parents or caregivers(40), socioeconomic status(41), and culture(42). The dimension of modeling in parenting in this study indicates that parents' behavior in using gadgets significantly contributes to children's screen time behavior. Research shows that mothers with high levels of gadget use tend to have higher modeling scores in groups of children with high screen time, indicating that parental behavior can trigger an increase in children's screen time(43,44). This transmission is consistent with social cognitive theory, in which children learn behavior through observation of their parents(45). Parents with high gadget usage often struggle to enforce screen time limits for their children(46). Additionally, research by Gonçalves indicates a significant positive correlation between parental screen time and children's screen time, reinforcing the importance of parental modeling in media use(44). Previous studies have shown that children mimic their parents' media behaviors, including digital multitasking habits and passive media consumption(16,47). The integration of digital media into family life further complicates this transmission process. Parents often use screens for entertainment and convenience, which can normalize high screen use in young children if not managed carefully(42). When parents frequently use gadgets in front of their children without explaining their educational functions, children tend to internalize this behavior as something normal and acceptable. To address this issue, it is important for parents to be aware of the influence of their own behavior on their children's media habits and to implement more conscious strategies in the use of gadgets at home(48,49). Socioeconomic status also plays a crucial role in children's digital behavior. Studies show that children from lower SES backgrounds are more likely to be exposed to screens, which may be due to factors such as limited access to outdoor play opportunities and recreational activities(41).

The gadget exposure dimension, which describes the frequency of parents providing access to children for gadgets, shows interesting results despite no significant differences between high and low screen time groups. The trend of gadget use among young children in Southeast Asia, including Indonesia, shows a significant increase. For example, in Thailand, the prevalence of screen time exceeding one hour per day reaches around 90% among two-year-olds(48). According to data from the Central Statistics Agency (BPS) at the end of 2022, approximately 33.44% of young children in Indonesia have used gadgets, with a higher percentage in the 5-6 age group reaching 52.76%(50). This gadget usage is not only common but also often occurs for extended periods; parents report that 41% of children use gadgets for one hour or more(50). Research by Rahmawati and Latifah in Bogor City, Indonesia, revealed that the majority of children use smartphones (95.9%), primarily for entertainment (46.7%) and games (18.9%), accessed through videos and applications both online and offline(21). In Malaysia, smartphone usage among young children stands at 86.5%. Interestingly, 17.9% of the sample owned tablets. Regarding content, the most popular type of content is cartoons (46.30%), followed by music (29.56%), while the least popular type of content is entertainment(3.17%). It was also found that over 48% of participants did not adhere to the AAP recommendations(51). Many children use devices for between 1 and 5 hours per day, with children preferring video-sharing and entertainment platforms such as YouTube, TikTok, and online games(52). Overall, the increasing exposure to gadgets among early childhood in Southeast Asia requires special attention and a more integrated approach so that parents and educators can implement healthy limits on digital media use to support children's holistic development.

The impact of gadget use on children's development is a significant area of research, particularly regarding mothers' perceptions. Research findings show significant differences in mothers' perceptions of the impact of gadgets on children's development between low and high screen time groups. Children with lower screen time tend to have higher maternal perception scores regarding the impact of gadgets on development compared to children with high screen time. Mothers' beliefs about the impact of gadget use on their children are crucial in determining actual gadget use; higher maternal concerns often correlate with lower gadget use for children. Hinkley et al. found that mothers who are concerned about the negative effects of gadget use are more likely to limit their children's exposure to gadgets, which in turn leads to better developmental outcomes for those children(46). Conversely, children with higher device usage times typically receive lower maternal perception scores due to concerns about developmental

delays and health impacts associated with excessive device exposure(53). Additionally, high and sustained screen time has been associated with adverse effects on language and cognitive development, supporting the notion that lower screen time is associated with better maternal evaluations of child development(54,55). In conclusion, these findings emphasize the important role played by maternal attitudes in shaping children's screen time and its potential consequences for development. Thus, the observed patterns of association in this study underscore the urgency of family-based interventions in managing children's digital media use. Efforts to raise awareness among parents and caregivers about the importance of balancing screen-based and non-screen-based activities are essential to support optimal child development.

Limitations and Cautions

This research has two primary methodological constraints. First, reliance on maternal self-reports for assessing children's health and developmental outcomes introduces potential recall and social desirability biases. Second, the cross-sectional design precludes causal inferences and cannot capture longitudinal dynamics between parenting practices and screen time patterns. These limitations may affect the generalizability of the observed relationships.

Recommendations for Future Research

To address these limitations and extend current findings, subsequent investigations should employ objective outcome measures (e.g., direct developmental assessments, clinical records) to minimize subjective bias. Implement longitudinal designs to establish temporal precedence and causal pathways. Examine paternal contributions to media regulation, given the significance of fathers' age in this study. Conduct content-specific analyses, differentiating educational versus entertainment media impacts. Utilize mixed-methods approaches to uncover contextual mechanisms underlying effective parenting strategies. Such advancements would strengthen theoretical models of digital media parenting while informing more nuanced interventions. Further research is recommended using a mixed-method approach, combining qualitative exploration through ethnographic observation and parent interviews to unpack cultural nuances in digital mediation. This dual approach will strengthen the framework for digital parenting in Indonesia.

CONCLUSION

The analysis revealed significant differences between the low and high screen time groups on several demographic variables and parenting patterns. The age of fathers and mothers was significantly higher in the low screen time group, which may reflect more mature and controlled parenting patterns. In terms of device type, children with high screen time tended to be exposed to television more often than those in the low screen time group. Additionally, screen time content also showed significant differences, with the high screen time group accessing more content overall. In terms of parenting practices, parental behavioral control, monitoring, and parental behavioral modeling were significantly higher in the low screen time group, indicating that more active parental involvement contributes to limiting children's screen time. Significant differences in mothers' perceptions of the average developmental impact of screen time were higher in the low screen time group.

The results of this study contribute theoretically to Bronfenbrenner's ecological framework, particularly in highlighting how elements in the microsystem (direct interactions between children and parents through control, monitoring, and modeling) interact with broader structures such as socio-demographic conditions (parental age) and access to digital media (chronosystem). In a regional context such as Indonesia, digital parenting practices in Indonesia need to be understood as the result of multilayered interactions between individuals, families, and the socio-cultural environment. Regional parenting practices include developing a culturally adapted parenting program that leverages Indonesia's multigenerational household structures, training older relatives as digital mediators to support young parents. These findings have important implications for parenting interventions and public policy. First, older parents appear to be more effective at managing screen time. This highlights the need for more intensive parenting education for younger parents, particularly in aspects of behavior control and monitoring children's screen time usage. Second, these results suggest that parenting approaches involving active supervision and modeling of parental behavior can play an important role in reducing children's screen time duration. Family-based intervention programs

emphasizing parents' active role in managing children's digital media exposure need to be developed more systematically. Third, the statistically significant differences in mothers' perceptions of the impact on children's development, along with the direction of the relationship, underscore the importance of considering screen time duration as a potential factor influencing children's well-being and development. Therefore, recommendations for balanced, age-appropriate, and education-based screen time should continue to be promoted within the context of early childhood health and care.

The limitation of this study is that it uses mothers' perceptions to measure the impact on children's health and development. Therefore, future research should measure the impact on children through direct observation of the children. Additionally, to assess the influence, it is recommended to conduct research using a longitudinal design. Furthermore, a mixed-method approach is recommended, combining qualitative exploration through ethnographic observation and parent interviews to uncover cultural nuances in digital mediation. This dual approach will strengthen the framework for digital parenting in Indonesia.

AUTHOR'S CONTRIBUTION STATEMENT

VI: Conceptualization; Data Curation; Investigation; Methodology; Project Administration; Resources; Writing Original Draft. ML: Conceptualization; Data Curation; Formal Analysis; Investigation; Methodology; Validation; Review & Editing; Supervisor. DH: Conceptualization; Formal Analysis; Investigation; Methodology; Validation; Review & Editing; Supervisor.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

Not applicable.

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