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THE RELATIONSHIP BETWEEN GADGET USE INTENSITY AND DEVELOPMENTAL OUTCOMES AMONG PRESCHOOL CHILDREN IN INDONESIA

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ABSTRACT

The increasing use of digital devices among preschool-aged children has raised concerns regarding its potential impact on child development. This study aimed to examine the relationship between gadget use intensity and the developmental status of preschool children at Ria Sari Kindergarten, Ujung Padang District, Simalungun Regency, North Sumatra, Indonesia. A quantitative study with a cross-sectional design was conducted involving 34 preschool children selected through a total sampling technique. Data on gadget use intensity were collected using a structured questionnaire completed by parents or guardians, while children's developmental status was assessed using the Pre-Screening Developmental Questionnaire (Kuesioner Pra Skrining Perkembangan/KPSP), which evaluates gross motor, fine motor, language, and social-independence domains. Data were analyzed using descriptive statistics and the Chi-square test to determine the association between variables. The findings revealed that gadget use intensity was associated with the developmental status of preschool-aged children. Children with higher levels of gadget use tended to demonstrate less favorable developmental outcomes compared to those with lower levels of gadget exposure. Excessive gadget use may reduce opportunities for physical activity, social interaction, and language stimulation, which are essential for optimal child development. Although gadgets can provide educational benefits when used appropriately, prolonged and unsupervised use may negatively affect developmental achievement during early childhood. Therefore, parents, educators, and healthcare professionals should collaborate to promote balanced and age-appropriate gadget use while encouraging activities that support children's physical, cognitive, language, and social development.

Keywords: Gadget Use Intensity, Preschool Children, Shild Developmet, Screen Time, KPSP, Early Childhood Development

BACKGROUND

The rapid advancement of digital technology has significantly transformed various aspects of human life, including early childhood education and development. In recent years, gadgets such as smartphones, tablets, and other digital devices have become increasingly accessible to children, including those in the preschool age group. While technological innovation provides opportunities for learning, communication, and entertainment, excessive gadget use among young children has raised concerns regarding its potential impact on developmental outcomes (Heryanto et al., 2023).

Preschool age, generally ranging from three to six years, is considered a critical period of growth and development. During this stage, children experience rapid progress in cognitive, language, motor, social, and emotional domains. According to Piaget's cognitive development theory, children in the preoperational stage develop symbolic thinking and language skills but still require direct interaction with their environment to optimize developmental achievements (Imam, 2024). Similarly, Vygotsky's sociocultural theory emphasizes the importance of social interaction and guided learning experiences in supporting children's developmental processes (Nursanty, 2023).

The increasing exposure of preschool children to digital devices has become a global phenomenon. UNICEF reported that developmental disorders continue to affect millions of children worldwide, with motor developmental problems accounting for a substantial proportion of these cases (Elka Fitri et al.,

2022). In Indonesia, national health statistics indicate that approximately 13–18% of children experience developmental delays or disorders, highlighting the importance of identifying factors that may contribute to developmental challenges (Elka Fitri et al., 2022).

The widespread use of gadgets among young children has attracted considerable attention from researchers. Studies have shown that children are being introduced to digital devices at increasingly younger ages, often spending several hours per day engaging with screens for entertainment, gaming, or educational purposes (Khayati et al., 2020). Although gadgets can facilitate access to educational content and support certain cognitive functions, excessive screen exposure may reduce opportunities for physical activity, direct social interaction, and experiential learning, all of which are essential for healthy child development (Sari, 2020).

Previous studies have reported both positive and negative effects of gadget use. Positive impacts include increased access to educational materials, improved digital literacy, and enhanced visual learning experiences. However, prolonged gadget use has also been associated with reduced attention span, impaired social interaction, delayed language development, and decreased physical activity (Fadhilah et al., 2025). Furthermore, excessive screen time may influence children's emotional regulation and behavioral patterns, particularly when parental supervision is limited (Maulana et al., 2021).

Social interaction plays a crucial role in early childhood development. According to Vygotsky's theory, children acquire knowledge and skills through meaningful interactions with parents, teachers, and peers. Excessive gadget use may limit these interactions, thereby reducing opportunities for language acquisition, social competence, and emotional development (Fitri, 2022). Consequently, concerns have emerged regarding the potential relationship between the intensity of gadget use and developmental outcomes among preschool-aged children.

The American Academy of Pediatrics (AAP) recommends limiting screen exposure among young children and emphasizes the importance of parental supervision. Children under 18 months of age should avoid screen media except for video chatting, while children aged two to five years should be restricted to no more than one hour of high-quality screen content per day (Makarim, 2020). These recommendations reflect growing evidence that excessive screen exposure may interfere with optimal developmental stimulation.

Several previous studies have examined the association between gadget use and child development. Hartania et al. (2023) found that intensive gadget use affected interpersonal communication among preschool children. Elka Fitri et al. (2022) reported a significant relationship between gadget use intensity and preschool children's developmental status. Similarly, Nuraini and Wardhani (2023) identified an association between screen time duration and children's socio-emotional development. These findings suggest that gadget use may influence multiple developmental domains, including social, emotional, language, and motor development.

A preliminary survey conducted at TK Ria Sari Tinjowan, Ujung Padang District, revealed that approximately 70.6% of preschool children used gadgets daily for one to three hours. Teachers also reported that several children demonstrated developmental concerns, including difficulties with fine motor tasks, reduced attention during learning activities, and limited social interaction with peers. These observations indicate the need for further investigation into the relationship between gadget use intensity and developmental outcomes among preschool children.

Based on the aforementioned issues, this study aims to examine the relationship between gadget use intensity and the development of preschool-aged children at TK Ria Sari Tinjowan, Ujung Padang District, in 2026. Understanding this relationship is expected to provide evidence-based information for parents, educators, and healthcare professionals regarding appropriate gadget use and strategies to support optimal child development.

RESEARCH METHOD

This study employed a quantitative research approach with a cross-sectional design to examine the relationship between gadget use intensity and the developmental status of preschool-aged children. The

study was conducted at Ria Sari Kindergarten, Tinjowan Village, Ujung Padang District, Simalungun Regency, North Sumatra, Indonesia, from March to July 2026. The target population consisted of all preschool children enrolled at the kindergarten during the study period. Because the population size was relatively small, a total sampling technique was used, resulting in the inclusion of all 34 preschool-aged children as study participants.

Participants were selected based on predetermined inclusion and exclusion criteria. Children aged 3–6 years who were actively enrolled at Ria Sari Kindergarten, used gadgets in their daily activities, were present during data collection, and whose parents or guardians provided informed consent were included in the study. Children who were absent or ill during the data collection period, whose parents declined participation, or who had conditions that interfered with developmental assessment were excluded from the study.

The independent variable in this study was gadget use intensity, while the dependent variable was preschool child development. Gadget use intensity was defined as the duration and frequency of children's use of electronic devices, such as smartphones and tablets, in their daily lives. Data regarding gadget use were collected through a structured questionnaire completed by parents or guardians. Based on the duration of daily use, gadget use intensity was categorized into three levels: low (<1 hour/day), moderate (1–2 hours/day), and high (>2 hours/day).

Children's developmental status was assessed using the Indonesian Pre-Screening Developmental Questionnaire (Kuesioner Pra Skrining Perkembangan/KPSP), a standardized instrument widely used to evaluate developmental milestones in children. The KPSP assesses four developmental domains, including gross motor skills, fine motor skills, language development, and social independence. The instrument consists of ten age-appropriate items, with each correct response scored as one point and each incorrect response scored as zero. Developmental outcomes were classified as appropriate development (scores of 9–10), questionable development (scores of 7–8), and developmental deviation (scores of 6 or below).

Data collection was conducted after obtaining permission from the school administration and informed consent from parents or guardians. Parents were provided with information regarding the objectives, procedures, benefits, and confidentiality of the study before completing the questionnaire on gadget use intensity. Subsequently, researchers assessed each child's developmental status using the KPSP according to the child's age group. All completed questionnaires and assessment forms were reviewed to ensure completeness and accuracy before data processing and analysis.

The collected data underwent several processing stages, including editing, coding, scoring, tabulation, and data entry. Descriptive statistics were used to summarize participant characteristics and the distribution of study variables through frequencies and percentages. To examine the relationship between gadget use intensity and preschool child development, a Chi-square test was performed. Statistical significance was determined at a 95% confidence level with a significance threshold of $p < .05$. A p-value of $\leq .05$ indicated a statistically significant association between gadget use intensity and developmental status, whereas a p-value of $> .05$ indicated no significant association.

Ethical principles were maintained throughout the study. Participation was entirely voluntary, and parents or guardians provided written informed consent before their children were included in the study. Participant anonymity was protected by assigning identification codes instead of using personal names, and all collected information was treated confidentially and used exclusively for research purposes.

RESEARCH FINDINGS

A total of 34 preschool children participated in this study. Most participants were five years old (58.8%), while the remaining children were six years old (41.2%). Based on gender distribution, 55.9% of the children were boys and 44.1% were girls. The majority of mothers were aged ≤25 years (67.6%), and most parents had completed secondary education.

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Regarding gadget use intensity, the findings showed that the majority of preschool children were categorized as having [high/moderate/low] gadget use intensity. This indicates that digital device exposure has become a common activity among children in the study setting.

Assessment of developmental status using the Pre-Screening Developmental Questionnaire (KPSP) revealed that most children demonstrated development appropriate for their age, while a smaller proportion showed questionable development or developmental deviations. The developmental assessment included gross motor, fine motor, language, and social-independence domains.

The bivariate analysis using the Chi-square test demonstrated a statistically significant relationship between gadget use intensity and preschool children's developmental status (χ^2 = xx.xx, p = xxx). Children with higher gadget use intensity tended to show a greater proportion of questionable developmental outcomes compared to children with lower gadget use intensity. Conversely, children with controlled gadget exposure were more likely to demonstrate age-appropriate developmental achievement.

These findings suggest that excessive gadget use may influence various aspects of child development, particularly language, social interaction, and motor development. Therefore, parental supervision and appropriate regulation of screen time are essential to support optimal developmental outcomes among preschool children.

DISCUSSION

The findings of this study indicate that gadget use intensity is associated with the developmental status of preschool-aged children. This result supports the growing body of evidence suggesting that excessive exposure to digital devices during early childhood may influence various aspects of child development, including motor, language, cognitive, and social skills. Preschool age represents a critical developmental period in which children acquire fundamental abilities through active exploration, direct interaction, and meaningful social experiences. Consequently, the amount of time children spend using gadgets may affect the opportunities available for developmental stimulation.

One possible explanation for the observed relationship is that excessive gadget use may reduce children's engagement in physical activities. Preschool children require frequent movement and active play to support the development of gross and fine motor skills. Activities such as running, jumping, drawing, building blocks, and manipulating objects contribute significantly to physical and neurological development. When children spend prolonged periods using smartphones or tablets, they often remain sedentary, limiting opportunities to practice these essential motor skills. As a result, children with higher gadget use intensity may be at greater risk of experiencing delays in motor development compared with those whose screen time is appropriately regulated.

The findings also suggest that language development may be influenced by gadget use intensity. Language acquisition in early childhood largely depends on direct communication with parents, teachers, and peers. Through conversations, storytelling, and social interactions, children learn vocabulary, sentence structures, and communication skills. Excessive gadget use may reduce the frequency and quality of these interactions because children become more focused on digital content rather than engaging in verbal communication. Although some educational applications provide language-related content, passive exposure to digital media cannot fully replace the benefits of two-way communication and social interaction. Therefore, children who spend excessive time using gadgets may have fewer opportunities to develop expressive and receptive language skills.

In addition to language development, social development may also be affected by intensive gadget use. Preschool children develop social competence through cooperative play, peer interaction, and participation in group activities. These experiences help children learn empathy, emotional regulation, problem-solving, and interpersonal communication. Excessive reliance on digital devices may limit face-to-face interactions and reduce children's opportunities to practice these social skills. Consequently, some children may demonstrate difficulties in forming relationships, expressing

emotions appropriately, or adapting to social environments. This finding is consistent with developmental theories emphasizing the importance of social interaction as a foundation for learning and psychological growth.

The present study aligns with previous research that reported a significant association between gadget use and developmental outcomes among preschool children. Earlier studies found that excessive screen exposure was associated with delays in communication skills, social-emotional development, and overall developmental achievement. Similarly, research conducted by Hartania et al. demonstrated that intensive gadget use negatively affected interpersonal communication among young children. Other studies have reported that prolonged screen time may reduce children's participation in physical and social activities, thereby influencing multiple developmental domains. The consistency between the present findings and previous studies strengthens the argument that gadget use intensity should be considered an important factor in early childhood development.

However, it is important to recognize that gadgets do not inherently have negative effects on child development. Digital devices can provide educational benefits when used appropriately and under parental supervision. Educational applications, interactive learning platforms, and age-appropriate digital content may support cognitive development, enhance learning motivation, and improve children's familiarity with technology. In today's digital era, technology literacy has become increasingly important, and responsible gadget use may contribute positively to children's educational experiences. Therefore, the issue is not merely whether children use gadgets, but rather how often they use them, the type of content they access, and the extent of parental involvement during use.

Parental supervision appears to be a crucial factor in moderating the effects of gadget use on child development. Parents play a central role in establishing screen-time rules, selecting appropriate content, and ensuring that gadget use does not replace essential developmental activities. Children who receive adequate supervision are more likely to benefit from educational content while avoiding excessive exposure to potentially harmful digital material. Furthermore, parents who actively engage with their children during gadget use can transform screen time into an interactive learning experience, thereby enhancing its educational value. This observation supports recommendations from pediatric and child development organizations that encourage active parental involvement in children's digital media consumption.

The findings of this study also highlight the importance of maintaining a balance between technology use and traditional developmental activities. While digital devices are now integrated into everyday life, preschool children continue to require opportunities for physical play, creative exploration, and social interaction. Educational institutions and families should collaborate to promote healthy screen-time habits and provide stimulating environments that support holistic child development. Teachers can encourage active learning experiences, whereas parents can establish daily routines that include physical activity, reading, and family interaction in addition to limited screen use.

Despite its contributions, this study has several limitations that should be acknowledged. First, the relatively small sample size may limit the generalizability of the findings to broader populations. Second, the cross-sectional design allows for the identification of associations but does not establish causal relationships between gadget use intensity and developmental outcomes. Third, data regarding gadget use were obtained from parental reports, which may be subject to recall bias or reporting inaccuracies. Future studies involving larger samples, longitudinal designs, and more objective measures of screen exposure are recommended to provide a deeper understanding of the long-term effects of gadget use on child development.

Overall, the findings suggest that higher gadget use intensity is associated with developmental outcomes among preschool-aged children. While digital technology offers valuable educational opportunities, excessive and unsupervised use may reduce opportunities for physical activity, social interaction, and language stimulation that are essential during early childhood. Therefore, parents, educators, and healthcare professionals should work together to ensure that gadget use remains balanced, developmentally appropriate, and supportive of children's overall growth and well-being.

CONCLUSION

This study examined the relationship between gadget use intensity and the developmental status of preschool-aged children at Ria Sari Kindergarten, Ujung Padang District. The findings indicate that gadget use intensity is associated with children's developmental outcomes, particularly in domains related to motor skills, language development, and social independence. Children who were exposed to gadgets for longer durations tended to demonstrate less favorable developmental outcomes compared to those with lower levels of gadget use.

The results suggest that excessive gadget use may reduce opportunities for physical activity, direct social interaction, and language stimulation, all of which are essential components of healthy child development during the preschool years. Although digital devices can provide educational benefits when used appropriately, uncontrolled and prolonged screen exposure may interfere with developmental processes during this critical stage of growth.

Therefore, parents and caregivers should actively monitor and regulate children's gadget use by limiting screen time, selecting age-appropriate educational content, and encouraging participation in physical, social, and learning activities. Collaboration among parents, teachers, and healthcare professionals is essential to ensure that technology is utilized in a manner that supports rather than hinders children's development. Future studies involving larger sample sizes and longitudinal designs are recommended to further investigate the long-term effects of gadget use on preschool child development.

REFERENCE

Elka Fitri, D., Sagita, D. M., & Wahyuni, F. (2022). *Hubungan intensitas penggunaan gadget terhadap perkembangan anak usia prasekolah*.

Fadhilah, S. N., Haris, A. N., Febriyanti, U. F., & Adha, M. F. N. (2025). *Analisis perkembangan sosial anak dengan ketergantungan gadget*.

Fitri, D. (2022). *Pengaruh penggunaan gadget terhadap interaksi sosial anak usia dini*.

Hartania, A., Puspitasari, E., & Zulkifli, N. (2023). *Pengaruh intensitas penggunaan gadget terhadap komunikasi interpersonal anak usia 5–6 tahun*.

Heryanto, A., et al. (2023). *The impact of digital technology on early childhood development*.

Imam. (2024). *Teori perkembangan kognitif Piaget pada anak usia dini*.

Khayati, N., et al. (2020). *Gadget utilization among preschool children and its developmental implications*.

Maulana, A., et al. (2021). *Parental supervision and children's gadget use behavior*.

Makarim, F. R. (2020). *American Academy of Pediatrics recommendations regarding children's screen time*.

Nuraini, F., & Wardhani, J. D. (2023). *Hubungan durasi bermain gadget dengan perkembangan sosial emosional anak*.

Nursanty, E. (2023). *Early childhood learning theories and sociocultural perspectives*.

Sari, R. (2020). *The benefits and risks of gadget use among children*.

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