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RESEARCH

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The Correlation Between Screen Time Duration, Parental Factors, and Socioemotional Development in Children Aged 2–5 Years in the Working Areas of Kupang

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Abstract

The digital era is marked by the growing use of gadgets among young children (ages 2–5). This trend is evident in both the duration of use and the number of users, which tend to increase each year. High screen time can lead to emotional, behavioral, and social interaction problems, especially when not supervised by parents. This study aims to determine the correlation between screen time duration, parental factors, and socioemotional development in children aged 2-5 years in the working areas of Kupang. An analytical, observational, cross-sectional design was employed, involving children aged 2–5 years in the working areas of Kupang. A total of 60 respondents were selected using consecutive sampling. Screen time duration was the independent variable, while socioemotional development was the dependent variable. Data were collected using a screen time questionnaire adapted from SMALLQ and the Strengths and Difficulties Questionnaire (SDQ), and subsequently analyzed using the Chi-Square test. Univariate analysis showed that 56.67% of children had excessive screen time (>60 minutes/day) and 30.00% experienced very high levels of socioemotional difficulties. Bivariate analysis revealed a significant correlation between screen time and socioemotional development ($p = 0.003$), with a higher risk among children with excessive screen time. However, the Linear-by-Linear Association test showed no significant linear trend ($p = 0.071$), suggesting that other factors are involved. This study also shows a significant association between parents' highest educational level and children's socioemotional development ($p\text{-value} = 0.005$). This finding is supported by the Linear-by-Linear Association test, indicating that screen time is not the only factor influencing children's socioemotional well-being. Other factors also contribute to children's socioemotional development. These findings indicate that excessive screen time and parental factors may be associated with socioemotional difficulties in early childhood, highlighting the importance of monitoring digital media use during this developmental period.

Keywords: Screen Time Duration, Socioemotional Development, Early Childhood.

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1. INTRODUCTION

In the digital era, the use of electronic devices has expanded rapidly, including among children aged 2–5 years. Screens are frequently used for entertainment, educational activities, and as a practical tool for parents in managing children's behavior during daily routines. National data from Statistics Indonesia show a steady increase in mobile phone use among young children, rising from 33.44% in 2022 to 38.92% in 2023 and 39.71% in 2024 (BPS, 2022, BPS, 2023, BPS, 2024). Empirical studies similarly report high levels of screen exposure, with a substantial proportion of children exceeding two hours per day (Shakya, Acharya, Pradhan, & Divya, 2023). These trends indicate that prolonged screen time has become increasingly common in early childhood.

Screen exposure during early childhood may produce both benefits and risks, depending on content quality, duration of use, and the presence of parental guidance (Canadian Paediatric Society, 2017). While age-appropriate educational content may support learning, excessive screen time has been associated with emotional and behavioral difficulties (Przybylski & Weinstein, 2017). Children exposed to more than four hours of screen time per day have demonstrated higher emotional lability and challenges in emotional regulation (Ofli et al., 2021). Socioemotional development in early childhood encompasses competencies such as emotional regulation, peer interaction, cooperation, and prosocial behavior (Likhar, Baghel, & Patil, 2022). Disruptions in these domains may interfere with children's ability to adapt to social environments and establish healthy relationships (Serlan, Khotijah, & Bunga, 2021).

Parental supervision plays a critical contextual role in shaping children's digital media use (Carson & Janssen, 2012). Parenting practices related to screen exposure are influenced by parental age, occupation, and education level (Tang, Darlington, Ma, & Haines, 2018). Adequate supervision may mitigate potential negative impacts by regulating duration and guiding content selection. However, despite growing evidence linking screen time to developmental outcomes, findings remain inconsistent, and limited research has specifically examined this relationship in community health center populations, particularly in East Nusa Tenggara (NTT). The socio-cultural and socioeconomic characteristics of this region may influence both media use patterns and child development outcomes, yet empirical data in this context remain scarce.

Therefore, this study was conducted in two settings: the Sikumana Community Health Center in Kupang City and the Tarus Community Health Center in Kupang Regency, to represent both urban and rural characteristics. Given the increasing exposure of young children to digital media, this study aims to determine the relationship between screen time duration and socio-emotional development among children aged 2–5 years, assess socio-emotional development, and describe parental characteristics.

2. RESEARCH METHOD

This study employed an analytical observational design with a cross-sectional approach to assess the correlation between screen time duration and socio-emotional development in children aged 2–5 years in the working areas of the Sikumana and Tarus Community Health Centers. The study was conducted from March to September 2025.

The target population comprised all children aged 2–5 years residing in the two study areas. A non-probability sampling approach was employed using the consecutive sampling technique. This method involves recruiting eligible participants consecutively, in the order of their attendance, until the predetermined sample size is achieved (Zulfikar et al., 2024). The sample measurement technique in this study used the following analytical correlation research formula (Dahlan, 2010). Based on this calculation, the minimum required sample was 54 participants; therefore, 60 respondents were recruited to account for potential non-response. The inclusion criteria were children aged 2–5 years who were exposed to at least one screen-based electronic device and whose parents or caregivers provided written informed consent. In

contrast, exclusion criteria included incomplete data or the inability of parents or caregivers to provide the required information.

The independent variable was screen time duration and parental factors, measured using a questionnaire adapted from the SMALLQ instrument. The adaptation process included translation, back-translation, expert review, and pilot testing to ensure clarity and cultural relevance. The dependent variable was socioemotional development, assessed using the parent-reported version of the Strengths and Difficulties Questionnaire (SDQ). The SDQ measures domains including emotional symptoms, conduct problems, hyperactivity, peer relationship problems, and prosocial behavior. Previous studies have demonstrated acceptable validity and reliability of the Indonesian version of the SDQ, with internal consistency coefficients above 0.70. Potential confounding variables included child gender, parental age, education, and occupation; these were collected using structured questionnaires. The researchers also collected additional data, including respondents' age, occupation, and highest level of education, which were analyzed in relation to the socioemotional development of the study subjects.

Data were collected through face-to-face structured interviews conducted by the researcher using standardized questionnaires. The researcher underwent prior training to ensure uniformity in questionnaire administration and to minimize interviewer bias. All collected data were edited, coded, entered, and cleaned prior to analysis.

Univariate analysis was performed to describe the distribution of each variable. Bivariate analysis using the Chi-square test was conducted to examine the association between categorized screen time duration, parental factors, and socioemotional development, with a significance level set at $p < 0.05$. The Chi-square test was selected because all of the main variables were categorical. Due to the relatively small sample size, multivariable regression analysis was not performed; therefore, potential confounding effects could not be fully controlled, and this is acknowledged as a limitation. Ethical approval was obtained from the Research Ethics Committee of Poltekkes Kemenkes Kupang (No. LB.02.03/1/0216/2025), and written informed consent was obtained from all participants' parents or caregivers.

3. RESULTS AND DISCUSSION

This study involved 60 respondents who met the inclusion criteria. The results are presented as distributions of respondent characteristics and main study variables, and as the correlation between screen time duration and socioemotional development.

Table 1. Respondent characteristics.

Characteristics	Category	n	%
Age Group	21-30 years old	20	33.3
	31-40 years old	33	55.0
	41-50 years old	6	10.0
	61-70 years old	1	1.7
Occupation	Housewife	45	75.0
	Entrepreneur	5	8.3
	Civil Servant	4	6.7
	Farmer	5	8.3
	Others	1	1.7
Latest Education	Elementary School	11	18.3
	Junior High School	14	23.3
	High School/Vocational School	26	43.4
	D3/S1/S2	9	15.0

As shown in Table 1, most respondents were in early to middle adulthood, particularly those aged 31–40 years. The majority were homemakers, with only a small proportion working in other occupations such as entrepreneurship, civil service, farming, or other fields. In terms of educational background, most respondents had completed secondary education, while fewer had only primary education or higher education degrees.

Table 2. Distribution of screen time duration and socioemotional development

		Normal	Increasing Difficulties	High Difficulty	Extremely Difficult	Total
Screen Time Duration of Research Subjects	Normal	7	8	9	2	26
	Excessive	10	3	5	16	34
Total		17	11	14	18	60

Table 2 shows that children with excessive screen time were more likely to fall into the extremely difficult socioemotional category ($n = 16$) than those with normal screen time ($n = 2$). In contrast, children with normal screen time were more evenly distributed across the normal ($n = 7$), increasing difficulties ($n = 8$), and high difficulty ($n = 9$) categories. Overall, the extremely difficult category had the highest total proportion ($n = 18$), predominantly among children with excessive screen time.

Table 3. Chi-Square test of screen time duration and socioemotional development of research subjects.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.016 ^a	3	.003
Likelihood Ratio	15.375	3	.002
Linear-by-Linear Association	3.251	1	.071
N of Valid Cases	60		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.77

Table 3 shows the results of the Chi-Square test, which yielded a significant p-value of 0.003. Since the p-value is <0.05 , it can be concluded that there is a significant correlation between screen time duration and the socioemotional development of children aged 2–5 years in the working areas of the Sikumana and Tarus Community Health Centers. These results indicate that longer screen time is associated with a greater likelihood of children experiencing difficulties in their socioemotional development.

The present study found a significant association between excessive screen time and socioemotional difficulties among children aged 2–5 years. Children with excessive screen exposure were more frequently categorized as having extremely high socioemotional difficulties. However, the Linear-by-Linear Association test did not demonstrate a significant progressive trend, suggesting that the relationship between screen time and socioemotional development is not uniform across categories. These findings indicate an association rather than a causal effect and should be interpreted within the limitations of the cross-sectional design.

From a developmental perspective, early childhood (0–5 years) is widely recognized as a critical period of rapid brain growth in cognitive, emotional, and social domains (Malik & Marwaha, 2022). During this period, the amygdala develops earlier than the prefrontal cortex, which is responsible for emotional regulation and self-control (National Scientific Council on the Developing Child, 2004). Neural networks involved in socio-cognitive processes—such as the temporoparietal junction, precuneus, and medial prefrontal cortex—become increasingly specialized between three and five years of age (Richardson, Lisandrelli, Riobueno-Naylor, & Saxe, 2018). These theoretical perspectives provide a developmental context for understanding why environmental exposures, including digital media use, may be associated with variations in socioemotional functioning. However, given the study's design, the findings should not be interpreted as evidence that screen time directly alters neurodevelopment.

In daily life, excessive gadget use may reduce opportunities for face-to-face communication, cooperative play, and parent–child bonding (Do & McCoy, 2024). It may also interfere with sleep quality and physical activity, both of which are closely linked to emotional stability and behavioral regulation (Ferreira et al., 2020). The World Health Organization (2025) recommends limiting screen time to no more than one hour per day for children under five, emphasizing the importance of active play and responsive caregiving for optimal socioemotional development.

The absence of a significant linear trend further supports a multifactorial interpretation of socioemotional development. While excessive screen time was associated with greater difficulties, the relationship did not increase progressively across all categories. It suggests that socioemotional outcomes are likely influenced by multiple interacting factors beyond screen duration alone, including parenting practices, quality of social interaction, environmental stimulation, and the type of digital content consumed (Paris, Ricardo, & Rymond, 2019). Although parental characteristics such as education, occupation, and socioeconomic status were collected and described in this study.

Table 4. Chi-Square test of the association between respondents' latest education and the socioemotional development of the research subjects.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	28.598 ^a	12	.005
Likelihood Ratio	34.968	12	.000
Linear-by-Linear Association	9.883	1	.002
N of Valid Cases	60		

a. 17 cells (85.0%) have expected count less than 5. The minimum expected count is .37

Table 4 shows a significant association between parents' most recent educational level and children's socioemotional development (p -value = 0.005). This finding is supported by the Likelihood Ratio test and the Linear-by-Linear Association test, indicating a linear trend in which higher parental education is associated with better socioemotional development in children.

Previous research has consistently demonstrated that higher parental education and positive parenting practices are associated with better child mental health and socioemotional outcomes (Fakhrunnisak & Patria, 2022; Pravita, Novitawati, & Sari, 2025). Parent–child interaction quality, including emotional synchrony, has also been shown to support emotional regulation in early childhood (Bell, 2020). These findings suggest that parental and environmental factors may act as contextual influences or potential confounders in the relationship observed in this study.

Consistent with earlier studies, excessive screen exposure has been associated with increased emotional and behavioral problems in young children (Kaloeti et al., 2021; Liu et al., 2021; Muppalla, Vuppapapati, Reddy Pulliahgaru, & Sreenivasulu, 2023). Nevertheless, reverse causality cannot be ruled out; children with existing socioemotional difficulties may also be more likely to engage in higher screen use (Raman et al., 2017). Therefore, longitudinal studies are needed to clarify temporal relationships.

Early socioemotional difficulties have been linked to later academic challenges, poor school adjustment, and increased risk of mental health problems (National Scientific Council on the Developing Child, 2004; Schneider, Greenstreet, & Deoni, 2022). Although causal conclusions cannot be drawn, the present findings highlight the importance of monitoring screen time within community health settings (Baldwin, Arundell, & Hnatiuk, 2022). Community health centers may consider incorporating parental education on balanced digital

media use and promoting responsive parent–child interaction into early childhood development programs (Kemenkes RI, 2018). Such strategies should be framed as preventive and supportive measures rather than definitive interventions, given the observational nature of this study.

4. CONCLUSION

This study found a significant association between screen time duration and the socioemotional development of children aged 2–5 years in the working areas of Kupang. Most children were exposed to prolonged screen time, and socioemotional difficulties were more commonly observed among those with longer screen exposure. Statistical analysis confirmed that screen time duration was significantly related to children’s socioemotional development. Additionally, parental characteristics, particularly educational level, were also associated with children’s socioemotional outcomes. These findings indicate that screen time duration and parental factors are important determinants of socioemotional development in early childhood.

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