JIKM. 2025; 17 (3): 137-143
DOI: 10.52022/jikm.v17i3.778
p-ISSN: 2085-4366, e-ISSN: 2684-950X

**Jurnal Ilmiah Kesehatan Masyarakat:**
**Media Komunikasi Komunitas Kesehatan Masyarakat**

# The Relationship Between Gadget Use Behavior and Emotional Mental Disorders in Children in Surakarta

**Asy Syifa*, Tanjung Anitasari Indah Kusumaningrum**

*Public Health Study Program, Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, A. Yani Street, Pabelan, Kartasura, Surakarta, Postal Code 57162, Central Java, Indonesia*

***Abstract***

***Background:*** *Excessive use of digital devices has been significantly associated with adverse emotional and psychological outcomes in children, including heightened levels of anxiety and depressive symptoms. In line with these global findings, recent data from Surakarta, Indonesia, indicate that approximately 5.1% of children are affected by emotional mental disorders. The aim of this study was to analyze the relationship between gadget use and emotional mental disorders in children in Surakarta.*

***Method:*** *This study employed a cross-sectional design involving 139 children aged 4—5 years as observational subjects. Purposive sampling was conducted in August 2024. Data were collected using two questionnaires completed by the children's parents: one assessing gadget use behavior, and the other evaluating emotional and behavior difficulties based on the parent-report of the Strengths and Difficulties Questionnaire (SDQ). Data analysis was conducted using Fisher's exact test.*

***Results****: The findings indicate that 76.3% of children exhibited what was categorized as appropriate gadget use, defined in this study as a total score ranging from 1 to 38 on the parental questionnaire. Additionally, 77% of the children scored within the normal range on the Difficulties Scale (indicating no significant emotional or behavioral problems), while 87.1% obtained normal scores on the Strengths Scale, reflecting adequate prosocial behaviors. Statistical analysis using Fisher's Exact Test revealed a significant relationship between gadget use behavior and emotional mental disorders in children ($p < 0.001$).*

***Conclusion****: This study reveals a significant association between gadget use and emotional mental disorders in children in Surakarta.*

***Keywords****: Child, Emotional disturbances, Mental disorders, Preschool, Screen time.*

## INTRODUCTION

Emotional and behavioral problems have become increasingly prevalent in early childhood, with growing concern over the influence of digital media exposure on young children's mental development. During the early years (ages 0—6), children's brain undergoes rapid growth, making them highly sensitive to environmental stimuli. At this stage, family dynamics and community environments significantly shape cognitive, emotional, and social outcomes, which in turn, impact long-term psychological resilience and adaptability.[1]

In Indonesia, child development continues to face several structural challenges, including poverty, malnutrition, limited access to healthcare, and high rates of child abuse. Recently, emotional and behavioral disorders have gained attention as a critical developmental concern. These disorders can compromise a child's ability to interact socially, manage emotions, and perform academically, which are essential factors for lifelong well-being.[2] Emotional mental disorders in children may manifest in various forms, such as anxiety, stress, and depression. These conditions can trigger other health problems, including decreased immunity and increased risk of chronic diseases if not properly addressed.[3]

**Correspondence***: Asy Syifa
E-mail: syifaasy04@gmail.com

Received: March 13, 2025
Accepted: August 10, 2025
Published: August 26, 2025

Global data indicate a rising trend in childhood mental health disorders. An estimated 12—13% of children and adolescents worldwide experience such issues. In Singapore, approximately 12.5% of children aged 6—12 years old face emotional and behavioral difficulties. In the United States, over 1.5 million children and adolescents are reported to suffer from long-term developmental, emotional, and behavioral disorders.[4] This rising trend is mirrored in Indonesia, where the prevalence of mental disorders increased from 6.1% in 2013 to 9.8% in 2018.[5] In Central Java Province, the rate is reported at 7.7% and in Surakarta, it affects 5.51% of the total population.[6] These figures indicate that this concern also extends to smaller urban populations.

This tren warrants further investigation, particularly regarding modifiable risk factors. One key factor frequently linked to emotional and behavioral outcomes is children's use of digital devices, commonly referred to as "gadget use". In this study, gadget use refers to the frequency and duration of children's interactions with smartphones, tablets, or similar screen-based technologies, typically for entertainment or distraction.[7]

Existing literature has presented mixed findings. A study conducted in a kindergarten in Bandung Wetan found no significant relationship between screen use and emotional and mental status in children.[8] In contrast, research at Anna Husada Preschool in Bangkalan, East Java, reported a significant correlation between gadget exposure and emotional mental disorders among young children.[9] These contrasting results highlight the need for further investigation, particularly in urban settings like Surakarta, where digital access is growing, yet research on its psychological impacts remains limited. Given this context, this study aimed to examine the association between gadget use behavior and emotional mental disorders among preschool-aged children in Surakarta. The results are expected to contribute to the understanding of digital media's role in early childhood mental health and to inform strategies for prevention and early intervention in comparable settings.

## METHOD

### Participants and Study Design

This study employed a quantitative approach with a cross-sectional design. The target population comprised parents of children aged 4—5 years old residing in Surakarta City. Due to the lack of a definitive total population size, it was treated as an infinite population. The sample size was calculated using the Lemeshow formula for an infinite population, with the following parameters: a 95% confidence level (Z= 1.96), an anticipated population proportion (p) of 0.5 to maximize sample variability, and a margin of error (d) of 10%. Based on these values, the minimum required sample size was 100 respondents. To account for an estimated 30% non-response rate, the target sample size was increased to 150. However, after the data collection process, 11 incomplete responses were excluded, resulting in a final analytical sample of 139 respondents.

The sampling technique used was purposive sampling, with inclusion criteria: parents who owned and used a gadget (e.g., smartphone, tablet), having a child aged between 4 and 5 years, residing in Surakarta City. The exclusion criteria: children diagnosed with physical or neurological conditions unrelated to emotional or mental health, children who had never been exposed to gadgets.

### Measurement and Procedure

This study used two main instruments: a modified Gadget Use Behavior Questionnaire and the Indonesian version of the Strengths and Difficulties Questionnaire (SDQ). The Gadget Use Questionnaire was adapted from a validated instrument originally developed by Agustin, R.P. It comprised 15 items assessing key domains, including duration of gadget use, parental supervision, type of content accessed, and daily usage patterns. Although the questionnaire was modified to improve linguistic clarity and contextual relevance for the local population, the core structure and constructs remained consistent with the original version. Content validity and readability were pretested on 30 parents from a similar demographic prior to full distribution.

Each item used an ordinal response scale, with the total possible score ranging from 15 to 75. Lower scores indicated better or healthier gadget use behavior. To facilitate interpretation, the scores were classified based on predefined theoretical cutoffs into two categories: "good" (score: 1—38) and "poor" (score: 39—75). This categorization was determined a priori, based on theoretical and practical reconsideration rather than empirical distribution. No reverse scoring was applied, higher scores directly indicated poorer gadget use behavior

The Indonesian version of the Strengths and Difficulties Questionnaire (SDQ) was validated for use in Indonesian populations. The SDQ consists of 25 items across five subscales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behavior. It has demonstrated good psychometric properties in local studies and was completed by parents, who served as primary informants of children's behavior at home. No modifications were made to the SDQ in this study. All questionnaires were distributed in printed form to parents in five subdistricts of Surakarta, following approval from local authorities and coordination with public health officials.

Note: Gadget use scores are based on parental reports, categorized as appropriate (1–38) and inappropriate (39–75). Emotional and behavioral conditions were assessed using the parent-report version of the Strengths and Difficulties Questionnaire (SDQ). Difficulties Scale: Normal = 0–13; Borderline = 14–16; Abnormal = 17–40, Strengths Scale: Normal = 7–10; Below Normal = 0–6.

### Statistical Analysis and Ethics

The collected data were analyzed using statistical software free version. Data processing involved editing (to ensure completeness), coding, data entry, and cleaning. Univariate analysis was performed to describe respondents' sociodemographic characteristics and the distribution of study variables.

Prior to bivariate testing, normality tests were conducted to assess the distribution of the data. Based on the categorical nature of the variables and presence of several cells with small expected frequencies, Fisher's Exact Test was selected as the most appropriate method to examine the association between gadget use behavior and emotional mental disorders. A significance level of $p < 0.05$ was used to determine statistical significance. No multivariate analysis was conducted in this study due to its exploratory nature.

This study received ethical approval from the Health Research Ethics Committee of the Faculty of Universitas Muhammadiyah Surakarta (Certificate No. 384/KEPK-FIK/VI/2024). All participants were given clear explanations regarding the purpose of the study, and informed consent was obtained. The confidentiality of the data and anonymity of participants were strictly maintained in accordance with established ethical research standards

## RESULT

This study on the relationship between gadget use behavior and emotional mental disorders in children in Surakarta involved 139 respondents selected based on inclusion and exclusion criteria. The questionnaires were administered to parents to gather information about their children's gadget use patterns and emotional-behavioral conditions, based on parental observation. Table 1 presents the distribution of children's gadget use and their emotional mental status as reported by their parents.

Table 1 presents the distribution of children's gadget use behavior and their emotional mental status based on parental reports. The majority of children demonstrated appropriate gadget use (76.3%) and were classified as "normal" on the Difficulties Scale (77%) and the Strengths Scale (87.1%). However, a closer look at the data suggests that children with poor gadget use, comprising 23.7% of the samples, may be more likely to fall into "borderline" or "abnormal" categories of emotional functioning. For instance, 15.1% of all children were identified as "abnormal" on the Difficult Scale, a figure that may disproportionately represent those with inappropriate gadget use. This contrast highlights a potential association between poor gadget habits and increased risk of emotional and behavioral difficulties in early childhood.

Table 2 illustrates a significant association between gadget use behavior and emotional mental disorders as measured by the SDQ Difficulties Scale ($p < 0.001$). Children with poor gadget use were nearly three times more likely to be classified as "abnormal" (30.3%) compared to those with appropriate gadget use (10.4%). Similarly, only 51.5% of children with poor gadget use fell within the "normal" category, in contrast to 84.9% among those with appropriate gadget use. These findings indicate that poor gadget use behavior is strongly associated with increased emotional and behavioral difficulties in early childhood.

**Table 1. Distribution of Gadget Use and Emotional Mental Status in Children**

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| Gadget Use | | |
| Good | 106 | 76.3 |
| Poor | 33 | 23.7 |
| Difficulties Scale | | |
| Normal | 107 | 77 |
| Borderline | 11 | 7.9 |
| Abnormal | 21 | 15.1 |
| Strengths Scale | | |
| Normal | 121 | 87.1 |
| Borderline | 14 | 10.1 |
| Abnormal | 4 | 2.9 |
| **Total** | 139 | 100 |

**Table 2. Relationship Between Gadget Use Behavior and Emotional Mental Disorders (Difficulties Scale)**

| Gadget Use Behavior | Emotional Mental Disorders | | | | *p*-value |
|---|---|---|---|---|---|
| | Normal n (%) | Borderline n (%) | Abnormal n (%) | Total n (%) | |
| Good | 90 (84.9%) | 5 (4.7%) | 11 (10.4%) | 139 (100%) | <0.001 |
| Poor | 17 (51.5%) | 6 (18.2) | 10 (30.3%) | | |

**Table 3. Relationship Between Gadget Use Behavior and Emotional Mental Disorders (Strengths Scale)**

| Gadget Use Behavior | Emotional Mental Disorders | | | | *p*-value |
|---|---|---|---|---|---|
| | Normal n (%) | Borderline n (%) | Abnormal n (%) | Total n (%) | |
| Good | 99 (93.4%) | 4 (3.8%) | 3 (2.8%) | 139 (100%) | <0.001 |
| Poor | 22 (66.7%) | 10 (30.3%) | 1 (3%) | | |

Meanwhile, Table 3 demonstrates a clear association between gadget use behavior and prosocial functioning in children, as measured by the SDQ Strengths Scale ($p < 0.001$). Children with poor gadget use were nearly eight times more likely to fall into the borderline prosocial category (30.3%) compared to those with good gadget use (3.8%). Furthermore, the proportion of children in the normal prosocial range declined significantly from 93.4% in the good-use group to 66.7% in the poor-use group. These findings highlight the potential impact of excessive or unregulated gadget use on children's prosocial development. These findings demonstrate that good gadget use behavior is consistently associated with more optimal emotional mental development, both in terms of difficulties and strengths. This reinforces the importance of healthy gadget use patterns in maintaining emotional and mental balance.

## DISCUSSION

### Gadget Use Behavior and Emotional Mental Disorders

The study results showed a significant relationship between gadget use behavior and emotional mental disorders in early childhood. Excessive use of gadgets negatively affects children's mental health, particularly in emotion regulation and social interaction. Children who use gadgets within reasonable limits tend to have more stable emotional and mental conditions than those whose usage is

uncontrolled. Children with unregulated gadget use patterns are more prone to emotional regulation difficulties, leading to an increased risk of emotional mental disorders.

Based on the questionnaire results, behaviors such as tantrums, crying, or clinging to parents when left alone were the most frequently reported. These behaviors indicate regression or emotional dependence, suggesting barriers to the child's independence. This finding is consistent with a study by Rizkiah et al., which stated that excessive gadget exposure contributes to emotional regulation disorders. In addition, Mulyantari et al., emphasized that prolonged gadget use can cause social isolation and hinder the development of children's interpersonal skills.

### Relationship Between Gadget Use Behavior and Emotional Mental Disorders (Difficulties Scale)

On the Difficulties Scale, the hyperactivity subscale had a relatively high proportion. Hyperactive children tend to exhibit excessive physical activity, difficulty staying still for long periods, and trouble concentrating. These behaviors are often associated with self-control disorders that affect the child's ability to adapt to their environment. Uncontrolled gadget use can worsen hyperactivity symptoms, disrupt concentration, and increase anxiety in children.

Agustin and Immanuel stated that unsupervised gadget use in early childhood increases the risk of addiction and hinders cognitive and social development.[10] One commonly identified impact is the increased risk of attention-deficit hyperactivity disorder (ADHD) in preschool-aged children. Therefore, parental supervision in gadget use is crucial to minimize these negative effects.

### Relationship Between Gadget Use Behavior and Emotional Mental Disorders (Strengths Scale)

Based on the Strengths Scale, which assesses prosocial behavior, the most frequent issue reported was unfriendly behavior toward younger children. This behavior indicates egocentric tendencies, difficulty in understanding and showing empathy toward others, especially those younger.

Shofiah and Fauzi explain that egocentric behavior in early childhood can be understood through Piaget's theory of preoperational cognitive development, where children still view the world from their own perspective. A lack of social interaction also contributes to increased egocentric tendencies.[11] Meanwhile, Keke found that unsupervised gadget exposure could reduce children's empathy and increase egocentric behavior.[12] Therefore, parental intervention is necessary to help children develop better social skills and emotional regulation.

This study has important implications for managing children's emotional mental health in the digital era. Based on the questionnaire results, only 20 out of 139 children used gadgets for less than one hour per day, while the recommended limit for children aged 3—5 years is no more than one hour per day under parental supervision. The American and Canadian Association of Pediatrics[13] emphasized that well-controlled gadget use can provide educational benefits without negative impacts. Helmi et al., also provided screen time guidelines by age: none for children under 2 years old, less than 60 minutes for children aged 3—5 years, and a maximum of 60 minutes per day for children aged 6—8 years. With adequate supervision, technology can be utilized optimally without neglecting important aspects of child development.[14]

Lack of parental supervision in gadget use has significant consequences for children's growth and development. Parents play roles as regulators, supervisors, and companions in ensuring their children use technology wisely. Strategies that can be implemented include limiting screen time, monitoring content, providing alternative activities, accompanying children, and setting good examples in gadget use. Some alternative activities for children include outdoor play, reading books, and engaging in creative tasks like drawing or crafting. By offering various activities, children can more easily shift their attention away from gadget dependence.[15]

Literature suggests that the level of parental involvement, especially the mother's understanding, greatly influences children's emotional development. The broader a mother's knowledge in fostering her child's personality through stimulating activities and play without relying on digital devices, the more optimal the child's social development, emotional well-being, and mental health during the preschool stage will be.[16]

Educating parents about the risks of uncontrolled gadget use is a strategic step in reducing the prevalence of emotional and mental disorders in children. Jasmidalis et al., emphasized the importance of parental education in guiding and supervising children's gadget use to optimize their social and emotional development. Public health professionals can also utilize these findings to design

community-based intervention programs, such as parenting workshops and educational resources on managing gadget use in children. Media campaigns highlighting the importance of gadget supervision can also raise public awareness of this issue.[17] Parental involvement in supervising and interacting with their children during gadget use is crucial in preventing negative effects, as most gadget applications are not designed to enhance parent-child interaction. Therefore, for early childhood, parental engagement in selecting and accompanying the use of age-appropriate applications is essential.[18]

This study has several limitations that must be considered. The use of questionnaires as the sole data collection tool increases the risk of subjective bias. Therefore, future studies are recommended to implement a mixed-methods approach by combining quantitative and qualitative data. Direct observation and in-depth interviews can provide broader insights into gadget use patterns and their effects on children's mental health. Additionally, future research could include additional variables such as family economic conditions, parents' education levels, and school environment factors to gain a more comprehensive understanding of the impact of gadget use on early childhood.

## CONCLUSION

The findings of this study reveal a statistically significant association ($p < 0.001$) between children's gadget use patterns and their emotional-behavioral functioning. Children with high levels of screen exposure were linked to exhibit emotional dysregulation, difficulty sustaining attention, and reduced social engagement. In addition, poor gadget use habits were associated with tendencies toward hyperactivity and challenges in self-soothing behavior, all of which may hinder their emotional and social development. These outcomes underscore the importance of active parental monitoring and guidance in gadget use to minimize its potential adverse effects on children.

Parents are encouraged to play an active role in supervising and regulating their children's screen use. According to recommendations from the American and Canadian Pediatric Associations, children aged 3—5 years should be limited to no more than one hour of screen time per day, and this should be accompanied by active parental supervision to ensure age-appropriate, educational, and meaningful content. In addition, parents are advised to implement practical strategies such as co-viewing content with their children, enabling parental control settings, and establishing screen-free routines during meals and before bedtime. Instead of screen-based activities, parents can introduce enriching alternatives such as storytelling, drawing, playing outdoors, creative building games (e.g., blocks or puzzles), or family-based interactive games that stimulate emotional and social development

Public health officers, pediatric nurses, and community health educators are encouraged to collaborate with regional stakeholders, including the departments of public health, education, child protection, and communication and information, as well as early childhood education institutions, community health centers (in Indonesian: *puskesmas*), local NGOs, and family-oriented organizations. Based on the study findings, these actors can jointly design and implement targeted initiatives such as school-based parenting workshops, mobile health (mHealth) campaigns, structured digital literacy training, and integrated counselling modules within existing community programs. These efforts should aim not only to raise awareness of the risks associated with excessive gadget use but also to promote healthy screen habits and emotional well-being among young children through multisectoral and community-based approaches.

Future studies should consider using more diverse research methods, such as direct observation and in-depth interviews, to obtain more comprehensive data. Furthermore, subsequent research could include additional variables such as family environment dynamics and the role of schools in supporting children's emotional and mental development. This would provide deeper insight into the various factors influencing children's mental health in the digital era.

## REFERENCES

1. Yusuf RN, Khoeri NSTA Al, Herdiyanti GS, Nuraeni ED. Urgensi Pendidikan Anak Usia Dini Bagi Tumbuh Kembang Anak. Jurnal Plamboyan Edu (JPE). 2023;1(1):37–44.
2. Yonaevy U, Prananingrum R. Gangguan Mental Emosional Pada Anak Sekolah Dasar. Jurnal Ners. 2024;8(2):1607–12.
3. Devita Y. Prevalensi Masalah Mental Emosional Remaja di Kota Pekanbaru. Jurnal Keperawatan Priority. 2019;2(1).

4. Prihatiningsih E, Wijayanti Y. Gangguan Mental Emosional Siswa Sekolah Dasar. HIGEIA (Journal of Public Health Research and Development). 2019;3(2):252–62.
5. Badan Penelitian dan Pengembangan Kesehatan. Laporan Nasional Riskesdas 2018. Jakarta; 2019.
6. Badan Penelitian dan Pengembangan Kesehatan. Laporan Provinsi Jawa Tengah Riskesdas 2018. Jakarta; 2019.
7. Rizkiah A, Risanty RD, Mujiastuti R. Sistem Pendeteksi Dini Kesehatan Mental Emosional Anak Usia 4-17 Tahun Menggunakan Metode Forward Chaining. JUST IT: Jurnal Sistem Informasi, Teknologi Informasi Dan Komputer. 2020;10(2):83–93.
8. Mulyantari AI, Romadhona N, Nuripah G, Susanti Y, Respati T. Hubungan Kebiasaan Penggunaan Gadget dengan Status Mental Emosional pada Anak Usia Prasekolah. Jurnal Integrasi Kesehatan & Sains. 2019;1:10–5.
9. Qomari SN, Antina RR. Pengaruh paparan gadget terhadap risiko gangguan mental emotional anak di paud anna husada. Jurnal Ilmiah Obsgin. 2021;13(4).
10. Agustin KT, Immanuel AS. Literature review: Penggunaan Gawai Bagi Perkembangan Anak Usia Dini. Jurnal Review Pendidikan dan Pengajaran (JRPP). 2024;7(3):7593–605.
11. Shofiah AN, Fauzi. Pengembangan Kemampuan Kerjasama Anak Usia Dini Melalui Fun Games Circle. Jurnal Ilmiah Potensia. 2023;8(1):207–18.
12. Keke M, Habibi M, Rachmayani I. Dampak Penggunaan Gadget di Era New Normal Pada Perkembangan Sosial Emosional Anak. Journal of Classroom Action Research. 2023;5(1).
13. Adwiah AR, Diana RR. Strategi Orang Tua dalam Mengatasi Dampak Penggunaan Gadget terhadap Perkembangan Sosial Anak Usia Dini. Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini. 2023 May 10;7(2):2463–73.
14. Helmi, Hardiansyah R. Dampak Interaksi dengan Gadget Terhadap Perkembangan Emosi dan Sosial Anak Sekolah Dasar: Sebuah Tinjauan Literatur. Journal of Education and Culture. 2024;4(1).
15. Rawanita M, Mardhiah A. Strategi Orang Tua dalam Mengelola Penggunaan Gadget Anak Usia Dini di Gampong Tanjung Deah Darussalam. Wathan: Jurnal Ilmu Sosial dan Humaniora. 2024;1(3):274–94.
16. Wati DF, Putri MA. Overview Impact of Gadget on Mental Emotional Health of Preschool Age Children in Bukittinggi. Journal of Health Science and Medical Therapy. 2025 Jan 1;3(01):28–34.
17. Jasmidalis DAS, Purnamasari O, Zulhaini L. Edukasi Gadget Ramah Anak Usia Dini bagi Orang Tua. Murhum : Jurnal Pendidikan Anak Usia Dini. 2023 Jan 18;4(1):1–10.
18. Septyani RA, Lestari P, Suryawan A. Penggunaan Gadget pada Anak: Hubungan Pengawasan dan Interaksi Orang Tua terhadap Perkembangan Bicara dan Bahasa Anak. Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini. 2021 Sep 30;6(3):121–30.