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# THE EFFECT OF GADGET USE ON THE GROSS MOTOR DEVELOPMENT OF PRESCHOOL-AGED CHILDREN

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***Abstract***
*The use of gadgets by children from an early age, especially as a distraction tool, can have negative impacts on their development. Children tend to be less physically active, more reluctant to move, and more vulnerable to developmental disorders in motor, cognitive, social, and emotional areas. This researched to determine the effect of gadget use on gross motor development in children aged 4–6 years at Al-Hidayah Kindergarten Ngeni 02, Wonotirto District, Blitar Regency. This study used an analytical quantitative approach with a retrospective cohort research design. Data collection was conducted from April 11–18, 2025. The population in this study consisted of all students at Al-Hidayah Kindergarten Ngeni 02. A total of 55 children were selected using the total sampling technique. The instruments used were the Denver Developmental Screening Test (DDST) form and a modified gadget use questionnaire based on Khomsah (2023) and Wandella (2022), administered via Google Forms. Data were analyzed using the Chi-square test. Among children with moderate gadget use, 27.3% showed that 6% experienced development categorized as "suspect." Among children with high gadget use, 16.4% showed that 3.6% experienced development categorized as "suspect." Statistical test results indicated a p-value = 0.032. There is an influence of gadget use on the gross motor development of children aged 4–6 years at Al-Hidayah Kindergarten Ngeni 02, Wonotirto District, Blitar Regency.*
***Keywords:*** *Gadget; Early Childhood; Child Development*

## INTRODUCTION

Gadgets are currently a popular technology used by all age groups, including children in their golden age (Sihabuddin et al., 2023). Children under the age of five are often referred to as being in the golden age, a highly valuable developmental period. It is called the golden age because more than 100 billion brain cells are highly receptive to stimulation, making it a unique opportunity to maximize a child's potential an opportunity that cannot be repeated (Yusuf et al., 2023). UNICEF reported in 2019 that 27.5%, or approximately 3 million toddlers, experienced problems in motor development. Meanwhile, data from the Indonesian Ministry of Health in 2018 indicated that 11% of toddlers in Indonesia faced issues related to growth and development (Ariani & Noorratri, 2022). In 2019, the Indonesian Ministry of Health recorded that 13% of 1% of preschool children experienced problems with gross motor skills, while the East Java Provincial Health Office reported that 35% of preschool children experienced delays in gross motor development (Jenang, 2021).

Children are introduced to gadgets by their parents from an early age to calm them or to prevent them from playing outside, but excessive use can lead to dependency (Purwadi & Fitriyani, 2023). The impact of gadget use becomes more severe if the underlying causes are not addressed promptly. One of the risk factors that can affect a child's development is the habit of using gadgets

routinely on a daily basis. Excessive gadget use can lead to negative effects such as delayed motor development, a decline in cognitive abilities, reduced social skills, and emotional behaviors that are difficult to manage (Putri et al., 2024). The World Health Organization (WHO) states that children under the age of 5, especially those aged 1–4 years, should not be exposed to screens for more than one hour every day (Purwadi & Fitriyani, 2023).

A preliminary study at Al-Hidayah Kindergarten Ngeni 02, based on interviews with 10 respondents, found that 4 children (40%) already had their own gadgets, while the remaining 6 (60%) used their parents' devices. Among these 10 respondents, all reported that their children would become angry and cry when asked to give up the phone. One parent stated that their child uses a gadget upon waking up, during meals, and before going to bed. Although a previous study by Widiana et al. (2022) focused on the impact of gadget use on gross motor development in children aged 5–6 years and indicated a significant relationship—where longer gadget use was associated with decreased gross motor skills—this aligns with findings by Nisa (2024), who also identified a link between gadget use and both fine and gross motor development in children aged 2–5 years at Posyandu Kartini 12 D and E in Surabaya. However, the researcher is particularly interested in examining the effect of gadget use on the gross motor development of children aged 4–6 years at Al-Hidayah Kindergarten Ngeni 02, Wonotirto District, Blitar Regency, due to the absence of existing studies on child development in that specific location.

## METHODS

This study uses an analytical quantitative approach with a retrospective cohort design. In a retrospective cohort study, both risk factors and outcomes or diseases have occurred prior to the study being conducted, and these variables are analyzed based on historical data. Therefore, research with this design can only be carried out if information regarding the risk factors has been well documented from the beginning of exposure in a population that experiences the effects when the observation begins (Boru Haloho & Legiran, 2023). Through this design, the effects on the gross motor development of children aged 4–6 years are observed in the present, while the risk factor of gadget use is examined to determine whether it exists or has ever existed in the past.

The research was conducted at Al-Hidayah Kindergarten Ngeni 02, located in Ngeni Village, Wonotirto District, Blitar Regency, from April 11 to 18, 2025. The population used in this study consisted of all students at Al-Hidayah Kindergarten Ngeni 02. The sample size was 55 students, consisting of 29 students from TK A and 26 students from TK B. The sample was determined using a total sampling technique. The instrument for measuring gadget use in children was modified from the questionnaire of Khomsah (2023) and Wandella (2022), which had been tested for validity and reliability. Items were considered valid with a correlation >0.30 and reliable with a Cronbach's Alpha value >0.70. The questionnaire consisted of 7 questions, with 3 main items to measure gadget use and 4 additional questions. The tool used to measure the gross motor

development of children aged 4–6 years was the Denver Development Screening Test (DDST), which includes 10 gross motor skills tests. The equipment used for the DDST procedure includes a plastic soccer ball, adhesive/plaster, and 22 cm paper. The use of the questionnaire instrument aligns with the study to be conducted, and the Denver Development Screening Test (DDST) form is standardized, ensuring its validity.

## RESULTS

Based on the findings of the study on the impact of gadget use on the gross motor development of children aged 4–6 years at Al-Hidayah Kindergarten Ngeni 02, Wonotirto District, Blitar Regency, the following results were obtained:

**Table 1. Frequency Distribution of Data Obtained from the Study**

| Variable | Frequency | Percentage (%) |
|---|---|---|
| Low gadget use | 31 | 56,4 |
| Moderate gadget use | 15 | 27,3 |
| High gadget use | 9 | 16,4 |
| Normal gross motor development | 33 | 60 |
| Suspect gross motor development | 22 | 40 |

Source: Research data, 2025

Based on Table 1, it indicates that the students of Al-Hidayah Kindergarten Ngeni 02 use gadgets in the low category, with 31 children (56.4%), while in the moderate category there are 15 children (27.3%), and in the high category, there are 9 children (16.4%). As for the gross motor development of the students at Al-Hidayah Kindergarten Ngeni 02, 33 respondents (60%) are in the normal category, while 22 children (40%) are in the suspect category when performing DDST developmental tasks on gross motor aspects.

**Table 2. Research analysis results**

| The influence between variables | | Gross motor development (Y) | | | | | | P-Value |
|---|---|---|---|---|---|---|---|---|
| | | Normal | | Suspect | | Total | | |
| | | f (n) | % | f (n) | % | f (n) | % | |
| **Gadget use (X)** | Low | 22 | 18.6 | 9 | 12.4 | 31 | 31.0 | 0.032 |
| | Moderate | 9 | 9 | 6 | 6 | 15 | 15.0 | |
| | High | 2 | 5.4 | 7 | 3.6 | 9 | 9.0 | |
| **Total** | | 33 | 33.0 | 22 | 22.0 | 55 | 55.0 | |

Source: Research data, 2025

Based on Table 2, of the 55 respondents, the majority of children with low gadget usage intensity showed normal gross motor development, with 22 children (18.6%). Meanwhile, gadget usage with moderate and high intensity

tended to correlate with an increase in the number of children in the suspect category. The Chi-square test results for the 55 respondents indicated a p-value of 0.032, which is smaller than 0.05, indicating a significant relationship between gadget use and the gross motor development of children aged 4–6 years at Al-Hidayah Kindergarten Ngeni 02.

## DISCUSSIONS

Based on Table 1, it was revealed that of the total students at Al-Hidayah Kindergarten Ngeni 02, 31 children (56.4%) were in the low gadget usage category, 15 children (27.3%) were in the moderate category, and 9 children (16.4%) were in the high category. This finding aligns with the research by Agustin et al. (2021), which indicated that an increase in gadget usage intensity correlates with a decline in children's gross motor skills. Similarly, Elka Fitri et al. (2022) highlighted the role of parents in regulating the duration of gadget use for preschool children, as prolonged usage can impact various aspects of a child's development. As for the gross motor development data of the students at Al-Hidayah Kindergarten Ngeni 02, 33 respondents (60%) were in the normal category, while 22 children (40%) were in the suspect category when performing DDST developmental tasks on gross motor aspects. According to Khadijah et al. (2022), the aspects of growth and development reflect the process of individual formation, both physically and mentally. The role of parents is crucial in supporting a child's success, as they are the first figures admired and looked up to by the child. Through interaction with parents, children begin to understand the world around them and develop various aspects of their personality. Each aspect of early childhood development is interconnected; if one aspect does not develop optimally, it can affect other aspects of development.

The findings of this study align with the research by Daro et al. (2022) on the growth and development of preschool children at the Posyandu in Seketeng Subdistrict, Sumbawa, which stated that the most common developmental status among children was normal. This suggests that parents are attentive to their children's growth and development. Parents are the primary factor in a child's success. In terms of occupation, most are housewives, giving them more time to spend with their children. Based on the research findings, there were children categorized as suspect during the developmental task monitoring in the gross motor aspect. This could be due to a lack of stimulation, which leads to less optimal development. Factors such as insufficient parental attention to a child's development can trigger delays in developmental stages. Parents who are too busy with their work may have less time to spend with their children. The findings of this study indicate that children with low gadget usage are more prevalent, but there are still many children who use gadgets in the moderate or high category. Parents who are overly busy with household chores or work may allow their children to play with gadgets freely, as they do not want their work to be disrupted. The role of parents is crucial in a child's life, which is why careful attention should be given to gadget use to ensure optimal child development.

Based on the research findings involving 55 child respondents, an analysis of the relationship between variables was conducted using the Chi-Square test with the assistance of SPSS version 20. The analysis results indicated a p-value of 0.032. Since this value is smaller than the significance threshold of 0.05, the null hypothesis (H0) was rejected, meaning there is a significant relationship between gadget use and children's gross motor development. Therefore, gadget usage has an impact on the development of children aged 4-6 years at Al-Hidayah Kindergarten Ngeni 02. Children under the age of five can indeed use gadgets, but the usage time should be limited. For example, gadget use should only be allowed for 30 minutes during leisure time, such as on weekends. Outside of this time, children should remain actively engaged with their surroundings. The apps used should be educational, such as those for color, shape, or sound recognition. As children age and enter the pre-adolescent stage, parents can give them a little more freedom in gadget usage (Yumarni, 2022). The findings of this study align with the research by Syaifuddin et al. (2024), which indicated a connection between gadget usage and preschool children's motor development, leading to disruptions in motor development. This finding supports the research conducted by Agustin et al. (2021), which stated that as the intensity of gadget use increases, children's gross motor skills decrease. This study suggests that excessive gadget usage can hinder the growth of children aged 4-6 years, as gadgets make children less interested in traditional games or other activities. Increased gadget usage makes children reluctant to engage in physical activities, as they become more absorbed in their devices. The resulting impact is that children tend to prefer sitting still and playing with gadgets, which impedes their gross motor development.

## CONCLUSSION

There is an influence of gadget usage on the gross motor development of children aged 4-6 years at Al-Hidayah Kindergarten Ngeni 02, Wonotirto District, Blitar Regency.

The findings of this study suggest that excessive use of gadgets negatively impacts the gross motor development of children. Children with higher levels of gadget use tend to show delays in their gross motor skills. Parents play a crucial role in regulating the duration and content of gadget usage. Limiting gadget usage to educational and brief sessions can help optimize children's physical development. It is important for parents to actively engage with their children in physical and social activities to support their overall development. Future interventions should focus on educating parents and caregivers on the balance between technology use and active play to ensure healthy growth and development during the early childhood years.

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