

The Effect of Using Gadget as a Parenting Method for Preschoolers on Their Cognitive and Emotional Developments

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Abstract: Preschool is a crucial parenting period for parents to monitoring the children on their cognitive and emotional developments. Recently, the using gadget is one of the parenting methods chosen by parents to their children in preschool. This study aims to evaluate the relationship between the using gadget duration and respectively with several parameters such as body weight, cognitive development, and emotional risk level. The methodology used in this study is a cross-sectional correlation study. The statistical analysis was conducted by using Spearman's rho correlation test with a p -value < 0.05 . The duration of using gadget was divided into two groups, namely group 1 (less than 2 hours) and group 2 (more than 2 hours). The results showed that the group 1 of using gadget in moderate duration presented on the ideal body weight (10-20 kg) of 92 %, the good cognitive development level of 36 %, and the moderate emotional risk level of 60 %. Meanwhile, on the group 2 of using gadget in over duration showed the ideal body weight (10-20 kg) of 76 %, the good cognitive development level of 4 %, and the moderate emotional risk level of 96 %. In conclusion, a parenting method by using gadget for less than 2 hours has a positive effect on children in preschool because they have the good cognitive development as well as the emotionality.

Keywords: Cognitive, Emotionality, Gadget, Parenting, Preschool.

Resumo: A fase pré-escolar é crucial para os pais monitorarem o desenvolvimento cognitivo e emocional dos filhos. Recentemente, o uso de dispositivos eletrônicos tem sido um dos métodos escolhidos pelos pais para auxiliar crianças em idade pré-escolar. Este estudo teve como objetivo avaliar a relação entre a duração do uso desses dispositivos e diversos parâmetros, como peso corporal, desenvolvimento cognitivo e nível de risco emocional. A metodologia utilizada foi um estudo transversal correlacional. A análise estatística foi realizada por meio do teste de correlação de Spearman, com valor de $p < 0,05$. A duração do uso dos dispositivos foi dividida em dois grupos: grupo 1 (menos de 2 h) e grupo 2 (mais de 2 h). Os resultados mostraram que o grupo 1, que utilizou os dispositivos por um período moderado, apresentou 92 % de massa corporal ideal (10-20 kg), 36 % de bom nível de desenvolvimento cognitivo e 60 % de nível moderado de risco emocional. Enquanto isso, no grupo 2, que utilizou dispositivos eletrônicos por um período prolongado, observou-se um peso corporal ideal (10-20 kg) em 76 % das crianças, um bom nível de desenvolvimento cognitivo em 4 % e um nível moderado de risco emocional em 96%. Em conclusão, um método de parentalidade que utiliza dispositivos eletrônicos por menos de 2 horas tem um efeito positivo em crianças em idade pré-escolar, pois promove um bom desenvolvimento cognitivo e emocional.

Palavras-chave: Cognitivo, Emocionalidade, Dispositivos Eletrônicos, Educação Parental, Pré-escola.

1. Introduction

Preschool period is a crucial childhood started from 3 to 6 years old [1]. There are two reasons why the preschool is a crucial period for the children as well as the parents. First, in this period commonly called as a golden age. It means in this time, the kid's brain works more active to build a foundation for the future life. The second is their cognitive and emotional developments influenced by using gadget recently [2]. *World Health Organization* (WHO) reported that preschool-aged children had the risk of cognitive and emotional dysfunctions up to 5-25 %. Globally, the prevalence of behavioral disorders and emotional vulnerability in children is from 9 % to 15 %. In

Indonesia, the Ministry of Health reported that 16 % of children in preschool had the growth and development problems.

Based on this condition, parents have an important role to monitoring their physical, cognitive, and emotional risk after using gadget as an early detection. Furthermore, parents is a main supporter on the growth and development their children [3]. Therefore, the parenting method is focus on regulating the emotional children to increasing their creativity in long-term [4]. The effective parenting method plays significant role for shaping the personality, character, and cognitive development [5]. Moreover, the parenting method should be focused on the

communication between parents and children. Because the communication can significantly improve the social, emotional, and cognitive development in early childhood. Lately, the using gadget for children was reported the negative effects for their psychosocial [6].

On the other hand, the using gadget is one of the parenting methods chosen by parents recently. There are several aims why the parents choose this method: to prevent the tantrum condition, to make their kids more manageable, and to prevent disruption when the parents on duties. However, they usually give the gadget excessively in a long duration. This condition can influence on the cognitive and emotional development [7]. Furthermore, the using gadget for preschoolers in long-term can influence their social interaction [8].

The previously study reported that there are the negative and positive effects of using gadget for children in preschool [9]. One of the negative effects is the phenomenon of using gadget increasingly worrying as evidenced by their abilities to adapt the technology and the tools quickly [10]. Furthermore, the using gadget frequently make them more addiction both on physical and mentally. Their impulses are lack and uncontrollable [11]. However, the positive impacts can improve their cognitive skills such as the broader insight, the better fine motor skills, and the children can reach the more languages from the several countries [12].

Unlike an adult, the cognitive and communication abilities of the preschoolers are immature. They need additional support from the parents to stimulate their brain to improve the growth and development [13]. Although the educational content can help their vocabularies and listening skills, they have to under parental control. Because of the over user, it makes either the speech delay or lack of social interaction [14].

Furthermore, the using gadget can create the behavioral disorders emotionally such as aggression, difficulty to regulate the emotions, and lack of empathy to the surrounding [15]. Cognitively, children who use gadget excessively make their focus is not good because of the screen addiction. Although the previous study showed that the using gadget is good to stimulate the creativity and support the learning process children in preschool [16]. Hence, the right parenting method is very necessary for children in preschool to keep them on the growth track. The parents should be used the gentle parenting to direct their children on the positive behavior and also do the earlier detection to check their growth and development. According to the literatures, this study focuses on evaluating the correlation analysis of the using gadget duration and respectively with several parameters such as body weight, cognitive development, and emotional risk level. Hopefully, the result will give a recommendation for the parents especially to choose their parenting methods selectively.

2. Material and methods

2.1. The study design and participants

In this study, the research was designed by a cross-sectional correlation study between the using gadget duration and several parameters such as the body weight, cognitive development, and emotional risk level, respectively. The population in this study was children in preschool started from 3 to 6 years old who were in one of the kindergartens in the Banjarsari sub-district, Surakarta. The respondents in this study were 50 children by using the random sampling method. The research inclusion criteria: children who were given gadgets either for less than 2 hours or more than 2 hours. The exclusion criteria: children who had tantrums and in not good condition. The research respondents were divided into 2 groups according to the duration of using gadget. The validated instrument by using the questionnaire. This research has been approved by the Research Ethics Committee of the Faculty of Health Science, Universitas Kusuma Husada Surakarta, Indonesia with No.2972/UKH.I.02/EC/VIII/2025.

2.2. Statistical analysis

The measurement data is presented as a frequency table of respondents according to the category of each parameter described in each group. Each group was tested by using Spearman's rho correlation test with a p -value <0.05 , indicating a relationship.

3. Results and discussion

The results showed the respondent characteristics data based on the gender and the age as presented in Table 1. Of the total of 50 children in preschool, the number of boys is 29 (58 %) and the girls are 21 (42 %). According to the age, both the 5 and 6 years old are dominant of 21 (42 %), respectively.

Table 1. The respondent characteristics data based on the gender and age.

	Category	Frequency	Presentation (%)
Gender	Boy	29	58,0
	Girl	21	42,0
Total		50	100,0
Age	4 years	8	16,0
	5 years	21	42,0
	6 years	21	42,0
Total		50	100,0

Source: Authors (2021)

3.1. The Relationship Between the Using Gadget Duration and Children's Body Weight

Table 2. The correlation analysis data between the using gadget duration and children's body weight.

Duration of using gadget	Body weight			Total	P value
	< 10 kg	10 – 22 kg	>22 kg	n	
	n	n	n		
< 2 hours	-	23	2	25	0,001
>2 hours	-	19	6	25	

Source: Authors (2021)

As presented in Table 2, the results showed that the group 1 means the total of children who used gadget for less than 2 hours had an ideal body weight on 10-22 kg are of 23 (92 %). Meanwhile, the total of children who had an excess weight more than 22 kg are of 2 (8 %). Then, the group 2 means the total of children who used gadget for more than 2 hours had an ideal body weight are of 19 (76 %). And the total of children who had an excess weight are of 6 (24 %). The results of the statistical test showed a p-value of 0.001 ($p < 0.05$), which indicates a significant relationship between the duration of using gadget and children's body weight parameter.

3.2. The Relationship Between the Using Gadget Duration and Children's Cognitive Development

Table 3. The correlation analysis data between the using gadget duration and children's cognitive development

Duration of using gadget	Cognitive Development Level			Total	P value
	Poor	Sufficient	Good	n	
	n	n	n		
< 2 hours	2	14	9	25	0,017
>2 hours	7	17	1	25	

Source: Authors (2021)

Based on Table 3, the results showed that the total of preschoolers who use gadget for less than 2 hours per day mostly have a cognitive ability in the "sufficient" category, are of 14 children (56%), and the "good" category, are of 9 children (36%). Meanwhile, the total of preschoolers who use gadget for more than 2 hours per day have the lower cognitive development, are of 17 children (68 %) in the "sufficient" category and only 1 (4 %) child is in the "good" category. The results of the nonparametric test with Spearman's rho test showed a p-value of 0.017 ($p < 0.05$). It means there is a significant relationship between the duration of using gadget and children's cognitive development.

3.3. The Relationship Between the Using Gadget and Children's Emotional Level

Table 4. The correlation analysis data between the using gadget and children's emotional levels.

Duration of using gadget	Cognitive Development Level			Total	P value
	Low Risk	Moderate Risk	High Risk	n	
	n	n	n		
< 2 hours	10	15	-	25	0,007
>2 hours	1	24	-	25	

Source: Authors (2021)

The correlation analysis data between the using gadget and emotional risk level on children has been presented in Table 4. The results showed that from the total of 50 respondents, the total of children in the "moderate risk" on the emotional level category are of 39 children and in the "low risk" are of 11 children. Interestingly, the total of children who use gadget for less than 2 hours per day are of 15 (60 %) are in the "moderate risk" on the emotional level category and of the 10 children are in the "low risk". On the other hand, the total of children who use gadget for more than 2 hours per day are 24 children (96 %) reported in the "moderate risk" on the emotional level category and only 1 child is the "low risk". The results of the nonparametric test with the Spearman's rho test showed a p-value of 0.007 ($p < 0.05$). It can be interpreted that there is a significant relationship between the duration of using gadget and children's emotional levels.

Interestingly, children in preschool have a strong curiosity to understand and explore the surrounding actively. The preschoolers often ask questions like "what" and "why", so the parents need to explain everything clearly and easily. Furthermore, the parents sometimes don't have much time to answer their children's questions. Based on this condition, many parents adopt a parenting method that involves using gadget for their children. Unfortunately, the using gadget is unsupervised parent and no limited neither term nor access.

Previously, the research reported that the 58 % of boys in preschool which have age range of 5 to 6 years old is more adaptive to use gadget than that of the girls. This result showed that the boys have a deep tendency to the digital screen. Therefore, the boys have the stronger visual-motor activity than that of the girls [17]. However, the children (3-6 years old) who frequently used the gadget will get the negative behavior symptoms such as more hyperactivity, lower concentration, and other behavior disorders. In this current study, the children who used gadget for more than 2 h had the higher body weight of 24 % compared to children who used gadget for less than 2 h (8 %). According to this result, the using of gadget for preschoolers can affect the body weight. Because the more often and longer a child with his gadget, the greater pattern of being overweight or obese [18].

Hence, there is a strong correlation between the duration of using gadget and the obesity [19]. Moreover, the dependency to gadget can give the negative impacts on children's lifestyle, such as disrupting eating patterns and daily routine activities which can increase the risk of overweight and obesity [20]. The preschool children who spend extra time to use gadget have the higher risk of obesity than children who do not. In addition, the using gadget in every 60-minutes a day can increase the risk of obesity level of 10 % [21].

Currently, this research reported that there is a correlation between the duration of using gadget for the preschoolers and their cognitive developments. The result presented that the children who used gadget for less than 2 hours have the better cognitive development at the sufficient and good levels. Meanwhile, the children who used gadget for more than 2 hours have a cognitive development at the sufficient and poor levels. A cognitive development in preschool is the crucial process of improving children's ability to think, understand, and solve problems. Therefore, the using gadget significantly impacts the children's cognitive development in preschool [22]. However, the more using gadget can lead to the negative behaviours for children, such as the decreasing ability to think, concentrate, focus, study, learn and so on. A poor concentration on children makes them more hyperactivity and also difficulty to focus on the one thing. Additionally, the decreasing of academic achievement might be happened because of their laziness to study in school [23]. Moreover, the other negative impact is to be an individualism person due to they focus on their gadget only for a long-term without interaction socially.

In addition, this study revealed a correlation between the duration of using gadget and the emotional risk level of children in preschool. The children who used gadget for less than 2 hours had the better emotional level compared to children who used gadget for more than 2 hours. Previously, the research studies indicate that the children with low emotional and psychosocial developments have a habit of playing gadgets limitless [24]. For children in preschool, their emotional levels are influenced by the duration of using gadget. The higher duration of using gadget, the more emotional reactivity level [25]. The ability of emotional control is a crucial part for preschoolers. This ability can be built by the parent's support fully. One of the kind supports is the way to limit their access to gadget. The limiting of using gadget can help the children to decrease the emotional problems. Thus, the parents can help their children to improving and optimizing their social-emotional function. It can be potential to reduce the risk of psychopathology in the future.

4. Conclusion

The right parenting method applied to the preschoolers is a crucial part for their better future. The parents have a responsibility to apply a good parenting style to their children. Nowadays, the using of gadget is one of the parenting styles

chosen the parents. The using gadget for children in preschool has a strong relationship with the cognitive and emotional developments. Of course, the screen time give the educational and interactive activities for the children. Moreover, it can stimulate the development of the languages, memories, and problem-solving skills. However, the over screen time for the children makes them on the serious problems such as obesity because of lack movement, low concentration, poor social skill, and the other problems on the cognitive and emotional developments. In conclusion, the effect of using gadget as a parenting method for preschoolers is not always the worse thing. For recommendation, the parent's support is needed to accompany and limit the children while the devices are accessed.

4.1. Ethical Considerations

The rules and regulations established by the UKH Faculty of Health Sciences Ethics Committee, No. 2972/UKH.L.02/EC/VIII/2025, were adhered to throughout the study. All information and data collection were kept confidential. Participants remained anonymous throughout the study. Subjects were informed that the study would not cause any harm.

4.2. Conflict of Interest

The authors declare no conflict of interest.

4.3. Acknowledgements

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