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RELATIONSHIP BETWEEN GADGET USAGE AND COGNITIVE DEVELOPMENT OF PRESCHOOL

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ABSTRACT

Approximately 79% of Indonesian children have used gadgets. Such use can have an impact on child development at preschool age, especially cognitive development. At the golden age, children experience 80% brain development which makes it easy for children to absorb information that occurs around them. Cognitive is the way children adapt and define objects and events in their environment. The purpose of this study is to identify patterns of gadget use, identify cognitive development, and identify the relationship between gadget use and cognitive development of preschool children at Kemala Bhayangkari 43 Jatinangor Kindergarten. Method: This research is quantitative with a correlational approach and uses a total sampling method of 34 respondents at Kemala Bhayangkari 43 Jatinangor Kindergarten. The measuring instrument used is the Gadget Use Pattern instrument in children with a validity value of 0.388 and a reliability of 0.666 and the Preschool Child Cognitive Development instrument (5-6 Years) with a validity value above 0.4 and a reliability result of 0.780 which means that these two instruments are valid and reliable. Data analysis used in this study used univariate and bivariate analysis with fisher's extract test. Results: The results of the univariate test on gadget use in children fall into the quite good category with the results of 23 respondents (67.6%) and cognitive development in children falls into the good category with the results of 25 respondents (73.5%). The bivariate test results using fisher's extract test with sig. (2-tailed) is 0.670 (>0.05). Conclusions: Based on the results of this study, it can be concluded that there is no relationship between the use of gadgets and the cognitive development of preschool children (5-6 years old) at Kemala Bhayangkari 43 Jatinangor Kindergarten.

Keywords: cognitive; gadgets; preschoolers

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INTRODUCTION

The evolution of the times continues to go hand in hand with the advancement of Science and Technology at the level of society where many people have used gadgets (Rosiyanti & Muthmainnah, 2018). Gadgets are tools that can make it easier for humans to get information, with a shape that is not large, can be carried everywhere, and makes it easy to get information from all places and all times. Gadgets can be in the form of laptops, cellphones, tablets, and others. With the benefits offered by gadgets, the development of gadgets globally is relatively rapid (Gusnadi et al., 2021). According to Statistic Center Indonesia (BPS) in 2022, 67.88% of Indonesians have owned and controlled gadgets due to the COVID-19 pandemic. BPS said that the western provinces of Indonesia tend to have higher ownership values than the eastern provinces (Badan Pusat Statistik Indonesia, 2022). Through the Indonesian Child Protection Commission (KPAI) in 2021, 79% of parents allow their children to use gadgets. Of this

figure 71.3% of children have their own gadgets (Komisi Perlindungan Anak, 2021). As much as 33.44% of gadgets have been used by preschoolers (Badan Pusat Statistik Indonesia, 2022). KPAI data shows that 79% of children do not have rules of use that are applied together with parents in using gadgets. This can be seen from the use of gadgets outside of learning interests for 1-2 hours / day with a total of 36.5%, 2-5 hours / day with a total of 34.8%, and even more than 5 hours / day with a total of 25.4% (Komisi Perlindungan Anak, 2021).

Gadget usage in fact has an impact on children. The impact of gadget use consists of positive impacts and negative impacts. The positive impact of using gadgets on children is that children are easier to gain new knowledge, such as getting new vocabulary and imitating movements and songs. Negative impacts that can arise are decreased concentration, loss of focus and decreased learning achievement (Harsela & Qalbi, 2020). The impacts mentioned are in fact part of the achievement aspects of cognitive development. The good or bad impact of the use of this gadget can arise depending on the policy in its use. According to the 2014 Regulation of the Indonesian Minister of National Education and Culture (Kemendikbud RI) No. 137 of 2014, child development includes aspects of religion and morals, physical-motor, cognitive, language, social-emotional, and art (Kementrian Pendidikan Nasional RI, 2014). According to Latifah (2017), the cognitive aspect is the ability to think and solve problems. The development of cognitive aspects is influenced by the development of central nerve cells. The left brain is related to skills in rational, scientific, logical, critical, and analytical thinking related to activities such as reading, counting, and language learning. Meanwhile, the right brain is closely related to intuitive, holistic imaginative which includes activities such as painting, playing music, and handicrafts.

Among children, the "golden phase" is the fastest phase of development in the child's brain. The child's brain in this phase experiences approximately 80% development which occurs at the age of 0-6 years or commonly referred to as the early childhood range which at the age of 5-6 years is a child with a preschool age category. With the development of 80% in the child's brain, the child easily absorbs all the good or bad information that occurs around them (Azijah & Adawiyah, 2020). Considering the significant development that occurs in children's brains at this age and the amount of information that can be obtained through gadgets beyond the good and bad information, cognitive formation in children is one of the developments that must be considered. The role of nurses is important in contributing to the provision of holistic care to children by understanding all aspects of development that occur in children. In the context of nursing, nurses have a role in providing nursing care to healthy children oriented towards preventive (prevention) and promotive (health promotion) efforts. This can be done by conducting an assessment of child development as in Tampubolon et al.'s research, 2021. Nurses are important to know the assessment of child development because if there are developmental delays in children, developmental stimulation will be carried out immediately in providing nursing care (Tampubolon et al., 2021).

In a study conducted in Alberta and Ontario, Canada by Zhang et al. (2021)with the title "Associations between screen time and cognitive development in preschoolers" with 97 participants, it was found that there was a relationship between screen time and cognitive development in the form of preschool children. Meanwhile, in the research of Maulia et al. (2020) with the title "The Relationship between Gadget Playing Patterns with Cognitive Ability and Creative Thinking in Preschool Age Children (5-6 Years) at TK-Aisyiyah Bustanul Athfal 33 Cita Insani Malang" found that there was no relationship between gadget playing patterns and cognitive abilities in preschool age children (aged 5-6 years) at TK-Aisyiyah Bustanul Athfal 33 Cita Insani Malang. Based on the results of these studies, there

are differences in results such as whether or not there is a relationship between gadget use and children's cognitive development. Differences in the results of this study can occur due to several differences that occur such as the use of instruments, population, and research time. So that makes the author want to do research again with different instruments, populations, and research times in this study.

This research is also supported by a preliminary study conducted on five mothers at Kemala Bhayangkari 43 Jatinangor Kindergarten that, the children stated that their children's activities with their gadgets include playing games, watching YouTube, and playing social media with an average of 3-4 hours per day. Parents at Kemala Bhayangkari 43 Kindergarten gave examples of games played by their children in the form of car racing, Roblox, and Sakura. Based on information released in 2022, Sakura and Roblox games were suspected of violating laws and regulations because there were adult scenes even though the games were games intended for children (Haryanto, 2022). In addition, some parents say that gadgets can help children in learning. Based on the background, the rapid growth of gadgets, especially in preschool children, needs special attention. The difference in results from previous studies by Zhang et al. (2021) and Maulia et al. (2020) made researchers interested in conducting this research. Researchers will conduct research with novelty from previous studies, namely related to the population and instruments used. This research is expected to be useful as an early detection by those who study such as nursing who acts as an educator by involving teachers or schools and parents regarding the impact of gadget use, especially on cognitive development, the limit of gadget use that should be in children, and the stimulus that can be given. The purpose of this study is to identify patterns of gadget use, identify cognitive development, and identify the relationship between gadget use and cognitive development of preschool children at Kemala Bhayangkari 43 Jatinangor Kindergarten.

METHOD

This study uses quantitative research with correlation research design and cross sectional approach. The variables in this study include independent and dependent variables. The independent variable is the use of gadgets in preschool children at Kemala Bhayangkari 43 Jatinangor Kindergarten with instruments quoted from Maulia et al. (2020) with a validity value of 0.388 and a reliability value of 0.666. The dependent variable is the cognitive development of preschool children at Kemala Bhayangkari 43 Jatinangor Kindergarten with instruments quoted from Chairilsyah (2018) with validity test results above 0.4 and reliability test of 0.780. The population of this study were 34 preschool children (5-6 years old) who used gadgets at Kemala Bhayangkari 43 Kindergarten. This study used a total sampling technique with data collection carried out to parents, teachers, and children using an observation sheet conducted on May 8-14, 2024. Data collection using questionnaires given to parents with assistance from teachers and child development questionnaires filled in directly by teachers. Observations on children were carried out every break time in kindergarten where researchers collected data by guiding children to understand the observation sheet. This study has also received ethical approval Number: 01/KEKP/FITKes-Unjani/V/2024 obtained from the Health Research Ethics Committee of the Faculty of Health Sciences and Technology, Jenderal Achmad Yani University. During the study, the researcher applied respect for autonomy, confidentiality, justice, and beneficence and nonmaleficence.

Categorization of the gadget use instrument based on the mean so that the results obtained are Good, score> 13; Quite good, 9 < score ≤ 12; and Less good, score ≤ 9. For the categorization of cognitive development has the following interpretation, namely Good, score> 49; Quite good, 33 < score ≤ 49; and Less good, score ≤ 33. Data analysis used in this study is

univariate and bivariate. Univariate was done to determine the frequency distribution and bivariate to determine whether there was a relationship between the two variables using the fisher's extract test method. This test is an alternative used to see the relationship when the chi-square test does not meet the requirements.

RESULTS

This study used univariate and bivariate analysis. The results of the study are as follows.

Table 1.
Respondent characteristics (n= 34)

Respondent characteristics	f	%
Gender		
Male	22	64.7
Female	12	35.3
Age (Month)		
60	1	2.9
61	1	2.9
63	8	23.5
64	3	8.8
66	1	2.9
67	5	14.7
69	3	8.8
70	3	8.8
71	4	11.8
72	5	14.7

Table 1. It shows that the majority of respondents were male with 22 children (64.7%). Respondents ranged in age from 60-72 months with 63 months being the most common age (23.5%).

Table 2.
Distribution of Gadget Use in Preschool Children (n= 34)

Gadget Usage Category	f	%
Less Good	2	5.9
Quite Good	23	67.6
Good	9	25.5

Table 2. shows the distribution of gadget use categories in preschool children. The quite good category was the highest category with 23 (67.6%). In the good category of gadget use, there were 9 (26.5%). In the less good category there were 2 (5.9%).

Table 3.
Distribution of Cognitive Development in Preschool Children (n= 34)

Cognitive Development Category	f	%
Less Good	0	0
Quite Good	9	26.5
Good	25	73.5

Table 3. Is the distribution of cognitive development categories in the children studied. The highest category is the good category with the results of 25 (73.5%). For the quite good category as many as 9 (26.5%). There are no results that occupy the less good category in this study.

Table 4
Relationship between Gadget Use and Cognitive Development in Preschool Children (n=34)

		Cognitive Development				f	%	Sig. (2-tailed)
		Quite Good		Good				
		f	%	f	%			
Gadget Usage	Less Good	1	2.9	1	2.9	2	0	0.670
	Quite Good	6	17.6	17	50.0	23	67.6	
	Good	2	5.9	26.5	20.6	9	26.5	
	Total	9	26.5	25	73.5	34	100.0	

Table 4. Results of fisher's extract test with a result of 0.670 (p>0.05). Therefore, H0 is accepted and Ha is rejected.

DISCUSSION

This study was conducted at Kemala Bhayangkari 43 Jatinangor Kindergarten. This study obtained 34 respondents of preschool age children (60-72 months) with data collection using questionnaires which included parents, teachers, and direct observation of children.

Gadget Use in Preschool Children (5-6 years).

Gadgets are electronic devices that have practical purposes and functions to help their users (Salis Hijriyani & Astuti, 2020). According to Anggraini (2019), there are several functions of gadgets, such as communication media, access to information, entertainment media, and lifestyle. Anggraini (2019) said that gadgets can include cellphones, laptops, and tablets or iPads. Therefore, this study consists of respondents aged 60-72 months who have operated cellphones, laptops, and tablets or iPads. Based on the results of research on 34 children at Kemala Bhayangkari 43 Jatinangor Kindergarten, the use of children's gadgets in the kindergarten with the most categories is quite good with 23 respondents (67.6%). In addition, as many as 9 (26.5%) respondents fell into the good category, and 2 others (5.9%) fell into the poor category. The results of research obtained from Ranti & Mahyuddin, (2023) showed that the use of gadgets in preschool children with the highest category was 53.3% with the category of children using gadgets every day. In the research of Bangsawan et al. (2022) showed that 100% of respondents fell into the high or unfavorable category of gadget use. Analysis of the results of this study was influenced by the duration, frequency, applications, games used, and assistance carried out when children use gadgets. Another thing with the research of Ranti & Mahyuddin (2023) and Bangsawan et al. (2022) who only focused on the frequency and duration of gadget use.

According to the Ministry of the Republic of Indonesia, the use of gadgets in children aged <6 years should always be supervised by parents with a maximum duration of 1 hour per day (Arisanti, 2023). In a study conducted by M. Hafiz Al-Ayouby, the use of gadgets by pre-school children should not exceed three times a day. The categorization of repeated use of gadgets a day (more than three times) is considered to have high intensity (Al-Ayouby, 2017). According to Heintz in 2016, the genres of games that can be accessed with gadgets include action, adventure, simulation, strategy, sport, puzzle, and education (Heintz, 2016). The genres in these games have different impacts so that parental assistance is needed in children using gadgets to limit time, choose safe and appropriate content, and set rules for children (Nugroho et al., 2022). This supports by Hadi & Sumardi (2023)research that children aged 5-6 years play more games, watch, and use social media.

As mentioned by Jafri & Defega (2020), nurses as educators in the family must be able to overcome excessive gadget use. Forms of assistance that nurses can provide include organizing children's schedules or limiting gadget use, collaborating with families, especially

parents in providing children's basic needs, providing knowledge to families about the negative and positive impacts of children using gadgets. The role of this nurse can foster family awareness so that families can educate children according to age.

Cognitive Development of Preschool Children (5-6 years).

Asmuddin & Salwiah explain that cognitive is the ability to learn, think, or intelligence such as the ability to learn new skills and concepts, skills to understand what is happening in the environment, and skills to use memory and solve simple questions (Asmuddin & Salwiah, 2021). According to Jean Piaget, as stated by Istiqomah & Maemonah, "cognitive is the child's way of adapting and defining objects and events in the environment". Jean Piaget suggested that the formation of knowledge in early childhood occurs through relationships with the surrounding environment (Istiqomah & Maemonah, 2021). Preschool children aged 5-6 years are in the preoperational stage because this stage starts from the age of 2-7 years. At this stage, children generally do not yet have a systematic, consistent, and logical way of thinking. Thus, children can make perceptual and motor adjustments to objects and events that are presented in the form of symbols such as pictures, words, and (Asmuddin & Salwiah, 2021). Citing Chairilsyah (2018), the scope of development assessed in this cognitive development research includes learning and problem solving, logical thinking, and symbolic thinking.

Based on research at Kemala Bhayangkari 43 Jatinangor Kindergarten, as many as 25 (73.5%) respondents got a good result category on their cognitive development. This is in line with the research of Maulia et al. (2020) that 81.4% of respondents in the study got good results in the cognitive development of children aged 5-6 years. The results in this study refer to 3 scopes of development namely learning and problem solving, logical thinking, and symbolic thinking based on the instrument quoted from Chairilsyah. According to Juita & Woga (2023) school is one of the most important aspects in children's cognitive formation. This is because during the golden age, children who attend kindergarten are given educational services in the form of stimulation. So this explains the reason that the cognitive development of preschool children in kindergarten gets good results.

Relationship between Gadget Use and Cognitive Development in Preschool Children (5-6 years).

The results of research with 34 respondents at Kemala Bhayangkari 43 Jatinangor Kindergarten showed that the significant value was 0.670. This value indicates that there is no significant relationship between the variable of gadget use and cognitive development of preschool children at Kemala Bhayangkari 43 Jatinangor Kindergarten because the sig value. 0.670 > 0.05. This is similar to the research of Maulia et al. (2020) there is no relationship between gadget play patterns and cognitive abilities of preschool children. This contradicted the research of Zhang et al. (2021) that there is a relationship between screen time in preschool children and children's cognitive development. The difference in the results of these studies can be due to other factors that affect cognitive development other than the use of gadgets in children. These factors can be internal and external factors. Internal factors include race, family, age, gender, genetics, chromosomal abnormalities. While external factors, including perinatal, labor, postpartum which includes the environment of care, stimulation and others (Wahyuni, 2022).

Environmental factors through social interactions such as individuals with individuals and individuals with groups can affect intelligence in children. This was conveyed by Vigotsky quoted by Ndai et al. (2023) that social interaction has a direct role in children's cognition. A simple example of social interaction in preschool children is the interaction of children with teachers in kindergarten as happened in Kemala Bhayangkari 43 Jatinangor Kindergarten. In

addition, the research of Reticena et al. (2019) contains the role of nurses that as a provider of preschool child development services provided holistically and integrally across sectors without fragmentation, can make children more developed. Policies to strengthen family resources can create an enabling environment to encourage, protect and support preschool development.

Other factors such as stimulation are in line with research conducted by Kristina & Sari (2021) that stimulation can have an important role, especially in children's cognitive function by paying attention to the needs of children in accordance with their development. Stimulation plays an important role because the golden age phase or 80% of development in a child's brain can make the child's brain more active. If the child is not stimulated, the brain center will become limited which will affect the child's cognitive development (Kristina & Sari, 2021). Nurses can educate parents and schools about optimization efforts (stimulation) in preschool children using several methods. These methods include the storytelling method, demonstration method, assignment method, tour work method, and experimental method.

CONCLUSION

Based on the results of research and discussion of "The Relationship between Gadget Use and Cognitive Development of Preschool Age Children at Kemala Bhayangkari 43 Jatinangor Kindergarten" it can be concluded that there is no relationship about that. In addition, the use of gadgets in children at Kemala Bhayangkari 43 Jatinangor Kindergarten is concluded to be quite good (67.6%) although there are still 2 children who are classified as less good category at using their gadgets. While cognitive development in children at Kemala Bhayangkari 43 Jatinangor Kindergarten is mostly in the good category (73.5%). There is no relationship between these two variables can be caused by other factors such as internal factors (race, family, age, gender, genetics, and chromosomes) and external factors which can be in the form of a care environment, stimulation carried out, and others. The role of nurses in optimizing children's cognitive development accompanied by the use of gadgets in children can be in the form of collaborating with families and teachers to provide stimulation with various methods, regulating patterns of gadget use in children, and educating families regarding policies to strengthen family resources in order to create an optimal environment in supporting the development of preschool children.

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