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### RELATIONSHIP BETWEEN SCREEN TIME AMONG CHILDREN WITH NUTRITIONAL STATUS AND THEIR DEVELOPMENT

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#### ABSTRACT

**Background:** The growth and development of children are two events that are different in nature but are related to one another. It is possible for people in downtown areas to experience easy internet access, so that everything cannot be separated from digital media. Especially during the COVID-19 pandemic like today, where children have to stay at home more, besides that learning is also done from home, so the screen time has increased. The goals of the research is to analyze the relationship between screen time among children with nutritional status and their development.

**Methods**: The research design used cross sectional analysis. The population is all children aged 3-5 years in Kalumpang Village in November 2020 as many as 497 children, the number of samples is 84 children using purposive sampling technique.

**Results:** Based on the spearman-rank statistical test, it is known that p-value = 0.002 (p-value  $<\alpha$ ), which with the correlation coefficient (r) = 0.330 that the relationship between Screen time with nutritional status is in the low category and has a positive relationship direction, namely the higher the screen time, the higher the nutritional status. Meanwhile, based on the spearman-rank statistical test, it is known that p-value = 0.001 (p-value  $<\alpha$ ), with the correlation coefficient (r) = 0.371 that the relationship between Screen time with development is in the low category and has a positive relationship direction, namely the higher the screen time screen time with development is in the low category and has a positive relationship direction, namely the higher the screen time, the development will deviate from age.

**Conclusion**: There is a relationship between screen time and nutritional status and there is a relationship between screen time and children development. So it is very important to improve parental control behavior towards the use of electronic devices in children aged 3-5 years old.

Keyword : Screen time; Nutritional status; Children development

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Background. Two important events that are different in nature but are related to each other, namely the growth and development of children. Development has successive stages ranging from doing simple things to the ability to do more complex things and each individual has a different speed of development (Kim, 2013). One of the efforts to detect deviations in the development of infants and toddlers is by earlv detection of deviations in child development. While growth is related to nutritional status, currently we are still faced with nutritional problems that never end. Nutritional status monitoring data in 2017 shows that our toddlers are underweight 17.5%, stunting 25%, wasting 10.3% and obese 2.1%, with the characteristics of acute and chronic nutritional problems in each district/city.

The results of the 2018 Basic Health Research show that North Maluku children who are underweight by 22.2%, stunting 31.4%, wasting 11.9% and obese 5.7% aged 0-60 months have an increase. Nutritional problems in these toddlers have contributed to the high child mortality rate and can threaten the future of the North Maluku generation in the future (Kim, 2013). There are seven Puskesmas in Ternate City such as Puskesmas Sulamadaha, Puskesmas Siko, Puskesmas Kalumpang, Puskesmas Kota, Puskesmas Kalumata. Puskesmas Gambesi. and Puskesmas Jambula. Kalumpang village is part of Puskesmas Kalumpang that is located in the center of city. In this village is very easy to access internet, so from adults to children always use electronic/digital media to do everything. Especially during the current covid pandemic, where children have to stay at home more. They study and play from home so the duration of screen time is increased.

The use of digital media by children can reduce their playing time and physical activity (Kim, 2013). According to him, a child with screen time for 4 hours per day with a smartphone will be more likely to experience obesity than those who only spend 2 hours per day. A similar opinion was also expressed by Subrahmanyam who stated that in addition to obesity, the passivity of children who are too long to use smartphones can trigger heart attacks and hand injuries (Subrahmanyam, K., Kraut RE., Greenfield, PM., and Gross, 2000).

On the other hand, McMonagle stated that games or physical activities are not only good for children's health, but can also increase children's appetite and make them sleep soundly. On the other hand, smartphone use makes children passive in their activities and decreases their appetite because they focus on games on smartphones (Kim, 2013).

Given the importance of children's growth and development, researchers are interested in conducting research on "The relationship of screen time to the nutritional status and development of children aged 3-5 years in Kalumpang Village, Ternate City, North Maluku Province in 2020".

**Methods.** The type of research used is analytic with cross sectional design. This research is located in Kalumpang Village, Ternate City, North Maluku Province. The research was conducted on 2-21 November 2020.

The study population are all children 3-5 years old in Kalumpang Village (497 children). The sample was calculated using the Slovin formula with a confidence level of 0.1 (10%) obtained 84 respondents and taken using purposive sampling technique based on inclusion and exclusion criteria. Inclusion criteria are children aged 3-5 years who live in Kalumpang Village, have a KIA book, and are willing to be research subjects. Exclusion criteria were children who were sick at the time of the study, had a history of low birth weight/premature, and had congenital defects.

The researcher explains the aims and objectives of the research to the prospective respondents, if they agree, then they invite the respondents to sign the informed consent. Then ask the mother to fill out a questionnaire related to screen time, record the child's identity, record the child's age, and weigh the weight to determine the nutritional status. Next, check the development of children aged 3 to 5 vears using The Pre-Development Screening Questionnaire mobile version 1.0 (KPSP mobile version 1.0). This research has obtained an ethical exemption from the Health Committee Research Ethics of the Tanjungkarang Health Polytechnic No.305/KEPK-TJK/IX/2020. Researchers tabulated the research data, then analyzed using the Spearman-rank test.

### **Result and Discussion.**

Table 1 Demographic and clinical characteristics data for research subjects

Characteristics			
Characteristics	N(%)		
Gender:			
Воу	29 (34,5)		
Girl	55 (65,5)		
Birth order:			
First	42 (50)		
Second	39 (46,4)		
More	3 (3,6)		
Number of siblings:	0 (0,0)		
None	36 (42,9)		
1			
2	45 (53,6)		
	3 (3,6)		
1>2	0 (0)		
Mother's age:			
<20 years old	0 (0)		
20-35 years old	82 (97,6)		
>35 years old	2 (2,4)		
Mother's education:			
Basic education	2 (2,4)		
Middle education	67 (79,8)		
Higher education	15 (17,9)		
Mother's occupation:			
House wife	54 (64,3)		
government employees	4 (4,8)		
Private employees	26 (31,0)		
	20 (31,0)		
Family income:			
< regional minimum wage of Ternate city	29 (34.5)		
≥ regional minimum wage of Ternate city	55 (65,5)		
Owned electronic equipment:			
1-2 kinds	58 (69)		
>2 kinds	26 (31)		
Age when electronic devices are			
introduced:			
1 years old	0 (0)		
2 years old	72 (85,7)		
3 years old	12 (14,3)		
4 years old	0 (0)		
5 years old	0 (0)		
Parental assisting:	0(0)		
Yes	84 (100)		
No	0 (0)		
Screen time:			
≤ 60 minutes/day	39 (46,4)		
>60 minutes/day	45 (53,6)		
Nutritional status:			
Very low weight	0 (0)		
Underweight	0 (0)		
Normal weight	68 (81)		
	( )		

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Risk of being overweight	16 (19)
Development children:	
In accordance	66 (78,6)
Suspect	17 (20,2)
Deviate	1 (1,2)
Total	84 (100)

Based on the table above, it can be seen that the demographic and clinical characteristics of the respondents, most of the respondents (65.5%) are female, half of the respondents (50%) are the first children, most of the respondents (53.6%) have 1 sibling. almost all mothers (97.6%) aged 20-35 years, almost all mothers (79.8%) had secondary education (SMA), most of the mothers (64.3%) did not work, most of the respondents (65, 5%) have family income UMR Ternate City, most respondents (69%) have 1-2 types of electronic devices, almost all children (85.7%) were introduced to electronic devices at the age of 2 years, all parents (100%) accompanying their children when using electronic devices, most respondents (53.6%) have screen time >60 minutes/day, most respondents (81%) are of normal weight, and most of them are 78.6% in accordance category.

Table 2. Cross tabulation between Screen time and nutritional status of children (n=84)

Screen	Nutritional status Normal Risk of being Total							
time	we	ight	over	weight				
	f	%	f	%	f	%		
≤60	37	44	2	2,4	39	46,4		
minute/day								
>60	31	37	14	16,6	45	53,6		
minute/day								
Total	68	81	16	19	84	100		
<i>P-value</i> = 0,002		α= 0,05		r=0,330				

Based on the Spearman-rank statistical test, it is known that p-value = 0.002 (p-value < ), this shows H1 is accepted and H0 is rejected, which means there is a relationship between screen time and nutritional status in children aged 3-5 years in Kalumpang Village, Ternate City. In 2020. Based on the value of the correlation coefficient (r) = 0.330, it can be seen that the relationship between screen time and nutritional status is in the low category and has a positive relationship direction, which means that the higher the screen time, the higher the nutritional status.

Nutritional status							
in accordance		suspect		deviate		Total	
f	%	f	%	f	%	f	%
37	44	2	2,4	0	0	39	46,4
29	34,6	15	17,8	1	1,2	45	53,6
66	78,6	17	20,2	1	1,2	84	100
0,001	001 α= 0,05		r= 0,371				
	<b>acco</b> <b>f</b> 37 29 66	in   accordance   f %   37 44   29 34,6	in Nutr   accordance sus   f % f   37 44 2   29 34,6 15   66 78,6 17	in accordance Nutritional suspect   f % f %   37 44 2 2,4   29 34,6 15 17,8   66 78,6 17 20,2	in accordance Nutritional stat   f suspect de   37 44 2 2,4 0   29 34,6 15 17,8 1   66 78,6 17 20,2 1	Nutritional status   in accordance suspect deviate   f % f %   37 44 2 2,4 0 0   29 34,6 15 17,8 1 1,2   66 78,6 17 20,2 1 1,2	Nutritional status   in accordance suspect deviate To   f % f % f % f   37 44 2 2,4 0 0 39   29 34,6 15 17,8 1 1,2 45   66 78,6 17 20,2 1 1,2 84

Table 3. Cross tabulation between Screen time and children development (n=84)

Based on the Spearman-rank statistical test, it is known that p-value = 0.001 (p-value < ), this shows H1 is accepted and H0 is rejected, which means there is a relationship between screen time and development in children aged 3-5 years in Kalumpang Village, Ternate City. 2020. Based on the value of the correlation coefficient (r) = 0.371, it can be seen that the relationship between screen time and development is in the low category and has a positive direction, which means that the higher the screen time, the more development will deviate from age.

## Relationship between screen time and nutritional status

Watching TV and using electronic media or gadgets allows toddlers to sit quietly for long periods of time. High screen time can increase the risk of being overweight higher than lack of physical activity, because screen time can affect in two ways, namely making less physical activity and increasing intake. This is in accordance with the results of the research that the results of the Spearman-rank statistical test are known to have p-value = 0.002 (p-value <  $\alpha$ ), which means that there is a relationship between screen time and nutritional status in children 3-5 years old.

Negative perceptions can make mothers less precise in determining the nutritional status of their toddlers. Maternal inaccuracy in assessing the nutritional status of children is still common in the community (Sari, 2015). Inaccuracy in assessing nutritional status, makes mothers become unaware of the obesity that has occurred in their toddlers. Mothers assume that their toddlers do not have obesity problems, so mothers do not take preventive actions or attitudes towards obesity (Baughcum, AE., Chamberlin, LA., Deeks, CM., Powers, SW., Whitaker, 2000).

The nutritional status of the risk category for overweight was 14 children (16.6%) with screen time >60 minutes/day, which means that children use gadgets more often and their duration is longer (more than 1 time a day with usage time of more than 60 minutes). This condition makes the child do little activity so that it increases sedentary behavior (lack of movement). This is supported by research results that high intensity gadget use has a 2.1 times greater chance of being obese/fat in children (Sarah, F., 2013). Obesity is the accumulation of fat under the skin because the calories that enter the body are greater than the calories that must be removed (Tanjung FS, Hurivati E, 2017).

The habit of spending time in front of the television. using computers and other technological tools will contribute to nutritional status, especially over nutrition (Dietz, WH, Gortmaker, 2001). Although parents express concern about health problems, loneliness, and isolation from the environment due to smartphone use, smartphone use is believed to be a powerful way to persuade children when it's time to eat. Thus, parents consider the use of smartphones for children as a consequence of being in the digital age (Genc, 2014). This is supported by the results of Sarah and Pujonarti's research, that high intensity of gadget use has a 2.1 times greater chance of being obese/fat in children (Sarah, F., 2013).

One of the causes of childhood obesity is a sedentary lifestyle, namely lack of physical activity, such as watching television (TV) and playing computer more than 2 hours / day (He, M., Piché, L., Beynon,C., Harris, 2010). Longer TV viewing time is associated with a risk of unhealthy body composition and an increase in Body Mass Index (Tremblay, MS and Willms, 2003). Increased energy intake during screen time due to inappropriate food choices, namely the consumption of snacks with high energy density (foods high in added sugar and fat) and lack of control over the number of servings eaten (Procter, 2007).

In this study, it has not been studied related to food consumption patterns applied by families to children aged 3-5 years. From the pattern of food consumption, it can be seen the composition of the food consumed every day to meet the needs of the body. Because this has not been studied, it causes a possible bias in the measurement of nutritional status variables.

# Relationship between screen time and development children

The introduction of gadgets to children from an early age can have a significant impact both physically and mentally (Elfiadi, 2018). This is in accordance with the results of the study that almost most of the respondents (44%) had screen time 60 minutes/day and development was according to age. Based on the spearman-rank statistical test, it is known that p-value = 0.001 (p-value <  $\alpha$ ), which means that there is a relationship between screen time and development in children aged 3-5 years.

The results of this study contradict the research conducted by Sujianti, namely there is no statistically significant relationship between the duration and use of gadgets with the social development of pre-school children (Sujianti, 2018). The type of family that is all nuclear family and the number of children <2 people can increase the quality of interaction between children and parents while at home. Parents are more focused and directed to accompany children when their playing gadgets and plaving together so that children's development can be achieved according to age. Thus, there are not only negative impacts arising from the use of gadgets but also many positive impacts from using gadgets including being able to be used as a learning tool, improving language skills because gadgets have language features of each country, reducing the level of boredom because there are various kinds of entertainment, and so on. etc. However, in children under five still need special monitoring by parents to avoid the effects of addiction.

Based on the results of this study, the results of the development of children aged 3-5 years in the appropriate category were 44% (37 people) in toddlers with screen time 60 minutes/day and 34.6% (29 people) in toddlers screen time >60 minutes. with /day. Development in the dubious category was 2.4% (2 people) in toddlers with screen time 60 minutes/day and 17.8% (15 people) in toddlers with screen time >60 minutes/day. While the development in the deviation category was 1.2% (1 person) in toddlers with screen time >60 minutes/day.

The Pre-Development Screening Questionnaire (KPSP) contains 9 to 10 questions containing 4 things that become indicators of a child's development, namely gross motion, fine motion, speech and language, as well as socialization and independence. The highest number of children under five in the doubtful category was screen time >60 minutes/day as many as 15 people (17.8%). It is said to be dubious because the number of "yes" answers in the Developmental Pre-screening Questionnaire is only 7 or 8 pieces, so there are 2 "no" answers. The majority "no" answers on socialization and independence indicators related to the child's ability to put on their own shoes, wash their hands after eating, wear trousers, shirts, shirts, or socks without assistance, play with rules such as hide and seek, snakes and ladders, or other games. Thus, the mother was told to stimulate the child's development at any time and as often as possible and told the mother to reassess the KPSP 2 weeks later according to the child's age.

In addition, there was also 1 child (1.2%) in toddlers with screen time >60 minutes/day who experienced deviations. This toddler is 42 months old (3.5 years), there are 9 KPSP questions with 4 "no" answers, namely on the indicator of independence socialization, so there are only 5 "yes" answers. Based on the results of the KPSP interpretation, if there is a "yes" answer 6, it means that there may be deviations. However, because deviations only occur in 1 indicator, namely socialization and independence, mothers need to be taught how to intervene in child development stimulation to overcome deviations or catch up and evaluate KPSP money 2 weeks later.

Based on the results of this study, it shows that developmental results are in the dubious category and deviations in socialization and independence indicators are the majority at screen time >60 minutes/day, so it can be interpreted that the use of gadgets causes children to not be able to learn in a natural way how to communicate and socialize, as a result children cannot respond to things around him both emotionally and verbally. The limited response of the child will interfere with the development of his ability to socialize and adapt. The use of the wrong gadget, such as excessive use of gadgets, improper positioning and poor lighting intensity, will have an impact on decreasing visual acuity so that children

have difficulty in carrying out their daily activities (Tiharyo,I., Gunawan,W., 2008). In addition, children who spend too long in front of the gadget screen will disrupt social interaction with the environment around their children. Children will grow and develop with less socialization skills because they are preoccupied with the world of their own gadgets without wanting to care about others so that they become more individualistic (Elfiadi, 2018).

In this study the development of children who doubted deviations were mostly found in mothers with secondary education, not only in working mothers but also in mothers who did not work or were housewives. The work of taking care of the household takes up a lot of time, from cooking, washing, cleaning the house, to taking care of children, so mothers sometimes feel tired.

Most of the respondents (53.6%) have 1 sibling, meaning that the mother has more than 1 child who must fulfill all their needs. a tool that is needed to accompany children to play when parents are busy, can be used as a media for children's entertainment and as a medium of distraction, so that children are not fussy and assistance to children is only done from a distance when turning on the gadget or when turning off or changing to menu options other. So it can be concluded that the existence of gadgets is a technological advancement that cannot be avoided by children.

Children develop rapidly in the first 5 years of life. Screen time can affect a child's ability to develop optimally. When young children screen time, they may miss important opportunities to practice and master interpersonal, motor, and communication skills. For example, when children observe screens without any interactive or physical component, they sit more and less so they do not practice gross motor skills, such as walking and running, which in turn can delay development in these Screens can also interfere areas. with interactions with caregivers by limiting opportunities for verbal and nonverbal social exchange, which is critical for promoting optimal growth and development.

Gadgets can provide stimulation through the visual and auditory senses which can cause children's mental instability and lack of attention to other things. In addition, continuous radiation is not good for children who are experiencing growth and development because of radio frequency waves that cause electromagnetic radiation (Wijoyono,VV., Negara,INS., Aryanto, 2015).

More screen time in general can affect the growth and development of toddlers. Therefore, parents have an active role in limiting children's use of gadgets. This is done to prevent children from becoming dependent and children can play more often with friends their age. In addition, parents must always supervise their children when using gadgets.

The use of gadgets in children with restrictions and full supervision from parents can have a positive impact on children, including supporting knowledge, developing creativity, and exploring something new (Pratama, 2012). In addition, variations of educational applications can increase children's motivation and interest in learning (Sugianto, VJ, Prayanto WH, Yudani, 2015).

Parents should ensure that screen time is not excessive and interferes with face-to-face interactions or family time. There is a need to provide guidance on establishing and enforcing rules and restrictions regarding child-age media use, how to design screenless zones and device curfews at home, and how to balance and allocate time for online and offline activities to ensure physical activity and family interactions are prioritized.

Limitation in this research, it has not been studied related to food consumption patterns applied by families to children aged 3-5 years. From the pattern of food consumption, it can be seen the composition of the food consumed every day to meet the needs of the body. Because this has not been studied, it causes a possible bias in the measurement of nutritional status variables.

Conclusion and Suggestions The conclusion of this study is that there is a relationship between screen time on the nutritional status of children aged 3-5 years and there is a relationship between screen time on the development of children aged 3-5 years. So it is very important to improve parental control behavior towards the use of electronic devices in children aged 3-5 years, have a time limit of using electronic devices not more than 1 hour per day, provide family support by downloading special applications for children, and pay attention to the position and distance look at the screen with the child's eyes.

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