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The Effectiveness of Toddler's Development of Android-Based Educational Media Towards Mother's Knowledge

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Abstract---This research aims to produce an android-based toddler development educational media product that can educate and increase mother's knowledge about toddler development. This research uses the combine method of Research and Development (R&D) to produce a new product in the form of android-based toddler development educational media and quasi experiment design with one group pretest and posttest models to figure out the influence of using android-based toddler development educational media. This research was conducted in October-November 2021 in the working area of

Poasia Health Center (Puskesmas) Kendari. The number of samples in this study was 70 mothers of toddlers. The Sampling technique was purposive sampling with non-random sampling methods. Data analysis used the Wilcoxon Signed Rank test and the Kruskal Wallis test. The results showed a significant difference in the acquisition of value before and after using android-based Pekke Madising application with a p-value of $0.000 < 0.05$. The Pekke Madising app can significantly increase the knowledge of toddler mothers.

Keywords---pekke madising, android application, toddler's development.

Introduction

Development is the process of the occurrence of complex accretion to the structure and function of the body both physical and mental which includes gross motor skills, fine motor, speech / language and socialization / independence which is the result of related to environmental influences. One of the risk factors that affect a child's development is inadequate in given the early stimulation. It is important for every child to get regular stimulation as early as possible and in accordance with the stage of development. The age of 0-12 months is the first year of life that becomes the basis for children to complete the next developmental task. (Usman, Sukandar and Sutisna, 2014; Kementerian Kesehatan RI, 2016; Suci Hati and Lestari, 2016; Setyaningrum, 2017).

The role of the family and the mother's skills in recognizing the delay in the child's developmental process is very important, hence the child can be given stimulation as early as possible on the physical, mental, and social aspects according to their age needs. Poor knowledge and skills possessed by parents in early detection of growth and development can result in growth and development disruption in the form of growth deviations, development and emotional mental disorders, such as down syndrome, short stature, and autism. Research conducted by Suryanto, et al (2014) shows that the role of family and social support has a positive impact on child growth and development. (Kusuma et al, 2013; Suryanto, H and Irmawati, 2014; Suci Hati and Lestari, 2016; Nilatullzah, Bakhar and Andari, 2018).

Health educational media is a tool of conveying information or viewer messages about health both through print, electronic media (television, radio, computers and so on), and board media that aims to increase knowledge and change mother behaviors. The use of appropriate health educational media in the delivery of information tailored to the needs of the target is one of the important factors that support the increase in knowledge. The child development educational media used by the community is the Mother and Child Health Book (KIA) which contains information and guidelines for adequate health care for infants and toddlers therefore they can grow and develop optimally. The use of KIA Books in Indonesia has been satisfactory, but the use of KIA books as an educational media is still poor. Mostly, mothers use KIA books limited, only for recording the health status of toddlers, it's not utilized as an educational media. According to the results of

the interviews conducted to toddler's mothers in Poasia Health Center Work Area (Puskesmas), 7 out of 10 toddler's mothers said they only use KIA books as a recording tool during 'posyandu' or check-up. The toddler's mother said, they did not use KIA books for educational purposes. (Sistiarani, Gamelia and Sari, 2014). (Notoatmodjo, 2012; Oktarina and Sugiharto, 2015; Indrayani, Legiati and Hidayanti, 2019; Ramadhanti, Adespin and Julianti, 2019).

In a line with the development of technology, many technological devices can be utilized. One of them is a mobile device such as a smartphone. Smartphones are an effective media in health services because of their wide use, easily carried and can present the information in person. The use of smartphones, tablets and so on is increasing in all circles both from the economic level, education, employment and age. This is an opportunity that can be utilized for interests in the field of child health, especially monitoring the growth and development of the children. One of the smartphone operating systems is Android. Android operating system is the most widely used system on smartphones. Android is an operating system with an open source license that can be developed freely by users in order that it can support daily activities and work. (Klasnja and Pratt, 2012; Amaliah *et al.*, 2018; Setiawan and Herdianto, 2018). Based on the background above, the author planned to design an android-based educational media that contains information about the development of toddlers and ways of stimulation that are expected to be able to educate and help mothers to optimize stimulation in their toddlers.

Material and Method

Location and design of the research

This research was conducted in October-November 2021 in the working area of Poasia Health Center (Puskesmas) Kendari. This research design uses quasi-experimental design with one group pretest and posttest models.

Population and sample

The population in this research was all mothers who had toddlers 0-59 months in the working area of The Poasia Health Center (Puskesmas) Kendari, in the period of October-November 2021 which amounted to 188 people. Sampling in this study uses purposive sampling techniques with non-random sampling methods. The size of the sampling in this study was determined using the formula Slovin. A total of 70 respondents met the sample inclusion criteria to be studied, namely mothers who have toddlers aged 0-59 months in the working area of Poasia Health Center (Puskesmas) Kendari, mothers who are adept at using android smartphones, and mothers who are willing to be respondents.

Data collection methods

Data collection was done using questionnaires. At the beginning of the research, respondents will be given a pretest to see the prior knowledge of respondents about the development of toddlers. Then, it will be given treatment using Pekke Madising which is an educational media for the development of toddlers android-

based for one month. Finally, at the end of the research will be given a posttest on respondents to see the knowledge of respondents after being given treatment. The questionnaire given was the form of a plural choice question with three alternative answers and there was only one correct answer.

Data analysis

In this research the data analysis was conducted computerized using the SPSS statistical test program. The data analysis will consist of the Wilcoxon Signed Rank test to figure out the influence of the use of android-based toddler development educational media on mothers' knowledge about toddler development and Kruskal Wals test to find out differences in mothers' knowledge about toddler development based on respondents' characteristics.

Research findings

Univariate analysis

Respondents' characteristics in this research was age, education, and employment.

Table 1
Respondents' Characteristic

Respondents' Characteristic	Frequency (n)	Percentage (%)
Age		
< 25 Years	27	38.6
25 – 30 Years	35	50
> 35 Years	8	11.4
Education		
Primary Education	16	22.9
Secondary Education	29	41.4
Tertiary Education	25	35.7
Employment		
Employed	24	34.3
Unemployed	46	65.7

Source: Primary data (processed), 2021

Table 1 shows the difference in respondents' characteristics identified by three variables: age, education, and employment. In the age variable, it was found that most respondents aged 25-30 years were 35 people (50%), the age of <25 years were 27 people (38.6), and at least the age of >35 years were 8 people (11.4%). In the education variable, it was found that most respondents had a secondary education background of 29 people (41.4%), tertiary education background were 25 people (35.7%), and the least was primary education background, 16 people (22.9%). On the employment variable, it was found that the majority of respondents were unemployed or a housewife, it was 46 people (65.7%) and respondents who employed were 24 people (34.3%).

Bivariate analysis

1. Frequency Distribution of Mother's Knowledge About Toddler's Development Before and After Being Given Intervention

Table 2
Frequency Distribution of Mother's Knowledge about Toddler's Development Before and After Being Given Intervention

Variable	Pretest			Posttest		
	Good	Average	Poor	Good	Average	Poor
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Definition and Toddlers' Developmental Disorder	31 (44.3)	0 (0)	39 (55.7)	42 (60.0)	0 (0)	28 (40.0)
Toddlers' Developmental Stages	6 (8.6)	29 (41.4)	35 (50.0)	39 (55.7)	29 (41.4)	2 (2.9)
Toddlers Developmental Stimulation	9 (12.9)	18 (25.7)	43 (61.4)	35 (50.0)	22 (31.4)	13 (18.6)
Questioner Whole Score Of The Knowledge	6 (8.6)	24 (34.3)	40 (57.1)	42 (60.0)	19 (27.1)	9 (12.9)

Source: Primary Data (processed), 2021

It can be seen on table 4.2 that before being given intervention, the level of knowledge respondents to the development of toddlers were 40 people (57.1%) having a poor level of the knowledge, then 24 people (34.3%) have an average level of the knowledge and only 6 people (8.6%) have a good level of the knowledge. It can be concluded that the prior knowledge of the respondents to the development of toddlers is still poor. After being given intervention in the form of an android-based toddler development educational media application, 42 people (60%) having a good level of knowledge. It means, there was an improvement in the level of respondents knowledge to the toddlers development, then 19 people (27.1%) had an average level of the knowledge and 9 people (12.9%) had a poor of knowledge level. So, it can be concluded that after being given intervention, the level of respondents knowledge have a good level of knowledge.

2. The Effect Of Using Android-Based Toddler Development Educational Media

Table 3
The Effect Of Using Android-Based Toddler Development Educational Media

Data	Mean	Std. Deviation	Min	Max	Z	Sig (2-tailed)
Pretest	54.21	15.029	27	87	-7.116	0.000
Posttest	77.39	11.957	47	100		

*Wilcoxon Signed Rank

Table 3 shows the results of statistical tests using the Wilcoxon Signed Rank test. From the result, it is obtained p-value 0.000 ($\alpha = 0.05$), so it can be concluded that there is a difference between the knowledge level of toddler mothers to the

development of toddlers before and after being given intervention in the form of providing an android-based toddler development educational media application. Then, viewed from the mean of posttest is higher than the mean of pretest where the score of post test is 77.39 while the mean of pretest is 54.21. It indicates an increase of the score before and after being given intervention. Thus, H_a was accepted and H_o was rejected because the android-based toddler development educational media application was shown to have an influence on the increase in maternal knowledge about toddler development.

3. The Differences in Maternal Knowledge About Toddler Development Based on Respondent Characteristics

Table 4
The Differences in Maternal Knowledge About Toddler Development Based on Respondent Characteristics

Responden Characteristic	Knowledge		
	Frequency	Mean Rank	<i>p-value</i>
Age			
< 25 Years	27	33.94	0.143
25 – 30 Years	35	39.24	
> 35 Years	8	24.38	
Education			
Primary Education	16	26.03	0.014
Secondary Education	29	33.38	
Tertiary Education	25	44.02	
Employment			
Employed	24	38.10	0.430
Unemployed	46	34.14	

**Kruskal Wallis*

Table 4 shows the results of statistical tests using the Kruskal Wallis test to figure out the differences in mothers' knowledge about toddler development based on respondents' characteristics covering the age, education, and employment. In the age variable obtained p -value 0.143 ($>\alpha = 0.05$) and in the variable of employment obtained p -value 0.430 ($>\alpha = 0.05$) shows that in the age and employment variable has no influence on the increase in mother knowledge. The education variable p -value 0.014 ($<\alpha=0.05$), it shows that the education variable is a confounding factor that has an influence on the increase in mother knowledge about the toddlers development.

Discussion

Knowledge is the result of known human behaviors, attitudes, and actions (Husna and Rokhaidah, 2021). According to Maulana (2009) health education is an educational activity that is carried out by spreading the message, instilling confidence. Hence, people are not only aware, know / understand, but also want and can do a recommendation that has to do with health. The "Pekke Madising" application developed in this research includes material on toddler growth and

development care, growth questionnaires, pre-developmental screening questionnaires (KPSPs) as well as toddler developmental knowledge questionnaires. This research was conducted to figure out the influence of android-based educational media in increasing mother's knowledge about stimulation of toddler development. For this reason, in this research did not conduct an assessment of toddler development using KPSP, but only focused on mother knowledge about stimulation of toddler development.

This research found that the educational media of android-based toddler development is effective in increasing the knowledge of toddler's mothers. This can be seen in table 4.2 where the mothers' knowledge before being given majority intervention, the result was poor. It was 40 people (57.1%) from 70 respondents. It means more than a half respondents had a poor knowledge. After being given intervention in the form of *Pekke Madising* application, it has a significant effect on mother's knowledge, which 42 people (60%) in a good category, 19 people (27.1%) in an average category, and 9 people (12.9%) in a poor category. This is in line with Amaliah et al. research, regarding the use of the mobile application "Healthy Toddlers" conducted in Bekasi, West Java in 2016. In the research, it was found that the use of the mobile application "Healthy Toddlers" can meaningfully improve mother's knowledge and attitudes in monitoring the growth and development of toddlers (p values 0.001 and 0.013). The conclusion from the research is, that the application of "Healthy Toddlers" can be an effective media to increase mother's awareness in monitoring the growth and development of their children. (Amaliah et al., 2018).

Then, researchers tested the significance of the acquisition of value before and after being given intervention in the form of android-based developmental educational media *Pekka Madising* and found the results of statistical tests using the Wilcoxon Signed Rank test obtained p-value 0.000 ($\alpha = 0.05$). furthermore, it can be concluded statistically the educational media *Pekka Madising* can increase the knowledge of toddler's mothers significantly. In line with the research conducted by Fahmi et al (2020) using the android-based SIDIMES application. The conclusion of the research is, that the results show there is a significant influence in given android-based SIDIMES application to the knowledge of toddler's mothers about stunting (p = 0.00). Research conducted by Perdana et al, 2017 on the development of android-based nutrition educational media and websites on behaviors about balanced nutrition of elementary school students also showed a significant influence on the use of android-based educational media on the knowledge, attitudes, and practices of respondents after being educated. (Perdana, Madanijah and Ekayanti, 2017; Fahmi, Akhmad Yanuar; Rudiyanto; Nazmi, 2020).

The use of media in health education aims to get any attention to a problem and remind the information that has been conveyed in order to obtain changes in knowledge (Dewi et al., 2020). Laranjo et al. (2014) revealed that internet and smartphone used has been shown to be effective in improving public health status. The use of smartphones and the internet as educational media will make the process of obtaining information easier and faster. Android-based educational media that used in smartphones becomes one of the interesting educational media and can increase the knowledge because it is easy to use anywhere and

anytime. Astuti et al. (2016) in the research presented android-based learning media as an effective and efficient learning media because it is practical so that it can be carried everywhere.

Providing education to stimulate the growth and development of children can improve the ability of parents to provide child stimulation from an early age because the mother is the first educator for her children. Good parental knowledge can be one of the supporting factors in supporting the stimulation of child development. (Imelda, 2017). Research conducted by Brown, et al., proves that parents who have knowledge of the stimulation of children's social and language development are associated with children's social development with a value of $p = 0.018$. Therefore, every mother who has a child aged 0-5 years needs information to improve the right knowledge, attitude and skills and must have high confidence to stimulate their child's growth and development according to the stage of development. (Fitriani IS, Oktobriani RR. 2017).

From the results of this research it can also be seen that age and employment factors have no influence on the increase in mother's knowledge about the development of toddlers. A person's knowledge is related to the exposure of time media such as print and electronic media. A person who is often exposed to electronic media and mass media such as television (TV), radio, newspapers, magazines, mobile phones and others get more information than not exposed. So that older age does not guarantee one's knowledge better than a younger age (Wawan & Dewi, 2011). In employed and unemployed mothers, there is no difference in knowledge improvement. Notoatmodjo (2012) states that employment is closely related to interaction with others. This type of work requires a person to interact intensely with people who have the possibility of knowledge transfer. Mamuroh et al (2019) stated that mothers who do not work is having a good knowledge. This is because mothers who do not work is having free time to gain and look for the information about the stimulation of toddler development.

Mother's education has an influence on the improvement of the mother's knowledge about the development of toddlers. The result of this research is in accordance with Retnaningsih 's (2010) research which suggested that the level of education affects the level of mother's knowledge. Education is closely related to the way a person's perspective or knowledge in perceiving and doing things. The higher a person's education is, the wider their knowledge is. However, that does not mean that poor education will always have poor knowledge anyway. This is because the increase in one's knowledge is not only obtained from formal education but can also be obtained from non-formal education. The higher the level of education, the better the level of mother's knowledge about the development of toddlers.

Conclusion

Based on the results of the study can be concluded some of the following:

- There is a significant increase in knowledge after the use of the application. It can be seen from the results of statistical tests obtained p -value 0.000 ($\alpha = 0.05$) and the difference in the value of the mean posttest and pretest

increased by 23.18 shows an improvement in value before and after being given intervention.

The use of the android-based *Pekke Madising* app is effective in increasing the mother's knowledge of the toddler's development.

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