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Research Article

The Influence of Health Education Using Animated Video Media on Mothers' Knowledge About Developmental Stimulation of Toddlers Aged 36-60 Months at Nurul Huda PAUD, Karangbesuki, Sukun District, Malang City

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Abstract: Mothers' knowledge about toddler development is very important because it can affect the way they provide stimulation to toddlers. Based on the results of a preliminary study through interviews with mothers of toddlers at PAUD Nurul Huda, it was found that 6 out of 11 mothers said they did not know about stimulation and had never received information about developmental stimulation in toddlers. One effort to improve mothers' knowledge is to provide health education using animated videos about developmental stimulation in toddlers. The purpose of this study was to determine the effect of health education using animated video media on mothers' knowledge about developmental stimulation in toddlers aged 36-60 months. The research design was a pre-experimental study with a one group pre-test post-test approach, with a population of 33 mothers, with sampling using a total sampling technique with a total of 33 mothers who had toddlers aged 36-60 months. The research instrument used a questionnaire and also media in the form of animated videos. Before the intervention was given, most (72.7%) mothers had sufficient knowledge, after the intervention was given, most (78.8%) mothers had good knowledge. Bivariate analysis using the Wilcoxon Signed Rank Test, and obtained a ρ-value of 0.000 < (α = 0.05). The conclusion of this study is that there is a significant influence of health education using animated videos on mothers' knowledge about stimulating the development of toddlers aged 36-60 months at PAUD Nurul Huda.

Keywords: Animated Videos; Health Education; Mother's Knowledge; Stimulation Of Development; Toddler Development

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1. Introduction

Toddlerhood is the period when a child reaches the age of 12-59 months (Ministry of Health of the Republic of Indonesia, 2024). Toddlerhood is a golden period or Golden Age Period. During this period, a child's development will develop rapidly. This is due to the occurrence of brain development in toddlers, commonly referred to as the Brain Growth Spurt period. Also, during this golden period, children will have a very high desire to learn (Afifah et al, 2018, in research (Ariani & Noorratri, 2022). According to (Inggriani et al, 2019, in research (Ariani & Noorratri, 2022), during this golden period, developmental disorders in toddlers are also often found, such as developmental delays in various aspects.

Developmental delays are a common problem in society, but they are not addressed properly. Mothers, as the primary caregivers of toddlers, should be more knowledgeable about the stages of toddler growth, the factors that influence them, and how to stimulate them. Mothers' knowledge of toddler growth and development is crucial because it can influence how they provide stimulation to their toddlers, which in turn influences their development. It can also change how they view the importance of providing stimulation to

encourage toddler development according to their age and developmental stage (IDAI, 2012 in Ramadia).*et al.*, 2021). Research (Soetjiningsih, 2008 in Haryanti et al., 2018) shows that toddlers who receive consistent stimulation will develop more optimally than toddlers who receive less or late stimulation.

*World Health Organization*The World Health Organization (WHO) reported that globally, an estimated 149.2 million children under 5 years of age experienced developmental disorders in 2020 (WHO, 2021). Meanwhile, according to UNICEF (2019), more than 200 million children have not reached their optimal developmental potential. Various developmental problems such as speech delays, autism, and hyperactivity show an increasing trend. According to UNICEF data, the incidence of developmental disorders, especially in the motor aspect, is still relatively high at around 27.5% or less than 3 million toddlers experience motor developmental disorders.

The prevalence of toddlers whose development is monitored in Indonesia is 82.3% of the target of 85% (Ministry of Health, 2023). In East Java Province, the prevalence of toddlers whose development is monitored at the age of 3-4 years is 38.1% with the results of developmental examinations of 42.7% in accordance with developmental stages and 57.3% not in accordance with developmental stages or having developmental problems, while at the age of 4-5 years, the prevalence is 28% with the results of developmental examinations of 38.2% in accordance with developmental stages and 61.8% not in accordance with developmental stages or having developmental problems (SKI, 2023). In Malang City in 2022, there were 13 toddlers suffering from developmental disorders, and 7 of them were referred for further services (Malang City Health Office, 2022). According to (PMK Number 66, 2024), health workers, kindergarten teachers and trained PAUD officers conduct developmental checks using the KPSP (Pre-Developmental Screening Questionnaire) instrument and also examination aids.

Based on the results of a preliminary study conducted by researchers at Nurul Huda PAUD, Karang Besuki, 54.5% of toddlers experienced questionable development, as assessed by researchers using the KPSP development instrument. Furthermore, from the results of a preliminary study conducted through interviews with mothers of toddlers at Nurul Huda PAUD, 6 out of 11 mothers stated they did not know about stimulation and had never received information about developmental stimulation for toddlers.

Some of the impacts that can occur due to suboptimal toddler growth include stunted brain development, excessive anxiety, uncontrolled emotions, and cognitive impairment. Furthermore, it can lead to poor reasoning skills and educational achievement, as well as decreased work productivity, which significantly impacts the toddler's future (Merita, 2019). Research (Izah*et al.*, 2019) shows that efforts to foster comprehensive and quality child development are carried out through early detection, monitoring and handling activities for early childhood maladjustments, these activities are aimed at children under 5 years of age, which is called the "golden period".

According to (Luqyana, 2024) to prevent growth and development delays in toddlers, Regulation of the Minister of Health of the Republic of Indonesia Number 66 of 2014 concerning Monitoring of Growth, Development, and Developmental Disorders in Children stipulates that stimulation must be provided appropriately and optimally, in addition to active early detection of growth and development which is given at least 2 times a year or every 6 months for children aged 0-5 years. Early detection carried out by the government is very helpful for mothers in monitoring the growth and development of their toddlers, but the role of mothers themselves in optimizing their children's development is very much needed. Efforts to optimize parental knowledge include providing health education related to developmental stimulation in toddlers.

Health education aims to change behavior towards a healthy lifestyle, based on self-awareness, both at the individual, group and community levels, in order to maintain and improve health levels (Trisutrisno*et al.*, 2022). Health education encourages individuals to obtain health information to improve their health and knowledge. Health education provided to mothers of toddlers is expected to help and change mothers' behavior regarding stimulation given to toddlers, so that toddlers' development is appropriate to their age and developmental stage.

The health education that will be carried out by researchers will use animated video media, where animated videos can increase mothers' knowledge, where animated videos regarding toddler development stimulation have never been implemented at Nurul Huda PAUD before, until now the media available at Nurul Huda PAUD are only toys and KIA books for toddler mothers. This is in accordance with research according to (Nuraeni*et al.*, 2024), the use of video media in health education has proven effective in improving pregnant women's understanding of the triple elimination program. This media is able to present information through a combination of visuals and text that are easy to observe, thus facilitating the acceptance and understanding of the material. Furthermore, the attractive display also encourages pregnant women's learning motivation, which ultimately contributes to a significant increase in knowledge. Another study by (Suryani & Nadia, 2022) found a significant effect of the use of animated videos on nutrition for pregnant women on improving nutritional knowledge during pregnancy. This increase occurs because animated videos can stimulate participants' imaginations and are easier to remember, thanks to the presentation of material that involves visual and audio elements simultaneously.

Based on this, researchers are interested in examining the effect of health education using animated videos on mothers' knowledge of stimulating the development of toddlers aged 36-60 months. The hope is that this research will help mothers recognize toddler development and learn how to stimulate children appropriately using animated videos, thus improving their development.

2. Preliminaries or Related Work or Literature Review

Concept of Health Education Theory

Health education is a process of helping individuals and groups make informed decisions, optimizing individual capacity to maintain health, and encompassing efforts to improve and strengthen both the physical and non-physical environment (Erwin Setyo, 2012, in Trisutrisno et al., 2022). Health education aims to foster healthy lifestyles based on self-awareness and can enhance a person's knowledge, which in turn stimulates better growth and development (Mulyanti & Kusmana, 2022).

Health education aims to guide individual behavior to align with recommended health norms, thereby achieving behavioral change to improve health and well-being through the active participation of individuals, families, and communities (Sinaga et al., 2021). Health education targets individuals, groups, and the wider community (Sari, 2013 in Trisutrisno et al., 2022). Targets are divided into primary targets as direct recipients, secondary targets as community leaders who convey information, and tertiary targets as policymakers who influence health improvement.

The success of health education is influenced by material aspects, physical and social aspects, learning instruments, and individual aspects such as the target's physiological and psychological conditions (Widyastuti, 2019). The stages of health education include sensitization to raise awareness, publicity to introduce health services, education to improve knowledge and behavior, and motivation to encourage behavioral changes in accordance with health recommendations (Azwar, 1983 in Sinaga et al., 2021).

Health education methods are ways of conveying information to targets individually, in groups, or on a mass scale (Suliha, 2002 in Trisutrisno et al., 2022). Methods can include face-to-face meetings, small and large group discussions, and the use of electronic and print media according to the characteristics of the target audience (Sinaga et al., 2021; Trisutrisno et al., 2022). Health education media are tools for conveying health information (Machfoedz & Suryani, 2013 in Trisutrisno et al., 2022). Media include print, electronic, and billboards, each of which has advantages and limitations in terms of reach, cost, and effectiveness of message delivery (Widyastuti, 2019; Mamahit et al., 2021; Hartono et al., 2023).

Distributed repetition theory, the Ebbinghaus forgetting curve, the primacy and recency effects, and proactive and retroactive interference emphasize the importance of spacing learning time to enhance information retention. Effective learning duration ranges from 45–90 minutes with periodic 10–15-minute breaks (Putri, 2024).

Concept of Theory of Knowledge

Knowledge is an individual's understanding of an object obtained through the senses and can be measured through interviews (Notoatmodjo, 2018 in Silitonga & Nuryeti, 2021). Knowledge is acquired through learning and experience and processed through sensory memory, working memory, and long-term memory (Hakim, 2014). Parental knowledge plays a crucial role in optimally stimulating children's growth and development (Lulianthy et al., 2020).

Knowledge is acquired through non-scientific means such as experience, authority, intuition, and common sense, as well as through systematic and rational scientific methods using research methods (Notoatmodjo, 2018). Knowledge is influenced by education, occupation, experience, beliefs, socio-cultural factors, information/mass media, environment, and age (Notoatmodjo, 2018). Knowledge is measured using a questionnaire based on the material being assessed and classified into good, sufficient, and insufficient based on a percentage score (Arikunto, 2010 in Haly, 2021; Swarjana, 2022).

The Concept of Developmental Stimulation Theory

Stimulation is the stimulation and training provided by a child's external environment to develop their intelligence and skills and is a basic need for development (Soetjiningsih, 2017, in Deswita et al., 2023). Varied and continuous stimulation promotes optimal child development (Deswita et al., 2023).

Stimulation aims to encourage optimal development in toddlers (Saadah et al., 2020). Providing stimulation supports optimal child development and prevents developmental disorders (Ministry of Health, 1990 in Saadah et al., 2020). Stimulation should be given from birth and can be incorporated into daily activities (Saadah et al., 2020). Stimulation is carried out with affection, in stages according to age, in a fun way, without coercion, using safe tools, and limiting gadget use according to IDAI recommendations (Ministry of Health, 2022).

Stimulation is influenced by social support, the environment, economic status, maternal education, and the availability of infrastructure (Misniarti & Haryani, 2022). Lack of stimulation can lead to decreased brain function, developmental disabilities, language delays, and emotional and social disorders in children (Akbar et al., 2021; Darmawan, 2019; Safaria, 2005 in Putra et al., 2018).

Concept of Development

Development is a gradual process of change toward more complex body structures and functions, encompassing motor skills, language, emotions, social skills, and independence, as a result of the interaction of the nervous system and the learning process (Ministry of Health of the Republic of Indonesia, 2022). Development is characterized by changes in function,

occurs sequentially, has a different pace for each child, and is closely related to physical growth (Ministry of Health, 2006 in Yulizawati et al., 2022).

3. Materials and Method

This study used a pre-experimental design with a one-group pretest–posttest design without a control group. The effectiveness of the intervention was evaluated by comparing the results before (pre-test) and after (post-test) the treatment was given. The study was conducted from August 2024 to June 2025 at PAUD Nurul Huda, Karangbesuki, Sukun District, Malang City. The population in this study were all mothers with toddlers aged 36–60 months at PAUD Nurul Huda, totaling 33 mothers, with a sample of 33 mothers taken using a total sampling technique. Data collection was carried out through administering pre-test and post-test questionnaires after being given health education using animated video media. The research instrument was a questionnaire containing questions related to mothers' knowledge about stimulating the development of toddlers aged 36–60 months. Data processing was carried out through the stages of editing, coding, scoring, data entry, and tabulating using Microsoft Excel and IBM SPSS Statistics version 25.

4. Results and Discussion

Research result

General Data

The characteristics of mothers who have toddlers aged 36-60 months at PAUD Nurul Huda, Karangbesuki, Sukun District, Malang City can be seen in table 1 below:

Table 1. Distribution of Characteristics of Mothers with Toddlers of Age.

No	Respondent Characteristics	n	%
1	**Age**		
	<18 years	**0**	**0%**
	18-40 years old	**28**	**84.8%**
	>40 years	**5**	**15.2%**
2	**Education**		
	Elementary School	**3**	**9.1%**
	JUNIOR HIGH SCHOOL	**10**	**30.3%**
	SENIOR HIGH SCHOOL	**19**	**57.6%**
	College	**1**	**3.0%**
3	**Work**		
	Doesn't work	**14**	**42.4%**
	Private employees	**11**	**33.3%**
	Self-employed	**6**	**18.2%**
	Etc	**2**	**6.1%**

. Based on table 1, the majority (60.6%) of mothers are in*range*aged 20-35 years, (57.6%) mothers with a high school education, and (42.4%) mothers who do not work.

Special Data

Mothers' Knowledge Before Being Given Health Education Using Animated Videos About Developmental Stimulation for Toddlers Aged 36-60 Months at Nurul Huda Early Childhood Education Center

Health education was conducted on the first and second days, three days after the pretest. Health education was conducted twice with respondents using media created by the researchers and tested for feasibility, namely animated videos. On the first day of health education, participants were given a pre-test questionnaire, followed by material on developmental stimulation in toddlers using animated videos. On the second day, participants were given a repetition of the material using animated videos and then filled out the post-test questionnaire.

Before being given health education using animated videos, the average value was 72.12, the median was 73.33, the standard deviation was 8.242, the minimum value was 53 and the maximum value was 93. The table of categorical data on mothers' knowledge using videos about stimulating the development of toddlers aged 36-60 months can be seen below.

Table 2. Frequency Distribution of Mothers' Knowledge Before Being Given Health Education Using Animated Videos.

Pre-Test	n	%
Good	**7**	**21.2%**
Enough	**24**	**72.7%**
Low	**2**	**6.1%**
TOTAL	**33**	**100%**

Mothers' Knowledge After Being Given Health Education Using Animated Videos About Developmental Stimulation for Toddlers Aged 36-60 Months at Nurul Huda Early Childhood Education Center

After Health Education with animated videos was taught, the average score was 86.86, median 86.70, standard deviation 86.70. 8,740, the lowest value is 73 and the highest value is 100. Then, if presented in categorical data, the frequency distribution of mothers' knowledge after being given health education using videos about stimulating the development of toddlers aged 36-60 months can be seen below.

Table 3. Frequency Distribution of Mothers' Knowledge After Being Given Health Education Using Animated Videos.

Post-Test	**n**	**%**
Good	**26**	**78.8%**
Enough	**7**	**21.2%**
Low	**0**	**0%**
TOTAL	**33**	**100%**

Mothers' Knowledge Before and After Being Given Health Education Using Animated Videos About Developmental Stimulation for Toddlers Aged 36-60 Months at Nurul Huda Early Childhood Education Center

Table 4. Frequency Distribution of Numerical Data on Mother's Knowledge Before and After Being Given Health Education.

Mother's Knowledge	**Min**	**Max**	**Mean**	**Median**	**Std. Dev**	***P-value***
Pre-Test	53	93	72.12	73.33	8,242	0,000
Post-Test	73	100	86.86	86.70	8,740	

Based on table 4, the results data were obtained.*pre-test*The average value obtained was 72.12, median 73.33, standard deviation 8.242, minimum value 53 and maximum value 93, while the post-test results obtained an average value of 86.86, median 86.70, standard deviation 8.740, the lowest value 73 and the highest value 100. This shows that there is an increase in the average value of the pre-test and post-test knowledge of mothers of toddlers about developmental stimulation. Categorical data can be seen below.

Table 5. Frequency Distribution of Categorical Data on Mothers' Knowledge Before and After Health Education.

Mother's Knowledge	Before		After	
	N	**%**	**N**	**%**
Good	**7**	**21.2%**	**27**	**78.8%**
Enough	**24**	**72.7%**	**7**	**21.2%**
Low	**2**	**6.1%**	**0**	**0%**
TOTAL	**33**	**100%**	**33**	**100%**

Analysis of the Influence of Health Education Using Animated Video Media on Mothers' Knowledge About Developmental Stimulation of Toddlers Aged 36-60 Months at Nurul Huda Early Childhood Education Center

Before conducting bivariate analysis, the researcher conducted a data normality test using the test.*Shappiro Wilk*it was found that the results of the ϱ value on data*pre-test*of 0.005 (ϱ<0.05) which indicates that the data is not normally distributed. The ϱ value in the post-test data is 0.001 (ϱ<0.05) indicating that the data is not normally distributed. Because the pre-test and post-test data are not normally distributed, the researcher used a non-parametric test, namely the Wilcoxon Signed Rank Test. The use of the Wilcoxon Signed Rank Test analysis aims to compare subjects before and after being given treatment (pre-test and post-test). The conclusion of the analysis of the difference in knowledge before and after with the results of ϱ-value = 0.000 < α = 0.05 indicates that there is a difference in knowledge before and after, and if there is a difference thenH_1accepted so it can be concluded that there isThe influence of health education on mothers' knowledge about stimulating the development of children aged 36-60 months.

Based on the results of the Wilcocxon Signed Rank Test, the ϱ value = 0.000 < α = 0.05 was obtained, soH_0rejected, accepted, meaning there is an influence of health education using animated video media on mothers' knowledge about developmental stimulation of toddlers aged 36-60 monthsH_1.

Discussion

Characteristics of Mothers with Toddlers Aged 36–60 Months at Nurul Huda Early Childhood Education Center

The study results showed that the majority of mothers were between 20 and 35 years of age (60.6%), which is considered productive age. This age is generally associated with optimal physical and psychological conditions for carrying out the role of parents. Productive age allows mothers to have more mature thinking skills, better comprehension, and readiness to receive and process information, including information about children's health and development (Notoatmodjo, 2018; Thobroni, 2017). This finding is in line with research by Rizki (2024), Afwani et al. (2022), and Hidayat et al. (2024), which states that the more mature a person is, the better their level of thinking maturity and understanding of health information.

Based on education, most mothers had a high school education (57.6%), and based on occupation, most mothers were unemployed (42.4%). Education plays a significant role in improving cognitive abilities and understanding of health information, while employment is related to the extent of social interaction and access to information. Previous research has shown that mothers with higher education and broader social interactions tend to have better knowledge about child care and development (Afwani et al., 2022; Khodijah et al., 2023; Sutini et al., 2023). Thus, the characteristics of mothers in this study align with the theory and findings of previous studies, and do not indicate any gaps between the respondents' characteristics and the underlying concepts.

Mother's Knowledge Before Being Given Health Education

The results of the study showed that the average value of mothers' knowledge before being given health education using animated videos was 72.12, with the lowest value being 53 and the highest value being 93. Most mothers were in the sufficient knowledge category, which was seen from the pre-test results where the average value was still below 80. This condition indicates that before the intervention, mothers' understanding of developmental stimulation for toddlers aged 36–60 months was not optimal.

These results align with research by Wejor et al. (2024) and Mulyanti & Kusmana (2022), which showed that before receiving health education, most respondents were in the moderate to poor knowledge category. In this study, mothers with low and moderate knowledge were

predominantly unemployed, who had limited social interaction and exposure to information. These findings align with Notoatmodjo (2012) and research by Ramli (2020) and Pemayun et al. (2021), which states that work and social experience influence a person's level of knowledge. Therefore, the pre-intervention results align with theory and previous research, and no discrepancies were found between the research findings and the theoretical basis.

Mothers' Knowledge After Being Given Health Education

The results showed that the average maternal knowledge score after receiving health education using animated videos increased to 86.86, with the lowest score being 73 and the highest being 100. Most mothers were in the good knowledge category (78.8%), while the remainder were in the sufficient knowledge category (21.2%). This increase indicates that health education using animated videos has a positive impact on maternal knowledge regarding developmental stimulation for toddlers aged 36–60 months.

The results of this study align with those of Mulyanti & Kusmana (2022), Afwani et al. (2022), Angelica et al. (2024), and Paramitasari et al. (2025), which show that health education can significantly improve maternal knowledge, especially among mothers with secondary or higher education. In this study, all mothers with sufficient knowledge had a junior high school education, while mothers with a high school education tended to have good knowledge. These findings indicate that educational level plays a role in the ability to absorb information, and the results of this study are consistent with theory and previous research without any gaps.

The Effect of Health Education Using Animated Videos on Mothers' Knowledge

The results of the study showed an increase in the average value of maternal knowledge by 14.74, from 72.12 before the intervention to 86.86 after being given health education using animated videos. The results of the Wilcoxon Signed Rank Test showed a ρ-value = 0.000 < α (0.05), which means there is a significant effect of health education using animated videos on maternal knowledge about stimulating the development of toddlers aged 36–60 months. After the intervention, almost all mothers had good knowledge, showing a real change compared to the condition before the intervention.

These findings align with research by Nafilah et al. (2023), Aprianti et al. (2024), and Nuraeni et al. (2024), which showed that audiovisual media effectively increases knowledge because it involves the senses of sight and hearing. These findings also align with Edgar Dale's Cone of Experience Theory and learning theories that suggest that using multiple senses and repeating material can improve understanding and retention (Kartikawati et al., 2020; Thobroni, 2017). Repeating the material through two sessions also supports increased knowledge, as supported by research by Destamega et al. (2021) and Ulfah et al. (2021). Thus, the results of this study demonstrate a strong alignment between theory, previous research, and research findings, and confirm that health education using animated videos has a significant effect on improving maternal knowledge

5. Comparison

Comparison with state-of-the-art is an important part. This section can provide a more measurable illustration of your research contribution. This section can also be added to a brief discussion. If you feel that this section is insufficient and unsuitable to be a separate section, the author(s) can integrate this section with section four (Results and Discussion).

6. Conclusion

Conclusion

Based on the results of research on the influence of health education using animated video media on mothers' knowledge about stimulating the development of toddlers aged 36-60 months at PAUD Nurul Huda, Karang Besuki, the following conclusions can be drawn: Based on the characteristics of mothers of toddlers at Nurul Huda PAUD, it was found that

most of the mothers were in the 20-35 year age range, most of the mothers had a high school education, and most of the mothers did not work. Before being given health education using animated video media, it was shown that most mothers had sufficient knowledge about stimulating the development of toddlers aged 36-60 months. After being given health education using animated video media, it was shown that most mothers had good knowledge about stimulating the development of toddlers aged 36-60 months. Based on the analysis, it can be concluded that there is a significant influence between health education using animated videos on mothers' knowledge about stimulating the development of toddlers aged 36-60 months at PAUD Nurul Huda with a ϱ-value of 0.000 < (α = 0.05).

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