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The Effect of Online Health Education Using Animated Videos and Booklets on Parents' Knowledge of Motor Development Stimulation in Preschool Children

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ABSTRAK

Latar Belakang: Stimulasi orang tua berperan penting dalam mendukung perkembangan motorik anak prasekolah, namun banyak orang tua yang masih kurang memahami stimulasi yang sesuai usia. **Tujuan**: Penelitian ini bertujuan untuk mengetahui efektivitas video animasi yang dikombinasikan dengan buklet digital dalam meningkatkan pengetahuan orang tua tentang stimulasi perkembangan motorik pada anak prasekolah. **Metode**: Desain quasi-eksperimental pretest-posttest control group digunakan, melibatkan 120 orang tua yang dipilih melalui purposive sampling, dengan 60 orang tua ditugaskan ke kelompok intervensi dan 60 orang tua ditugaskan ke kelompok kontrol. **Hasil**: Pengetahuan diukur menggunakan kuesioner terstruktur dan dianalisis menggunakan uji-t berpasangan dan independen ($p<0,05$). Temuan menunjukkan bahwa penggunaan video animasi yang dikombinasikan dengan buklet memiliki dampak yang signifikan terhadap peningkatan pemahaman orang tua. **Kesimpulan**: Penelitian ini menunjukkan bahwa media edukasi multimoda dapat meningkatkan pemahaman lebih efektif daripada media cetak konvensional. Temuan ini menyoroti pentingnya pendekatan edukasi yang mudah diakses, menarik, dan ramah pengguna bagi orang tua, dengan implikasi untuk program edukasi kesehatan di lingkungan anak usia dini.

Keywords:

Animated Video, Booklet, Parental Knowledge, Motor Stimulation, Preschool Childres

ABSTRACT

Background: Parental stimulation plays an important role in supporting the motor development of preschool children, but many parents still lack understanding of age-appropriate stimulation. **Objective**: This study aimed to determine the effectiveness of animated videos combined with digital booklets in improving parental knowledge about motor development stimulation in preschool children. **Method**: A quasi-experimental pretest-posttest control group design was used, involving 120 parents selected through purposive sampling, with 60 parents assigned to the intervention group and 60 parents assigned to the control group. **Results**: Knowledge was measured using a structured questionnaire and analyzed using paired and independent t-tests ($p<0.05$). The findings indicate that the use of animated videos combined with booklets has a significant impact on improving parental understanding. **Conclusion**: This study shows that multimodal educational media can improve understanding more effectively than conventional print media. These findings highlight the importance of educational approaches that are accessible, engaging, and user-friendly for parents, with implications for health education programs in early childhood settings.

1. INTRODUCTION

Early childhood motor development is a crucial aspect of growth and development, as the 0-6 years period is the "golden" period for children's cognitive and motor development. At this age, appropriate stimulation can prevent developmental delays; conversely, without adequate stimulation, children are at risk of experiencing motor delays (Rosalianisa et al., 2023). Regional Health Research shows that the motor development of children aged 36-59 months has reached 97.8% of the target of 98.3%. Ten percent of children experience developmental delays, and 1-3% of children under 5 years of age experience motor development (Hura, 2024). Parents, as the primary educators, play a central role in providing early stimulation. However, previous research has shown that parents' lack of understanding of child developmental stimulation can lead to developmental delays in some children (Maja Vukelja, 2024). Health education for parents is crucial for improving children's developmental literacy (Lubis et al., 2024).

Interactive learning media such as animated videos and booklets are becoming increasingly popular in health education. Animated videos present information visually and audibly, making it easier to understand (Andrasari, 2022). Conversely, booklets provide structured explanations that can be studied at any time (Hermasari et al., 2021). Previous research indicates that both media are effective in increasing parental knowledge. This research aligns with Nurfadhillah (2023). who found that health education using animated videos significantly increased parental knowledge ($p<0.05$) regarding early childhood motor development (Nurfadhillah et al., 2021). Meanwhile, based on previous research, Raodah (2023) reported a significant increase in mothers' knowledge scores after being given booklet education ($p=0.00$) (Raodah et al., 2023). These studies support the idea that animation and booklets can be used in child health promotion. Based on this background, this study specifically examines the effectiveness of a combination of animated videos and booklets in increasing parents' knowledge regarding motor stimulation of preschool children. Although previous research has shown that both animated videos and booklets are effective in increasing parental knowledge, most studies have only evaluated the two methods separately. Animated videos are considered helpful because they convey information visually and easily, while booklets provide structured explanations that can be reread. However, few studies have tested the use of these two media simultaneously. This gap underlies the novelty of this research. By combining animated videos and booklets, this study seeks to offer a more comprehensive educational approach and potentially yield stronger results in improving parents' understanding of stimulating preschoolers' motor development.

2. METHOD

This study utilizes a quasi-experimental design with two interventions pre-test and post-test. The intervention group is located at KB-TK ABA Kembaran, while the control group comprises KB Asiah Kalibayem and TK ABA Godegan in Kasihan District, Bantul. All three kindergartens are partners of Muhammadiyah University of Yogyakarta, facilitating permissions, coordination, and implementation of educational activities. This collaboration also ensures that the schools provide full support during data collection, from offering time and space to assisting in contacting parents.

Based on initial observations and discussions with teachers at the three kindergartens, many parents still lack an understanding of the stages of motor development stimulation, both gross and fine, for preschool-aged children. Several parents admitted that they had never received specific education on motor development or how to provide appropriate stimulation at home. This indicates that these locations have a genuine educational need relevant to the focus of this research.

The sample was determined using total purposive sampling, resulting in 120 parents (60 in the intervention group and 60 in the control group), with equivalent baseline characteristics for both groups. The pre-test was conducted online using Google Forms on July 21, 2025. The intervention group received education through animated videos and digital booklets, while the control group received only leaflets. After three weeks, both groups underwent a post-test using the same instrument. In health education, changes in knowledge do not always occur immediately after the material is presented, some respondents need time to understand, remember, and adapt the information to their daily activities. A three-week intervention period was chosen because it was deemed sufficient to determine whether the knowledge increase was genuinely effective and not just a short-term effect. Previous studies have also utilized intervention periods of two to four weeks to evaluate educational impacts, particularly in interventions involving visual media such as videos and booklets. This interval is considered ideal to avoid immediate recall bias and to provide a more stable picture of knowledge changes. With these considerations, the three-week intervention was deemed methodologically appropriate and relevant to the study's objectives.

Data analysis was performed using SPSS version 26 with paired t-tests and independent t-tests at a significance level of $p < 0.05$. This study received an ethical certificate from the ethics committee of RS PKU Muhammadiyah Gamping, numbered 196/KEP-PKU/VI/2025, and was declared ethically appropriate in accordance with the seven (7) WHO 2011 Standards: Social Values, Scientific Values, Fair Assessment and Benefits, Risks, Persuasion/Exploitation, Confidentiality and Privacy, and Informed Consent, referring to the 2016 CIOMS Guidelines. This is evidenced by the fulfillment of the indicators for each standard.

3. RESULTS

Respondents in this study were parents of students from ABA Kembaran Kindergarten, ABA Godegan Kindergarten, Tamantirto, and Asiah Kindergarten, Kalibayem, Kasihan, Bantul. The characteristics of each informant can be seen in the table below.

Table 1
Overview of Respondent Characteristics

No	Characteristics	Intervention (N=60)		Control (N=60)	
		F	%	F	%
1.	**Parent Age**				
	Min-Max	24- 52		22-45	
	Mean ± SD	36		34	
2.	**Child Age**				
	36-47 months	6	10.0	5	8.3
	48-59 months	9	15.0	15	25.0
	60-72 months	45	75.0	40	66.7
	Total	**60**	**100.0**	**60**	**100.0**
3.	**Child Gender**				
	Man	36	60.0	28	46.7
	Woman	24	40.0	32	53.3
	Total	**60**	**100.0**	**60**	**100.0**
4.	**Parental Education**				
	No school - junior high school	6	10.0	10	16.7
	Senior high school	30	50.0	30	50.0
	Bachelor / Diploma	24	40.0	20	33.3
	Total	**60**	**100.0**	**60**	**100.0**
5.	**Parents' job**				
	Not Working/Housewife	32	53.3	30	50.0
	Work	28	46.7	30	50.0
	Total	**60**	**100.0**	**60**	**100.0**

The characteristics of the respondents in both groups appeared fairly balanced. The ages of parents in the intervention group ranged from 24-52 years, with an average of 36, while those in the control group ranged from 22-45 years, with an average of 34 years. In terms of child age, the majority were between 60-72 months, representing 75% in the intervention group and 66.7% in the control group. This means that the majority of children were in the late preschool stage, a time when they require continuous motor stimulation. In the intervention group, boys were more prevalent (60%), while in the control group, girls were slightly more numerous (53.3%).

Parental education levels in both groups were also relatively similar. The most common educational attainment was high school, with 50% of parents in each group.

Furthermore, the percentage of parents with a college education was also quite high, representing 40% in the intervention group and 33.3% in the control group. This educational background indicates that the respondents had a fairly good ability to understand the educational material provided.

Table 2
Baseline Characteristics of Respondents Between Groups

No	Characteristics	Intervention (N=60)		Control (N=60)		X^2 Test/Mann-Whitney U	P-value
		F	%	F	%		
1.	**Parent Age**						
	Min-Max	24- 52		22-45		1470.5	0.083
	Mean ± SD	36		34		Z = -1.733	
2.	**Child Age**						
	36-47 months	6	10.0	5	8.3		
	48-59 months	9	15.0	15	25.0	1,885	0.390
	60-72 months	45	75.0	40	66.7		
	Total	**60**	**100.0**	**60**	**100.0**		
3.	**Child Gender**						
	Man	36	60.0	28	46.7		
	Woman	24	40.0	32	53.3	2,143	0.143
	Total	**60**	**100.0**	**60**	**100.0**		
4.	**Parental Education**						
	No school - junior high school	6	10.0	10	16.7		
	Senior high school	30	50.0	30	50.0	1,364	0.506
	Bachelor / Diploma	24	40.0	20	33.3		
	Total	**60**	**100.0**	**60**	**100.0**		
5.	**Parents' job**						
	Not Working/Housewife	32	53.3	30	50.0		
	Work	28	46.7	30	50.0	0.133	0.715
	Total	**60**	**100.0**	**60**	**100.0**		

Based on Table 2, the average age of parents in the intervention group was 36 years, while in the control group it was 34 years. The statistical test results showed a p-value > 0.05, thus concluding that there was no significant difference between the two groups. The majority of children in this study were between the ages of 60–72 months, both in the intervention group (75%) and the control group (66.7%). The gender of the children in both groups was also relatively balanced (p>0.05). Based on both groups, it was proven to be balanced in all variables tested (Parental Age, Child Age, Child Gender, Parental Education, Parental Occupation), indicated by all P-values that were above the significance limit >0.05 (the highest 0.715 for Occupation and the lowest 0.083 for Parental Age).

Table 3.
Pre-test and Post - Test Knowledge Motor Development of Parents Group Interventions and Groups Control

Variables	Group	N	Min	Max	Mean	Elementary School
Pre-test	Intervention	60	57	89	75.68	6,516
	Control	60	55	87	72.65	6,691
Post-test	Intervention	60	67	98	86.35	5,994
	Control	60	65	89	78.47	5,604

Table 3 shows that the average pre-test score for the intervention group was 75.68 and for the control group 72.65. After treatment, the average post-test score for the intervention group increased to 86.35, while the average post-test score for the control group increased to 78.47. Both groups showed an increase in knowledge, but the increase was greater in the intervention group. This indicates that the intervention was effective in improving parental knowledge.

Table 4.
Results of the Normality Test of Motor Development Knowledge Scores of Parents in the Intervention Group and the Control Group

Variables	p-value	Information
Intervention Pre-test	0.200	Normal
Post-test Intervention	0.200	Normal
Pre-test Control	0.167	Normal
Post-test Control	0.163	Normal

Based on the results in Table 4, all variables showed p-values greater than 0.05. This indicates that the parental knowledge data, both in the intervention and control groups, during both the pre- and post-tests, were normally distributed.

Table 5.
Results of the Paired T-Test (Pre-test and Post-test) in the Intervention and Control Group

Variables	Group		Mean	Std. Deviation	Paired	P-value	95%CI	
							Lower	Upper
Knowledge	Intervention	Pre-test	75.68	6,516	-17,813	0.001	-11,865	-9,468
		Post-test	86.35	5,994				
	Control	Pre-test	72.65	6,691	-10,852	0.001	-6,889	-4,774
		Post-test	78.47	5,604				

Based on Paired Sample T-Test results No in pairs obtained mark significance (p-value) of 0.001 which is greater small than 0.05. Therefore, the results indicate a significant relationship between the pre-test and post-test results in both the intervention and control groups. Furthermore, the mean score in the intervention group was higher than in the control group, thus concluding that the health education provided improved parents' knowledge about stimulating the motor development of preschool-aged children.

Table 6.
Results of the Homogeneity Test of Motor Development Knowledge Scores of Parents in the Intervention Group and the Control Group

Variables	F	Sig.	Information
Parents' Knowledge Regarding Motor Stimulation of Preschool Children	0.480	0.490	Homogeneous (Equal variances assumed)

Based on Table 6, the results of the homogeneity test using Levene's Test, an F value of 0.480 was obtained with a p-value (Sig.) of 0.490. Because the significance value is greater than 0.05 (0.490 > 0.05), therefore the data have the same variance or are homogeneous. Where the data between the intervention group and the control group are not significantly different.

Table 7.
Results of the Independent Sample T-test for the Intervention Group and the Control Group

Variables	Group	Mean	Std. Dev	T-test	P-Value	95%CI	
						Lower	Upper
Pre-test Knowledge	Intervention	75.68	6,516	2,516	0.013	0.646	5,421
	Control	72.65	6,691				
Post-test Knowledge	Intervention	86.35	5,994	7,442	0.001	0.646	5,421
	Control	78.47	5,604				

Based on the results in Table 7, The pre-test knowledge scores between the intervention and control groups appeared to differ, but the difference was not yet significant. After receiving education through animated videos and booklets, there was a clear increase in knowledge scores in the intervention group compared to the control group. The statistical test results showed a post-test p-value of 0.001, indicating a significant difference. This finding confirms that providing education using intervention media has a significant effect on improving parents' understanding of children's motor development.

4. DISCUSSION

The respondents in this study were 120 parents of preschool-aged children, with 60 in the intervention group (KB-TK ABA Kembaran) and 60 in the control group (KB Asiah Kalibayem and TK ABA Godegan). The majority of parents were in the productive age range, with an average age of 36 years in the intervention group and 34 years in the control group. This age range indicates that the majority of respondents were in the productive adult stage, generally having experience in caring for and supporting children's growth and development. There was no statistically

significant difference (p = 0.083). The results indicate that both groups had relatively equal readiness to receive education.

The characteristics of respondents in both groups were fairly balanced in terms of child age. Most children in both groups were in the 60-72 months age group, with 75% in the intervention group and 66.7% in the control group. This indicates that the majority of children were in the late preschool age phase, a period that requires consistent stimulation for motor development (Nurramadhanti & Wijdaningtyas, 2024). In the intervention group, there were more boys (60%), while in the control group, there was a slight preponderance of girls (53.3%). The gender of the children in both groups was also evenly distributed, thus avoiding any bias in comparing motor development abilities between groups (Panyura et al., 2022). Parents' education levels generally range from high school to college, with almost equal proportions in both groups. Furthermore, most parents were unemployed or housewives, allowing them more time to accompany their children.

These balanced characteristics indicate that the intervention and control groups were at similar baselines, so any differences in outcomes after the educational treatment were more likely due to the intervention (Rosidi et al., 2023). Overall, the respondents' characteristics were homogeneous, indicating that changes in knowledge were primarily due to the educational intervention using animated videos and booklets (Parmiti et al., 2024).

The results of this study show that health education through animated videos and booklets significantly increased parents' knowledge about stimulating children's motor development (Nuraenah, 2023). The significant increase in knowledge scores in the intervention group indicates that interactive and multimodal information presentations are more effective than leaflets.

These findings are consistent with Piaget's (1936) theory, which states that learning occurs through active experience and information processing (Pakpahan & Saragih, 2022). The animated videos provided engaging visual and auditory stimuli that helped facilitate conceptual understanding, while the booklets offered written explanations that could be reviewed repeatedly to reinforce retention (Cholik & Umaroh, 2023).

Before the intervention, parental knowledge in both groups was moderate. The average pre-test score in the intervention group was 75.68 and in the control group 72.65. After the education, knowledge increased in both groups, but the increase was greater in the intervention group. This suggests that education plays a crucial role in helping parents understand appropriate forms of stimulation according to their child's developmental stage (Permatasari et al., 2023).

This study aligns with research by Khamim Zarkasih Putro (2021), who found a significant increase in mothers' knowledge after counseling using animated videos (Khamim Zarkasih Putro, 2021). Animated video media is categorized as "engaging" because it combines visual and audio elements, making the concept of motor stimulation easier to understand through concrete illustrations (Arieska, 2023).

Educational videos facilitate parents' understanding by simultaneously engaging both sight and hearing, thus improving the material's (Faira Zanada et al., 2023).

Booklets also offer several advantages, such as structured material that can be studied repeatedly at any time (Cantika Brilliana et al., 2022). Parents can read and memorize the booklet's contents at their convenience without time constraints, and can use it as a long-term guide when guiding their children (Ariani et al., 2022). Previous research by Raodah (2023) demonstrated that booklets effectively increase parental knowledge due to their practical and portable nature, resulting in improved parental attitudes and knowledge after booklet education (Raodah et al., 2023). This combination of animated videos and booklets aligns with Piaget's (1936) research, which has been shown to strengthen parents' understanding of motor stimulation. The visual information in the video can be supplemented with detailed written explanations in the booklet, so parents are engaged not only in reading but also in learning (Saputri et al., 2021).

The control group was only given leaflets without additional explanations. Although there was an increase in scores from 72.65 to 78.47, the increase was smaller than the intervention group. Statistical tests also showed a significant increase ($p = 0.001$) in the control group using simple media counseling in the form of useful leaflets (Shalahuddin & Salsabila, 2025). However, the greater difference in improvement in the intervention group underscores the effectiveness of digital media-based educational methods (Pramanda, 2023).

Another factor that may influence the results is the respondent's background, for example, parental education and occupation can moderate the speed of comprehension of educational material (Syaadah et al., 2023). However, statistical tests at the beginning of the study showed that both groups had comparable demographic characteristics and a balanced baseline, so the effectiveness of knowledge improvement was primarily due to the type of educational media used (Hermasari et al., 2021).

Post-test results showed a significant difference between the two groups ($p < 0.05$). Knowledge gains in the intervention group were also significantly higher than in the control group. The results of the Independent Sample t-test showed that after the intervention, there was a significant difference in scores between the two groups ($p = 0.001$), with the average post-test score of the intervention group being significantly higher than that of the control group.

This study's strength lies in the use of two educational media animated videos and digital booklets, which complement each other in enhancing parents' knowledge regarding developmental stimulation for preschool-aged children. The online implementation facilitated media distribution and data collection, making it more efficient. The questionnaire instrument has also been proven valid and reliable, ensuring reliable results. Furthermore, respondents demonstrated good participation in the pre- and post-tests, and the educational materials used had a clear theoretical basis.

The main limitation of this study was its online implementation, which prevented researchers from directly observing respondents' levels of attention while using the educational media. Network issues also sometimes hampered access and completion of the questionnaire. The study only involved respondents from one region, so the results cannot be generalized to a wider population. Furthermore, the study only measured increases in knowledge, not changes in attitudes and practices regarding direct stimulation at home.

5. CONCLUSION

This study shows that providing education using animated videos combined with booklets has been proven to increase parents' knowledge regarding stimulating the motor development of preschool children. The group receiving the intervention experienced a higher increase in knowledge scores than the control group ($p < 0.05$). Video media helps clarify the material through visual and audio displays, while booklets provide parents with the opportunity to return to the material at any time. The collaboration of these two media can be an effective choice in counseling activities or parent support in health services and educational settings. Based on these findings, parents are expected to be more active in seeking and using easily accessible learning resources such as educational videos and booklets, so that the stimulation provided to children is more age-appropriate. Health workers and teachers are also encouraged to use this digital educational media in their practices, because the delivery is simple, engaging, and can be accessed anytime, making the process easier to understand.

Similar research could be developed further by involving a wider region and a wider number of respondents, and by adding other aspects such as changes in parental attitudes and practices regarding children's motor stimulation. This is crucial so that the impact of education is seen not only in increased knowledge but also in direct application in everyday life.

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