

Android-Based Childcare Booklet as an Educational Medium to Improve Mothers' Knowledge and Attitudes

Resna Litasari¹, Neli Sunarni¹, Aulia Ridla Fauzi¹, Sandriani¹

¹STIKes Muhammadiyah Ciamis, Ciamis, Indonesia

Article Information

Revised: September 2025

Available online: October 2025

Keywords

Android-Based Booklet, Childcare, Maternal Knowledge, Maternal Attitudes, Health Education

Correspondence

E-mail : litasari76@gmail.com

ABSTRACT

The knowledge and attitudes of mothers as primary caregivers are key factors in implementing optimal parenting patterns. The use of technology-based educational media, such as Android-based booklets, is one innovation in maternal and child health education. This study aims to determine the effect of education using Android-based parenting booklets on improving the knowledge and attitudes of mothers of toddlers. This study is a quantitative study with a pre-experimental one-group pretest-posttest design. The study sample consisted of 60 mothers who had children aged 37–60 months at the Lembah Medina Health Centre in Ciamis Regency and were selected using total sampling technique. The research instruments were questionnaires on mothers' knowledge and attitudes. Data analysis was performed using the Friedman test. The results showed an increase in mothers' knowledge from the adequate category (65.0%) to the good category (90.0%) and a change in attitude from poor (60.0%) to positive (93.3%) after the intervention. The Friedman test showed a significant difference before and after the intervention ($p < 0.05$). It was concluded that the Android-based child care booklet was effective as an educational medium for improving the knowledge and attitudes of mothers of toddlers.

INTRODUCTION

Parenting patterns are a fundamental factor that plays an important role in determining the quality of child growth and development, especially in the first five years of life, known as the golden period (Hernawati et al., 2025). During this phase, children's cognitive, emotional, social, and motor development progresses rapidly, requiring optimal stimulation and care from parents, especially mothers as primary caregivers utama (Hernawati et al., 2025; Siswati et al., 2024). Inappropriate parenting patterns can lead to developmental delays, behavioural disorders, and an increased risk of health and psychosocial problems in children (Marniwati Lafau et al., 2025).

Mothers' knowledge and attitudes are key components in shaping good parenting practices. Mothers with adequate knowledge tend to have positive attitudes in meeting their children's basic needs, such as nutrition, developmental stimulation, hygiene, and utilisation of health services. Conversely, limited maternal knowledge is often associated with suboptimal parenting practices, which can potentially hinder children's growth and development (Mutiar, 2022; Widyahening et al., 2021).

With the development of information technology, health education approaches have shifted from conventional methods to the use of digital media. Android-based educational media are considered more flexible, easily accessible, and allow users to obtain information independently and repeatedly (Monalisa et al., 2021). Android-based booklets are a form of digital educational media that combine text and visuals in an attractive way, thereby increasing the appeal and understanding of

the educational target (Putri Yorenza et al., 2024).

Several studies in the last five years have shown that digital educational media, including e-booklets and Android-based health applications, are effective in improving mothers' knowledge and attitudes (Monalisa et al., 2021). A study (Oktaviani & Heriteluna, 2021) reported a significant increase in mothers' knowledge and attitudes after being given health education using digital media. Other studies also show that Android-based media can increase target engagement and strengthen the learning process because it can be accessed anytime according to user needs.

However, the use of Android-based child care booklets as a medium for maternal health education has not been systematically implemented at the primary health care level, particularly in efforts to increase mothers' knowledge and attitudes regarding child care. Therefore, research is needed to assess the effectiveness of Android-based child-rearing booklets as an educational medium in improving mothers' knowledge and attitudes. The results of this study are expected to provide an innovative alternative in the development of effective, practical, and easily accessible health education media for mothers and children.

METHOD

This study involved 60 mothers with children aged 37–60 months at the Lembah Medina Health Centre, Linggasari Village, Ciamis Regency, conducted in July–August 2023. The sampling technique used total sampling. The inclusion criteria included mothers who had children aged 37–60 months, owned an Android-based device, and were willing to be respondents. Mothers who worked as health workers, lecturers, or psychologists were excluded

from the study. The study used a pre-experimental one-group pretest–posttest design. Initial measurements were taken to determine the mothers' level of knowledge and attitudes towards parenting before the intervention. Next, the respondents were given education on parenting using an Android-based booklet. After the intervention, re-measurements were taken to assess changes in the mothers' knowledge and attitudes after being given education. The instruments used in this study were questionnaires on mothers' knowledge and attitudes about parenting, which were compiled by the researchers based on a literature review. The knowledge questionnaire was compiled in the form of multiple-choice questions, while the attitude questionnaire used a

Likert scale. All instruments underwent validity and reliability testing before being used in data collection. The intervention medium used was an Android-based child parenting booklet containing material on parenting and child growth and development stimulation. Data analysis was performed using SPSS software version 24. The normality of the pretest and posttest data was tested using the Shapiro–Wilk test. If the data were normally distributed, the analysis was continued using Repeated ANOVA, whereas if the data were not normally distributed, the Friedman test was used. Hypothesis testing was set at a significance level of $p < 0.05$.

RESULTS AND DISCUSSION

1. Univariate Analysis

Table 1. Distribution of Respondent Characteristics Based on Mother's Age, Education and Occupation

Respondent Characteristics		Frequency (f)	Percentage (%)
Mother's age	20-35	52	86,7
	35-45	8	13,3
	Total	60	100
Mother Education	Primary school	3	5,0
	Secondary school	8	13,3
	Senior secondary school	49	81,7
	Higher education	0	0
	Total	60	100
Mother's work	Housewife	51	85,0
	Farmer	7	11,7
	Trader	2	3,3
	Total	60	100

The description in Table 1 shows that the respondents in this study were mostly aged 20-35 years old, 81.7% had a high school education, and most were housewives (85%).

Table 2. Respondents' Knowledge Before and After Education on Child Parenting Using Android-Based Booklets

Knowledge	Pre-test		Post-test	
	(f)	(%)	(f)	(%)
Good	10	16,7	54	90,0
Fair	39	65,0	6	10,0
Poor	11	18,3	0	0
Total	60	100,0	60	100,0

Based on Table 2, respondents' knowledge before receiving education through the Android-based parenting booklet was sufficient at 65.0%, while after receiving education, most had good knowledge at 90.0%.

Table 3. Respondents' Attitudes Before and After Education on Child Parenting Using Android-Based Booklets

Attitude	Pre test		Post test	
	(f)	(%)	(f)	(%)
Good	24	40,0	56	93,3
Not So Good	36	60,0	4	6,7
Total	60	100,0	60	100,0

Based on Table 3, the attitude of respondents before receiving education through the Android-based parenting booklet was poor in 60.0% of cases, while after receiving education, 93.3% had a positive attitude.

2. Bivariate Analysis

A statistical test to determine the effect of education using Android-based parenting booklets on improving the knowledge and attitudes of mothers of toddlers was conducted using the Friedman test.

Table 4. Bivariate Analysis of the Effect of Android-Based Child Parenting Booklet Education on Mothers' Knowledge and Attitudes

Variable	Test	Mean Rank	χ^2 (Chi-Square)	df	p-value
Knowledge	Pre	1,00	180,000	3	0,000
	Post	3,00			
Attitude	Pre	2,00			
	Post	4,00			

Based on Table 4, the results of bivariate analysis using the Friedman test show that Android-based parenting education has a significant effect on improving the knowledge and attitudes of mothers of toddlers ($p < 0.05$). The mean rank value for knowledge increased from 1.00 in the pretest to 3.00 in the posttest, while the mean rank value for attitudes increased from 2.00 in the pretest to 4.00 in the posttest. These results indicate that education using Android-based parenting booklets is effective in improving mothers' knowledge and attitudes towards parenting.

The results showed that education using Android-based parenting booklets had a significant effect on improving the knowledge and attitudes of mothers of toddlers. This finding was clearly evident in both univariate analysis and was reinforced by bivariate analysis using the Friedman

test, which showed a significant difference before and after the intervention ($p < 0.05$). This indicates that the educational intervention provided was able to meet mothers' needs for information related to parenting.

In terms of knowledge, the univariate analysis showed that before the education was provided, most respondents were in the adequate knowledge category (65.0%). This condition indicates that mothers already had a basic understanding of parenting, but there were still limitations in certain aspects. Based on the knowledge questionnaire, some of the questions that were most often answered incorrectly before the intervention were related to the principles of age-appropriate parenting, the importance of developmental stimulation at 37–60 months of age, and the role of parental consistency in shaping children's behaviour. After receiving education using the Android-based booklet, the proportion of respondents with good knowledge increased significantly to 90.0%. This increase shows that the material in the booklet was able to clarify child-rearing concepts that were not previously fully understood by the respondents.

This increase in knowledge was also reflected in changes in knowledge scores in measurements after the intervention, which was reinforced by the results of the Friedman test with an increase in the mean rank value. This shows that the Android-based booklet not only provides new information but also helps mothers understand and recall the material repeatedly. The digital media feature, which can be accessed at any time, allows mothers to reread the material as needed, making the learning process more effective. These findings are in line with research (Pratiwi et al., 2022; Siswati et al., 2024) which states that digital educational media contributes significantly to increasing mothers' knowledge of child rearing. (Dewi et al., 2022) in their research reported that mobile health applications can increase mothers' knowledge, especially among mothers with limited education. These findings reinforce the results of this study, where the majority of respondents who were previously in the adequate knowledge category experienced an increase to the

good knowledge category after being educated through Android-based booklet media.

In addition to increased knowledge, more noticeable changes were also seen in attitude variables. Before the intervention, most respondents had a negative attitude towards parenting (60.0%). Based on the attitude questionnaire, respondents tended to disagree with statements related to setting aside special time to interact with children, using positive communication in disciplining children, and mothers' readiness to apply consistent parenting patterns at home. After receiving education through an Android-based booklet, the proportion of respondents with positive attitudes increased to 93.3%. This change indicates that the increase in knowledge gained through education also influenced mothers' readiness to apply better parenting in their daily lives.

The results of bivariate analysis using the Friedman test further strengthened these findings, where there was a significant difference in mothers' attitudes before and after the intervention ($p < 0.05$), accompanied by an increase in the mean rank value. This shows that Android-based booklet education is effective not only in improving cognitive aspects but also in shaping mothers' affective aspects. A more positive attitude reflects mothers' acceptance and readiness to apply the information obtained in child-rearing practices.

The effectiveness of Android-based booklet media in this study is also inseparable from the characteristics of the respondents, where most mothers were of productive age and had a secondary education level. This group generally has fairly good digital literacy skills, making it easier for them to accept and utilise technology-based educational media. These findings are in line with research (Katmawanti et al., 2024) which states that mobile application-based parenting education interventions are more effective

in groups of parents who are accustomed to using digital technology.

Another study supporting this finding was reported by (Monalisa et al., 2021), which showed that digital media-based health education significantly increased mothers' positive attitudes towards implementing responsive and consistent parenting practices. This change in attitude was influenced by mothers' increased understanding of the importance of positive communication, age-appropriate stimulation, and active involvement in child care. These findings are relevant to the results of this study, where an increase in mothers' positive attitudes was reflected in respondents' increased agreement with the attitude statements in the questionnaire after the intervention.

In addition, research by (Pratiwi et al., 2022) also reported that the use of Android-based educational media had a significant effect on changes in mothers' attitudes towards child care, particularly in terms of mothers' readiness to apply consistent parenting patterns that support child development. Digital media is considered capable of conveying educational messages in a more interesting and easily understandable way, making it easier for mothers to accept and internalise the information provided. Furthermore, research by (Seyyedi et al., 2021) shows that smartphone-based interventions increase mothers' self-efficacy and self-confidence, which are important components in forming positive attitudes towards parenting practices (Lima et al., 2020) also reported a sustained change in attitude among mothers who used health applications, even up to 6 months after the intervention, demonstrating the long-term impact of digital media on attitude change.

Digital media is considered capable of delivering educational messages in a more interesting and easily understandable way, making it easier for mothers to accept and internalise the information provided.

Thus, the results of this study reinforce the evidence that Android-based parenting

booklets are not only effective in increasing mothers' knowledge but also play an important role in shaping mothers' positive attitudes towards parenting. These attitude changes serve as an indicator of the success of Android-based educational media as an adaptive health promotion tool that aligns with technological advancements and the needs of modern parents.

CONCLUSIONS AND RECOMMENDATIONS

Education using an Android-based parenting booklet has been proven effective in improving the knowledge and attitudes of mothers of toddlers. The results of univariate analysis show an increase in the level of knowledge of mothers from the adequate category to the good category after the intervention, as well as a change in attitude from the poor category to a positive attitude. These findings are reinforced by the results of bivariate analysis using the Friedman test, which shows a significant difference between before and after the provision of education ($p < 0.05$). Thus, the Android-based child-rearing booklet can be used as an effective health education medium to improve understanding and shape positive attitudes among mothers in child-rearing.

The Android-based child care booklet is recommended for use as an educational medium in primary health care services, particularly in integrated health service posts and community health centres, as a promotional and preventive measure to improve the quality of child care. Health workers are expected to integrate this medium into their ongoing counselling and assistance activities for mothers of toddlers. Further research is recommended to use a control group study design and a longer intervention period to determine the long-term effectiveness of the Android-based booklet on child-rearing practices.

BIBLIOGRAPHY

- Dewi, I. M., Waryana, W., & Sunartono, S. (2022). Penggunaan aplikasi berbasis android meningkatkan pengetahuan ibu tentang tumbuh kembang balita. *Jurnal Kebidanan dan Keperawatan Aisyiyah*, 18(2), 114–123.
<https://doi.org/10.31101/jkk.1634>
- Hernawati, E., Hassan, H. C., Nambiar, N., & Hidayati, S. N. (2025). A Quasi-Experimental Study of Mobile Health Intervention: Measuring the Impact of Android-Based Prenatal Classes on Knowledge and Attitudes of First-Time Mothers in Indonesia. *Jurnal Bidan Cerdas*, 7(1), 131–139.
<https://doi.org/10.33860/jbc.v7i1.4184>
- Katmawanti, S., Paramita, F., Kurniawan, A., Khuzaimah, S., Sharoni, A., Fauzi, R., Samah, D. A., Audina, Y. T., Syahputra, M. I., Pahlevi, R., & Pratiwi, I. G. (2024). Development of the “Mother Give Me Exclusive Breastfeeding” e-booklet based on Android as a nutrition educational media. In *Healthcare in Low-resource Settings* (Vol. 12, Number 1).
- Lima, D. R., de Aguiar Filho, S. Q., do Oh, L. B. C., dos Santos Pereira, A. K., & Pereira, D. H. (2020). Theoretical study of internal rotational barriers of electrons donating and electrons withdrawing groups in aromatic compounds. *Heliyon*, 6(9).
<https://doi.org/10.1016/j.heliyon.2020.e04957>
- Marniwati Lafau, Debi Novita Siregar, Lelli Kristia Wahyuningsih, Liana, Lidia Siregar, & Kusniati Nova Nainggolan. (2025). The Relationship of Mother’s Knowledge and Attitude in Giving Stimulation of Infant Growth and Development. *JURNAL KEBIDANAN KESTRA (JKK)*, 7(2), 122–128.
<https://doi.org/10.35451/jkk.v7i2.2451>
- Monalisa, Suharti, & Sovia. (2021). SEDICD Booklets Android-Based for Health Cadres: Research and Development. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 58(2).
<http://gssrr.org/index.php?journal=JournalOfBasicAndApplied>
- Mutiara, A. (2022). The Relationship of Mother’s Knowledge and Attitudes with Toddler’s Growth and Development Anggina Mutiara Btr. *Benih: Journal of Midwifery*, 01(02).
<https://doi.org/https://doi.org/10.54209/benih.v1i02.246>
- Oktaviani, & Heriteluna, M. (2021). Linking ASI-Mobile Android-Based App on Mothers’ Attitude and Behavior on Exclusive Breastfeed. *Kemas*, 16(3), 348–355.
<https://doi.org/10.15294/kemas.v16i3.24636>
- Pratiwi, S. K., Sinrang, A. W., Syarif, S., Ahmad, M., Bahar, B., & Maddepungeng, M. (2022). The effectiveness of toddler’s development of android-based educational media towards mother’s knowledge. *International Journal of Health Sciences*, 1031–1040.
<https://doi.org/10.53730/ijhs.v6ns2.5170>
- Putri Yorenza, D., Anas, N., & Aisyah Hutasuhut, M. (2024). Pengembangan Booklet Berbasis Android Sebagai Media Belajar Pada Materi Invertebrata Untuk Meningkatkan Hasil Belajar. *Edu-Sains*, 13(1).
- Seyyedi, Navisa, Rahmatnezhad, L., Mesgarzadeh, M., Khalkhali, H., Seyyedi, Negisa, & Rahimi, B. (2021). Effectiveness of a

- smartphone-based educational intervention to improve breastfeeding. *International Breastfeeding Journal*, 16(1). <https://doi.org/10.1186/s13006-021-00417-w>
- Siswati, T., Sitasari, A., Paramashanti, B. A., Tjaronosari, T., Nurhidayat, N., Wijanarka, A., & Waris, L. (2024). Effect of mHealth based intervention on Maternal Knowledge and Practices of Child Care: A quasi-experimental study. *Public Health of Indonesia*, 10(1), 10–20. <https://doi.org/10.36685/phi.v10i1.756>
- Widyahening, I. S., Aufa, M. A., Alhas, M. F., Widodo, A. B., & Friska, D. (2021). Knowledge, Attitude, and Practice of Mothers on the First 1000 Days of Life. *EJournal Kedokteran Indonesia*, 9(2), 129. <https://doi.org/10.23886/ejki.9.65.129>