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Effectiveness of a Digital Pocketbook in Improving Knowledge of Long-Acting Contraceptive Methods among Women of Reproductive Age

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ABSTRAK

Latar Belakang: Rendahnya pemahaman wanita usia subur mengenai Metode Kontrasepsi Jangka Panjang (MKJP), terutama implant dan IUD, masih menjadi salah satu faktor penghambat keberhasilan program keluarga berencana. **Tujuan:** Penelitian ini bertujuan untuk meningkatkan pengetahuan wanita usia subur mengenai Metode Kontrasepsi Jangka Panjang (MKJP), terutama implant dan IUD melalui edukasi menggunakan buku saku digital. **Metode:** Metode yang digunakan adalah pendekatan kuantitatif dengan desain pre-eksperimental one group pretest-posttest yang melibatkan 15 wanita usia subur di Klinik Mutiara Hati. Intervensi dilakukan melalui penyuluhan edukatif partisipatif menggunakan buku saku digital berbasis Android yang diawali dengan pre-test, pemberian materi, diskusi interaktif, dan diakhiri dengan post-test. Analisis data menggunakan uji Shapiro-Wilk menunjukkan data pre-test berdistribusi normal (p=0,600) dan post-test tidak berdistribusi normal (p=0,002) sehingga analisis dilanjutkan dengan uji Wilcoxon Signed Ranks Test. **Hasil:** Hasil menunjukkan seluruh responden (100%) mengalami peningkatan nilai post-test dibandingkan pre-test dengan nilai Z = -3,450 dan signifikansi p < 0,001. Tingkat pengetahuan peserta meningkat dari kondisi awal yang masih didominasi kategori cukup dan rendah menjadi seluruhnya berada pada kategori baik setelah intervensi. **Kesimpulan:** Hasil penelitian ini menunjukkan potensi efektivitas buku saku digital sebagai media edukasi dalam meningkatkan pengetahuan wanita usia subur mengenai MKJP implant dan IUD. Namun, penelitian ini memiliki keterbatasan karena menggunakan desain pre-eksperimental tanpa kelompok kontrol dan ukuran sampel yang relatif kecil sehingga generalisasi hasil perlu dilakukan secara hati-hati.

ABSTRACT

Background: *Limited understanding among women of reproductive age regarding Long-Acting Reversible Contraceptive (LARC) methods, particularly implants and intrauterine devices (IUDs), remains a major barrier to the success of family planning programs.* ***Objective:*** *This study aimed to improve the knowledge of women of reproductive age regarding long-acting contraceptive methods, especially implants and IUDs, through digital pocket book-based education.* ***Methods:*** *This study employed a*

quantitative approach using a pre-experimental one-group pretest-posttest design involving 15 women of reproductive age at Mutiara Hati Clinic. The intervention was conducted through participatory educational counseling using an Android-based digital pocket book, beginning with a pre-test, followed by material delivery, interactive discussion, and ending with a post-test. Data analysis using the Shapiro-Wilk test indicated that pre-test data were normally distributed (p = 0.600), while post-test data were not normally distributed (p = 0.002); therefore, the Wilcoxon Signed Ranks Test was applied. ***Results:*** *The results showed that all respondents (100%) experienced an increase in post-test scores compared to pre-test scores, with a Z value of -3.450 and a significance level of p < 0.001. Participants' knowledge levels improved from predominantly moderate and low categories at baseline to entirely good after the intervention.* ***Conclusion:*** *The findings show the potential effectiveness of digital pocket books as educational media for increasing knowledge among women of reproductive age regarding implant and IUD long-acting contraceptive methods. However, these findings are limited by the pre-experimental design without a control group and the relatively small sample size, which may limit the generalizability of the results.*

INTRODUCTION

Indonesia faces persistent reproductive health challenges related to rapid population growth and unequal access to effective family planning services. As one of the most populous countries globally, Indonesia requires evidence-based strategies to improve contraceptive uptake and informed reproductive decision-making among women of reproductive age (Kaderia & Zamli, 2025). Family Planning (FP) programs play a critical role in addressing these challenges by enabling individuals and couples to regulate fertility, improve maternal health outcomes, and support sustainable population development (Bongaarts & Hodgson, 2022).

From a public health perspective, effective family planning is closely linked to reduced maternal and infant morbidity and mortality, as well as improved quality of life for families (Askew *et al*., 2024). Women of reproductive age (15-49 years) are the primary target of FP interventions due to their biological and social roles in reproduction (Endah Tri Ratnawati & Sulistyowati, 2021). Among available contraceptive options, Long-Acting Contraceptive Methods (LACM), particularly implants and intrauterine devices (IUDs), are recognized as highly effective, safe, and cost-efficient methods for long-term pregnancy prevention (Taştekin & Ok, 2025).

Despite their proven effectiveness, the utilization of LACM in Indonesia remains relatively low compared to short-term methods such as injections and oral contraceptives. National data indicate that implants and IUDs account for a substantially smaller proportion of contraceptive use among new FP participants, reflecting persistent gaps in knowledge, misconceptions about side effects, and inadequate counseling quality (Zulfitriani *et al*., 2021). These findings suggest that existing educational approaches have not fully addressed the informational and cognitive barriers influencing women's contraceptive choices.

Conventional MKJP education in primary healthcare settings is commonly delivered through brief verbal counseling, printed leaflets, or one-time group sessions, which are often limited by time constraints, passive learning approaches, and lack of personalized or repeatable access to information. Such methods may be insufficient to support deep understanding, critical reflection, and informed decision-making regarding LACM, particularly for women with limited health literacy or prior

misconceptions. Consequently, there is a need for innovative, learner-centered educational media that can enhance knowledge acquisition and retention in real-world clinical contexts.

Previous studies have highlighted the potential of digital health education tools to improve reproductive health knowledge; however, empirical evidence evaluating the effectiveness of digital pocketbook-based education specifically for LACM, within a clinical counseling context, remains limited. Moreover, many existing studies focus on program implementation outcomes rather than systematically assessing knowledge change as a measurable educational effect. This gap indicates the need for research that positions digital educational media not merely as service innovations, but as interventions whose effectiveness can be scientifically evaluated.

This study is explicitly positioned as an educational effectiveness study that examines the impact of an Android-based digital pocket book on improving knowledge of LACM (implants and IUDs) among women of reproductive age. The digital pocket book developed in this study differs from conventional MKJP educational media by integrating structured evidence-based content, simplified medical explanations, visual illustrations, and flexible self-paced access that allows repeated learning beyond face-to-face counseling sessions. Pedagogically, it applies a participatory and learner-centered approach by combining digital materials with interactive discussion facilitated by health workers in a clinical setting.

By employing a pre-experimental one-group pretest-posttest design, this study aims to scientifically assess changes in knowledge levels following exposure to the digital pocket book intervention. The findings are expected to contribute to the existing literature on reproductive health education by providing empirical evidence on the potential effectiveness of digital educational media in supporting informed contraceptive decision-making. Rather than serving as a community service report, this research seeks to advance understanding of how digital learning tools can function as measurable educational interventions within family planning services.

RESEARCH METHOD

This study employed a quantitative research approach using a pre-experimental design, specifically a one-group pretest-posttest design, aimed at evaluating the educational effectiveness of a digital pocket book on knowledge improvement regarding Long-Acting Contraceptive Methods (LACM), particularly implants and intrauterine devices (IUDs) (Al Imron *et al*., 2024). This design was selected to assess changes in participants knowledge before and after exposure to the educational intervention without a control group.

The study population consisted of women of reproductive age (WRA) attending Mutiara Hati Clinic. Initially, 20-30 participants were targeted based on clinic attendance records; however, only 15 participants completed both the pre-test and post-test and were included in the final analysis. The reduction in sample size was due to participant unavailability during the post-test phase and incomplete responses, resulting in a final sample of 15 WRA.

Participants' knowledge regarding LACM was measured using a structured knowledge questionnaire developed by the researchers based on national family planning guidelines and relevant literature. The instrument consisted of 20 multiple-choice items covering definitions, benefits, mechanisms, duration of effectiveness, side effects, and eligibility criteria for implant and IUD contraceptive methods. Each correct answer was scored as 1 and incorrect answers as 0, yielding a total possible

score range of 0-20, with higher scores indicating greater knowledge levels. Knowledge scores were subsequently categorized into low, moderate, and good levels based on predetermined cut-off points.

Prior to data collection, the questionnaire underwent content validity assessment by reproductive health experts, including midwives and public health academics. Reliability testing was conducted using internal consistency analysis, which demonstrated acceptable reliability (Cronbach's alpha > 0.70), indicating that the instrument was suitable for measuring knowledge consistently.

Data collection was conducted in three methodological stages. First, participants completed a pre-test to assess baseline knowledge of LACM. Second, participants received the educational intervention in the form of an Android-based digital pocket book, which contained structured educational content, visual illustrations, and simplified explanations of implant and IUD contraception. Third, a post-test using the same instrument was administered to evaluate changes in knowledge following the intervention.

Statistical analysis was performed using SPSS software. Normality testing was conducted using the Shapiro-Wilk test, which showed that pre-test data were normally distributed (p = 0.600), while post-test data were not normally distributed (p = 0.002). Consequently, the Wilcoxon Signed Ranks Test was applied to analyze differences between pre-test and post-test scores. Univariate analysis was used to describe participant characteristics and knowledge distribution, while bivariate analysis examined the effect of the intervention on knowledge scores.

This study has several limitations. The use of a pre-experimental design without a control group limits causal inference, and the relatively small sample size (n = 15) restricts the generalizability of the findings. Future studies are recommended to employ a quasi-experimental or randomized controlled design with a comparison group and a larger sample size to strengthen academic rigor and causal interpretation of the educational intervention's effectiveness.

RESULTS

The pre-test and post-test scores were analyzed to examine short-term changes in participants' knowledge following the educational intervention. Prior to hypothesis testing, data normality was assessed using the Shapiro-Wilk test. The pre-test data showed a significance value of 0.600, a normal distribution (p > 0.05). In contrast, the post-test data showed a significance value of 0.002, a non-normal distribution (p < 0.05). Based on these findings, a non-parametric Wilcoxon Signed Ranks Test was applied to assess differences between pre-test and post-test scores. All statistical analyses were conducted using SPSS version 22.0, as presented in Table 1.

Table 1. Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Pre Test	,176	15	,200*	,955	15	,600
Post Test	,288	15	,002	,783	15	,002

*. This Is A Lower Bound Of The True Significance.

A. Lilliefors Significance Correction

The Wilcoxon Signed Ranks Test showed an increase in post-test scores

compared to pre-test scores. All 15 participants demonstrated higher post-test scores relative to their baseline measurements, reflected by 15 positive ranks, with no negative ranks or ties observed. The mean rank was 8.00 with a sum of ranks of 120.00 (Table 2). Although all participants showed score improvement, this finding should be interpreted cautiously given the small sample size and the short interval between pre-test and post-test measurements.

Table 2. Wilcoxon Signed Ranks Test

Ranks				
		N	**Mean Rank**	**Sum Of Ranks**
Post Test - Pre Test	Negative Ranks	0[a]	,00	,00
	Positive Ranks	15[b]	8,00	120,00
	Ties	0[c]		
	Total	15		
A. Post Test < Pre Test				
B. Post Test > Pre Test				
C. Post Test = Pre Test				

Statistical testing yielded a Z value of −3.450 with an Asymp. Sig. (2-tailed) of < 0.001, statistically significant difference between pre-test and post-test knowledge scores (Table 3). To complement statistical significance, effect size was calculated using $r = Z / \sqrt{N}$, resulting in an effect size of r = 0.89, which shows a large effect. This suggests a substantial short-term increase in knowledge following the intervention. However, this effect size reflects immediate post-intervention outcomes and does not capture long-term knowledge retention.

Table 3. Statistics Test

Test Statistics[a]	
	Post Test - Pre Test
Z	-3,450[b]
Asymp. Sig. (2-tailed)	<,001
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Participant characteristics are presented in Table 4. The majority of participants were aged 26-30 years and had completed senior high school education, that most respondents were within an active reproductive and decision-making age group.

Table 4 Characteristics of Participants (n = 15)

Variable	**Category**	**Frequency (n)**	**Percentage (%)**
Age	20-25	3	20.0
	26-30	10	66.7
	31-35	2	13.3
Education	Primary school	2	13.3
	Junior high school	3	20.0

	Senior high school	9	60.0
	Higher education	1	6.7
Occupation	Private sector	5	33.3
	Farmer	4	26.7
	Housewife	5	33.3
	Nurse	1	6.7

Pre-test results showed heterogeneous baseline knowledge levels, with participants distributed across low, moderate, and good knowledge categories. Following the intervention, post-test results showed a shift toward higher knowledge scores, with all participants classified in the “good” category (Table 5). This shift indicates a short-term improvement in knowledge levels; however, the uniform post-test categorization may also reflect a potential testing effect due to repeated exposure to similar questionnaire items in a short timeframe.

Table 5. Knowledge Levels Before and After Intervention (n = 15)

Knowledge Level	Pre-test n (%)	Post-test n (%)
Good	4 (26.7)	15 (100)
Moderate	7 (46.7)	0 (0)
Low	4 (26.7)	0 (0)

The results show a statistically significant and practically large short-term increase in knowledge following exposure to the digital pocketbook intervention. Nevertheless, these findings should be interpreted with caution due to the small sample size, the absence of a control group, potential testing effects, and the very short duration between pre-test and post-test administration. Consequently, the results primarily reflect immediate knowledge gains rather than sustained educational impact.

DISCUSSION

This community service activity was successfully implemented and actively participated in by women of reproductive age focusing on Long-Acting Reversible Contraception (LARC), particularly implants and intrauterine devices (IUDs). The 100% attendance rate reflects strong community interest and awareness regarding family planning issues. The success of this program was strongly supported by healthcare providers at Mutiara Hati Clinic, especially the coordinating midwife, who assisted in disseminating invitation posters for the digital pocketbook on implants and IUDs. This finding is consistent with the study by Sari *et al*. (2025), which emphasizes that information delivery in family planning programs known as Communication, Information, and Education (CIE) plays a crucial role in accelerating behavioral change within communities (Sari, 2025). Through CIE activities such as counseling and educational outreach, healthcare workers help prospective acceptors choose appropriate contraceptive methods and support sustained contraceptive use, thereby increasing the success of family planning programs (Sari, 2025)**.**

Pre-test results showed that 4 participants (26.7%) had good knowledge, 7 participants (46.7%) had moderate knowledge, and 4 participants (26.7%) had low knowledge regarding LARC methods. These findings indicate that although participants possessed basic awareness of implants and IUDs, their deeper understanding of advantages, disadvantages, indications, contraindications, and fertility return after LARC use was still limited (Linton *et al*., 2022). This condition

reflects the general situation in Indonesia, where information about LARC has been delivered by healthcare workers, yet comprehensive understanding remains insufficient. Therefore, innovation in delivering contraceptive information is needed, particularly through accessible and effective educational media such as digital pocketbooks. This is in line with the findings of Febriati *et al*. (2025), who stated that knowledge and attitudes significantly influence contraceptive use and method selection. Educational interventions, including the use of health promotion media such as booklets, have been shown to effectively improve understanding of LARC. Booklets, as small-format printed educational media containing concise text and images, serve as effective communication tools for conveying health messages and improving information retention (Febriati *et al*., 2025)**.**

The participatory educational counseling approach applied in this program proved to be highly effective. Post-test results demonstrated a substantial improvement, with all 15 participants (100%) achieving a good level of knowledge, compared to the pre-test results where some participants still had moderate and low knowledge. Analysis based on educational background showed that participants with elementary and junior high school education initially tended to have lower knowledge levels, while those with senior high school education mostly had moderate knowledge. After the intervention, participants from all educational backgrounds elementary, junior high, senior high, and higher education achieved 100% good knowledge scores. This achievement exceeds typical health education outcomes and indicates that the educational process was effectively delivered and well absorbed. The use of innovative media such as digital pocketbooks increased participant engagement, curiosity, and active learning (Nugraheni & Marianti, 2022). This finding aligns with Febriati *et al*. (2025), who highlighted that booklet-based educational media can significantly enhance understanding of LARC information by allowing users to read repeatedly at their own pace (Febriati *et al*., 2025)**.**

A key strength of this program was the use of a digital pocketbook as an innovative and interactive learning medium. Digital pocketbooks offer easy access anytime and anywhere using smartphones or other digital devices, making them more practical than printed materials. They also eliminate printing and physical distribution costs, making them cost-effective and environmentally friendly by reducing paper and ink usage. Furthermore, digital content can be updated quickly and efficiently. Sari (2025) reported that booklet-based educational interventions significantly improved respondents' understanding of LARC, particularly among women with lower educational backgrounds, as the material could be revisited according to individual needs and learning speeds (Sari, 2025)**.**

In addition, the digital pocketbook functioned as an interactive educational medium by incorporating images and visual elements to facilitate comprehension. Its portability and ease of dissemination through WhatsApp, email, QR codes, or social media enable wider and faster information distribution. Features such as search functions allow users to quickly locate specific information, while digital durability ensures that content is not easily lost or damaged, unlike physical books. Digital pocketbooks also support self-directed learning, enabling users to repeatedly access materials without time limitations. Nisa *et al*. (2025) emphasized that digital pocketbooks are advantageous due to their portability, accessibility via digital devices, and ability to present concise yet interactive content, including multimedia elements that enhance independent learning and conceptual understanding (Nisa *et al*., 2025)**.**

Post-test results further confirmed the effectiveness of the educational

intervention, with all participants (100%) achieving good knowledge levels regarding LARC. This indicates that the educational activity successfully met its performance indicators and resulted in uniformly high participant comprehension, with no individuals remaining in moderate or low knowledge categories. This finding is consistent with the study by Ervina *et al*. (2025), which reported that digital pocketbook-based educational media demonstrated very high validity and practicality. Their study showed strong validation scores from content, language, and media experts, as well as high practicality scores from student responses, indicating that digital pocketbooks are effective, user-friendly, and widely applicable educational tools (Ervina *et al*., 2025)**.**

The discussion and question-and-answer session provided participants with opportunities to gain deeper and more personalized understanding of LARC information. Through open discussions, participants were able to express doubts, share experiences, and voice concerns related to implants and IUDs, such as fertility return, HIV prevention, and side effects (Minnis *et al*., 2021; Wemrell & Gunnarsson, 2023). Two-way interactions enabled healthcare providers to correct misconceptions and misinformation commonly circulating in the community. Direct explanations also helped participants better understand mechanisms of action, benefits, side effects, insertion procedures, and duration of LARC use. This interactive approach increased participants' confidence in selecting appropriate long-term contraceptive methods based on their individual conditions and needs, while also strengthening trust between healthcare providers and the community, thereby enhancing counseling effectiveness.

Despite the success of the educational program, several considerations are necessary to ensure sustainability. First, follow-up evaluations should be conducted to assess whether participants apply the knowledge gained, for example through WhatsApp group monitoring. Second, systematic documentation of knowledge improvement, challenges, and recommendations is essential for reporting and program refinement. Third, persistent myths and barriers should be identified and addressed in subsequent sessions. Fourth, effective communication and coordination among field officers, healthcare providers, and program managers must be maintained to ensure that program objectives are achieved. Then, behavioral change monitoring is needed to determine whether increased knowledge translates into actual adoption of long-acting contraceptive methods.

CONCLUSION AND RECOMMENDATION

Based on the results of the digital pocketbook counseling activity on implant and IUD contraceptive methods at Mutiara Hati Clinic, Tambakrejo, Bojonegoro, it can be concluded that the program was highly effective in increasing participants' knowledge of long-acting reversible contraception (LARC). This was evidenced by a significant improvement in post-test results, in which all 15 participants (100%) from various educational backgrounds elementary, junior high, senior high school, and higher education achieved a good level of knowledge, exceeding the typical targets of health education programs. The participatory educational approach, combined with theoretical counseling and practical implementation, enabled participants to clearly understand the material delivered. The use of a digital pocketbook proved to be an effective and innovative medium for knowledge transfer, providing women of reproductive age with easy, practical, and continuous access to LARC information, and encouraging some participants to reconsider contraceptive options they had previously not favored. Furthermore, the strong involvement of local healthcare

providers, including village midwives and community health cadres, contributed substantially to the success of the program. Therefore, it is recommended that midwives and cadres establish LARC-focused discussion groups to facilitate experience sharing and support decision-making related to long-term contraception. In addition, women of reproductive age and their husbands or families are encouraged to actively utilize the digital pocketbook to support informed and shared decision-making in selecting appropriate contraceptive methods.

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