



Transformation of Health Technology "SiKemBang" as a Decision-Making Tool for Postpartum Family Planning

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Abstract

Background. The maternal mortality rate (MMR) in Indonesia is still a major problem in the health sector. Based on the results of the 2020 Population Census, the maternal mortality rate in Indonesia is 189/100,000 live births (KH), the infant mortality rate (AKB) is 24/1,000 KH, with a target in 2024 of 16/1,000 KH. This requires efforts and hard work to reduce the maternal mortality rate in Indonesia in accordance with the targets set in the Sustainable Development Goals (SDGs).

Method. The Safe Motherhood approach is an effort to reduce the maternal mortality rate in Indonesia, which consists of 4 pillars, one of which is family planning. Family Planning has a great contribution to efforts to improve reproductive health and is a strategic intervention in reducing AKI and AKB.

Results. One of the causes of high AKI is the risk of pregnancy in four ways, namely being too young, too often, too close, and too old, which can be prevented by participating in a family planning program. The Postpartum Balanced Counseling Strategy (SKB) is a breakthrough in family planning service strategies, as it increases the accuracy of interactions between health workers and clients in family planning services. This method is easy to do, interactive, and client-oriented, so that it can increase client participation in family planning. With the rapid development of communication technology in this digital era, it is necessary to design postpartum SKB media based on Android applications, so that health workers can provide counseling to prospective acceptors more effectively and efficiently anywhere and anytime, without having to bring 3 SKB media. As an implementation of one of the pillars of Indonesia's health transformation, namely Health Technology, the author plans to design an Android/smartphone-based application "Balanced Counseling Strategy" SiKemBang as a decision-making tool for postpartum family planning. The purpose of this study is to determine the effectiveness of "SiKemBang" as a decision-making tool for postpartum family planning. The research method used in this study is the research and development method.

Conclusion: There is a plan to develop the SiKemBang application. A feasibility test has been carried out by material experts and media experts with very decent results without revision. Small-scale tests were conducted on 10 respondents with very decent results, with an average score of 46.9 (93.8%), and large-scale tests were conducted on 100 respondents with very decent results, with an average score of 482 (96.4%).

Keywords: SiKembang, Application; Family Planning, Tools; Postpartum



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INTRODUCTION

AKI in Indonesia is still a major problem in the health sector. Based on the results of the 2020 Population Census, the maternal mortality rate in Indonesia is 189/100,000 live births (KH), and the infant mortality rate is 24/1,000 KH. This requires efforts and hard work to reduce the maternal mortality rate in Indonesia in accordance with the targets set in the Sustainable Development Goals (*SDGs*). The Safe Motherhood approach is an effort to reduce maternal mortality in Indonesia, which consists of 4 pillars, one of which is Family Planning (Lestari et al., 2021).

One of the causes of high AKI is the risk of pregnancy, namely pregnancies that are too young, too frequent, too close, and too old, which can be prevented by following a family planning program. In public health programs, postpartum family planning services play a very important role, especially in helping families create an ideal pregnancy distance. Family planning services are focused on the use of Long-Term Contraceptive Methods (MKJP) and are carried out immediately after childbirth to reduce missed opportunities in obtaining family planning services. With the development and advancement of science and technology today, various tools and media in providing family planning services can be used by couples of childbearing age as soon as the mother gives birth before returning home from a health facility (Ake et al., 2021)

Balanced Counseling Strategy (SKB) - Postpartum is a breakthrough in family planning service strategy, where this strategy improves the accuracy of interaction between health workers and clients in family planning services. This method is easy to do, interactive, and client-oriented, so that it can increase client participation in family planning. Based on MCHIP 2014 research from several countries, namely Afghanistan, Ghana, Liberia, and Malawi, the results are that family planning runs better, shows that the rights of the client and the rights of the counselor are equal, as well as decisions according to the client's wishes. The SKB method uses 3 media, namely algorithms, cards, and brochures. (Hernawati et al., 2020).

The SKB method is more effective than the ABPK 6 method. This is in line with the results of Indo Ake's (2020) research that the SKB method increases acceptors' knowledge

about postpartum IUD birth control 7. Based on the results of Erni H's (2023) research, SKB can increase the selection of postpartum MKJP family planning (Nursalam, 2024).

With the rapid development of communication technology in this digital era, it is necessary to design the development of postpartum SKB media using Android-based applications so that health workers can provide counseling to prospective acceptors more effectively and efficiently, anywhere and anytime, without having to bring 3 SKB media. As an implementation of one of the pillars of Indonesia's health transformation, namely Health Technology, the author plans to design an Android-based application, "Balanced Counseling Strategy" (SiKemBang), as a decision-making tool for postpartum family planning (Siti et al., 2021; Yulianita et al., 2023).

The purpose of this study is to determine the effectiveness of "SiKemBang" as a decision-making tool for postpartum family planning. The special purpose is to design the SiKemBang application, conduct feasibility tests and trials, and measure the effectiveness of using the SiKemBang application. This research was carried out as one effort to reduce AKI due to too-close pregnancy spacing by improving the quality of postpartum family planning services before the mother returns home from health facilities through the "SiKemBang" Balanced Counseling Strategy Application.

LITERATURE REVIEW

The Concept of Family Planning

Family Planning is an effort to regulate the birth of children, the right distance and age for childbirth, and pregnancy regulation through promotion, protection, and assistance in accordance with reproductive rights to realize a quality family (Mulyati et al., 2024 and Hardianti et al., 2024). The Family Planning Decision Making Tool (ABPK) is an interactive work tool, intended for service providers (doctors or midwives) to help clients choose and use the family planning method that best suits their needs, provide the information needed in providing quality family planning services, and offer advice or guidance on how to build communication and conduct counseling effectively (Darmastuti et al., 2024).

Overview of Balanced Counseling Strategy (SKB)

The Balanced Counseling Strategy was first developed in Peru in 2000. The Balanced Counseling Strategy is a counseling method that encourages the active participation of clients so as to increase the accuracy of interactions between health workers and clients in family

planning services such as postpartum family planning (KBPP) and post-miscarriage family planning (KBPK). This method is easy to do, interactive, and client-oriented. The focus of the Balanced Counseling Strategy (SKB) is pregnant female clients in the third trimester (ANC), women in the latent phase when they are about to give birth, postpartum women when they have not returned home, and postpartum mothers who have been in contact with officers several times to check themselves or their babies (Ake et al., 2021). The SKB method is more effective than the ABPK 6 method. This is in line with the results of Indo Ake's (2020) research that the SKB method increases acceptors' knowledge of postpartum IUD birth control (Nazir, 2023), and based on the results of Erni H's (2023) research, SKB can increase the selection of postpartum MKJP birth control (Nursalah, 2024). This is strengthened by Yulianita (2023), who states that there is an influence of balanced counseling strategies (SKB) on family planning decision-making in pregnant women in the third trimester in the Tanjung Selor Health Center area (Ahyani, 2024).

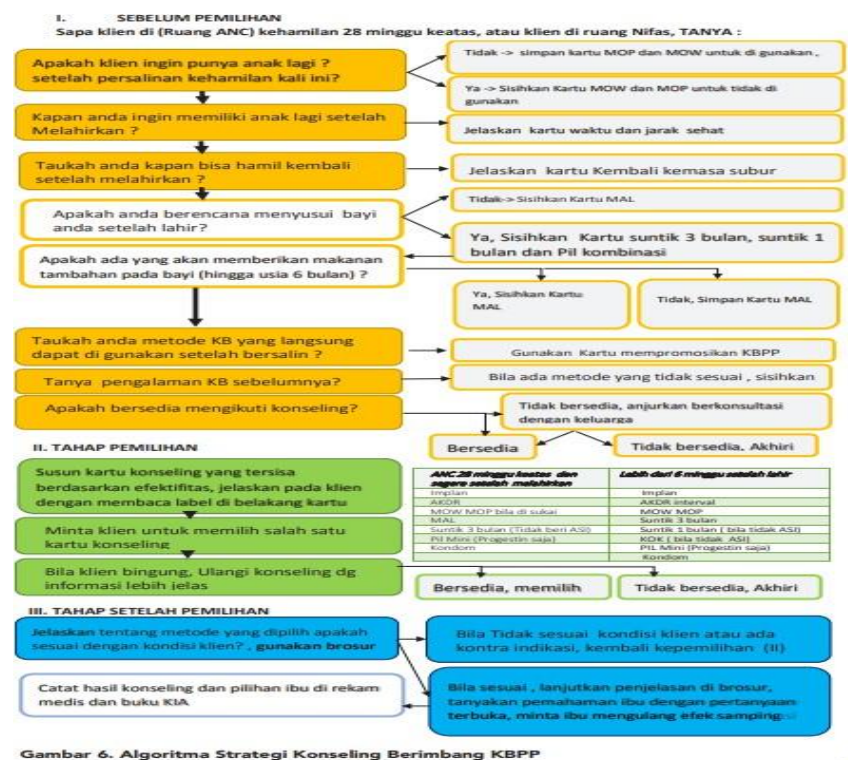


Figure 1 KBPP Counseling Card Algorithm

It is a tool used to provide brief information to clients, where this counseling card contains an overview of the main information about each contraceptive method. Information is available on both sides of the counseling card: The information side, intended for the client,

contains images that are expected to stimulate ideas about the things being counseled. For information intended for counselors, there are main points that must be conveyed to clients. This brief main information will later be reinforced with more detailed information in the brochure (Ake et al., 2021).

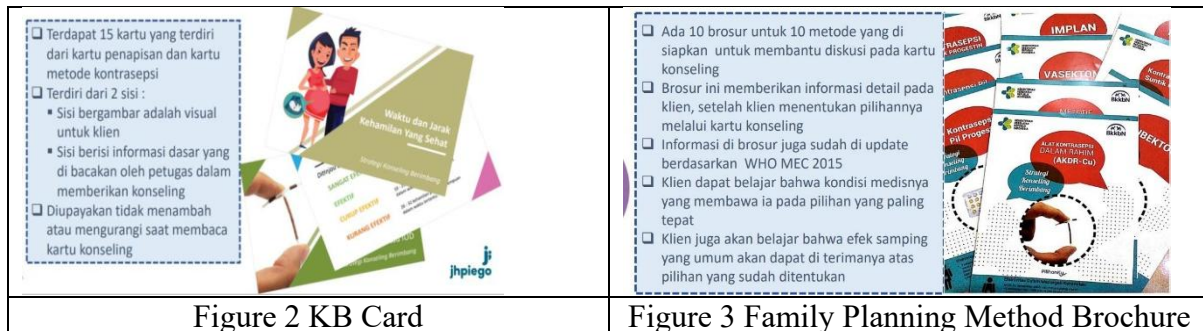


Figure 2 KB Card

Figure 3 Family Planning Method Brochure

Brochure

The brochure contains detailed information about each method, including the medical criteria for being able to use the method, how it works, side effects, and how to use the method. This method brochure has been updated to reflect the Medical Requirements Criteria of the WHO released in July 2015. (Ake et al., 2021; De Lone et al., 2015).

Pre-Election Stage

This stage is when health workers screen the family planning method according to the client's needs and body condition. At this stage, the officers use algorithms and counseling cards. The following screening/screening questions were submitted to the client: Does the client want to have another child after this delivery/pregnancy?; Are you planning to breastfeed your baby after birth? If the client chooses to breastfeed, the next question is: will anyone give additional food (up to 6 months of age)?; Ask about your previous family planning experience? The following are open-ended questions in providing education:

When do you want to have another child after giving birth? The officer explained the time card and the distance of a healthy pregnancy.

Do you know when you can get pregnant again after giving birth? The officer explained the fertile period card again.

Do you know the birth control method that can be used immediately after childbirth? The officer explained the card promoting KBPP before the mother went home (Ake et al., 2021 dan Saputra et al., 2020).

Selection Stage

At this stage, all the remaining method cards according to the mother's needs and conditions based on the client's answers will be sorted from the most effective. Furthermore, the officer will explain one by one an an overview of all family planning methods contained in the counseling card. The final part of this stage is when the officer asks the mother to choose the method she wants.

Post-Election Stage

At this stage, the officer uses the family planning method brochure to provide complete information about the method that has been chosen by the client. If the client has a condition that makes this method not recommended or is dissatisfied with this method after learning more information about the method he has chosen, then the officer returns to the selection stage and helps the client to choose another method from all the remaining cards (Ake et al., 2021).

Counseling Steps Using the Postpartum Family Planning Balanced Counseling Strategy (SKB):

Pre-Counseling Preparation

Pre-Selection Counseling Stage Postpartum Family Planning Method Counseling Stage
Selection of Postpartum Family Planning Method Counseling Stages Postpartum Selection
Postpartum Family Planning Method

Android-Based Apps

Applications in the Android system are generally a part of designing operations related to Linux-based mobile devices, whereas Android applications include operating systems, applications, and *middleware*. These three elements are very closely related to the use of smartphones

RESEARCH METHODS

The research method used in this study is the research and development method.

Research Subject

The population in this study is midwives and postpartum mothers in the PONED Tasikmalaya City Area. The sampling technique uses accidental sampling. The variable measured in the first year is the feasibility test. Meanwhile, in the second year, the effectiveness test of the "SiKemBang" application was carried out. The questionnaire used in the first year

was a feasibility test instrument by media experts consisting of 10 questions, including the quality of display design, button quality, and media efficiency. The questionnaire by the subject matter expert contains 10 questions consisting of material suitability, material accuracy, and curiosity stimulation. The trial questionnaire for 10 respondents consisted of ease of use, clarity of material, and appearance/application design. Meanwhile, the questionnaire used in the second year is in the form of an effectiveness test questionnaire.

Data Analysis

Quantitative and qualitative data analysis was used. Quantitative data was obtained from a questionnaire in the form of assessment scores by material experts, media experts, midwives, and birth mothers. Qualitative data was obtained from suggestions and inputs provided by media experts and subject matter experts.

Research Stages

In the first year, the Android-based Mobile Application Development Design "SiKemBang" was carried out as a decision-making tool for postpartum family planning.

The steps of the research are explained as follows:

Potential problems

Conducting a preliminary study to find problems by analyzing data related to areas with low family planning coverage in Tasikmalaya City.

Data Collection

The collection of various information that can be used as material for planning includes collecting references and material from library books and scientific journals contained in the feasibility of designing an Android-based application "SiKemBang"

Product Design

Making product designs in the form of Android-based application designs "SiKemBang". . The creation of this mobile application media uses Android Studio version 2023.1.1 with the Kotlin programming language.

Design Validation

It was done before the field trial. This validation was carried out by one material expert and one media expert.

Design revision

The design revision was carried out to correct the weaknesses and shortcomings of the design of the Android-based application "SiKemBang" which was created after validation by material experts and media experts.

Product Trials

At this stage, the first trial was carried out on 2 midwives and 10 postpartum mothers to determine the feasibility of designing an Android-based application "SiKemBang" . that is made. In this trial, researchers used a questionnaire of 10 questions with an assessment scale of 1-5 that must be filled out by midwives and postpartum mothers. This questionnaire is used to determine the suitability of the application and the suitability of the material.²⁵

Product Revision

The product revision was carried out after the weaknesses and shortcomings of the first phase of the trial were known in 10 midwives and postpartum mothers for further improvement. The trial of the use of the improved application was then tested on more targets to see the shortcomings contained in the use of the android-based application design "SiKemBang" The second trial was carried out on 10 midwives and 50 postpartum mothers. If the results obtained are in the feasible category, then the trial stage has been completed without revision.

Mass Production

The end of the design of the Android-based application "SiKemBang" which was developed based on the results of validation, revision, and product tests, if it has been declared feasible, the researcher then conducts mass production by uploading it to the Play Store. In the second year, after the "SiKemBang" application product is feasible, a test of the effectiveness of the "SiKemBang" application is carried out.

DISCUSSION

The product produced in this study is the development of *an SiKembang Android-based application*. This SiKembang application can be used by midwives/health workers to carry out a Balanced Counseling Strategy (SKB). (Kemenkes, 2017 ; Lestari et al., 2021).

The stages of making SiKembang application products are as follows:
Description of the design of the Android-based application "SiKembang".

The SiKembang application can be accessed by devices that have the following specifications:

1. Android smartphone

2. Minimum processor: 1 GHz Dual-Core ARM Cortex-A9

3. Operating system: Android 3.0.3 Ice Cream Sandwich

4. RAM: 512 MB

5. Storage: 4 GB (Internal), 32 GB (External)

An overview and how to use *the "SiKembang"* application include:

1. Login and Registration

Enter your email and password, then click Login. If you don't have an account yet, click Register and enter the data according to the registration field, then click Login.

2. Profile Page

On the profile page, you can view your personal data; you can edit your profile to add photos and log out of your account.

3. The Main Page of the "SiKembang" Application. The main page consists of:

- Profiles containing personal data and user photos
- About SiKembang, which contains an overview of the application
- Number of Patients Description: Displays the number of patients/clients who have undergone counseling through the SiKembang application.
- There are 3 main menus, namely Balanced Counseling Strategies, Types of Family Planning, and Brochures
- Consultation History

4. Menu About SiKembang

The About SiKembang menu contains information about the SiKembang application.

5. Balanced Counseling Strategy Menu

The Balanced Counseling Strategy menu consists of:

- Client data inputs include name, date of birth, education, occupation, and address.
- Informed Consent: whether or not you are willing to do counseling
- Consultation: this is the stage at which counseling begins. The order and list of questions in the consultation menu are in accordance with the algorithm and family planning card in the Balanced Counseling Strategy media.

6. Menu Brochure

The Brochure menu contains brochures of different types of KB. Choose the brochure that is the client's choice to read clearly, thoroughly, and specifically.

7. Menu of Types of Family Planning

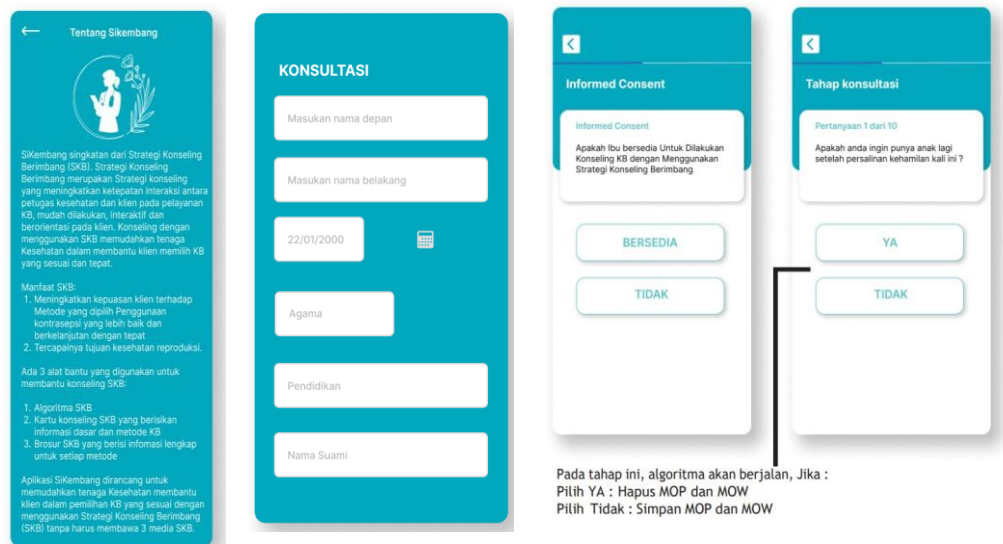
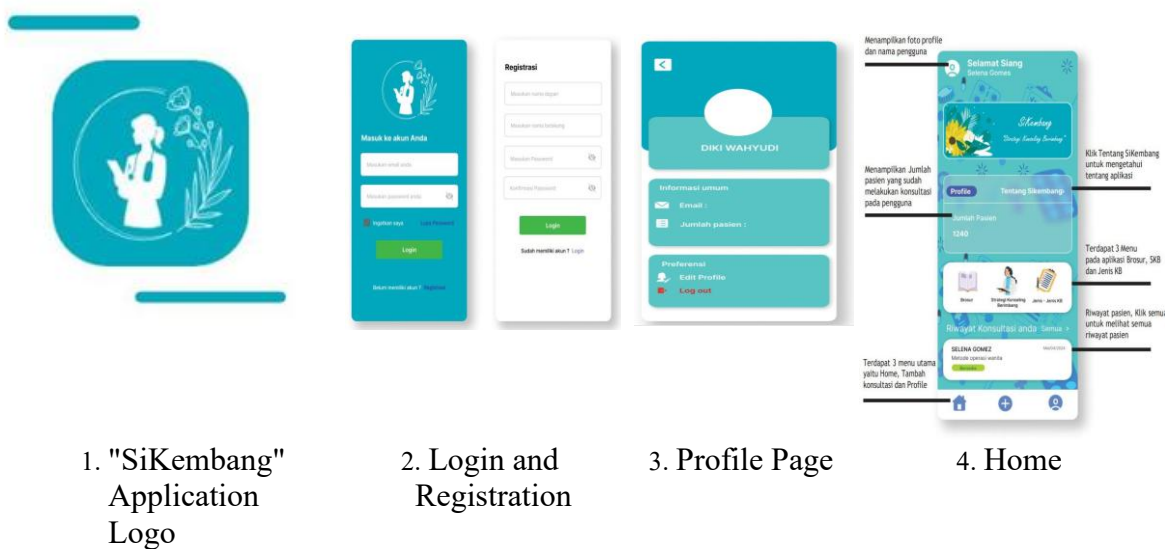
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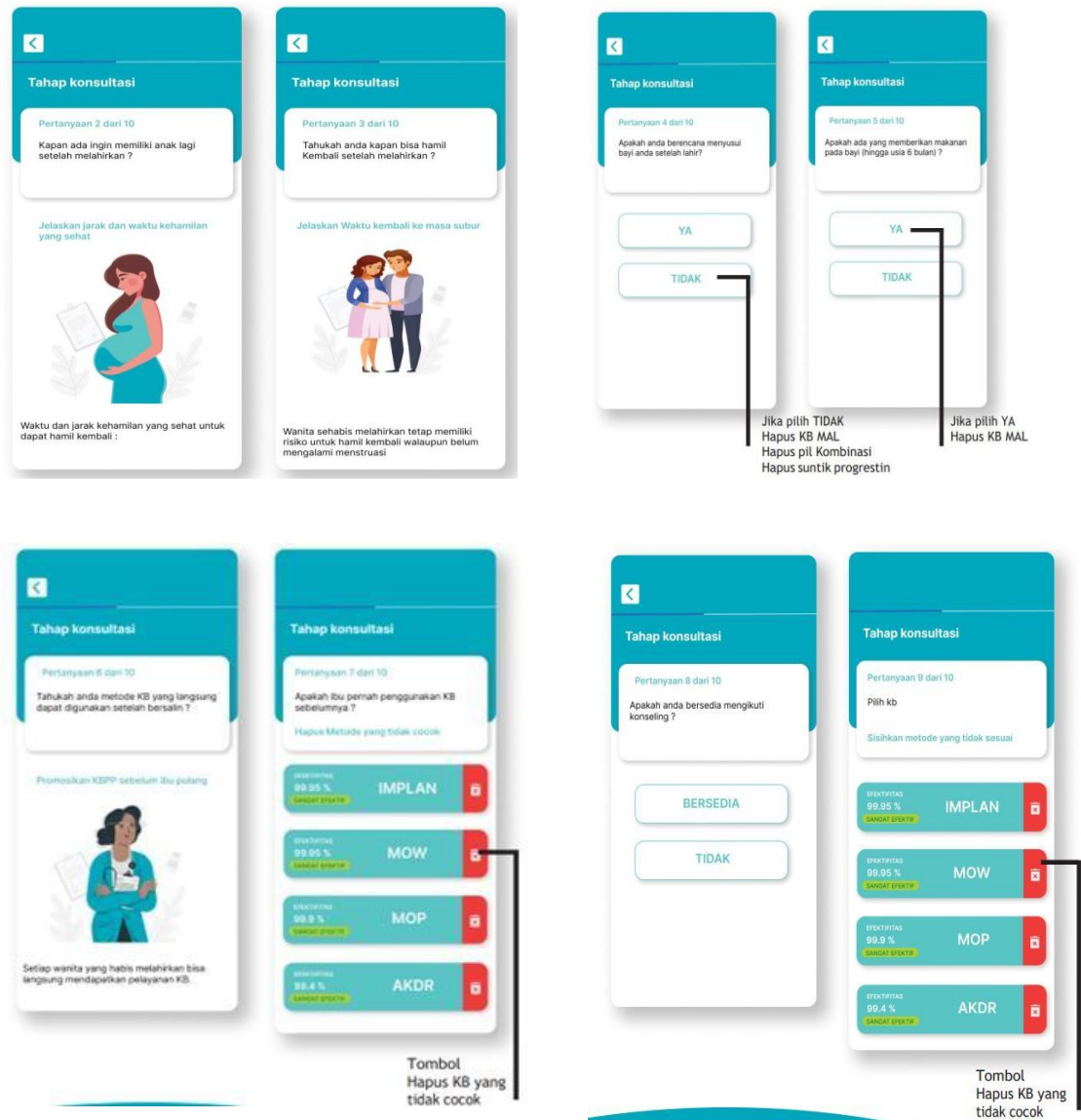
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The Types of Family Planning menu displays all types of family planning in the SiKembang application. Then select the family planning, and it will display the details of the family planning (1–3).

A. "SiKembang" Application Design

The design description of the "SiKembang" application is as follows:





Balanced Counseling Strategy Menu



Menu Brochure

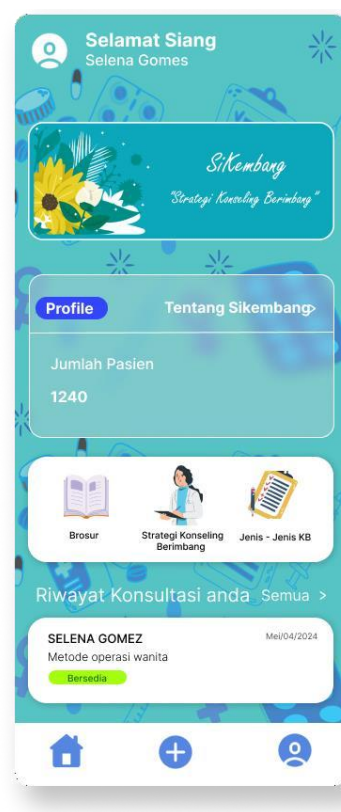
Menu Types of Family Planning

Revision Results:

The color change from green to blue was made to match the brochure's color theme. Changes to the consultation stage drawings that previously used the image according to the original KB card. Addition of a menu about sikembang, renaming consultation to a balanced counseling strategy



Before Revision



After Revision

		Score
	Design/Display Quality	
1.	<i>Layouts of inputs, buttons, and outputs</i>	5
2.	Background selection (<i>Skins</i>) compatibility	5
3.	Suitability of size and font selection	5
4.	Color Compatibility	5
	Quality Button	
5.	The attractiveness of the button display	4
6.	Regularity and consistency of button display	4
7.	Button reaction accuracy	5
	Media Efficiency	
8.	Ease of use of the program	5
9.	Ease of selecting program menus	5
10.	Ease of entry and exit of the program	5
	Total <i>Score</i>	48
	Average	4,8
	Value (%)	96%

Based on Table 4 above, the average value of validation results from media experts is 4.8 (96%). Thus, the "SiKembang" application is included in the category of very feasible and can be used without revision.

1. Small Scale Trials (Nursalap, 2024)

Small-scale trials were carried out on 10 midwives in the Tasikmalaya City area

Based on Table 2 above, the results of a small-scale test conducted on 10 midwives regarding the feasibility of the "SiKembang" application were declared very feasible with an average score of 46.9 (93.8%). All respondents stated that the "SiKembang" application is very feasible to use.

	Statement			
		Quantity	Presentation	Categories
	Ease of Use			
1.	Is the application-based Android "SiKembang" easy to use?	48	96%	Highly Worth It
2.	Is an Android-based app "SiKembang" is easy to install?	50	100%	Highly Worth It
3.	Is the Android-based application "SiKembang" easy to enter and exit the program?	46	92%	Highly Worth It
4.	Is the Android-based application "SiKembang" suitable for use as a health education medium for teenagers?	47	94%	Highly Worth It
	Clarity of Material			
5.	Is the material contained in the "SiKembang" Application easy to understand?	46	96%	Highly Worth It
6.	What are the images on the app "SiKembang" according to the material?	49	98%	Highly Worth It
7.	What is Contents material in the "SiKembang" application, is it clear enough?	45	90%	Highly Worth It
	App appearance/design			
8.	What is Display Overall Is the "SiKembang" application right?	45	90%	Highly Worth It
9.	Is the placement of the buttons in each menu correct?	45	90%	Highly Worth It
10.	Is the <i>background</i> display in the "SiKembang" application appropriate?	48	96%	Highly Worth It
	Total Score	469		
	Average	46,9	93,8%	Highly Worth It

	Statement			
			Presentation	Categories
	Ease of Use			
1.	Is the Android-based application "SiKembang" easy to use?	470	94%	Highly Worth It
2.	Is an Android-based app "SiKembang" is easy to install?	500	100%	Highly Worth It
3.	Is the Android-based application "SiKembang" easy to enter and exit the program?	500	100%	Highly Worth It
4.	Is the Android-based application "SiKembang" suitable for use as a health education medium for teenagers?	480	96%	Highly Worth It
	Clarity of Material			
5.	Is the material contained in the "SiKembang" Application easy to understand?	490	98%	Highly Worth It
6.	Are the images contained in the "SiKembang" application appropriate to the material?	480	96%	Highly Worth It
7.	What is Contents material in the "SiKembang" application is quite clear?	490	98%	Highly Worth It
	App appearance/design			
8.	What is Display Is the whole "SiKembang" application right?	460	92%	Highly Worth It
9.	Is the placement of buttons <i>on</i> each menu correct?	470	94%	Highly Worth It
10.	Is the <i>background</i> display in the "SiKembang" application appropriate?	480	96%	Highly Worth It
	Total Score	4820		
	Average	482	96,4%	Highly feasible

Based on Table 3 above, the results of a large-scale test conducted on 100 midwives on the feasibility of the "SiKembang" application were declared very feasible with an average score of 482 (96.4%). All respondents stated that the "SiKembang" application is very feasible to use.

After passing the feasibility test and trial use, the results are very feasible and can be used; then the next stage is uploading Sikembang to the Play Store. Here is the link to access the Sikembang Android-based application on the Play Store: <https://play.google.com/store/apps/details?id=com.woluwolu.bidan>



The use of postpartum contraceptives in Indonesia is still low. Factors such as limited information, lack of access to health services, and cultural or social constraints contribute to the low coverage. (Yulianita et al., 2023).

Factors Causing Low Coverage of Postpartum Family Planning include:

1. Lack of education and counseling. Many new mothers do not get adequate information about the benefits of AKPP, its types, and the right time to start.
2. Access to health services. Some regions in Indonesia, especially remote areas, are still experiencing limited health facilities that provide KBPP services.
3. Culture and Social Norms. Traditional and religious norms often influence people's views on contraceptive use. Some couples may feel uncomfortable talking about contraception immediately after giving birth.
4. Availability of trained health workers. Not all health workers, especially midwives or doctors in the regions, have adequate training to provide KBPP services.
5. Uncertainty in Spouse Decisions. Some couples are hesitant to start postpartum

contraception because they want to ensure the distance between births that suits their wishes (Mulyati et al., 2024; Hardianti et al., 2024; and Darmastuti et al., 2024).

Strategies to improve postpartum family planning include:

1. Increased Education and Awareness. Engage health workers to provide intensive counseling during pregnancy and after childbirth. Education about the types of AKPP, such as IUDs, implants, or birth control pills, can be delivered.
2. Service Integration. Ensure that KBPP is part of routine postpartum services at hospitals or clinics, so that mothers can immediately start contraception before going home.
3. Community Approach. Involve community leaders and religious leaders to help reduce stigma or myths about KBPP.
4. Capacity Building of Health Workers. Train midwives, doctors, and nurses to provide effective counseling and install contraceptives such as IUDs or implants.
5. Improved Access and Availability. Ensure the availability of contraceptives in health facilities, including in remote areas.
6. Promotion through the media. Using social media, television, and radio to spread information about the importance of the AKPP. (Ahyani, 2024 and Leon, 2024)..

Increasing KBPP coverage is very important to support the Family Planning (KB) program and reduce maternal and infant mortality. With the right strategy and the collaboration of various parties, the scope of use of KBPP in Indonesia can be increased. (Ayuningtyas et al., 2024).

The Postpartum Family Planning Balanced Counseling Strategy (SKB) is a counseling approach that aims to provide information, support decision-making, and help married couples choose the right contraceptive method after childbirth. This strategy focuses on providing complete, accurate, and unbiased information, taking into account the needs, health conditions, and preferences of couples to have family planning after childbirth. This will increase the coverage of postpartum family planning. The media used in the Balanced Counseling Strategy are family planning cards, algorithms, and brochures. Based on the results of Mulyati et al.'s research, there is an effect of balanced counseling strategies along with audiovisual on mothers' interest in using postpartum contraceptives (Hernawati et al., 2020 and Yulianita et al., 2023).

In the current era of globalization, technological developments are increasingly advanced and there are more and more smartphone users in Indonesia. Smartphones have features that can be adjusted to the needs of their users, including to obtain health information. Several studies have stated that the use of technology in the health sector can support the

increase of public knowledge about health information more quickly. Technological developments and increasing mobile phone ownership encourage the use of Android-based educational media in health services. Most people already have Android-based smartphones, but have not used them to obtain health information on the internet or through applications on the Play Store (Ezalia et al., 2020).

The Sikembang application is an android-based application designed as a Balanced Counseling medium, where SKB media (family planning cards, algorithms, and brochures) are included in the Sikembang application in an integrated manner, so that health workers can easily conduct counseling by accessing the Sikembang application. The Sikembang application can be accessed through the Google Play Store. The Sikembang application is designed to be more applicative and displays images that are suitable for family planning cards and brochures. This is in line with several studies that state that educational media in the form of applications designed with pictorial elements can improve: (Yulianita et al., 2023 and Hardianti et al., 2024).

1. **Attraction.** The use of interesting and relevant images can make the app more enjoyable to use, making students more interested in learning.
2. **Understanding Concepts.** Visualization through images helps students understand complex concepts more easily than using text alone.
3. **Information Retention.** Pictures can strengthen students' memory because visual information tends to be easier to remember than verbal information.
4. **Learning Motivation.** Pictorial educational media can increase learning motivation, especially in children, because it feels more interactive and not boring.
5. **User Engagement.** Engaging visual elements trigger students to be more actively involved in the learning process, such as exploring app features or completing specific assignments.
6. **Visual-spatial skills development.** Using drawings, students can develop skills such as recognizing patterns, relationships between objects, and layouts.

CONCLUSION

An app designed with images is effective if the visual elements are relevant, simple, and age-appropriate for the target user. The presence of interactive elements, such as animations or educational games, can amplify these benefits. The above is in line with the results of small-scale trials and large-scale trial results, which show that the sikembang application is very feasible to be used as a medium in carrying out a Balanced Counseling Strategy.

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