



The Open Public Health Journal

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RESEARCH ARTICLE

The Impact of Preconception Counseling Through ayukSEHAT Application for Conceiving A Healthy Baby

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Abstract:

Background:

Many adverse outcomes encountered by mothers and infants are directly attributable to the woman's health prior to conception. The preconception period is ideal for the bride and groom to prepare for a healthy pregnancy. Several preconception risk factors, like biomedical, social, and environmental, can contribute to adverse perinatal outcomes. In the digital era and the COVID-19 pandemic, a mobile phone application, as the most effective method for intervening in behavior change, can help respond to pregnancy risks by disseminating information, promoting healthier lifestyles, and assisting users in making informed decisions.

Objective:

The study aims to assess the effectiveness of the ayukSEHAT mobile phone applications in promoting knowledge and changing the perception and attitudes of brides and grooms.

Methods:

The study used a quasi-experiment pre-posttest with a control group design. Sample selected by purposive technique among 138 brides and grooms from November 2021- March 2022 at Kuranji and Padang Timur Health Center, Padang City, Indonesia. The experiment group (n=69) received preconception counseling through the ayukSEHAT application for 4 weeks, and the control group (n=69) received conventional methods. Data were analyzed using Wilcoxon signed rank test.

Results:

There were significant differences in the level of knowledge ($p < 0.001$), attitude ($p < 0.001$), and perception ($p < 0.001$) between the experiment and control group before and after getting counseling using the ayukSEHAT application.

Conclusion:

The ayukSEHAT application is an effective method in preconception counseling to increase the knowledge, perceptions and attitudes of brides and grooms. Stakeholders in the public health center recommended using this application to prepare for healthy pregnancies.

Keywords: Application, Brides and Grooms, Counseling, Preconception, ayukSEHAT, COVID-19.

Article History

Received: February 14, 2023

Revised: June 04, 2023

Accepted: July 14, 2023

1. INTRODUCTION

Over the past few decades, maternal and child health has been a global priority and an essential public health service [1]. Globally, In 2020, approximately 800 women per day will

perish from pregnancy and childbirth-related preventable causes, or one woman every two minutes [2]. An estimated 295,000 maternal deaths occurred annually in 2017, and 18 newborns per 1,000 live births died in 2018 [3]. Around 86% of the maternal deaths reported worldwide occur in Sub-Saharan Africa and Southern Asia [4]. Maternal mortality continues to be an unacceptable problem in Indonesia.

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Indonesia's maternal mortality ratios (MMR) have consistently ranged between 200 and 350 maternal deaths per 100,000 live births over the past decade, based on a variety of methods of estimation [5]. The neonatal mortality rate (NMR) decreased slowly from 32 deaths per 1000 live births in 1991 to 15 deaths per 1000 live births in 2017. Compared to ASEAN countries, this NMR is higher than the Philippines (13,8), Malaysia (4,4), Thailand (5,3) and Singapore (1,1) [6]. West Sumatra Province is one of the provinces in Indonesia where the MMR and NMR are still high; namely, 193 mothers and 891 babies are reported to have died in 2021. This has not yet reached the SDGs target of reducing the maternal mortality ratio to less than 70 per 100,000 live births and reducing the NMR to at least 12 per 1000 KH (Live Births)

The goal of every family is to have healthy mothers and babies. Maternal health during pregnancy, childbirth, and postpartum is influenced by women's health during preconception or before pregnancy [7, 8]. Preconception care is essential for a healthy pregnancy, improving infants' health and avoiding fatal situations [9, 10, 11]. Preconception care policies in Indonesia have been issued but not implemented properly, so the number of preconception services is still lacking. Based on the Padang City health office report, 74.67% of the prospective bride and groom did not perform preconception services. Improper preconception care has an impact on unhealthy lifestyles, and disease is not detected early, so the pregnancy is unhealthy, and the baby born is unhealthy. Research suggests that, in addition to regular checkups, other pregnancy care methods, including yoga, physical activity, lifestyle, mindfulness, and psychotherapeutic experiments, are effective ways to improve maternal well-being during pregnancy, as are regular checkups, therapists, and social workers [12]. Preconception care is "a set of experiments aimed at identifying and modifying, through prevention and management, biomedical behavior, and social risks to a woman's health or pregnancy outcome; we focus on risk factors used early to have the greatest impact [13, 14]. Preconception care provides an opportunity for women and their partners to intervene early and address health risks that benefit all women and men, regardless of their intentions or desire to conceive. Extension applications can overcome the risk of HIV transmission to the mother and fetus, the risk of anemia in pregnant women, hereditary diseases, low birth weight, and reduce the risk of stunting. Preconception care can help improve sperm and partner health, which is also associated with pregnancy and birth outcomes [10].

However, working couples of bride and groom may be unable to attend these traditional health services in the daytime because of time and location restrictions [15]. E-Health is becoming increasingly popular as a tool to improve preconception care for women and men getting married. The smartphone app for e-Health can provide women with easy access to evidence-based, comprehensive preconception health information available 24 hours a day which broadens the range of services, and it could contribute to the optimal health of women before and during pregnancy [16]. Mobile phone applications can be used to address these risks of anemia in

pregnancy, early detection of disease, and risk of stunting because of low birth weight by providing information, supporting healthier lifestyles, and supporting informed decision-making. In the perinatal period, experiments based on mobile applications were found to be feasible and promising for improving parents' well-being [17].

Several application models already exist designed to improve the welfare of mothers and children, but they focus more on knowledge about pregnancy, while preconception preparation has not yet been developed. The study of the preconception counseling model development program through this android application really needs to be reviewed and researched to measure the level of public awareness to carry out early screening before pregnancy. The development of this android-based preconception model is implemented to make it easier for the bride and groom to access and get information easily without having to visit a health facility. The counseling content includes determining nutritional status, nutrition of prospective fathers and mothers, diseases that affect pregnancy, healthy lifestyles, bad habits, preconceptional problems, information on healthy births and recommendations for brides and grooms to prepare for healthy births. To understand and seek the best way the bride and groom can think of so that the best and most accurate results are obtained as an effort to plan for a healthy baby. The study aims to see the impact of preconception counseling using the Android application on the level of knowledge, attitudes, and perceptions of the prospective bride and groom regarding the preparation for giving birth to a healthy baby.

2. MATERIALS AND METHODS

A quasi-experiment approach was used in this study. The data was collected through a pre-and post-test. This research was conducted in the Kuranji and Padang Timur Public Health Centers, Padang, Indonesia, from November 2021 to March 2022. This research was approved by the public health study program at the doctoral faculty of Andalas University. The respondents of the study were 138 brides and grooms in this area. The experimental group consisted of 69 pairs who received preconception counseling through an android application, and the 69 pairs control group practiced conventional counseling methods. The sampling technique was purposive sampling. Samples are taken randomly. The inclusion criteria in this study were the bride and groom couple who had completed the research approval, and everyone had an Android phone. The application is uploaded by the bride and groom's cell phones. The research instrument uses an android application called ayukSEHAT, which researchers have designed. It can be accessed by clicking the following link ayukSEHAT. This preconception counseling application contains material on nutritional status, nutrition and illnesses suffered, and family history of the disease. Both groups were given a pre-test, and then the experimental group was given preconception counseling with ayukSEHAT for 4 weeks, while conventional methods gave the control group counseling. After that, both groups were given a post-test to see whether there were differences in the level of knowledge, attitudes, and perceptions. For data analysis, the Wilcoxon test was used.

Table 1. Respondent's characteristic of the impact of preconception counseling through ayukSEHAT application.

Respondent's Characteristic	Experimental Group (n=69)		Control Group (n=69)	
	Frequency	%	Frequency	%
Age (Years)				
< 25	10	14	12	17
25-30	36	52	38	55
31-35	11	16	10	14
>= 36	12	17	9	13
Education level				
Low	42	61	40	58
Average	17	25	19	28
High	10	14	10	14
Occupational status				
Unemployed	21	30	23	33
Entrepreneur	15	22	11	16
Government employees	10	14	6	9
Privat employees	12	17	12	17
Labor	9	13	13	19
Others	2	3	4	6
Income				
Low	40	58	2	61
High	29	42	27	39

3. RESULTS

Respondent's characteristics included socio-demographics, as represented in Table 1. A total of 138 respondents participated in this study. Most of the respondents were of reproductive age (25-36 years). Nearly half of the respondents have low education levels, 42% in the experimental group and 40% in the control group. There were unemployed respondents, about 30% in the experimental group and 33% in the control group. Most of them have low income, 58% in the experimental group and 61% in the control group.

After being given preconception counseling on the ayukSEHAT application to the bride, the results are as follows:

The Wilcoxon test result shows that there was a significant difference before and after the preconception counseling of ayukSEHAT was given in level of knowledge ($p < 0.001$), attitude ($p < 0.001$) and perception ($p = 0.03$). There was no significant difference in the control group, just a slight increase. Preconception counseling with ayukSEHAT application to grooms also showed significant differences.

Table 3 shows improvement in the average knowledge level, attitude, and perception in the experiment group. Statistical tests show that there is an effect of preconceptions on counseling using the ayukSEHAT application ($p < 0.000$). The control group remained unchanged at the final grade point average.

4. DISCUSSION

The ayukSEHAT application is a form of preconception health education media which contains information related to the physical health of the bride and groom, including nutritional status, medical history, history of hereditary diseases, bad habits, basic vaccinations, and information on babies born healthy. In this application, there are also recommendations for the couple to behave regarding health. Moreover, there are also questions related to preconception health that can be measured to see the level of knowledge in

this application. Preconception counseling through the ayukSEHAT application in this study increased the understanding related to respondents' knowledge level, attitude, and perception. There is a significant difference between the experiment groups before and after counseling. These results indicated that the ayukSEHAT application is an effective method in improving preconceptions about the health of brides and grooms in Padang, Indonesia.

This study is in line with Hussein's research (2016). The brides with good knowledge have a higher level of education, and the more they need health counseling, especially in preparing for pregnancy as future wives. Meanwhile, the brides with less knowledge have a low level of education and feel less in need of health education which affects their preparation for pregnancy as future wives [18]. Khan's research in 2019 also suggests that knowledge of reproductive health affects marriage readiness [19], and the finding by Priani *et al.* showed that preconception education for unmarried women to increase their knowledge about health in West Java, Indonesia [20].

Based on Table 2, it was found that the p-value of knowledge in the experiment group was 0.000 and the control group was 0.288, indicating that the knowledge variable experiment group had a relationship with the development of the preconception counseling model, while the knowledge variable control group had no relationship with the preconception counseling model. Meanwhile, for the attitude variable, it is known that the p-value of the experiment group is 0.000, and the control group is 0.102. It can be concluded that the experiment group is related to the development of the preconception counseling model, while the knowledge variable control group is not related to the preconception counseling model. However, in the perception variable, the p-value of the experiment group was 0.000, and the control group was 0.102, indicating that the perception variable experiment group had a relationship with the development of the preconception counseling model. In contrast, the knowledge variable control group had no relationship to the preconception counseling model.

Table 2. Results of preconception counseling on the ayukSEHAT application to the bride.

Variables	Group	n	Pre-test		Post-test		P-Value
			Mean	SD	Mean	SD	
Knowledge Level	Experimental	69	13.01	3.08	15.68	2.81	0.0001 0.317
-	Control	69	11.91	3.59	11.96	3.66	
Attitude	Experimental	69	61.86	12.38	77.99	12.99	0.0001
-	Control	69	63.10	12.54	64.12	14.01	0.290
Perception	Experimental	69	6.99	2.40	7.62	2.08	0.030
-	Control	69	5.90	2.94	6.09	2.92	0.066

Table 3. Results of preconception counseling on the ayukSEHAT application to the groom.

Variables	Group	N	Pre-test		Post-test		P-Value
			Mean	SD	Mean	SD	
Knowledge Level	Experiment	69	12.45	3.69	16.75	2.91	0.000 0.288
-	Control	69	12.72	3, 64	12.75	3.24	
Attitude	Experiment	69	72.62	13.51	71.73	8.56	0.000
-	Control	69	11.67	71.73	11.56	71.55	0.102
Perception	Experiment	69	6.31	8, 59	6.37	1.43	0.000
-	Control	69	2.51	1.43	2.01	1.94	0.102

Digital educational media is web-based or digital media. Internet and social media trend data for 2020 shows a total population of 272.1 million, 175.4 million internet users and 160 million active social media users. From this data, it is clear that the ability of the Indonesian people is very good to use digital technology, but its use is still entertainment. The ayukSEHAT application can be a solution to expand the reach of providing preconception to the community to increase the prevalence of preconception health services in Indonesia. With the increasing prevalence of preconception health services for the bride and groom, the health risk during preconception, pregnancy, and the baby being born can be overcome, such as anemia, HIV/AIDS from mother to baby, low birth weight, and stunting.

Interesting findings in this study are that grooms with high knowledge do not have a greater level of obedience and concern for the health of their future wives and children than grooms with less knowledge. The grooms have average never heard of and known about the importance of preconceptions to their future wives to have the baby born healthy. The study by Nugraheni in Gorbogan Regency found that the premarriage course has a significant influence on reproductive health and sexual health behavior [21]. Based on the research by Lassi S (2019), which states that preconception counseling can reduce alcohol consumption, smoking, illegal drugs, and preconception behavior, experiments reduce the incidence of sexually transmitted infections (STIs) [22]. The study is limited only to Muslim couples who registered at the Office of Religious Affairs. There is still a lot that needs to be perfected regarding features, functions, and benefits, such as the consultation room feature that connects clients and consultants. Because of the limited respondents' time in collecting data, researchers could not explore more deeply, only preconception psychological studies.

CONCLUSION

The results of this study have the effect of developing a preconception counseling model through an Android application on the knowledge, perceptions, and attitudes of brides and grooms before and after giving experiments. It is hoped that the couple and the bride and groom can use this application 3 months before marriage. AyukSEHAT application can be recommended by the government to puskesmas through health cadres to people who want to get married as a way for counseling and education on factors (knowledge, attitudes, and perceptions) effective in providing information to brides and grooms. The most important thing is that the couple has a positive influence on efforts to increase the birth of healthy babies as a contribution and role in the process of the mother's pregnancy until the child is born, so it takes all information, knowledge and nutritional status that is sufficient and sustainable in planning for a healthy born baby.

LIST OF ABBREVIATIONS

MMR	=	Maternal Mortality Ratios
NMR	=	Neonatal Mortality Rate
STIs	=	Sexually Transmitted Infections

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Research Ethics Committee of the Medical Faculty of Andalas University, Description of Ethical Approval No: 587/UN.16.2/KEP-FK/2021. All techniques have been executed according to the applicable guidelines and regulations.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in

accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information is available within the article.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflicts of interest in this study.

ACKNOWLEDGEMENTS

We would like thanks to all respondents, stakeholders, and supervisors.

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