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## Development of Android-Based Media in Support of Birth Planning and Complications Prevention Programs

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### ABSTRACT

In Indonesia, AKI and AKB until now are still high, related to the problem of pregnancy, childbirth, and postpartum based on data released by the Ministry of Health, among others: AKI amounting to 305/100.000 live births. AKB (Neonate 15/1000 Live births and 24/1000 live births( KLH) in 2018 (Kemenkes, RI 2018). AKI in South Sumatra Province in 2015 amounted to 165/100,000 KH. AKI is one of the indicators of the degree of health of a country that shows the ability and quality of health services. The high AKI and the slow decline of this figure show that maternal and child health services (KIA) urgently need to be the main priority in terms of reach and quality of service.

Maternal mortality is caused by multiple factors, which result from the interaction of various aspects, both clinical elements, parts of the healthcare system, and non-health factors that affect the delivery of clinical services and the optimal implementation of the healthcare system. The dominant aspects of maternal mortality in 2017 were bleeding in 37 cases, hypertension in pregnancy at 35 points, and 21 issues due to other factors (Dinkes Prov. Sumsel, 2017). First aid is a breakthrough effort to accelerate the decline in maternal and newborn mortality through activities to improve access and quality of care, as well as an exercise to build community potential, especially community concern for preparation and action in saving mothers and newborns through pregnancy, childbirth and postpartum (Ministry of Health, 2009 in Putri Andanawarih, 2018). One of the efforts to reduce AKI due to complications of pregnancy and birth is through first aid. First aid includes recording pregnant women, savings of pregnant women, preparation of prospective blood donors, family roles, helper plans, transportation to health facilities, and stamping stickers in the built house. At the Palembang City Health Center, the Purpose of The Research is to discover the "Development of Android-Based Health Promotion Methods in implementing the Birth Planning and Complication Prevention (P4k) Program of Palembang city and Jogjakarta in 2021". Benefits are expected as input to take a policy in applying first aid in Palembang City. The type of research carried out is Analytical research with experimental research design, which is where independent variables (Knowledge and attitudes) and dependent variables (Behavioral Changes in the Application of Childbirth Planning and Prevention of Complications (P4K). The study results showed a significant difference in maternal knowledge and attitudes before and after intervention giving health promotion through android applications with first aid with a value of 0.00 ( $<\alpha 0.05$ ) and no association in the Control group. As for the distinct group of mothers, the most dominant case group is maternal education which can affect behavior changes. It is recommended that health workers should continue to improve information communication and education to pregnant women and conduct counseling and health promotion activities for the public. Health workers for education related to first aid and readiness to face childbirth complications.

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## 1. INTRODUCTION

Pregnancy and childbirth are a natural process, not without the risk of complications, both during pregnancy and during delivery. These complications can cause many problems, which eventually lead to death. Death is the most significant contributor to the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR), which is a particular concern in one of the government programs, namely the Childbirth Planning and Complications Prevention (P4K) Program (Kusumawaty, 2021; Nursanti & Kusumawaty, 2021)(Putri Andanawari, 2018).

MMR in South Sumatra Province in 2015 was 165/100,000 KH, in 2016 it was 142/100,000 KH and in 2017 it was 107/100,000 KH and in Palembang MMR was reported to be 7/27,876 KH. The Delivery Planning and Complications Prevention Program (P4K) is a breakthrough effort in the context of accelerating the reduction of maternal and newborn mortality through activities to increase access and quality of services, as well as an activity to build community potential, especially community awareness for preparation and action in saving mothers and babies. Newborn (Ministry of Health, 2009 in Putri Andanawari, 2018) ).

Hopefully, the P4K program can reduce MMR because all pregnant women who have been given P4K can be monitored by all components of society, husbands, families, midwives, and other health workers quickly and accurately. However, for monitoring to be successful, from the community side, it is necessary to prepare a family and community for a community alert system (Andira, 2015 in Ni Made Werdiyanthi et al., 2017).

P4K includes registration of pregnant women, savings for pregnant women, preparation of prospective blood donors, mentoring, plans for assistance, transportation to health facilities, and pasting stickers at pregnant women's homes. To run these programs, there are still many obstacles encountered. The obstacles encountered were based on a preliminary study through interviews with several cadres and health workers of the Health Center, that P4K had been running but not as expected due to a lack of knowledge of the benefits of P4K, such as transportation, tubulin, and prospective blood donors, birth attendants.

The results of the pre-survey conducted by researchers on several pregnant women in the Pakjo Health Center Working Area of 10 pregnant women (80%) did not know the contents on the P4K sticker, including the name of the pregnant woman, estimated delivery, birth attendant, place of delivery, birth attendant, transport used and prospective blood donors.

### 1.2 PROBLEM FORMULATION

"Is there an effect of Android-based health promotion methods in implementing the Palembang City Delivery Planning and Complications Prevention (P4k) Program in 2021?"

### 1.3 RESEARCH OBJECTIVES

#### 1.3.1 GENERAL PURPOSE

To find out the effect of Android-based Health Promotion Methods in implementing the Maternity Planning and Complications Prevention (P4K) Program for pregnant women in Palembang City in 2021.

#### 1.3.2 SPECIAL PURPOSE

1. The effect of mother's knowledge before and after giving Android-based Health Promotion Methods on behavioral changes in the implementation of P4K in the Independent Practice of Midwives in Palembang and Yogyakarta in 2021.
2. It is known the effect of mother's knowledge before and after giving Android-based Health Promotion Methods on behavioral changes in the implementation of P4K in the Independent Practice of Midwives in Palembang and Yogyakarta in 2021

#### 1.4.1 FOR INDEPENDENT MIDWIFE PRACTICE

This research can be used to analyze the implementation of the Childbirth Planning and Complications Prevention Program (P4K) to make a new policy to reduce MMR.



1.4.2 FOR SOCIETY

This research can add insight for pregnant women to prevent pregnancy, childbirth and postpartum complications.

1.5 HYPOTHESIS

1. There is an influence of the Android-based Health Promotion Method on the knowledge of pregnant women in behavioral changes in implementing the Delivery Planning and Complications Prevention (P4K) Program in the City of Palembang in 2021.
2. There is an influence of the Android-based Health Promotion Method on the attitudes of pregnant women in changing behavior in implementing the Delivery Planning and Complications Prevention (P4K) Program in Palembang City in 2021.

UNDERSTANDING P4K

The Birth Planning and Complications Prevention Program (P4K) is an activity facilitated by village midwives to increase the active role of husbands, families, and communities in planning safe deliveries and preparing for complications for pregnant women.

Many aspects must be considered because maternal mortality is a complex problem with direct and indirect causes. Therefore, an accurate follow-up related to the obstacles and reasons for maternal death faced in health services immediately to achieve community health and welfare, especially in reducing mortality, morbidity, and complications (Herlina, 2017).

On matters related to health, health-illness and health risk factors. Attitude is a syndrome or collection of symptoms in response to a stimulus or object so that the attitude involves thoughts, feelings, concerns, and other psychiatric symptoms (Notoatmodjo, 2012).

The most visible to the invisible, from what is felt to the most that are not deemed (Okviana, 2015).

2. RESEARCH METHODS

The type of research carried out is analytical research with an experimental design.

This research looks at the Effect of Android-based Health Promotion Methods on Behavioral Changes for Pregnant Women in implementing the Delivery Planning and Complications Prevention Program in the City of Palembang and Yogyakarta in 2021.

PRETEST-POSTTEST GROUP DESIGN

In this design, two groups are selected randomly and then given a pretest to determine the difference in initial conditions between the experimental and control groups. A good test result is if the value of the Android-based Health Promotion experimental group and the Android-based Control group without health promotion is significantly different.

Research Time and Place.

1. Research Location

Several Practicing Midwives carried out this research. Independent city of Palembang and Yogyakarta

2. Research Time

This research was conducted from August to November 2021.

This study's sampling technique was random sampling, namely from several independent practices of the Palembang City Midwife and Ananda Maternity Home and the Health Polyclinic of the Ministry of Health, Jokgyakarta. Pregnant women were recorded in the cohort of pregnant women from April to June 2021.

POPULATION

Table 1. Population

1	Ilir Barat District I	RB Partner Ananda	28 people (14 cases and 14 controls)
2	District Housing Sako	Midwife Meli Rosita	28 people (14 cases and 14 controls)
3	Plaju Kecamatan District	Midwife Husniyati	14 people (7 cases and 7 controls)
4	Alang-Alang Lebar District	Lismarini	40 people (20 cases and 20 controls)
5	Yogyakarta Ministry of Health Polytechnic	Midwifery Clinic Poltekkes Kemenkes Yogyakarta	30 people (15 cases and 15 controls)

The number of samples obtained in the city of Palembang, as many as 110 pregnant women consisting of 55 people were given treatment with the Android application as a health promotion development about P4K and as a control 55 people and from the obstetrics clinic of Jogjakarta received a sample of 30 people consisting of 15 who given the treatment and 15 people as the control.

### VALIDITY AND RELIABILITY TEST

According to Notoadmodjo (2013), experimental research, especially quasi-experiments (quasi-experiments), is constantly questioned about their internal and external validity. Internal validity relates to the accuracy of identifying changes in the output variables (experimental results) only as a result of the treatment (experimental). Factors that affect or interfere with the validity can be referred to as internal validity threats, including:

### 5.3 RESEARCH OBJECTIVES

From the results of univariate research, the knowledge variable is divided into 2: good knowledge if you get it (score > 70% of 10 questions) and poor ability if you get a score of 70 %). In contrast, attitudes are divided into two categories: positive attitude if you get an average score. In contrast, the negative attitude if you get a score < average, while the behavior is divided into two categories of behavior that is applied (if applied > 50%) and is not used if 50%) of the ten questions. The results of the analysis can be seen in the table below:

Table 2. Results of Univariate Analysis of Pre-test and Post-test Cases and Controls  
In independent practice midwives in Palembang and Yogyakarta year 2021

Variable	Pretest Case		Post-test Case		Pretest Control		Post-test Control	
	n	%	n	%	n	%	n	%
Knowledge Well	15	21.4	57	81.4	4	5.7	6	8.6
Not Good	55	78.6	13	18.6	66	94.3	64	91.4
Attitude Positive	15	21.4	63	90	19	27.1	20	28.6
Negative	55	78.6	7	10	51	72.9	60	71.4
Behavior Applied	13	18.6	61	87.1	11	15.7	19	27.1
Not Applied	57	81.4	9	12.9	59	84.3	51	72.9

Based on the data above, it can be seen that the case respondents who had good knowledge were 15 people (21.4%) before the intervention (Pretest) after the intervention increased to 54 people (81.4%). For the attitude variable in the case at the time of the pretest, there were 15 people (21.4%) after the intervention increased to 63 people (90%). Meanwhile, for the pretest behavior variable that applied it, 13 people got it. After the intervention, there were 61 people (87.1%).

### BIVARIATE TEST RESULTS USING THE WILCOXON TEST

Bivariate analysis was performed to identify the differences between the two variables. In this study, there were two groups of paired data, namely the intervention group and the control group, on an ordinal scale. Still, the data was not normally distributed to see the knowledge, attitudes, and behavior before and after the P4K intervention in the paired group (pre and post) using the Wilcoxon test.

Table 3. Bivariate Test results Using The Wilcoxon Test

Variable	Z-value	P-value
Pre Knowledge	-7.048	0.000
Knowledge Post		
Pre Attitude	-7.227	0.000
Post Attitude		
Pre Behavior	-7.024	0.000
Behavioral Posts		
Pre Knowledge	-3.257	0.001
Pre Behavior		
Pre Attitude	-4.537	0.000




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Pre Behavior Knowledge Post Behavioral Posts	-2.592	0.010
Post Attitude Behavioral Posts	-2.440	0.025

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Based on the table above, the Z value for the pre and post case knowledge variables is -7.048. The P-value is 0.000, meaning there is a difference between knowledge before and after the intervention. In contrast, the pre and post-attitude variables have a Z-value of -7.227 and a p-value of 0.000, meaning that there is a difference between attitudes before and after the intervention, and the pre and post behavior values have a value of -7.024 p. Value 0.000 means that there is a difference between behavior before and after the intervention, so the hypothesis that there is a difference between before and after the intervention, both knowledge of attitudes and behavior is statistically proven

Meanwhile, the pre-knowledge and pre-case behavior variables have a Z value of -3.257 pValue 0.001, for pre-attitude and pre-behavior variables Z-value -4.537, pValue 0.000, for post knowledge and behavior Z-value -2.592 pValue 0.010 and post-attitude and post-value values the behavior of the Z value -2.440 pValue 0.025 based on the results above so it can be said that there is a difference

Table 4. Bivariate Test results Using The Wilcoxon Test

Variable	Z-value	P-value
Pre knowledge Knowledge post	-1.414	0.157
Pre Attitude Post Attitude	-1.342	0.180
Pre Behavior Post behavior	-2.000	0.046

Based on the table above, it can be seen that from the Wilcoxon test results, control respondents, both pre and post knowledge, pre and post attitudes, and pre and post behavior, are all not significant or insignificant.

Table 5. The relationship between the characteristics of pregnant women and the behavior of mothers in implementing P4K (Pre Intervention) in Palembang and Yogyakarta in 2021

Variable	Pretest Behavior				Total		PV value	OR
	Applied		Not Applied		n	%		
	n	%	n	%				
Gravida								
2 kids	27	56.3	21	43.7	48	100	1.00	1.071
>2 kids	12	54.3	10	45.7	22	100		(0.388-2,955)
Gestational Age:								
tr II	9	60	6	40	15	100	0.933	1,250
TR III	30	54.5	25	45.5	55	100		(0.391-3.993)
Mother's Age								
20-35	34	57.6	25	42.4	59	100		
<20 >35	5	45.5	6	54.5	11	100	1.73	1,632 (0.447-5.954)
Mother's Education								
high school	33	55.9	26	44.1	59	100	1.00	1.026

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< high school	6	54.5	5	45.5	11	100	(0.281-3.744)
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From the table above, it can be seen that among 70 pregnant women who have children  $\leq 2$ , as many as 48 people apply P4K behavior there are 27 (56.2%), While those who do not apply there are 21 (43.8%) people with p.value 1,00(> 0.05) means that there is no difference between maternal gravida and maternal behavior in implementing P4K.

Based on the results of the Odds Ratio (OR) 1.071 ((0388-2.955), it means that mothers who have children 2 1.071 times will apply P4K.

Of the 70 mothers in the 2nd trimester of pregnancy, 15 people applied P4K behavior. There were 9 (40%) people, while six people did not use (40%). In contrast, those who were pregnant in the 3rd trimester were 55 people, 30 people (54,5%) who did not apply, and 25 people (45%).

Based on the results of pValue 0.933 (> 0.05), it means that there is no difference between gestational age and the application of P4K, while the OR 1.250 (0.391-3.993) implies that mothers who are in the 2nd trimester of pregnancy will do 1.25 times and will apply P4K.

Of the 70 people, the age of the mother who is at low risk (25-35 years old) is 59 people, and 34 people apply (57.6%), while among those who do not use, there are 25 people (42.4%) and those who have a high-risk age (<20 >35) there were 11 people, five people (45.5%) applied and six people (54.5%) did not apply.

Based on the results of pValue 1.73 (> 0.05), it means that there is no difference between gestational age and the application of P4K, while the OR result is 1.632 (0.447-5.954), meaning that mothers who are of low-risk age will apply 1.632 times to implementing P4K.

Of the 70 people, the maternal age included in high school education ( $\geq$  SMA) ) there were 59 people, and there were 33 people who applied (55.9%). In comparison, those who did not use there were 26 people (44.1%), and for those who had low education (< SMA), there were 11 people, six people (54.5%) who applied, and five people (45.5%) do not use.

Based on the results of pValue 1.00 (> 0.05), it means that there is no difference between education and the implementation of P4K. In contrast, the development of OR 1.026 (0.281-3.744) implies that mothers who are included in higher education will do 1.026 times will apply P4K.

#### 5.4 DISCUSSION

1. It is known the effect of the mother's knowledge before and after giving Android-based Health Promotion Methods on behavioral changes in the implementation of P4K in the Independent Practice of Midwives in Palembang City in 2021 with a p-Value of 0.00 (< 0.05)
2. To know the effect of a mother's attitude before and after giving the Android-based health promotion method on changes in the behavior of pregnant women in implementing P4K in the Independent Practice of Palembang City Midwives in 2021 with a P-Value of 0.00 (< 0.05).

**Suggestion:** It is recommended that health workers continue to improve communication of information and education to pregnant women

#### REFERENCES (10 PT)

The primary references are international journals and proceedings. All references should be to the most relevant and up-to-date sources. References are written in **IEEE style, with at least 30 contacts of recently published research**. Please use a consistent format for references – see examples below (9 pt):

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