



# “SI-RAJA” ANDROID APPLICATION (ESTIMATED FETAL WEIGHT) IMPROVES MIDWIFE’S ATTITUDE IN MONITORING FETAL GROWTH IN HEALTH CENTERS THROUGHOUT TANJUNGPINANG CITY, RIAU ISLANDS PROVINCE

by

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## ABSTRACT

Estimated Fetal Weight is one way to monitor the growth of the fetus in the womb. Along with technology development, Android users can be used as a health educational information medium. This study aims to analyze the effect of using the Si-RAJA Android Application (Estimated Fetal Weight) on the attitude of midwives in monitoring fetal growth at health centers throughout Tanjungpinang City, Riau Islands Province. This study used a quasi-experiment method with a one-group pretest and posttest design on 30 midwives selected using the proportionate random sampling technique. The data was collected from September to October 2021 at health centers throughout Tanjungpinang City. Data analysis using the Wilcoxon test. There was a significant difference in the attitude before and after using the Si-RAJA android application, with a p-value of 0.000. As a result, it is hoped that midwives can monitor growth, provide counseling to pregnant women about fetal growth, and provide treatment as early as possible if abnormal fetal weight estimates are found.

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## 1. INTRODUCTION

Pregnancy is a process that begins with the combining of egg and sperm cells and continues through fertilization and implantation to the birth of the fetus. During antenatal checkups, fetal growth monitoring is routinely performed to detect early abnormal fetal growth. Estimated Fetal Weight (TBJ) is a bodyweight estimate based on the results of a calculation performed outside the uterus [1].

The estimated weight of the fetus is significant throughout pregnancy since the growth of the intrauterine fetus is not continuous and is connected with the risk of complications during birthing in both women and newborns, such as low birth weight or excess birth weight. It is believed that the fetus’s growth and development would increase during pregnancy [2].

Maternal death is caused by three things that are too late, namely late early detection of danger signs, late reaching facilities, and late in getting adequate help [3]. The estimated weight of the fetus helps monitor the growth of the fetus in the womb, so it is expected to be able to detect early the possibility of abnormal fetal growth so that health workers are not late in making referrals [2]. The complications experienced by mothers during pregnancy and childbirth are unpredictable. However, with the early detection and preparedness of health workers and patients, it is

hoped that they can reduce lateness in making decisions so that they are not late in making referrals [4]. Strengthening referrals in the archipelago area is very necessary due to the geographical conditions consisting of clusters of islands [3].

One easy way to assess the weight of the fetus in the uterus is to measure the height of the uterine fundus (TFU) [1]. The TBJ formula commonly used to date is the Johnson-Toshack Formula, which is defined as  $BB$  (Baby Weight) =  $(TFU - N) \times 155$  [5]. Gayatri & Afyanti (2006) stated a fairly strong relationship between the predicted results using the good formula of Niswander Modification and the actual birth weight. The formula of such modifications of the Niswander is  $(1.12 TFU - 7.7)100$ , obtained in grams [6].

Many health applications on smartphones have been developed and used widely in health. Smartphones are often used to help with activities in the health field, such as diagnosis, disease therapy, and health education. The Android operating system is one of the most widely used smartphones operating systems as an educational medium compared to the Windows, Blackberry, and iOS operating systems [7].

An attitude is a still closed reaction or response of a person to a stimulus or object. An attitude becomes a readiness or willingness to act and is not an exercise of any particular motive [8]. Saraswati et al. (2020) stated that the Aneminfo android application could be an alternative medium for the government and health workers in providing education about iron deficiency anaemia to increase the knowledge and attitudes of adolescents toward preventing anaemia from an early age [9].

This research developed an application called the Si-RAJA application. The Android application, Estimating Fetal Weight (Si-RAJA), is an application that midwives and students can use to determine the estimated fetal weight (TBJ) of pregnant women during the Antenatal Care (ANC) examination. This application aims to facilitate the work of midwives and as a learning medium for midwifery students. The Si-RAJA application features fetal weight estimation with two choices of measurement methods, namely Johnson Tausack and Niswander Modification. By entering data on uterine fundus height (TFU) and the decrease in the lower part of the fetus, users can see a display of the results of the fetal weight estimate and compare the measurement results with normal TBJ. In addition, there are also health education features that can be used as counseling material for patients.

## 2. RESEARCH METHOD

This research used a quasi-experiment method with a one-group pretest and posttest design. The data was collected from September to October 2021 at health centers throughout Tanjungpinang City. The population of this study was all midwives who serve ANC in health centers throughout Tanjungpinang City. The number of samples set was 30 people, taken using the Proportionate Stratified Random Sampling technique. The dependent variable in this study was the midwife's attitude, while the independent variable was using the Si-RAJA Android Application. The confounding variables in this study were age, education, and training.

The instrument used in this study was an e-questionnaire containing data on the characteristics of responders and questions about attitudes. Attitude measurements were carried out twice. Each midwife was given an e-questionnaire (pretest) and then given an instruction manual to use the application. Researchers provided application links, assisted with application installations, and demonstrated how to use the application. The use of the application by midwives was monitored through the website. After the midwife used the Si-RAJA Android Application for two weeks, the midwife's attitude (posttest) was measured again. Data processing was carried out with the help of the SPSS program version 22.0 with a  $p$ -value  $< 0.05$ . The data normality test was carried out with the Shapiro Wilk test. A Wilcoxon test was carried out to find out the influence of the Si-RAJA Android Application on the attitude of midwives. This research has obtained ethical reliability number 06/PHB/KEPK/30/10.21 from the Health Research Ethics Committee of the Patria Husada Blitar College of Health Sciences.

## 3. RESULTS AND ANALYSIS

### 3.1. Result

**Table 1. Characteristics of Midwives in Health centers throughout Tanjungpinang City, Riau Islands Province**

Characteristics	Frequency (n=30)	%
<b>Age</b>		
18-40 years	22	73.33
>40 years	8	26.67
<b>Education</b>		
Diploma III	24	80
Diploma IV/ Bachelor (S1)	6	20
<b>Training</b>		



Ever	19	63.33
Never	11	36.67

Table 1 above illustrates the characteristics of respondents. Most midwives aged 18–40 years are 22 people (73.33%), and most have a Diploma III education of 24 people (80%). In addition, most of the respondents had also attended training related to the estimated fetal weight of 19 people (63.33%).

**Table 2. The Effect of The Si-RAJA Android Application on Midwives' Attitudes in Monitoring Fetal Growth in Health centers throughout Tanjungpinang City, Riau Islands Province**

Attitude	n	Mean (SD)	Median	Range	P-value
Pre-Test	30	80.42 (7.46)	77.50	70-97.5	0.000
Post- Test		82.83 (7.54)	80	72.5-97.5	

Table 2 shows the average attitude of midwives before using the android application. Estimated Fetal Weight (Si-RAJA) is 80.42 with a standard deviation of 7.46. The average attitude of midwives after using the android application Estimated Fetal Weight (Si-RAJA) is 82.83, with a standard deviation of 7.54. The results of the attitude analysis using the Wilcoxon Test obtained a p-value of 0.000 ( $p < 0.05$ ). So, from this test, it can be concluded that there is a significant difference in attitude before and after using the Si-RAJA android application. According to additional data, the average increase in midwife attitudes on PreTest and Post-Test was 2.41.

**Table 3. The Relationship between Responder Characteristics and Midwife Attitudes in Health centers throughout Tanjungpinang City, Riau Islands Province**

Characteristics	Attitude		Total	p value
	Negative	Positive		
<b>Age</b>				
18-40 years	7	15	22	0.002*
>40 years	8	0	8	
Total	15	15	30	
<b>Education</b>				
Diploma III	11	13	24	0.651*
Diploma IV/ Bachelor (S1)	4	2	6	
Total	15	15	30	
<b>Training</b>				
Ever	10	1	11	0.001**
Never	5	14	19	
Total	15	15	30	

Description: \*Fisher's Exact Test \*\* Pearson Chi-Square

Table 3 shows the relationship between respondents' characteristics and midwife attitudes. There is a relationship between age and training with the attitude of midwives toward monitoring fetal growth ( $p$ -value  $< 0.05$ ), and there is no relationship between education and midwives' attitudes toward monitoring fetal growth ( $p$ -value  $> 0.05$ ). Age and training are factors that influence improving the attitude of midwives.

### 3.2. Discussion

Respondents dominated this study in the early adult age group (18–40 years), 22 people (73.33%). The bivariate analysis results showed a relationship between age and knowledge ( $p$ -value  $< 0.05$ ). Harlock (2009) classified a person's age into three groups, namely early adult (18–40 years), late adult (41–65 years), and elderly ( $> 65$  years). In the early adult group, a person has a better ability and maturity in thinking and receiving information than at a younger age. In adulthood, there is an increase in proficiency, skills, and professionalism so that a person can apply and develop science, technology, and the arts [10].

The results showed that most had a Diploma III education of 80% and a Diploma IV/Bachelor (S1) of 20%. The bivariate analysis results showed that there was no relationship between education and attitudes ( $p$ -value  $> 0.05$ ). In providing antenatal care, midwives must provide quality services using the 10T standard, one of which is measuring the height of the uterus fundus and calculating the estimated fetal weight (TBJ). Prospective midwives have obtained

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this competence in the diploma III midwifery and Diploma IV / Bachelor of Midwifery education curricula. In this study, midwife education did not affect the attitude of midwives in monitoring fetal growth [11].

The results showed that most of the respondents had also attended training related to fetal weight estimation of 19 people (63.33%). The bivariate analysis results showed that there was a relationship between training and attitudes ( $p$ -value  $< 0.05$ ). Efforts have been made to increase collaboration in health services, especially in the field of health education. One of the strategies that can be used is training activities. The majority of training activities that have been carried out affect the knowledge of the activity participants [112]. Training will influence knowledge, and knowledge plays an important role in determining attitudes and behaviors. When a person has a positive attitude, he is more likely to change his behavior [13]. Widodo (2015) said that training is a series of individual activities to systematically improve expertise and knowledge to perform professionally in their fields [14].

The results of the data analysis showed an average increase in midwife attitudes in the Pre-Test and Post-Test of 2.41. The average attitude of midwives before using the android application Estimated Fetal Weight (Si-RAJA) was 80.42 and increased to 82.83 after using the android application Estimated Fetal Weight (Si-RAJA). The results of the attitude analysis using the Wilcoxon Test obtained a  $p$ -value of 0.000 ( $p < 0.05$ ). So, from this test, it can be concluded that there is a significant difference in attitude before and after using the Si-RAJA android application.

An attitude is a closed reaction of a person to the stimulus obtained. Attitude is the readiness to react to a certain environmental object as a passion for the object. Personal experience can influence a person's attitude [15]. The experience of using the Si-RAJA application provided by the author to respondents was able to increase the attitude of midwives towards the application of fetal weight estimation (TBJ) measurements. It was evidenced by the results of research that showed a significant increase in respondents' attitude questionnaire answers after using the Si-RAJA application. The provision of health education is one of the factors that can affect attitudes. The messages conveyed through the Android application will change a person's view of the message conveyed.

This is in line with Nurillah's research (2018) that suggests there is an increase in maternal attitudes towards monitoring the growth and development of toddlers after being given the intervention of the "Balita Sehat" mobile application. The Balita Sehat application can be an alternative to improving mothers' attitudes in monitoring toddlers' growth, development, and consumption [16].

In the Si-RAJA application, there is a health education feature. Health education is a long-term behavioral investment as a behavior change process in a person. In a short period (immediate impact), health education produces a change or increase in public knowledge [17]. Knowledge is a factor in the strength of changing attitudes. Knowledge and attitudes will be the basis for forming one's behavior. In a person, ideally, there is a harmony between knowledge and attitudes, where attitudes are formed after the process of knowing first occurs. This means that if someone has good knowledge, they tend to have a positive attitude. On the other hand, if a person lacks knowledge, it tends to be negative [18].

Dinengsih (2020) states that using the DDILAN application can create a positive attitude about high-risk pregnancies [19]. Likewise, Lestari et al. (2019) research state that was applying Sik-Asiek (Exclusive Breastfeeding Health Information System) increases a person's knowledge and attitude towards exclusive breastfeeding. The knowledge gained by respondents through the Sik-Asiek application media is in the stage of awareness, which starts from knowing the application and then feeling interested in the Sik-Asiek application to provide a stimulus to other stages to become new behaviors [20].

#### 4. CONCLUSION

The study concludes that there is an influence of the use of the "Si-RAJA" Android Application (Estimated Fetal Weight) on the attitude of midwives in monitoring fetal growth in health centers throughout Tanjungpinang City Riau Islands Province. For this reason, it is hoped that midwives can monitor growth and provide counseling to pregnant women about fetal growth and provide treatment as early as possible if abnormal TBJ is found.

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