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Research Article

The Effectiveness of Celengan Rindu in Monitoring Fetal Movement in Third-Trimester Mothers

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Abstract

Aims: Neonatal mortality ranks fifth among the top ten causes of death in the world, including neonatal conditions. Early detection measures, such as assessing the well-being of the fetus during the womb through monitoring Fetal Movements (FM), can help to reduce the incidence of IUF. Monitoring FM aims to determine fetus well-being. Celengan Rindu application was created with the goal of making it easier for mothers to monitor FM daily. This study to determine the efficacy of Celengan Rindu in monitoring FM in third-trimester mothers at the Sidomulyo Inpatient Health Center.

Methods: This study was carried out quantitatively on Celengan Rindu using a quasi-experimental design and FM monitoring. This study's sample included up to 30 pregnant women in their third trimester. The sampling technique used was accidental sampling with a questionnaire designed by the researcher himself regarding monitoring FM. The Wilcoxon test was used to analyze the data in this study.

Results: Most of the pregnant women 66.7%, were in their early adulthood and had gravida status, with the majority being primigravida, 63.3%. Only 16.7% of respondents monitored FM according to the results of the pretest before using the Celengan Rindu. The post-test showed that 25 people monitoring fetal movements out of 30 respondents. The P-value was 0.001, it means Celengan Rindu was effective to monitor FM.

Conclusions: Celengan Rindu can be used to prevent IUF and provide the results of a successful pregnancy, allowing the mother to proceed with the expected delivery process.

Keywords:

Celengan Rindu, FM Monitoring, Third-trimester

INTRODUCTION

Intrauterine fetal death is a major obstetric complication and a traumatic experience for parents and medical personnel. If the cause of IUF is identified, an effective IUF prevention strategy can be developed, and maternal complications can be avoided (1). Fetal death in the womb, also known as Intrauterine Fetal Death (IUF), occurs when the gestational age is more than 20 weeks, and the fetus weighs 500 grams or more. IUF usually occurs before delivery

when the pregnancy has reached the 32nd week mark (2). IUF will influence the mother's and fetus's health. IUF is one of the causes of perinatal death that contributes to Indonesia's Infant Mortality Rate (IMR) (3). Child health efforts are governed by Health Minister Regulation Number 25 of 2014, which states that one method is to provide fetal health services while the child is still in the womb (4).

According to global data for 2020, neonatal mortality is ranked fifth among the world's

ten most common causes of death, including neonatal conditions such as birth asphyxia and birth trauma, sepsis and neonatal infections, and complications of premature birth (5). The cause of death in the perinatal group was caused by IUFD as much as 29.5%, this means that the condition of the mother before and during pregnancy determines the condition of her baby. The challenge ahead is to prepare prospective mothers to be ready for pregnancy and childbirth (4). Data from the Riau Provincial Health Office shows that there were 73 cases of IUFD in 2020 that occurred in 21 Community Health Centers in the city of Pekanbaru (6). Reduce the incidence of IUFD, it can be done by assessing the well-being of the fetus through monitoring fetal movements.

Fetal movement counting daily is a simple and non-invasive method that the mother can use to increase the attachment of her fetus and alleviate her concerns about a healthy pregnancy outcome (Neethu, Bhavya, & Shella, 2018). A woman can monitor fetal movements during pregnancy to estimate fetal well-being without the use of medical devices. Between 16 and 20 weeks, women start to feel their baby's movements. Up until the 32nd week of pregnancy, the number of movements tends to increase (8). The goal of fetal monitoring during pregnancy is to prevent fetal death (9). According to (10) study, healthcare providers recommended that mothers to monitor fetal movements, especially in the last trimester, because they could determine the health of the fetus. (11) defined normal fetal movements as more than 10 times in 12 hours. If the mother notices a change in the pattern of fetal movement, she should contact a health professional right away.

(12) collected data for their study, My Baby's Movements: Integration of a mobile phone application into the antenatal education toolkit, from 13 locations and 27 hospitals, with 4,686 women downloading the MBM app. Sixty-one percent (61.9%) of the 837 users who completed the survey

reported that the app provided information that they did not receive from other sources. In addition, 46.3% of women said the MBM app encouraged them to go to the hospital if they were concerned about their baby's movements.

Monitoring fetal movements can help to reduce IUFD. In keeping with the times, fetal movements can be monitored using the "Celengan Rindu" application. Celengan Rindu is interpreted as saving the mother's affection in monitoring the health of her fetus until the time she meets her baby when the baby is born. Celengan Rindu was inspired by the title of a song written by an Indonesian artist, Fiersa Besari. Celengan Rindu is a software product designed for an Android application that is used to calculate fetal movements daily. Every day, the application will display normal or abnormal fetal movement data, as well as education for mothers about fetal movement monitoring. In the Celengan Rindu Application, daily fetal movements are accumulated after 12 hours, it is normal if fetal movements are > 10 times/12 hours. The calculation is done by the mother entering fetal movement data, by clicking on the fetal movement in the application. Every time the fetus moves, the pregnant woman opens the piggy bank application to enter the fetal movement. The goal of this study was to see how well Celengan Rindu worked for monitoring fetal movement in third-trimester mothers.

METHODS

This was a quantitative study with a quasi-experimental design and a pretest and posttest for one group. This study was carried out between October and November of 2022. Thirty-third trimester mothers had participated in this study. The technique used for data collection was accidental sampling. Third-trimester pregnant women with cell phones are the sample criteria (Android). Data collection was carried out using a questionnaire developed by the research team that had conducted a content validity test on maternity nursing experts.

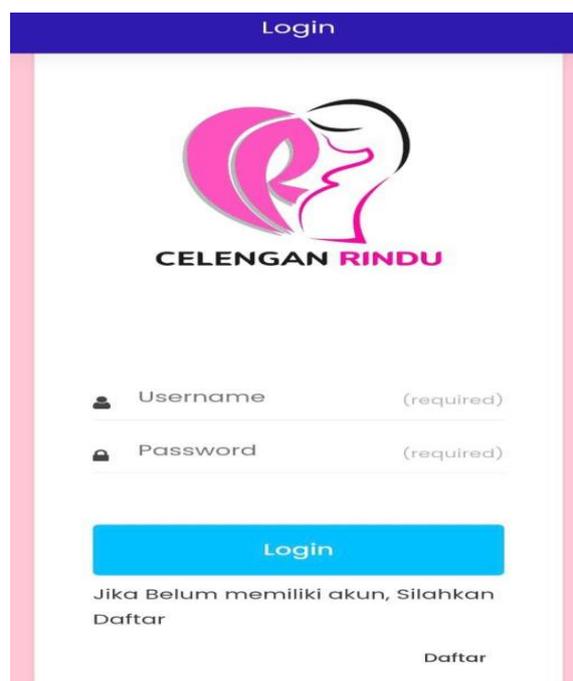
The questionnaire is in the form of questions to monitor fetal movement in the form of a checklist according to the education provided in the Celengan Rindu longing application. Respondents could answer more than one according to their knowledge regarding fetal movement monitoring before and after using the application. The data was collected by using research questionnaires face-to-face with respondents for the pretest and online (on the network using the WhatsApp application) for the post-test by the mother

sending a photo of the questionnaire they had filled out after using the Celengan Rindu. The research team can also see the mother's activity in using the application to calculating fetal movements every day from the domain used. In this study, data was analyzed using univariate and bivariate analysis. The data was analyzed using a computer application and the Wilcoxon test to determine the effectiveness of the Celengan Rindu for monitoring fetal movements.

Figure 1. Display of Celengan Rindu Application



Figure 2 Login Page



On July 25, 2022, the Health Research Ethics Commission granted ethical approval to the Hang Tuah Higher Education of Health Science Pekanbaru under the following number: 526/KEPK/STIKes-HTP/VII/2022. During the study, the pregnant women who were met had agreed to be respondents and signed informed consent.

RESULTS

According to Table 1, the majority of mothers in the third trimester are in their early adulthood by as much as 66.7%, and most of the mothers in gravida are primigravids by as much as 63.3%.

Table 1. Distribution of Respondents' Characteristics for Monitoring Fetal Movement in Third-Trimester Mothers

Variable	<i>n</i> = 30	%
Age		
Late Teens	5	16.7
Early Adult	20	66.7
Late Adult	5	16.7
Gravida		
Primigravida	19	63.3
Multigravida	11	36.7

According to statistical tests using the Wilcoxon test, it was discovered that fewer mothers monitored fetal movements in the pretest, namely 16.7%, while almost all mothers examined fetal movements as much as 90% in the posttest. The P-Value is known to be 0.001, which means it is less than 0.05, so it can be concluded that there is a significant difference between monitoring fetal movement in the pretest and posttest data, implying that the Celengan Rindu is effective for monitoring fetal movement in third-trimester mothers.

Table 2. Effectiveness of Celengan Rindu for Monitoring Fetal Movement in Third-Trimester Mothers

Variable	Fetal Movement Monitoring				<i>p</i> -value
	Performing Monitoring		Not Performing Monitoring		
	<i>n</i>	%	<i>n</i>	%	
Pretest	5	16.7	25	83.3	0.001
Posttest	27	90	3	10	

DISCUSSION

The primary goal of pregnancy is to keep the mother and fetus healthy. The observation of fetal movements by the mother is a self-screening technique for determining fetal well-being. Reduced fetal movement is linked to a variety of adverse perinatal outcomes (13). There are numerous ways to monitor fetal health. Among them, fetal movement counting is the simplest, most cost-effective, and most widely used method for assessing fetal health (14). Methods for assessing fetal movement in pregnancy vary and can be broadly classified as subjective depending

on the mother's perception and awareness of fetal movement and objective depending on the mother's perception and awareness of fetal movement (active or structured). An objective assessment, on the other hand, employs tools such as 'kick charts' to observe or record fetal movements. Many methods, such as multisensory magnetocardiography recordings, mobile apps, and stomach sensors, have recently become available (15).

Fetal movement can improve maternal-fetal attachment because the fetus becomes more real to the mother after moving. Counting fetal movements on a daily basis is a simple and non-invasive method that

mothers can use to improve fetal and maternal bonding and reduce maternal anxiety (16). The fetal movement count activity involves counting the movements of the fetus in the womb. The Cardiff and Sadovsky methods are used to monitor fetal movements. The Cardiff method requires monitoring to begin at 9 a.m., whether you are sleeping on your side or sitting up. Count the time it takes to get to 10 fetal movements. Meanwhile, the Sadovsky method is keeping an eye on the mother while she sleeps on her left side and counting every movement of the fetus. Four fetal movements must be made in one hour; if this time is not met, another hour must be added (17).

With the widespread availability of the internet and the decreasing cost of remote medical services over time, the internet mode of healthcare has an impact on many developing countries. Because patients can easily consult with health professionals, this system can improve health education and raise public health awareness (18). Pregnant women are increasingly using mobile health applications to receive health information and support rather than face-to-face. Using the health app on a mobile device during pregnancy provides a unique perspective for learning, and motivates pregnant women to improve their health and lifestyle. Apps could also serve as a platform for specific pregnancy behavior change interventions such as maternal awareness of decreased fetal movement, maternal weight monitoring, and breastfeeding. Their use of smartphones to access health-related applications that encourage healthy behavior (19).

Mobile Health Applications (Mobile Health/mHealth) have recently experienced rapid growth. The use of mobile technologies such as cell phones, personal digital assistants, and even tablet computers to improve patient's health is referred to as mHealth. A growing body of literature indicates that mHealth and other digital interventions are feasible, acceptable, and can promote better health

behaviors outside of pregnancy. A mobile phone is owned by 76% of people in high-income countries, and 87% use the Internet. Furthermore, a more focused study of pregnant women in the United States found that 88% of them had access to a cell phone and 89% of them had access to the Internet. These findings suggest that both are promising media for use in pregnant women in the management of chronic conditions in high-income settings (20).

(19) conducted research on Mobile Phone Apps in Australia for Improving Pregnancy Outcomes: A systematic search of App Stores revealed that of the three applications evaluated, namely Ovia Pregnancy, COLO-RE, and the Australian Safer Baby Bundle Handbook and Resource Guide, this application is for assessing fetal movement. The use of these three applications discourages pregnant women from contacting a healthcare provider if they are concerned about decreased fetal movement or the risk of IUFD. This is the first study to systematically describe the quality of application and use of behavior change techniques in pregnancy applications for three major health behaviors: monitoring maternal fetal movements, monitoring weight gain during pregnancy, and breastfeeding.

(20) study Mobile Phone-Based Pregnancy Behavioral Interventions to Promote Maternal and Fetal Health in High-Income Countries: A systematic review discovered that available cell phone interventions resulted in some positive changes in behavior and health in pregnant patients. Even though findings are limited, and some studies have a high risk of bias, these preliminary findings suggest that these mobile app interventions may have some ability to improve behavior and health outcomes.

Digital interventions (programs and tools that use digital technologies) have the potential to improve public health, efficiency, and reach in health service delivery. Mobile applications, SMS

messaging (short message service), social media, and interactive websites can improve health by promoting disease prevention, self-management of chronic conditions, and evidence-based healthcare services (21). In this study, researchers provided fetal movement monitoring via an Android application called Celengan Rindu. This application is designed to make it easier for mothers to monitor fetal movements by counting every movement every day.

The Celengan Rindu application for Android is designed to calculate the number of fetal movements per day. The 30 people who took part in this study used an Android cellphone to calculate fetal movements. Celengan Rindu was found to be effective for monitoring fetal movement in third-trimester mothers, according to the study's findings. Most pregnant women do not count their fetal movements in the pretest results. The mother calculated fetal movement for 1 week. The respondent brought a questionnaire home for the posttest, and the researcher contacted the respondent using a cell phone (via WhatsApp). The respondent completed the fetal movement monitoring questionnaire again as the posttest. Based on the results of this posttest, it was found that the Celengan Rindu was used by most the pregnant women to count fetal movements.

Monitoring fetal movements with Celengan Rindu can help mothers count fetal movements daily. Fetal movements can be counted using this application at any time and from any location if the mother has a mobile phone. The mother can open the application and enter the number of fetal movements. This Celengan Rindu application includes information about estimated delivery, daily fetal movement history, and fetal movement education, such as the meaning of Celengan Rindu, understanding of fetal movement monitoring, the benefits of monitoring fetal movement, and normal fetal movement. If fetal movement is reduced, the mother can do things to increase fetal movement and

contact the nearest health care facility. Several pregnant women who counted movements every day but did not count a full day were included in the research team's analysis of the application. This could be due to pregnant women's lack of awareness about monitoring the health of their fetuses. This could also be because the third-trimester pregnant women in this study were mothers with normal pregnancies, and mothers assumed their pregnancies would be fine.

Celengan Rindu application was effectively used to calculate fetal movements every day. Fetal movements will be accumulated automatically after 12 hours of use. Mothers can monitor independently fetus well-being of at home using an Android, without having to go to a health service. When the results of fetal movement decrease, the mother can minimize the complications that will occur by immediately going to the nearest health service which can be seen from the application. The sooner you know the condition of the fetus, the sooner the treatment must be given so that this can reduce IUFD. The education provided in this application can increase the mother's understanding and knowledge about the importance of counting fetal movements because fetal movements are one of the signs that the fetus is growing and developing in the womb.

During pregnancy, expectant mothers consider how their fetus will move, how it will resemble a human, and how it will develop. This positive feeling aids pregnant women in developing feelings of protection, sensitivity, and communication with their fetus (22). The mother benefits from monitoring fetal movements to assess the health of the fetus and prevent pregnancy side effects, to monitor the condition of the fetus in the womb, and to strengthen the bond between mother and fetus. The goal of calculating daily fetal movements is to improve the mother's ability to recognize warning signs in time and to determine whether the fetus is in danger. Fetal movement is reduced, which increases the

risk of complications such as fetal growth restriction and stillbirth. When constantly monitoring fetal movements and reporting reduced fetal movement time to a doctor or health provider, the goal is to prevent perinatal morbidity and mortality (4). It is hoped that the Celengan Rindu application will help to avoid IUFD and provide the results of a healthy pregnancy, allowing the mother to proceed with the expected delivery process. The advantages of this application are that it can make it easier for mothers to monitor fetal movements every day, and can increase mothers' knowledge about monitoring fetal movements from the education provided in the application. This application cannot be used on iOS yet, and when entering fetal movements into the application, it sometimes requires the mother to log back in.

CONCLUSION

Celengan Rindu is effective for monitoring fetal movements in third-trimester mothers, according to this study. Pregnant women should be made aware of the importance of monitoring fetal movements to avoid pregnancy complications, particularly IUFD. It is hoped that the Celengan Rindu application will help to avoid IUFD and provide the results of a healthy pregnancy, allowing the mother to proceed with the expected delivery process.

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