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The Effect of Knowledge of Mothers Assisted by Cadres during Pregnancy on the Incidence of Low Birth Weight

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Abstract
Every pregnancy carries risks to the quality of birth outcomes, such as low birth weight (LBW). Interventions such as increased maternal knowledge, supervision, and intensive assistance are required, which can be performed by health cadres. The study aimed to examine the impact of knowledge on the incidence of LBW in pregnant women accompanied/assisted by cadres during pregnancy. This method combines descriptive research with a quasi-experiment. The study included 30 pregnant women who fulfilled the following criteria: single pregnancy, 30 weeks gestation, not a high-risk pregnancy, and no comorbidities. The study lasted three months, and the independent variable was the knowledge of pregnant women assisted by cadres, while the dependent variable was the incidence of LBW. Pregnant women's questionnaires and observation sheets were employed as instruments. T-Test and Yates' Correction were utilized during data analysis. The findings revealed a p-value of 0.031 increase in knowledge of pregnant women before and after being assisted by cadres during pregnancy, and the incidence of LBW was 3 cases (10%). With a p-value of 0.041, the results of Yates' Correction statistical test revealed that knowledge of pregnant women assisted by cadres is one of the determinants of the occurrence of LBW. It is critical to increase cadre involvement and role in assisting pregnant women.

Keywords: Knowledge, Cadres, Pregnancy, Low Birth Weight.

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1. INTRODUCTION

Low birth weight (LBW) is a major public health concern worldwide, as it is associated with increased infant morbidity and mortality rates, as well as long-term health effects such as developmental delays and chronic diseases (Bianchi & Restrepo, 2022). A high-risk pregnancy is one that deviates from normal conditions in which mothers face a variety of issues that can disrupt their pregnancy and increase the risk of adverse pregnancy outcomes such as low birth weight (LBW)(Lowe, 2020). LBW conditions are the leading cause of neonatal death in Indonesia. In Indonesia, 25 of 34 provinces reported around 3.4% of babies with LBW, while the results of the 2018 Basic Health Research (RISKESDAS) implementation demonstrate 6.2% of 56% of children under five with a birth weight record were born with LBW conditions (Badan Penelitian dan Pengembangan Kesehatan, 2019).

Among the risk approaches developed in Indonesia to prevent maternal death is factor 4 being late, which includes being late in detecting danger signs, being late in making a decision to refer, being late at the referral site, and being late in receiving help at the referral site. Delays in detecting problems can be avoided by educating pregnant women and their families so that they recognize danger signs and make the referral process easier, resulting in faster treatment and better final results. Early detection of maternal health problems is advantageous in lowering the risk of complications and death during pregnancy because prompt, precise, and effective treatment can be administered immediately (Patriajati & Hadijono, 2021).

Maternal knowledge and attitude during pregnancy have been identified as important factors in preventing LBW (Esposito et al., 2015). Pregnant women's ability to recognize danger and high-risk signs of pregnancy has an effect on the growth of the fetus in the womb. Pregnant women who recognize the danger signs of pregnancy will take immediate action to seek medical attention (Esposito et al., 2015), (Mwilike et al., 2018). While previous research has looked into the efficacy of community health worker interventions, such as health education programs delivered by cadres, the specific impact of the cadres' assistance to mothers during pregnancy on LBW has not been thoroughly investigated. Community health cadres can play an important role in educating and supporting pregnant women. Cadres have important jobs, especially when it comes to problems involving pregnant women's health, such as identifying pregnant women, providing health education, and conducting early detection of health conditions that require referral to a higher level of care that a pregnant mother may be experiencing (Olaniran et al., 2019). The focus of this study on the specific intervention of cadres accompanying/assisting mothers during pregnancy on the incidence of LBW offers a unique perspective and fills a critical gap in the existing literature. The findings of this study may help to guide the development of targeted maternal and child health interventions that leverage the role of community health workers, including cadres, to reduce the incidence of LBW in developing countries.

2. RESEARCH METHOD

This research is descriptive research with a Quasi Experiment One Group Pre-Post Design. This method will be employed in order to determine whether the knowledge of pregnant women who are assisted by cadres has an effect on the incidence of LBW. From August to October 2019, the research was conducted in three primary health center areas in Gorontalo City, where cadre assistance activities for pregnant women were carried out five times using a guidebook. The participants in this study were all pregnant women in their third trimester. Purposive sampling was utilized, and all pregnant women in their third trimester were in the working areas of Dungingi Health Center, Sipatana Health Center, and East City Health Center during the study period. The inclusion criteria for this study are single pregnancy, 30 weeks gestation, not a high-risk pregnancy, and not with comorbidities. The 30 cadres chosen to assist pregnant women have worked as cadres for more than 5 years, are under

50 years old, and are always active. A questionnaire with 22 questions on anemia in pregnant women (1 question), danger signs in pregnancy (9 questions), use of Blood Add Tablets (2 questions), personal hygiene and maternal health (1 question), nutrition and a balanced diet (1 question), physical activity and exercise (1 question), examination to a health facility (1 question), and preparation for delivery (1 question) (6 questions). Data analysis used T-Test to measure knowledge of pregnant women before and after being assisted by cadres and *Yates's Correction* to calculate the effect of knowledge of pregnant women assisted by cadres on the incidence of LBW (<2500 gr). This research has received approval from the ethics commission for health research, Poltekkes Kemenkes Gorontalo, Number: LB.01.01/KEPK/031/2019.

3. RESULTS AND DISCUSSION

Table 1. General Characteristics of Respondents

Characteristic	*n=30*	*%*
Age (years)		
< 30	18	60
≥ 30	12	40
Parity		
Primipara	10	66,7
Multipara	20	33,3
Education		
High	22	73,3
Low	8	26,7
Job Status		
Working	7	23,3
Not working	23	76,7

Source: *Primary Data 2019*

Table 1 show that the age of the respondents revealed that most of the respondents were <30 years old as many as 18 people, which was 60.0%, and most of the respondents were multiparous as many as 20 people, which was 33.3%. Most of the respondents possess a higher education level of 22 people, which is 73.3%, and most of the respondents own a non-employment status of 23 people, which is 76.7%.

Table 2. Average Knowledge Score of Respondents Before and After Cadre Mentoring

Knowledge Score	*Mean*	*N*	*Standard Deviation*	Δ	*p-value*
Pretest	18,80	30	2,235	0,97	0,031
Posttest	19,77	30	1,832		

Source: *Primary Data 2019*

Table 2 show that the respondent's knowledge before mentoring was 18.80 with a standard deviation of 2.2, and the respondent's knowledge after mentoring was 19.77 with a standard deviation of 1.8. With a delta of 0.97, the respondent's knowledge score after mentoring was higher than before mentoring. With a p-value of 0.031, statistical tests show that there are differences in the knowledge scores of respondents before and after mentoring by cadres using manuals.

Table 3. The Effect of Knowledge of Pregnant Women Assisted by Cadres on the Incidence of BBLR.

| Variable | Birth Weight Incident | | | | p-value |
| | Normal | | Low | | |
	n	%	n	%	
Knowledge					
Good	19	100,0	0	0,0	0,041
Insufficient	8	72,7	3	27,3	

Source: *Primary Data 2019*

Table 3 show that a p-value of 0.041 is obtained, smaller than 0.05, thus, Ho is rejected and Ha is accepted which indicates that there is an effect of cadre assistance to pregnant women on preventing the incidence of LBW.

Assistance for pregnant women is a risk screening step that allows for the early identification or detection of risks, potential disturbances, and abnormalities in pregnant women's health so that they can receive the appropriate treatment, and this activity is one of the efforts to reduce the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) (IMR) (WHO, 2019). The delay in seeking obstetric treatment is caused by the mother's lack of awareness and knowledge of obstetric danger signs (Nkamba et al., 2021). To reduce MMR, the involvement of many parties is required, including community involvement through empowerment, which is the right step so that the community has responsibility according to their respective roles. One example of community empowerment is the formation of health cadres with extensive knowledge and a strong commitment to improving the health of mothers and children (Nurfazriah et al., 2021).

In this study, cadres' activities of assisting pregnant women were preceded by a day of refreshing cadres. Cadres are provided information on a variety of topics related to the task of assisting pregnant women, such as monitoring of anemia, monitoring of danger signs in pregnancy, monitoring of blood-supplementing tablet consumption, monitoring of personal hygiene and maternal health, monitoring of nutrient and balanced food consumption, monitoring of physical activity and exercise, monitoring of examinations to health facilities, and monitoring of childbirth preparation. Increasing cadre knowledge and skills through refreshing cadres aims to provide new information that is a substitute for previously obtained knowledge or is a refinement of previously obtained information and increases active participation of health cadres (Profita, 2018).

Cadres are health workers' extensions; they serve as a link between the community and health workers. Cadres are responsible for identifying pregnant women at risk, encouraging pregnant women to have their pregnancies checked at healthcare facilities, informing the public, and coordinating the types of services provided with health workers (Krieger et al., 2021).

The respondents in this study ranged in age from 20 to 35 years. This age is part of the productive period, during which pregnant women are expected to understand and comprehend pregnancy information conveyed by cadres. Prior to the mentoring activity, pregnant women were given questionnaires to assess their knowledge levels. Knowledge is obtained through cognitive processes, and in order to know that knowledge, a person must understand or recognize science. A sensory experience is an important tool for knowing the occurrence of knowledge. The majority of human knowledge is acquired through the eyes and ears (Darsini et al., 2019).

In this study, it was discovered that the knowledge score of the respondents after the mentoring increased compared to the knowledge score of the respondents before the mentoring. All forms of information provided by cadres during mentoring will increase the mother's knowledge about detecting pregnancy risk factors and complications that may occur, allowing

the mother to maintain her health independently and make visits to check her pregnancy in order to have a good quality delivery.

The respondents' education level is mostly high school education level/equivalent, which is 80.0%, where that level of education is included in the higher education level so that pregnant women are considered to be able to receive and understand well the information obtained and have the motivation to behave in a way that has a positive impact on pregnancy. Furthermore, information has a significant impact on a person's knowledge (Pipitcahyani, 2018). Education is one of the factors that determines a person's breadth of insight and knowledge (Fatimah & Kania, 2019). Education is one of the factors that determines a person's breadth of insight and knowledge. Education is required to obtain information, such as things that support health, in order to improve a person's quality of life. A high level of education greatly influences a person's ability to receive information, making it easier to change the mother's mindset (Nurzeza et al., 2017), (Chowdhury et al., 2017). With the majority of respondents having completed high school, it will affect mothers' knowledge and attitudes toward pregnancy. The more education a person has, the easier it is for him to absorb the knowledge he has gained (Fatimah & Kania, 2019).

The weight of the baby born to the mother can be used to assess labor outcomes. According to the study's findings, three respondents gave birth to babies with LBW, two of whom gave birth at the age of >30 years and one at the age of 22 years, all of whom were with a third party. Maternal parity is one of the factors that contribute to the prevalence of LBW (Rasyid & Yulianingsih, 2021). High parity above three causes the function and workings of uterine muscle cells to weaken, which has an effect on the inhibition of the supply of nutrients transported from the mother's body through the placenta to the fetus, resulting in an increase in the incidence of LBW. The incidence of LBW is associated to maternal parity (Khoiriah, 2017), (Mahayana et al., 2015), (Setiati & Rahayu, 2017), (Putri, 2019).

During mentoring, cadres solicit complaints about the mother's condition, use manuals to provide counseling and monitoring, involve families in providing support to pregnant women, and make pregnant women feel comfortable. Family support in pregnant women is important in lowering the incidence of low birth weight (Tessema et al., 2021). Cadres also carry out monitoring using a manual which contains materials, namely: 1) anemia status of pregnant women through examination of the face and eyelids and maternal nails; 2) Danger signs in pregnancy in the form of monitoring of birth canal bleeding, swelling of the feet, hands and face or headache assisted by seizures, high fever, premature discharge of amniotic fluid, reduced or immobile fetal movements, continuous vomiting and refusal to eat; 3) Consumption of Blood Add Tablets; 4) personal hygiene and maternal health; 5) Consumption of balanced nutrition and food; 6) Physical activity and sports; 7) Examination to health facilities; 8) Preparation for labor (Rasyid & Claudia, 2019).

Based on the results of *Yates's Correction*, it was revealed that there was an effect of respondent's knowledge after mentoring on the incidence of LBW with a p-value of 0.041 below the value of 0.05. The better pregnant women's knowledge after being assisted, the less likely the occurrence of Low Birth Weight. It indicates that cadres' assistance to pregnant women is effective in reducing the incidence of LBW in Gorontalo City's working area.

A total of 19 respondents had good knowledge and had babies with normal birth weight, while 8 had poor knowledge and had babies with LBW. Pregnant women who are well-informed about a healthy pregnancy can alter their behavior in order to maintain and care for their pregnancy so that the baby is born healthy and at a normal weight (Chowdhury et al., 2017), (Aji et al., 2019). Changes in pregnant women's behavior are a description of the learning process obtained from stimulation in the form of pregnancy monitoring assistance by cadres, which is well received by pregnant women in the form of paying attention and carrying

out what the cadres suggest, ensuring that the stimulation or form of assistance is effective. If the organism's attention is drawn to or receives the stimulus, it is understood and will be carried forward in the next process (Notoatmodjo, 2014). In this case, pregnant women who receive stimulation in the form of assistance from cadres will follow the recommendations made by cadres because they understand the purpose of mentoring activities that benefit their pregnancy.

The impact of maternal health conditions during pregnancy is reflected in birth weight. Pregnant women's physical activity has an effect on the incidence of LBW, which is exacerbated by stressful events. Walking in the morning, assisted by light body movements, breathing techniques, and muscle stretching, will improve blood circulation to support the supply of oxygen from the mother to the fetus through the placenta can be fulfilled and has a positive influence on the fetus, fetal development and fetal brain development (Díaz-Burrueco et al., 2021) (Kubler et al., 2022).

Early detection of pregnancy with risk factors is an activity performed to identify pregnant women who possess risk factors and obstetric complications. Detection of risk factors in mothers both by health workers and the community is one of the efforts to prevent death and illness (Diana et al., 2020), (Damayanti et al., 2019). Counseling and health information about obstetric complications as well as early detection and management of complications performed by cadres when conducting pregnancy assistance owns a positive impact on the knowledge of pregnant women (Wachamo et al., 2019). Therefore, the detection of risk factors in mothers by both health workers and the public is one of the efforts to prevent death and pain (Khadijah & Arneti, 2018). The findings of this study indicate that the role of cadres as members of the community in assisting pregnant women by directly monitoring their health conditions has a positive impact on increasing pregnant women's knowledge as well as their willingness to behave in maintaining their health conditions so that the expected quality of delivery in the form of prevention of the incidence of LBW can be achieved.

Overcoming pregnant women's health problems requires more than just promotional and preventive efforts from health workers; the role of the community, particularly health cadres and family empowerment, is critical to success in assisting pregnant women (Aisyah, 2018). In addition to the knowledge of respondents, the knowledge of cadres must be ensured to be good as it affects success in increasing the knowledge of pregnant women (Mediani et al., 2022). The better the respondent's knowledge, the better the respondent's acceptance understanding and be willing to conduct the cadre's recommendations (Parmawati et al., 2020). One of the researcher's assumptions is that pregnant women's exposure to the media in the form of guidance manuals used by cadres, which contain pictures, simple language, instructions, and ways to behave in a healthy life, recognizing danger signs, is the most effective factor in preventing LBW incidents.

Cadres' mentoring activities to pregnant women five times in the third trimester are a form of receiving external stimuli and responses in order to form pregnant women's perceptions and knowledge about the importance of monitoring anemia, danger signs in pregnancy, consumption of blood-added tablets, and personal hygiene. and maternal health, balanced nutrition and food consumption, physical activity and sports, examinations at health facilities, and childbirth preparation. It is a good habit to have close sources of information and regular interactive activities so that the mother's knowledge is more mutually reinforcing with the knowledge she already has. Mothers will be more aware of the significance of avoiding low birth weight.

When there are interactive activities between cadres and pregnant women that pioneer the creation of a source of information that is closer and easier to understand as well as motivation or triggering the mother's interest to perform her pregnancy well, mothers' understanding enhances. This can result in a mutually reinforcing relationship in which the mother is more willing to deal with any pregnancy discomforts that may arise. The researcher

did not administer the control group as a comparison in this study, so it was not optimal for demonstrating the representativeness of the research results.

4.   CONCLUSION

Most pregnant women possess good knowledge after cadre mentoring, thus, mother's ability to perform cadre recommendations encourages the formation of healthy living behavior and good pregnancy care. This condition affects maternal delivery outcomes, specifically the birth of babies with normal birth weights. It indicates that the knowledge of pregnant women who are assisted by cadres influences the prevention of LBW in Gorontalo City's working area. Direct cadre assistance to mothers during pregnancy must be optimized in order to detect and prevent pregnancy complications as early as possible.

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