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# THE FACTORS CAUSES OF LOW BIRTH WEIGHT IN RSUD WATES KULON PROGO DISTRICT

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**ABSTRACT**

Based on WHO and UNICEF data, in 2013 around 22 million babies were born in the world, of which 16% were born with low birth weight and contributed 60-80% of the total neonatal deaths. According to Riskesdas 2018 the average LBW in Indonesia is 6.2% and LBW in DIY amounting to 8.2, the percentage of LBW in DIY in 2017 is 4.86%. The highest area of LBW is Kulon Progo Regency 6.69%, and in Wates RSUD Kulon Progo Regency in 2017-2018 there are as many as 554 who experience LBW. The Objectives of this study is To find out the causes of LBW incidence in Wates Hospital Kulon Progo Regency in 2017-2018. This study uses a case-control design. The population in this study were all of mothers who gave birth and their babies were treated in Wates Hospital which was recorded in the medical record at Wates Hospital. Data is taken from the patient's medical record. The sampling technique used was purposive sampling. The sample is 152 samples, consisting of 76 cases and 76 controls. There are external variants analyzed, namely maternal age, parity, Hb level, nutritional status, birth distance, pre-eclampsia history, history of antepartum bleeding and LBW history. The data analysis was in a univariate, bivariate using Chi-square test, and multivariate used logistic regression. Chi-square analysis results obtained a value (p <0.05) which showed a significant relationship including maternal age p = 0.011 (OR 3.046 CI95% 1.338-6.933), Hemoglobin level p = 0.043 (OR 2.303 CI95% 1.089-4.870 ), nutritional status p = 0.49 (OR 2.188 CI95% 1.063-4.503), history of pre-eclampsia p = 0.032 (OR 2.564 CI95% 1.147-5.735), history of LBW p = 0.007 (OR 4.407 CI95% 1,542-12,591) with the incidence of LBW, and there was no relationship between parity, birth distance and history of antepartum bleeding with the incidence of LBW. There is a relationship between maternal age, Hemoglobin level, nutritional status, pre-eclampsia history, LBW history.



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## INTRODUCTION

Infant Mortality Rate (IMR) is the number of deaths for infant under one year of age, per 1000 live births in a given year.[1] According to the *World Health Organization* (WHO), the low birth weight contributes 60 to 80% of all neonatal deaths and has a risk of death 20 times greater than a baby

with normal weight. Based on WHO and UNICEF data, in 2013 around 22 million babies were born in the world, of which 16% were born with low birth weight.[2]

The result of *Indonesian Demogravi Health Survey* (IDHS 2012) show that AKB in Indonesia reaches 32 per 1000 live births, and it is expected that AKB can decrease to 23 per 1,000 live births.[3]Data Riskesdas 2018, proportion of birth weight <2500 grams (LBW) in children age 0-59 months based on 56.6% who have a record of birth weight, the average LBW in Indonesia is 6.2 and LBW in DIY, 8.2, the National Medium Term Development Plan (RPJMN) targets 2019 to be 8% .[4]

Based on the percentage of LBW in DIY In 2014-2017 Kulon Progo Regency ranked first and experienced an increase and decrease, in 2014 amounting to 7.11%, in 2015 it decreased to 6.95%, in 2016 it rose to 7.47 and in 2017 2017 decreased to 6.69%. According to the Kulon Progo Health Service Data for babies with LBW in Kulon Progo Regency in 2017 there were 332 babies from 4961 live births or 6.69% .[5.6] According to data in Wates Hospital Kulon Progo Regency the number of live births in January 2017 to October Year 2018 as many as 1563, and 554 experienced LBW [6.7]

WHO defines *Low Birth Weight* (LBW) as a baby born weighing less than 2500 grams.[2] LBW is one of the risk factors that have a contribution to infant mortality, especially during the perinatal period.[8] Factors that can cause LBW include maternal factors, pregnancy factors, fetal factors, and factors that are still unknown. Maternal factors that cause LBW babies include lack of maternal nutrition during pregnancy, maternal age less than 20 years or more than 35 years, distance of pregnancy and childbirth that is too close, chronic illness (hypertension, heart disease, vascular disorders/smokers) and occupational factors that too heavy. Pregnancy factors such as pregnancy with hydramnios, multiple pregnancy, antepartum bleeding, and pregnancy complications. As for fetal factors such as congenital defects and infections in the uterus.[9]

The purpose of this study was to determine the proportion, size of risk and most influential factors between age, parity, hemoglobin level, LILA, birth distance, history of pre-eclampsia, history of antepartum bleeding, and history of LBW on LBW events.

The benefit of this study is as information for students regarding the causal factors of *Low Birth Weight* (LBW), for the hospital as information about the causes of the incidence of *Low Birth Weight* (LBW) so that it can be input into efforts to improve maternal and child health programs. and for the next researcher, this research is expected to become additional information and become input to further research with the same theme.

**METHOD**

The type of this study was an observational analytic study with Case-control design. The study was conducted at Wates Hospital in Kulon Progo Regency on April 17, 2019 until April 20, 2019. The population in this study were all mothers giving birth and their babies receiving treatment at Wates Hospital Kulon Regency Progo in January 2017 until December 2018. The sampling technique was purposive sampling technique. Samples in this study were all live newborns recorded in the maternal medical record at Wates Hospital in Kulon Progo Regency in January 2017 to December 2018 that met the inclusion criteria and exclusion. The total sample of 152 samples

consisted of 76 cases in the case group (babies with low birth weight) and 76 samples in the control group (infants with normal birth weight).

The dependent variables studied in this study included age, parity, hemoglobin level, LILA, birth distance, pre-eclampsia history, history of antepartum bleeding, and history of LBW, and the independent variables in this study were LBW events. The types of data in this study are secondary data both for the dependent variable, and the independent variable. In data collection, researchers use a data collection format that is useful for recording all the data needed in this study. Data analysis in this study was carried out in univariate, bivariate using test Chi Square, and multivariate using logistic regression test.

**RESULTS**

1. Characteristics of Subjects

Based on the results of the study, it can be described the comparison of the proportion of case subjects and controls based on exposure to risk factors in the following table:

Table 1. Comparison of Proportion of Case Subjects and Based Controls Exposure to Risk Factors

| No. | Characteristics | LBW events | | | | Total | |
|---|---|---|---|---|---|---|---|
| | | LBW | | Not LBW | | | |
| | | n | % | n | % | n | % |
| 1. | Mother's age | | | | | | |
| | a. Risk | 24 | 31,6 | 10 | 13,2 | 34 | 22,4 |
| | b. Not Risk | 52 | 68,4 | 66 | 86,8 | 118 | 77,6 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |
| 2. | Parity | | | | | | |
| | a. Risk | 44 | 57,9 | 37 | 48,7 | 81 | 53,3 |
| | b. Not Risk | 32 | 42,1 | 39 | 51,3 | 71 | 46,3 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |
| 3. | Hb Level | | | | | | |
| | a. Risk | 26 | 34,2 | 14 | 18,4 | 40 | 26,3 |
| | b. Not Risk | 50 | 65,8 | 62 | 81,6 | 112 | 73,7 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |
| 4. | LILA | | | | | | |
| | a. Risk | 28 | 36,8 | 16 | 21,1 | 44 | 28,9 |
| | b. Not Risk | 48 | 63,2 | 48 | 78,9 | 108 | 71,1 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |
| 5. | Birth Distance | | | | | | |
| | a. Risk | 9 | 11,8 | 7 | 9,2 | 16 | 10,5 |
| | b. Not Risk | 67 | 88,2 | 69 | 90,8 | 136 | 89,5 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |
| 6. | History of Pre-Eclampsia | | | | | | |
| | a. Risk | 23 | 30,3 | 11 | 14,5 | 34 | 22,4 |
| | b. Not Risk | 53 | 69,7 | 65 | 85,5 | 118 | 77,6 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |
| 7. | History of Antepartum Bleeding | | | | | | |
| | a. Risk | 1 | 1,3 | 1 | 1,3 | 2 | 1,3 |
| | b. Not Risk | 75 | 98,7 | 75 | 98,7 | 150 | 98,7 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |
| 8. | History of LBW | | | | | | |
| | a. Risk | 18 | 23,7 | 5 | 6,6 | 23 | 15,1 |
| | b. Not Risk | 58 | 76,3 | 71 | 93,4 | 129 | 84,9 |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 |

Table 1. shows that the proportion of mothers at risk in the case group was 31.6% and in the control group 13.2%, the proportion of risky parity in the case group was 57.9% and in the control group 48.7%, the proportion of Hb levels the risk in the case group was 34.2% and the control group was 18.4%, the proportion of LILA at risk in the case group was 36.8% and the control group was 21.1%, the proportion of risky birth spacing in the case group was 11.8 and the group control as much as 9.2%, the proportion of pre-eclampsia history in the case group 30.3% and the control group 14.5%, the history of antepartum bleeding in the case group 1.3% and in the control group 1.3%, and the history of LBW in the case group 23.7% and the control group 6.6%.

## 2. Bivariate Analysis

Table 2. Relationship of Risk Factors with LBW Events

| No. | Characteristics | LBW events | | | | Total | | *p-value* | OR | CI |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Case | | Control | | | | | | |
| | | n | % | n | % | n | % | | | |
| 1. | Mother's age | | | | | | | | | |
| | a. Risk | 24 | 31,6 | 10 | 13,2 | 34 | 22,4 | 0,011* | 3,046 | 1,338-6,933 |
| | b. Not Risk | 52 | 68,4 | 66 | 86,8 | 118 | 77,6 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |
| 2. | Parity | | | | | | | | | |
| | a. Risk | 44 | 57,9 | 37 | 48,7 | 81 | 53,3 | 0,329 | 1,449 | 0,764 – 2,749 |
| | b. Not Risk | 32 | 42,1 | 39 | 51,3 | 71 | 46,7 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |
| 3. | Hb Level | | | | | | | | | |
| | a. Risk | 26 | 34,2 | 14 | 18,4 | 40 | 26,3 | 0,043* | 2,303 | 1,089 – 4,870 |
| | b. Not Risk | 50 | 65,8 | 62 | 81,6 | 112 | 73,7 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |
| 4. | LILA | | | | | | | | | |
| | a. Risk | 28 | 36,8 | 16 | 21,1 | 44 | 28,9 | 0,049* | 2,188 | 1,063 – 4,503 |
| | b. Not Risk | 48 | 63,2 | 60 | 78,9 | 108 | 71,1 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |
| 5. | Birth Distance | | | | | | | | | |
| | a. Risk | 9 | 11,8 | 7 | 9,2 | 16 | 10,5 | 0,792 | 1,324 | 0,466 – 3,759 |
| | b. Not Risk | 67 | 88,2 | 69 | 90,8 | 136 | 89,5 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |
| 6. | History of Pre-Eclampsia | | | | | | | | | |
| | a. Risk | 23 | 30,3 | 11 | 14,5 | 34 | 22,4 | 0,032* | 2,564 | 1,147 – 5,735 |
| | b. Not Risk | 53 | 69,7 | 65 | 85,5 | 118 | 77,6 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |
| 7. | History of Antepartum Bleeding | | | | | | | | | |
| | a. Risk | 1 | 1,3 | 1 | 1,3 | 2 | 1,3 | 1,000 | 1,000 | 0,061 – 16,285 |
| | b. Not Risk | 75 | 98,7 | 75 | 98,7 | 150 | 98,7 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |
| 8. | History of LBW | | | | | | | | | |
| | a. Risk | 18 | 23,7 | 5 | 6,6 | 23 | 15,1 | 0,007* | 4,407 | 1,542-12,591 |
| | b. Not Risk | 58 | 76,3 | 71 | 93,4 | 129 | 84,9 | | | |
| | Total | 76 | 100 | 76 | 100 | 152 | 100 | | | |

Table 2. The results of bivariate analysis using Chi Square test with a p-value of 0.011 OR 3.046 (CI95% 1,338-6,933) which showed a significant relationship between the age of the

mother and the incidence of LBW in newborns. Mothers with age <20 years or> 35 years have a risk 3 times more likely to give birth to LBW babies than mothers aged 20-35 years. The analysis results obtained p-value of 0.329 OR = 1.449 (95% CI 0.764-2.749) which means there is no significant relationship between parity and the incidence of LBW in newborns. The results of the analysis with a p-value of 0.043 OR = 2.303 (CI95% 1.089-4.870) showed that there was a significant relationship between maternal Hb levels and the incidence of LBW in newborns. Anemic mothers have a 2.3 times greater risk of giving birth to LBW babies than mothers who are not anemic. The results of the analysis with a p-value of 0.049 OR = 2.188 (CI95% 1.063-4.503) which showed that there was a significant relationship between the size of the LILA of mothers and the incidence of LBW in newborns. Mothers with a size of LILA <23.5 cm had 2.1 times greater risk of giving birth to LBW babies than mothers with a LILA size of ≥23.5 cm. The analysis results with a p-value of 0.792 OR = 1.324 (CI 95% 0.466-3.759) which means there is no significant relationship between birth distance and LBW incidence in newborns. The results of the analysis with p-value 0.032 OR = 2.564 (CI95 % 1,147-5,735) which showed a significant relationship between the history of pre-eclampsia and the incidence of LBW in newborns. Mothers with a history of pre-eclampsia had a 2.5 times greater risk of giving birth to LBW babies than mothers who did not have a history of pre-eclampsia. The results of analysis with a p-value 1,000 OR = 1,000 (95% CI 0.061-16,285) which means there is no significant relationship between history of antepartum hemorrhage and the incidence of LBW in newborns and the results of the analysis with a p-value of 0.007 OR 4.407 (CI95% 1.542-12.591) which showed a significant relationship between history of LBW and the incidence of LBW in newborns. Mothers with a history of low birth weight have a 4.4 times greater risk of giving birth to LBW babies than mothers who do not have a history of low birth weight.

### 3. Multivariate Analysis

Table 3. Results of Multivariate Analysis

| variable | B | Wald | Df | Sig | Exp (B) | OR (95% CI) |
|---|---|---|---|---|---|---|
| Mother's age | 1,160 | 6,876 | 1 | 0,009 | 3,189 | 1,340-7,589 |
| LILA | 0,987 | 5,727 | 1 | 0,017 | 2,551 | 1,185-5,494 |
| History of LBW | 1,451 | 6,836 | 1 | 0,009 | 4,267 | 1,435-12,689 |
| Constant | -2,836 | 15,056 | 1 | 0,000 | 0,059 | |

Table 3. shows that mothers at risk (<20 and> 35 years) have 3.189 times more at risk of giving birth to LBW babies, mothers with a risk of LILA (<23.5 cm) have 2,551 times more at risk of giving birth with LBW, and mothers with a history of LBW 4.267 times more at risk for giving birth to babies with LBW. The most dominant variable influencing the incidence of LBW is the history of LBW with p-value 0.009 OR = 4.267 (95% CI 1.435-12.698).

## DISCUSSION

Low Birth Weight (LBW) is a baby who is born weighing less than 2500 grams.[2] LBW is one of the risk factors that have a contribution to infant mortality, especially in the perinatal period.9

factors that can cause LBW include maternal factors, pregnancy factors, fetal factors, and factors that are still unknown. Maternal factors that cause LBW babies include lack of maternal nutrition during pregnancy, maternal age less than 20 years or more than 35 years, distance of pregnancy and childbirth that is too close, chronic illness (hypertension, heart disease, vascular disorders / smokers) and occupational factors that too heavy. Pregnancy factors such as pregnancy with hydramnios, multiple pregnancy, antepartum bleeding, and pregnancy complications. As for fetal factors such as congenital defects and infections in the uterus.[9]

Based on the results of the study showed that the age of mothers in the case group 31.6% gave birth to LBW babies, and in the majority control group gave birth to LBW babies as much as 13.2%. Based on this research, it is known that there is a significant relationship between the age of the mother and the incidence of LBW with a p-value of 0.011 OR = 3.046 (95% CI 1.338-6.933) and a chance to give birth to a LBW baby 3 times greater. This is in line with research conducted by Yulia (2016) states that there is a relationship between the age of mothers at risk (<20 and> 35 years) to the incidence of LBW, and the results of the study show that the age of mothers less than 20 years and over 35 years of age is 1.4 times more likely to experience LBW big from 20-35 years. It is more susceptible to pregnancy complications at less than 20 or over 35 years of age, but will be corrected by regular pregnancy monitoring and examination, so that the process of pregnancy and fetal development will occur optimally.

Freser et al., In Cunningham (2006), states that teenage pregnancies are more risky because they rarely get preconception counseling, but if counseling obtained in early pregnancy may still be beneficial for pregnancy. Health services and counseling, including nutrition for healthy pregnancy, is one of the concepts of integrated antenatal services. At the age of less than 20 years, the reproductive organs have not functioned properly, the uterus and pelvis of the mother have not grown to an adult size so that in the event of pregnancy and childbirth it will be easier to experience complications. Pregnancy teenagers are more at risk because they rarely get preconception counseling, but if counseling obtained at the beginning of pregnancy may be beneficial for pregnancy. At the age of more than 35 years there is a decline in reproductive health because the degenerative process has begun to appear. One effect of the degenerative process is blood vessel sclerosis of the small arteries and myometrial arterioles causing uneven and maximal blood flow to the endometrium so that it can affect the distribution of maternal nutrition to the fetus and disrupt fetal growth in the uterus.[10]

Based on the results of the study showed that parity in the case group as much as 57.9% gave birth to LBW babies, in the majority control group gave birth to LBW babies as much as 48.7%. Based on this study, it is known that there is no significant relationship between parity and the incidence of LBW with a p-value of 0.329 OR = 1.449 (95% CI 0.764-2749) and the chance to give birth to LBW babies 1.4 times greater. The results of this study are in line with the results Sharma study (2008) Primi's mothers were relatively lower risk (18.4%) giving birth to LBW babies compared to multi-expectant mothers (29.5%), Primigravida mothers comparatively at lower risk (15.3%) giving birth to LBW babies compared to multigravida mothers (32.6%) .[11]

The results of this study are not in line with the results of the research of saifudin (2009) mothers with a proportion of more than 3 children at 2.4 times at risk of giving birth to babies with LBW.[12] In Joshi's research also stated Primigravida's mother showed the highest prevalence of low birth weight (30.86%, p <0.001) Primiparous women in this study also had more (29.11%) LBW babies like y found in other studies. And there was an increase in LBW after the fourth parity (51.28%), mothers with parity> 3 were at risk of giving birth to LBW, in primipara associated with unprepared organ function in maintaining pregnancy and accepting the presence of the fetus, the mother's skills to carry out self-care and her baby and factors the psychological condition of the mother is still unstable, while the mother who has given birth to a child four or more times because of too high parity will cause disruption of the uterus, especially in terms of blood vessel function.[13]

Based on the results of the study, 34.2% gave birth to hemoglobin in the case group LBW, while in the majority control group gave birth to LBW babies as much as 18.4%. Based on this study it is known that there is a significant relationship between hemoglobin levels and the incidence of LBW with a p-value of 0.043 OR = 2.303 (95% CI 1.089 to 4.870) and the chance to give birth to LBW babies is 2.3 times greater. This is in line with research carried out by Elhassan ME (2010) significantly more women in the case group had anemia, 65 (67.0%) vs 27 (27.8%), p = 0.001. While anemia was moderate at 19 (29.2%), mild in 46 (70.8%) of 65 anemia women in the case group, it was severe in one (3.7%), moderate in 2 (7.4%), and mild in 24 (88.8%) of 27 anemia women in the control group. The current study shows that anemic women have a nine times higher risk of giving birth to LBW babies. This is consistent with previous observations from eastern and western Sudan and other African countries, where anemia was reported as a predictor of LBW and poor perinatal outcomes. Anemia during pregnancy is a big burden in Sudan where Sudanese pregnant women are more susceptible to anemia regardless of their age and parity.

In addition anemia has been reported to be associated with fetal anemia and still being born in eastern Sudan. Maternal hemoglobin is an indirect indicator of overall maternal nutrition and therefore, low maternal hemoglobin can be identified as malnourished mothers whose fetus suffers from the prevalence of prevalence of malnutrition 47, 61% of LBW is inversely proportional to the level of 6.0-8.0 of hemoglobin. The prevalence of LBW is inversely proportional to the level of hemoglobin.

A study was conducted by Mavalankar et al. suggested that among 924 out of 1024 mothers screened for hemoglobin (Hb) levels, that was more than 10.9 mg 35.28% only. Thus, two-thirds of the women in this study suffered from anemia.[14] In Yunus's study (2013) also stated that there was a relationship between hemoglobin levels and the incidence of LBW and the length of birth of the baby. In this study, low hemoglobin levels have a chance of 2,303 times more at risk of giving birth to babies with LBW.[15]

In the study of Michael Ofori Fosul (2013) also stated the prevalence of LBW among anemic mothers was 1,338 times higher than mothers who were not anemic.[16]Centers for Disease Control (1990) defines a significant hemoglobin level (anemia) as a hemoglobin level of less than 11 g / dl in the first and third trimesters, and less than 10.5 g / dl in the second trimester. Anemia in pregnancy

reduces oxygen supply to maternal metabolism because lack of hemoglobin that binds oxygen and results in indirect effects on mother and baby, among others, mother's vulnerability to infection, fetal death, preterm birth and low birth weight.[17] Maternal hemoglobin is an indirect indicator of overall maternal nutrition and therefore, maternal hemoglobin the low is an important risk factor for LBW.[18]

Based on the results of the study showed that LILA in the case group as many as 36.8% gave birth to LBW babies, while in the majority control group gave birth to LBW babies as much as 21.1%. Based on this study, it is known that there is a significant relationship between LILA and the incidence of LBW with a p-value of 0.049 OR 2.188 (95% CI 1.063 to 4.503) and a chance to give birth to LBW babies 2 times greater. This is in line with Yulia's research (2016) Maternal nutrition during pregnancy has an influence on the incidence of LBW, women with insufficient nutritional status have a risk 5.5 times greater than women with adequate nutritional status and statistically significant (OR = 5.61; 95% CI = 0.21 to 0.79; p = 0.008). Insufficient nutritional status in this study was stated in the category of Mid-Upper Arm Circumference (MUAC), less than 23.5 cm indicated CED, more than 23.5 indicated not CED.

The results of this study are consistent with the research conducted by Ruji (2009), where he found that MUAC <23.5 cm. has a risk of 4.89 times higher for giving birth to LBW babies. Maternal nutritional status is very important for pregnancy, in a state of malnutrition, maternal nutrition will not be sufficient to support the growth and development of fetal and maternal health. In the pla-centa condition it is not well developed so that it is unable to supply adequate nutrition for the needs of the fetus, the possible impacts are fetal development, birth defects, miscarriage or stillbirth, birth weight before birth, or low birth weight. infants (LBW) .10 According to a study conducted by Lina (2012), there was a significant relationship between SEZs and birth weight with p = 0.003, mothers who experienced SEZ were more likely to give birth to LBW compared to non-SEZ mothers who were more likely to give birth baby with BBLN. In this study, the nutritional status of mothers who had less chance was 2.188 times more at risk of giving birth to babies with LBW. [19]

According to the study from Mochamad S et al (2013) the prevalence of LBW was higher in mothers with low nutritional status (8.3%) and overweight nutritional status (11.8%). Income has an indirect influence on the incidence of LBW, high-income families will be able to meet nutritional needs, whereas low income families will find it difficult to meet nutritional needs, therefore, regardless of the economic status of the mother, it is expected that pre-pregnant mothers need to pay attention Nutritional status starting early in pregnancy and giving attention to weight gain during pregnancy because it will be related to the growth and nutrition of the baby to be born.[20]

Based on the results of the study showed that the distance of pregnancy in the case group as much as 11.8% gave birth to LBW babies, while in the majority control group gave birth to LBW babies as much as 9.2%. Based on this study, it is known that there is no significant relationship between birth spacing and LBW incidence with a p-value of 0.792 OR = 1.324 (95% CI 0.466 to 3.759) and the chance to give birth to a baby LBW 1.3 times greater.

This study is in line with research Anjas (2016) based on the results of bivariate analysis of the relationship between the distance of pregnancy and LBW incidence is not significant which

means that there is no relationship between the distance between pregnancy and LBW events. This shows that the pregnancy distance is not at risk for LBW events. first child in the case group, as many as 45 people (75%). LBW cases occur due to other causes such as multiple pregnancy factors, hypertension and anemia. The distance of pregnancy pregnancy ≤24 months can cause unfavorable pregnancy conditions, disorders of child development and affect reproduction. The distance of pregnancy kehamilan24 months also increases the risk of infant mortality by 50%. Chuku (2008) argues that pregnancy distance regulation is important because pregnant women can store energy in their bodies for preparation for breastfeeding and reproduction in the future. Women usually change their lifestyle and diet to increase energy reserves. In the case of short pregnancy spans can reduce the average energy reserve of the fetus, making the fetus smaller. The inadequate distance of pregnancy can cause the gestation to be shorter, causing premature birth. The results of this study are also not in line with the results of Anant P (2017) 's study stating birth spans at risk of having an effect on giving birth to babies with LBW. [18]

Based on the results of the study showed that the history of pre-eclampsia in the case group 30.3% gave birth to LBW babies, while in the majority control group gave birth to LBW babies as much as 14.5%. Based on this study it is known that there is a significant relationship between the history of pre-eclampsia and the incidence of LBW with a p-value of 0.032 OR = 2.564 (95% CI 1.147 to 5.735) and the chance to give birth to a LBW baby 2.5 times greater. with the results of Siza's study (2015) that there is a relationship between pre-eclampsia and the incidence of LBW having the highest prevalence (46.67%) and a history of pre-eclampsia has a chance of 2,188 x more at risk of giving birth to LBW babies.[1]

According to G Singh's study (2009) the study of women with pre-eclampsia was six times more likely to have LBW babies than controls (p <0.01). Pre-eclampsia by reducing plasma volume reduces the supply of nutrients to the fetus which affects fetal growth.[21] Pre-eclampsia is a pregnancy-specific syndrome in the form of reduced perfusion of organs due to vasospasm and endothelial activity. Eclampsia is a seizure in women with preeclampsia that cannot be caused by other things. This situation has a direct influence on the quality of the fetus because there is a decrease in blood to the placenta causing fetal deficiencies resulting in impaired fetal growth. In pre-eclampsia trophoblast invasion is not optimal so that atrial cervical vasospasm occurs, it remains rigid and hard, making the uteroplacental flow inadequate. [22]

Based on the results of the study showed that the history of antepartum hemorrhage in the case group was 1.3% giving birth to LBW babies, while the majority control group gave birth to LBW babies as much as 1.3%. Based on this study it is known that there is no significant relationship between the history of antepartum bleeding with the incidence of LBW with a p-value of 1,000 OR = 1,000 (95% CI 0.061-16,285) and the chance to give birth to a LBW baby 1 times greater. Lisnawati's (2017) research stated that there was a relationship between bleeding history and the incidence of LBW. Vaginal bleeding in pregnancies over 28 weeks or more. Because antepartum bleeding occurs at more than 28 weeks' gestation, it is often called third trimester bleeding. Complications of

antepartum hemorrhage are premature birth and fetal distress because of the termination of pregnancy that is forced to be carried out in term pregnancies.[23]

In the results of this study it is not in accordance with a study conducted by Sondari which showed that antepartum bleeding was associated with the incidence of LBW, with p = 0.643 (Placenta previa 48.5% and placental abruption 7.6%), however Letcworth, et al. Research in 2008 which indicates that pregnant women with antepartum bleeding have good perinatal results. Bleeding from the placenta will cause quite a lot of bleeding, so it can disrupt the circulation of oxygen and carbon dioxide and nutrients from the mother to the fetus. It should be seen from the volume of blood that comes out due to different antepartum bleeding in each pregnant woman.[24]

Based on the results of the study showed that the history of LBW in the case group as much as 23.7% gave birth to LBW babies, while in the majority control group gave birth to LBW babies as much as 6.6%. Based on this study it is known that there is a significant relationship between the history of antepartum hemorrhage and the incidence of LBW with a p-value of 0.007 OR = 4.407 (95% CI 1.542-12.591) and a chance to give birth to a LBW baby 4.4 times greater. The results are in line with research According to Chaitanya (2016) there was a relationship between previous preterm labor and the incidence of LBW (ARR, 5.37; 95% CI, 1.5 to 19.1), in a previous study a history of preterm labor was reported in 10/219 (4.5%) women, and risk factors influenced by ethnicity / race among women underline the need to assess risk factors at the international level to form interventions.[14] According to Abida S's research (2018) a history of prematurity conducted by asking for information from mothers, there was a significant relationship with the incidence of LBW (p = 0 , 0001). And prematurity births have been recognized as important determinants of LBW in other studies.[25]

According to Bahareh's study (2014), states a history of previous preterm infants (OR = 4.8; P <0.001), and a history of preterm labor in mothers and sisters of pregnant women (OR = 3.2; P <0.001), there was a significant relationship seen between the history of maternal prematurity and their preterm birth. This parameter has not been investigated in other studies. Although not significant in multivariate analysis, but because of other variables, called family history of prematurity, they may be related. Therefore maternal prematurity is probably an independent risk factor for premature newborns; but not evaluated in other studies. The history of preterm labor in family members of pregnant women (sisters and mothers) is also a risk factor. This finding shows the genetic effect of preterm labor.[26]

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