

## FACTORS ASSOCIATED WITH THE INCIDENCE OF LOW BIRTH WEIGHT

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### ABSTRAK

Latar Belakang: Faktor yang berhubungan dengan kejadian BBLR adalah usia ibu, jarak kelahiran, paritas, status gizi, dan kadar hemoglobin. Berdasarkan data di Puskesmas Poned Karya Mukti, jumlah bayi yang lahir di wilayah kerja Puskesmas Karya Mukti pada tahun 2018 sebanyak 487 bayi dengan penanganan komplikasi neonatal sebanyak 74 bayi dan 11 bayi dengan berat badan lahir rendah. Kemudian jumlah bayi yang lahir pada tahun 2019 sebanyak 456 bayi dimana penanganan komplikasi neonatus sebanyak 59 bayi dan 12 bayi dengan berat badan lahir rendah dan jumlah bayi yang lahir pada tahun 2020 sebanyak 448 bayi dimana penanganan komplikasi neonatus sebanyak 47 bayi dan 15 bayi lahir rendah Berat lahir.

Tujuan Penelitian: Untuk mengetahui hubungan umur, paritas dan status gizi dengan kejadian berat badan lahir rendah (BBLR) di Puskesmas Poned Karya Mukti Tahun 2020.

Metode: Penelitian ini menggunakan penelitian survei analitik kuantitatif dimana variabel bebas yaitu umur, paritas dan status gizi serta variabel terikat termasuk kejadian berat badan lahir rendah (BBLR) dikumpulkan pada waktu yang bersamaan. Populasi seluruh bayi yang lahir di Puskesmas Poned Karya Mukti tahun 2020 adalah 115 orang. Sampel sebanyak 53 orang diperoleh dengan menggunakan teknik random sampling.

Hasil: uji statistik Chi-Square pada variabel umur diperoleh p-value 0,003 ( $\leq 0,05$ ), pada variabel paritas diperoleh p-value 0,006 ( $\leq 0,05$ ) dan pada variabel status gizi diperoleh p-value 0,001 ( $\leq 0,05$ )

Kesimpulan ada hubungan yang bermakna antara umur, paritas dan status gizi dengan kejadian BBLR.

Saran : Sebaiknya Puskesmas Karya Mukti lebih aktif memberikan penyuluhan kepada bidan terkait dengan berat badan lahir rendah.

Kata kunci: Berat badan lahir rendah, Keseimbangan, Status nutrisi, Usia

### ABSTRACT

Background: Factors related to the incidence of low birth weight (LBW) are maternal age, birth spacing, parity, nutritional status, and hemoglobin levels. Based on the data at Poned Karya Mukti Public Health Center, the number of babies born in the work area of Karya Mukti Public Health Center in 2018 was 487 babies of which handling neonatal complications was 74 babies and 11 babies had low birth weight. Then the number of babies born in 2019 was 456 babies of which handling neonatal complications was 59 babies and 12 babies had low birth weight and the number of babies born in 2020 was 448 babies of which handling neonatal complications was 47 babies and 15 babies had low birth weight.

Purpose : to find out the relationship between age, parity and nutritional status with the incidence of low birth weight (LBW) at Poned Karya Mukti Public Public Health Center in 2020.

Methods: This study used a quantitative analytical survey study in which the independent variables, namely age, parity and nutritional status and the dependent variable including the incidence of low birth weight (LBW) were collected at the same time. The population of all babies born at Poned Karya Mukti Public Health Center in 2020 was 115 people. The sample was 53 people obtained using random sampling technique.

Results: statistical test, Chi-Square on age variable was obtained p-value 0.003 ( $\leq 0.05$ ), on parity variable was obtained p-value 0.006 ( $\leq 0.05$ ) and on nutritional status variable was obtained p-value 0.001 ( $\leq 0.05$ )

Conclusion that there was a significant relationship between age, parity and nutritional status with the incidence of low birth weight.

Suggestion: It is recommended that Karya Mukti Public Public Health Center should be more active in providing counseling to midwives related to low birth weight.

Keywords: Age ,Low birth weight, Nutritional status, Parity

## INTRODUCTION

Low birth weight is a baby with a birth weight of less than 2500 grams. The most common cause of low birth weight is premature birth. Other maternal factors are age, parity and so on. Placental factors such as vascular disease, twin / multiple pregnancies, and fetal factors are also the cause of low birth weight (Pantiawati, 2019).

Based on the data from the World Health Organization (WHO) in 2018, the prevalence of low birth weight is still quite high in which the prevalence of low birth weight (LBW) is estimated at 21% of all births in the world with the range of 4.5% -40% and is more common in developing countries. In Southeast Asia, the incidence of low birth weight is 42.7% (World Health Organization, 2018).

Indonesia is a developing country with a high infant mortality rate (IMR). According to the Indonesian Ministry of Health, infant mortality rate in Indonesia reaches 24/1000 live births. Based on the United Nations (UN) data, the infant mortality rate in 2018 was 21.86/1000 live births, then in 2019 it was 21.12/1000 live births and in 2020 until August it was 9.78/1000 live births. One of the causes of infant mortality in Indonesia is the incidence of low birth weight of 38.85% (Kemenkes RI, 2017).

The high infant mortality rate in Indonesia, 24 per 1000 live births, makes Indonesia ranks fifth with the highest number of low birth weight in the world and the birth of babies with low birth weight is identified as the largest contributor to infant mortality. One of the reasons for the high rate of low birth weight in Indonesia is the lack of adequate nutritional intake for the fetus and mother (Paramita, 2017).

Problems in babies with low birth weight (LBW), especially in premature, occur because of the immaturity of the organ system in the baby. Problems with low birth weight that often occur are disorders of the respiratory system, central nervous system, cardiovascular, hematology, gastro interstinal, kidney, and thermoregulation. Treatments for babies with low birth weight (LBW) is by strictly maintaining body temperature because babies with low birth weight are prone to hypothermia, therefore the baby's body temperature must be maintained strictly; strictly preventing infection because babies with low birth weight is very susceptible to infection; and nutritional monitoring (breast-feeding) because the swallowing reflex of babies with low birth weight is not perfect, therefore nutrition is given carefully (Rukiyah, 2013).

The main cause of the high infant mortality rate, especially during the perinatal period is low

birth weight (LBW). Babies born with low birth weight have a 35 times higher risk of death compared to babies whose body weight is more than 2500 grams. Low birth weight can have long-term effects on children's growth and development and children have a risk of heart disease and diabetes in the future (Trihardiani, 2011). Factors associated with the incidence of low birth weight (LBW) are maternal age, birth spacing, parity, nutritional status, hemoglobin levels.

The data from OKU District Health Office showed that the number of newborns in 2018 was 7,659 babies and 87 babies with low birth weight, then the number of newborns in 2019 was 7,817 and 103 babies with low birth weight, and the number of newborns in 2020 was 7,130 and 62 babies with low birth weight (Dinkes OKU, 2020).

Based on the data at PONEK Karya Mukti Public Health Center, the number of babies born in the work area of Karya Mukti Public Health Center in 2018 was 487 babies of which handling neonatal complications was 74 babies and 11 babies had low birth weight, the number of babies born in 2019 was 456 babies of which handling neonatal complications was 59 babies and 12 babies with low birth weight, while the number of babies born in 2020 was 448 babies of which handling neonatal complications was 47 babies and 15 babies with low birth weight. Based on the above background, the researcher is interested in conducting a study with the title "Factors associated with the incidence of low birth weight at PONEK Karya Mukti Public Health Center in 2020".

## RESEARCH METHODOLOGY

This study used a quantitative analytical survey research in which the independent variables, namely age, parity and nutritional status and the dependent variable including the incidence of low birth weight (LBW) were collected at the same time (Notoadmodjo, 2010). The population in this study were all babies born at PONEK Karya Mukti Public Health Center in 2020 as many as 115 people. Then, the sample was 53 people obtained using random sampling technique. The data collected in this study were secondary data. Secondary data were obtained using a checklist by looking at the medical records at PONEK Karya Mukti Public Health Center. The analysis was carried out to know the frequency distribution and the percentage of each variable. Bivariate analysis using a quadratic test (Chi Square) was used to test the hypothesis of the relationship/influence between two variables (the independent variables, namely age, parity and

nutritional status and the dependent variable including low birth weight) (Susila, 2015).

**RESEARCH RESULTS AND DISCUSSION**

**Univariate Analysis**

**Table 1.**  
**Respondents' Frequency Distribution and Percentage by Low Birth Weight at PONED Karya Mukti Public Health Center in 2020**

Low Birth Weight	Frequency (N)	Percentage %
Yes	11	20,8
No	42	79,2

From the table 1 above, it shows that out of 53 respondents, 11 respondents (20.8%) are babies with low birth weight, while 42 respondents (79.2%) are babies without low birth weight.

**Table 2.**  
**Respondents' Frequency Distribution and Percentage by Age at PONED Karya Mukti Public Health Center in 2020**

Age	Frequency (N)	Percentage %
High Risk	25	47,2
Low Risk	28	52,8

From the table 2 above, it shows that out of 53 respondents, there are 25 respondents (mothers) (47.2 %) with high risk age and 28 respondents (52.8 %) are with low risk age.

**Bivariate Analysis**

**Table 5.**  
**Cross Tabulation between Age and Low Birth Weight at PONED Karya Mukti Public Health Center in 2020**

Age	Low Birth Weight				Total	Sig	OR
	Yes	%	No	%			
High Risk	10	40	15	60	25	0.003	18.000
Low Risk	1	3,6	27	96,4	28		

Based on the table 5 above, it shows that of the 25 respondents who are at high risk age, there are 10 respondents (40.0%) with low birth weight and there are 15 respondents (60.0%) without low

From the table 3 above, it shows that of the 53 respondents, there are 23 respondents (43.4%) with high risk parity and 30 respondents (56.6%) are with low risk parity.

**Table 3.**  
**Respondents' Frequency Distribution and Percentage by Parity at PONED Karya Mukti Public Health Center in 2020**

Parity	Frequency (N)	Percentage %
High Risk	23	43,4
Low Risk	30	56,6

From the table 4 above, it shows that of the 53 respondents, there are 20 respondents (37.7%) with chronic energy deficiency (CED) and there are 30 respondents (62.3%) with normal nutritional status.

**Table 4.**  
**Respondents' Frequency Distribution and Percentage by Nutritional Status at PONED Karya Mukti Public Health Center in 2020**

Nutritional Status	Frequency (N)	Percentage %
CED	20	37,7
Normal	33	62,3

birth weight. Meanwhile, out of 28 respondents who are at low risk age, there is 1 respondent (3.6%) with low birth weight and there are 27 respondents (96.4%) without low birth weight.

**Table 6.**  
**Cross Tabulation between Parity and Low Birth Weight at PONED Karya Mukti Public Health Center in 2020**

Parity	Low Birth Weight				Total	Sig	OR
	Yes	%	No	%			
High Risk	9	39,1	14	60,9	23	0.006	9.00
Low Risk	2	6,7	28	93,3	30		

Based on the table 6 above, it shows that of the 23 respondents with high risk parity, there are 9 respondents (39.1%) with low birth weight and there are 14 respondents (60.9%) without low birth weight.

Meanwhile, of the 30 respondents with low risk parity, there are 2 respondents (6.7%) with low birth weight and 28 respondents (93.3%) are without low birth weight.

**Table 7.**  
**Cross Tabulation between Nutritional Status and Low Birth Weight at PONED Karya Mukti Public Health Center in 2020**

Maternal Age	Low Birth Weight				Total	Sig	OR
	Yes	%	No	%			
CED	9	45	11	55	20	0.001	12,682
Normal	2	6,1	31	93,9	33		

Based on the table 7 above, it shows that of the 20 respondents whose nutritional status is CED, there are 9 respondents (45.0%) with low birth weight and 11 respondents (55.0%) are without low birth weight. Meanwhile, of the 33 respondents whose nutritional status is normal there are 2 respondents (6.1%) with low birth weight and 31 respondents (93.9%) are without low birth weight.

Based on the results of the chi-square statistical test, the p-value of 0.003 ( $\leq 0.05$ ) was obtained, meaning that there was a significant relationship between the frequency of age and the incidence of low birth weight at PONED Karya Mukti Public Health Center in 2020.

## DISCUSSION

Age is the length of time an individual experiences life from birth to the present (Chaniago, 2012). According to Departemen Kesehatan RI (2012), high-risk pregnancies can occur in situations of too young, too old, too many, and too close-groups. The high risk age group is less than 20 years and more than 35 years and the low risk or mild risk age group is 20 to 35 years.

Pregnancy at the age of less than 20 years, the pelvis and uterus are still small and the reproductive organs are immature. At the age of over 35 years, the maturity of the reproductive organs decrease compared to the age of 20-35 years. This can lead to health problems at the time of delivery and the risk of congenital defects of the fetus and low birth weight (Manuaba, 2009).

This study is in line with a study conducted by Rizka Firdausi (2017) showing that 40 (55.6%) mothers with pregnancies in their teens gave birth

to babies with low birth weights and 116 (46.8%) were born to mothers with pregnancies not in their teens. Meanwhile, 32 (44.4%) mothers with pregnancies in their teens gave birth to babies with normal birth weights and 124 (53.2%) were born to mothers with pregnancies not in their teens.

The results of chi-square was obtained p-value = 0.047 ( $< 0.05$ ) and 95% confidence level, it could be concluded that pregnancy in adolescence was significantly associated with the incidence of low birth weight (LBW) in Panembahan Senopati Hospital. The OR value obtained was 1.8 meaning that mothers who were pregnant in their teens with age less than 20 years had a 1.8 times risk of giving birth to a baby with low birth weight compared to giving birth to a normal birth weight baby (Rizka Firdausi, 2017).

It is in line with a study conducted by Faradila Monita (2014) showing that out of 36 mothers at risky age, 25 (69.4%) of them gave birth to LBW babies and the results of statistical tests showed that the p-value obtained was 0.001 ( $p < 0.05$ ) meaning that there was a significant relationship between pregnant women at risky age with the incidence of low birth weight. The age of the mother during pregnancy affects the condition of the mother's pregnancy because it is related to the maturity of the reproductive organs and psychological conditions. In terms of age for high-risk pregnancy ( $< 20$  and 35 years) there were 36 mothers (40%) and 25 of them (69.4%) gave birth to babies with low birth weight. Statistical test results were obtained p value = 0.001 and RP = 4.947, CI = 1.98 - 12.32, meaning that there was a significant relationship between the age of the mother at risk and the incidence of low birth weight.

Based on the results of the chi-square statistical test, it was obtained the p-value of 0.006 ( $\leq 0.05$ ), meaning that there was a significant relationship between parity frequency and the incidence of low birth weight at PONEK Karya Mukti Public Health Center in 2020.

This study is in line with the results of a study conducted by Minda Septiani (2017) focusing on the relationship between parity and the incidence of low birth weight showing that of the 23 respondents with high risk parity ( $\geq 4$  people), 16 people (26.7%) had low birth weight and of 37 respondents with low risk parity ( $< 4$  people), 14 people (23.3%) had low birth weight. Based on the results of the Chi-Square statistical test analysis, the p-value was  $0.034 < 0.05$  meaning that  $H_0$  was rejected and  $H_a$  was accepted and it could be concluded that there was a significant relationship between parity and the incidence of low birth weight.

Parity is the number of deliveries experienced by pregnant women before the present delivery or pregnancy. Low birth weight increases in line with the increase in maternal parity. Mothers who are at risk of giving birth to low birth weight are mothers who are pregnant for the first time and the parity that is more than four (Merzalia, 2016). A study showed a significant relationship between parity and the incidence of low birth weight. Mothers with high risk parity have a 2.2 times greater chance of delivering babies with low birth weight compared to mothers with low risk parity (Indrasari, 2012).

Based on the Odds Ratio (OR) analysis, the Lower Limit-Upper Limit (LL-UL) value was 3.755 (95% CI = (1,239-11,385), indicating that respondents with high risk parity had a 3 times risk of giving birth to a baby with low birth weight.

It is in line with a study carried out by Wahyu Ernawati (2017) showing that of the 94 respondents, there were 19 (65.5%) respondents with parity at risk of 1 or  $>3$  who gave birth to low birth weight babies, 10 (34.5%) respondents with parity at risk of giving birth to LBW babies, 24 (36.9%) respondents with no risk 2-3 parity giving birth to low birth weight babies, and 41 (63.1%) respondents with parity which is not at risk giving birth to low birth weight babies. The results of the bivariate test showed the p-value of 0.01, meaning that there was a significant relationship between parity and the incidence of low birth weight.

Based on the results of the chi-square statistical test in this present study, p-value obtained was 0.001 ( $\leq 0.05$ ) meaning that there was a significant relationship between the frequency of nutritional status and the incidence of low birth

weight at PONEK Karya Mukti Helath Center in 2020.

A person's nutritional status is the result of a balance between the consumption of food substances and the needs for food. Malnutrition in pregnant women reduces blood volume the size of the placenta and the transfer of nutrients through the placenta, so that the fetus grows slowly or experiences growth disorder (IUGR). Pregnant women with malnutrition tend to give birth to low birth weight babies.

One of the nutritional status assessments used is clinical examination, namely by checking Hb (Hemoglobin) levels. Hemoglobin is a colored compound in red blood cells that functions to transport oxygen and carbon dioxide. If the level of Hb in the blood decreases, it means that the ability of the blood to bind and carry oxygen will decrease, as well as the nutrients carried by red blood cells will decrease. This situation causes the fetus to lack nutrients and oxygen so that it experiences growth disorders. The Hb level that is considered normal for pregnant women is 11gr% (Indrasari, 2012; Arisman, 2009; Supriasa 2001).

This present study is in line with the results of a study conducted by Resti Lidiawati (2014) showing that the nutritional status of the mother, maternal gestational age and premature rupture of membranes had a significant relationship with the incidence of low birth weight. Those results also showed that out of 48 low birth weight babies, 7 (3.9%) low birth weight babies were born to mothers with good maternal nutritional status and 41 low birth weight babies (80.4%) were born to mothers with poor nutritional status. Then, out of 182 babies without low birth weight, 172 (96.1) babies were born to mothers with good nutritional status and 10 (19.6) babies were born to mothers with poor nutritional status. The results of the chi square statistical test showed p-value of 0.000, meaning  $p < 0.05$ , so it could be concluded that there was a significant relationship between maternal nutritional status and the incidence of low birth weight babies. Statistical results obtained OR value of 0.010, and it could be concluded that the nutritional status of the mother had a 0.1 times chance of the incidence of low birth weight.

The present study is also in line with a study carried out by Destya Farhiana (2019) showing that the incidence of low birth weight was more common in mothers with a history of CED by 73.2% and only 23.2% of mothers with CED who did not give birth to low birth weight babies. The results of bivariate analysis using the chi-square test obtained p-value  $< 0.001$  ( $\alpha = 0.05$ , OR: 9.041, 95% CI = 3.837-

21.304) meaning that there was a significant relationship between CED in pregnant women and the incidence of low birth weight at the Tenganan District Public Health Center Semarang in 2018.

In the present study, the results of the analysis showed that there was a relationship between pregnant women with CED and the incidence of low birth weight. It is indicated by p-value obtained=0.001 and OR value=9.041. This indicates that a pregnant woman with mid upper arm circumference (MUAC) < 23.5 cm (CED) has a 9.041 times greater risk of giving birth to babies with low birth weight compared to pregnant women with mid upper arm circumference (MUAC)=23.5cm (not CED). Pregnant women with CED are at risk for giving birth to babies with low birth weight because the mother before pregnancy has experienced nutritional deficiencies and after pregnancy the mother not only provides nutrition for herself but also for the fetus. It causes the nutrition consumed by the mother during pregnancy cannot be sufficient for the fetus due to nutrition that enters the mother's body will be divided for herself and also for the fetus which causes the growth and development of the fetus to be hampered so that it is born with low birth weight.

#### CONCLUSION

Based on the results of the study at PONEK Karya Mukti Public Health Center in 2020, it could be concluded that there was a significant relationship between age, parity and nutritional status with the incidence of low birth weight. It was indicated by the results of Chi-Square test on the age variable showing the p-value of 0.003 (< = 0.05), on the parity variable showing the p-value of 0.006 (< = 0.05) and on the nutritional status variable showing the p-value of 0.001 (< = 0.05).

#### SUGGESTION

It is recommended that Karya Mukti Public Health Center should be more active in providing counseling to midwives related to low birth weight.

Then, this study can be used as a reference in an effort to improve health services, especially in handling the incidence of low birth weight at PONEK Karya Mukti Public Health Center.

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