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# The effect of age, parity and pregnancy distance on <sup>3</sup>Low Birth Weight baby in the working area of Puskesmas Pangkah

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**Abstract.** The Infant Mortality Rate (IMR) is one of the health indicators included in Sustainable Development Goals (SDGs) targets for the period 2015-2030. LBW baby is a condition where babies are born weighing less than 2500 grams. It contributes 60% -80% to neonatal mortality. In Tegal regency, from January to September 2021, the number of live births was 26,916, with 1,252 LBW cases (4.7%) and the highest case was in Pangkah Subdistrict with 69 cases. The research was quantitative with the correlational method using a retrospective approach taking secondary data from medical records. The sample was total sampling, the entire population of LBW babies as many as 69 cases born in January-September 2021 at Puskesmas Pangkah, Tegal Regency. The independent variables included maternal age, parity and gestational spacing and the dependent factor was LBW baby. The statistical test used multiple logistic regressions. The results showed that there was an effect of age variable (0.046), parity (0.036), and gestational distance (0.005) on LBW baby. Therefore, factors taken by the mother can influence the incidence of LBW.

## <sup>1</sup>1. Introduction

Low birth weight (LBW) baby is one of the most important determinants of perinatal survival, infant morbidity and mortality, and the risk of developmental disorders and diseases in future life [1].

LBW has a serious impact on the growth and development in newborns. They had higher risk facing a cognitive disorder as mental retardation. Moreover, their lungs are not fully developed which has at risk of asphyxia. The immune system is not good enough than normal weight baby; it is easier to get pain and even death [2].

According to WHO (2018), the prevalence of the incidence of LBW in the world was 20 millions (15.5%) each year and developing countries are the highest contributor about 96.5% [3]. Indonesia is a country with the high prevalence of LBW. This is evidenced that Indonesia is at the 9th in the world in terms of LBW incidence, more than 15.5% of infants each year [4]. In Central Java 2021, the incidence of LBW is still relatively high, 46.4% of neonatal mortality caused by LBW baby [5].

One of the supporting factors causing the occurrence <sup>12</sup>of LBW is the age of the mother to-be including at the high risk. A woman's best reproductive age is between 20-35 years; under and over the age, it can increase the risk in pregnancy and childbirth. The research result conducted by Cahyani at RSUD Dr. Soediran, Surakarta (2015) showed that majority of maternal age who gave birth LBW baby was <20 and >35 years. While the maternal age between 20 – 35 years had lower case of LBW [6]. This is in line with the study about factors on LBW undertaken in Iran (2015), those were low parity, maternal age and a history of preterm delivery. The study resulted that efforts or strategies in

preventing LBW babies could be performed by avoiding preterm delivery, optimizing pregnancy in the health reproductive age, and improve the high quality of health care services [7].

The number of live births in Tegal regency 2021 from January – September was 26,916 with 1,252 LBW cases (4.7 %). The highest number as many as 69 cases is in Pangkah sub-district [8].

## 2. Methods

The study was a qualitative correlational research with retrospective approach. The population was all LBW babies who gave birth in January – September 2021 at Puskesmas Pangkah Tegal regency as many as 69 cases taken by total sampling technique. In this study, independent variables were age, parity, and pregnancy distance. While LBW baby. The secondary data was taken from patients' medical record of mothers who gave birth at Puskesmas Pangkah. The quantitative analysis used crosstab from all variables to determine the effect in each independent and dependent variable [9]. The data were analyzed by SPSS version 16 with multiple logistic regression analysis.

## 3. Results and Discussion

### 3.1. Result

Table 1. A Frequency Distribution of Age of Mother Having LBW Newborns at Puskesmas Pangkah, Tegal Regency

No	Variable	Frequency	%
1	<20 years	21 people	30 %
2	20-35 years	48 people	70 %
TOTAL		69 people	100%

Based on the table above, most of the respondents are mothers of reproductive age (20-35 years); 48 people (70%) and 21 respondents (30%) aged <20 years.

Table 2. A Frequency Distribution of Mother Parity Having LBW Newborns at Puskesmas Pangkah, Tegal Regency

No	Variable	Frequency	%
1	Primipara and Multipara	51 people	74 %
2	Grand multipara	18 people	26 %
TOTAL		69 people	100%

Table 2 shows that 74% respondents are Primipara and multipara. 26% respondents include Grand multipara.

Table 3. A Frequency Distribution of Pregnancy Distance Having LBW Newborns at Puskesmas Pangkah, Tegal Regency

No	Variable	Frekuensi	%
1	≤ 2 years	29 people	42 %
2	3-9 years	40 people	58 %
TOTAL		69 people	100%

Table 3 describes that there are 58% respondents having pregnancy distance of 3-9 years and 42% respondents of <2 years.

Table 4 The Analysis of The Effect of Maternal and Fetal Risks on LBW

Variable	Category	p	OR	Note
Effect of age on LBW	Age	0.046		Having an effect
	1(<20 years)	0.314	0.286	
	2(20-35 years)	0.018	0.108	
Effect of parity on	Parity	0.036		Having an effect



LBW	1 (Primipara & Multipara)	0.598	7.167	
	2 (Grand Multipara)			
Effect of pregnancy distance on LBW	Pregnancy distance	0.972	0.883	Having an effect
	2 ( $\leq 2$ years)	0.005		
	3 (3-9 years)	0.929	0.900	
		0.003	0.026	

Table 4 indicates that maternal age has an effect on the incidence of LBW at Puskesmas Pangkah with p-value of 0.046; age under 20 years has no significant effect and having 0.2 times the risk of experiencing LBW baby. While, healthy reproductive age (20-35 years) is significantly influenced (0.018) with 0.1 times the risk of LBW. Therefore, mothers' reproductive age has lower risk of having LBW baby.

Generally, parity has an effect ( $p=0.036$ ). Yet, it cannot be identified which one parity having risk at LBW. Pregnancy distance is also significantly effected ( $p=0.005$ ) where the distance of  $\leq 2$  years has no effect with 0.9 times the risk of LBW. However, the pregnancy distance of 3-9 years has a significant effect ( $p=0.003$ ) with 0.0 times facing LBW. To sum up, the ideal pregnancy distance has lower risk having LBW baby.

### 3.2. Discussion

Maternal age with high parity, under 20 and over 35 years, can experience the incidence of LBW. Too young women had poor blood flow to the uterus so that it can interfere in the transport of nutrients from the mothers to the fetus [2]. It was accordance with the research in Ethiopia conveying that factors of sociodemographic, maternal age, income, education, and a history of consuming alcohol showed a statistical relationship on the weight newborns. Age and income had a positive relationship with neonatal weight. On the obstetric factor, multigravida mothers had better neonatal weight than primi gravida mothers. Maternal nutrients also influenced the birth weight of newborns [10].

Another factor was pregnancy distance. A good pregnancy distance is  $> 2$  to 5 years; if it is under 2 years, the mothers have high risk for preeclampsia and other complications during pregnancy and even having LBW baby. The research result from Colti S. at RSUD Semarang (2014) obtained that mothers with pregnancy distance of  $< 2$  years, as many as 18 respondents (78.2%), had LBW baby. Also, 5 mothers (21.7%) with pregnancy distance of  $\geq 2$  years had baby with LBW. On the other hand, mothers with pregnancy distance  $< 2$  years was more having LBW [11].

The age of woman is the most important thing in considering planning for pregnancy because the age determines prognosis delivery causing morbidity or complications both for the mothers and the fetus. A woman's reproductive age is between 20-30 years which is evidenced that there is an effect between age and the incidence of LBW. The blood circulation to the cervix and uterus for adolescent is not fully developed so that it can interrupt the process of transferring nutrients from the mothers to the fetus. The adolescent nutrients also play a role because they still need it shared with the fetus. The incidence of LBW increases with advanced maternal age by having the changes of blood vessels and the decrease of hormonal regulation of the reproductive system (endometrium). The more age of the pregnant women, the lower hormonal regulation of reproductive system that they get. One of the hormonal regulations is estrogen, a hormone secreted by the ovaries in response 2 hormones of the anterior pituitary gland. The decrease hormones is also followed by the reduce of the function of hormones. The Estrogen functions are to increase uterine blood flow, have proliferative endometrium, get the development of endometrium gland used to assist in distributing nutrients from the mothers to the fetus. Low estrogen levels and imperfect endometrial development causes the decrease of uterine blood flow and also influences the transferring nutrients to the fetus. Another hormone is progesterone functioned to keep a pregnancy going. The hormone is produced by the formed placenta; if it produces low levels, it will cause preterm delivery ( $< 37$  weeks) followed by LBW. Pregnant women aged  $> 35$  years will increase the risk of disease as hypertension which is one of the factors causing LBW baby [12].



<sup>11</sup> Parity is the number of children born to a woman. During childbirth, the uterus will face muscle strains. The more often the women were pregnant and gave birth, the closer the pregnancy distance the childbirth. It decreased the elasticity of uterus thus it had no contractions fully [13]. The number of baby born to a woman is the important thing in determining maternal and infant prognosis. Childbirth primipara tends to have the high risk of mothers and babies which can decrease the second and the third parity, rise again at the fourth parity and so on [14]. The result <sup>2</sup> showed that there was an effect between parity and the incidence of LBW. The incidence happened to mothers with parity >4 because of the existence of scar tissue by the previous pregnancy and delivery. The scar tissue causes insufficient blood flow to the placenta so that a partial placenta occurs, thinner, fullfills the broader uterus. Besides, the result of the attachment abnormalities placenta is inhibiting the nutreints from the mothers to the fetus. The incidence of LBW on mothers with the first parity was caused by the lack of experience and <sup>4</sup> knowledge of pregnant women in dealing with the pregnancy [15].

In female reproductive cycle, the minimum pregnancy distance to keep the the organ and reproductive system going is 24 months, while the ideal pregnancy distance is between 2-9 years. The statistical test stated that there was an effect between pregnancy distance and LBW. The women pregnant having too close distance from the previous pregnancy can provide worse prognosis in the health of mother and baby. It was due to the imperfect form or function of reproductive system yet [16]. The pregnant mothers with parity >2 years have 14.083 times greater in having LBW. This was in line with the study by Colti Sistiari at RSUD Banyumas (2018) stating that <sup>6</sup> there was a relationship between pregnancy distance and the incidence of LBW with p-value of 0.004. Also, the reserach conveyed that pregnancy distance <2 years had 52.111 times greater chance than the mothers with pregnancy distance  $\geq 2$  years. The nearest pregnancy distance can cause anemia because the mother's condition has not recovered yet and the fullfilment of nutrients is imbalance however the mother must fullfil the fetus nutrients. Pregnancy distance under 2 years influences on the next pregnancy because of the unprepared mothers womb. Psychologically, the mothers are not ready yet since the baby still needs more attention. The next pregnancy should be avalaible after having pregnancy distance more than 2 years [16].

Ministry of health has been carried out some ways to reduce MMR and IMR such as getting closer the midwife care to the community, providing additional authority to Puskesmas to manage Basic Emergency Obstetric and Newborn Care (PONED) [2].

To decrease MMR, midwife plays a strategic role. It is because of having a capacity to facilitate maternity services, provide maternal and child health education. The midwife can also crry out the early detection on referral case especially in rural ares. In collaboration with doctors, midwife plays a role to improve the use of contraception as a preventive action for woman in 4-too category; too young (<20 years), too old (>35 years), too frequent (<2 years), and too many (>2 children) [2].

#### 4. Conclusion <sup>4</sup>

Most of the <sup>4</sup> respondents in this study were mothers of reproductive age (20-35 years) as many as 70%. Majority of respondents was primipara and multipara (74%) and the rest included Grand multipara. Most of the respondents had pregnancy distance of 3-9 years <sup>2</sup> (58%). The result of multiple logistic regression analysis showed that there was an effect of age, parity and pregnancy distance on the incidence of LBW at Puskesmas Pangkah-Tegal regency.

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