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Analysis of Maternal Factors with the Incidence of LBW Infants at Situbondo Health Center: Study of Cohort Register Data in 2020

Analisa Faktor Ibu dengan Kejadian Bayi BBLR di Puskesmas Situbondo: Studi Data Register Kohort Tahun 2020

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ABSTRACT

Background: Infant mortality rate (IMR), especially in the perinatal period, is caused by the condition of low-birth-weight babies (LBW). The nutritional and health conditions of pregnant women play an important role in determining the nutritional status of infants starting during pregnancy. Maternal factors are one of the causes of LBW in infants.

Objectives: Analyzing maternal factors (parity, hemoglobin (Hb) level of the mother during pregnancy, age of the mother during pregnancy, nutritional status of the mother during pregnancy (chronic energy deficiency = KEK), and the distance between pregnancies that cause the incidence of LBW babies at the Situbondo Health Center in 2020.

Methods: The case-control method was used in this study by using cohort register data at the Situbondo Health Center. In March 2022, data were collected from 82 mothers including 41 mothers of LBW babies as a case group and 41 mothers of the control group who did not have LBW babies. Data were analyzed using chi-square test.

Results: The results proved that maternal hemoglobin level was associated with the incidence of LBW babies (p=0.026; OR=3.088; 95%; CI=1.240-7.692). However, the variables of parity, maternal age during pregnancy, maternal nutritional status (SEZ), and pregnancy distance were not associated with the incidence of LBW babies.

Conclusions: Low Hb levels in pregnant women have a higher risk of delivering LBW babies. It is recommended that pregnancy checks be carried out by pregnant women regularly at least 6 visits to health facilities and it is recommended to take blood supplement tablets regularly, eat healthy foods and do not believe in myths that are detrimental to the health of pregnant women.

INTRODUCTION

A condition of a baby at birth with a weight of <2,500 g is called a BBLR baby[1]. One of the indicators of child health is BBLR, where BBLR is an important factor for life, growth, and development in the future[2]. Every year, the number of Infant Mortality Rate (IMR) cases always increases. In this regard, Indonesia is still facing the problem of infant mortality, especially those that occur during the perinatal period caused by LBW[3].

Babies with LBW have a high risk of death and during childhood, there will be obstacles to their growth and development, when compared to those who do not experience LBW[4,5]. A well-prepared pregnancy with a prime nutritional and health status is essential for the nutritional condition of the baby, especially while still in the womb. If a pregnant woman is malnourished, it can cause abortion, infant death, anemia, genetic defects, miscarriage, stillbirth, and birth with low birth weight[6]. Babies who are born with low birth weight and still survive with inadequate nutritional intake due to family inability can have an impact on the child's growth disorders, namely stunting[7].

Factors that influence the birth of babies with LBW include, first, maternal and paternal factors such as area of residence, economic status, age, education, marital status, and the number of live/stillbirths. Second, neonatal factors, namely the gender identity of the baby. Third, health services factors such as visits for pregnancy check-ups or Antenatal Care (ANC), iron consumption, location of delivery[8]. LBW cases are also influenced by gestational age, chronic diseases, pregnancy spacing, and nutritional status[9]. Other causal factors mentioned by Hartiningrum and Fitriyah (2019) anemia affects the increase in the prevalence of LBW in Situbondo Regency[5].

The age of pregnant women is a factor that influences the occurrence of LBW. Age 20-35 years is considered a good reproductive age for women, if less than or more than the age of 20-35 years can affect the increased risk of pregnancy and the risk of childbirth[10]. Parity has a risk of 68.2% in giving birth to LBW. Poor

parity is a parity condition of 1 and >3. Pregnant women with maternal hemoglobin levels <11 g/dL are at risk of giving birth to babies with LBW. Anemia can cause obstacles in the transport of oxygen so that nutrition for the fetus is reduced[11].

The prevalence of LBW in East Java Province is 3.9%, whereas out of 38 regencies or cities, the prevalence of LBW in Situbondo Regency is in the second highest position with a percentage of 7.4%[12]. Infant mortality in Situbondo Regency in 2019 was caused by LBW and is still the highest cause with 62 cases of death or 45.6%[13]. Based on the results of data obtained during a preliminary study at the Situbondo Regency Health Office, the percentage of LBW cases at the Situbondo Health Center in 2020 was ranked second at 7.4% of 652 LBW cases in Situbondo Regency. Where previously in 2019 the percentage of LBW cases at the Situbondo Health Center was 7.2% of 673 LBW cases in Situbondo Regency. This study aims to analyze the variables of parity (1 and >3), maternal Hb levels (<11 g/dL), maternal age (<20 years and >35 years), maternal KEK status during pregnancy (<23.5 cm), pregnancy spacing (<2 years) associated with the incidence of LBW babies at the Situbondo Health Center in 2020.

METHODS

Quantitative research with a case-control design was conducted in March 2022 at the Situbondo Health Center which has a working area of 6 (six) villages, namely Patokan, Dawuhan, Olean, Talkandang, Kotakan, and Kalibagor. The subjects of the study were all members of the case population who met the exclusion and inclusion criteria. Out of 49 LBW babies born and recorded in the Situbondo Regency Cohort Register in 2020, 8 babies were not included in the inclusion criteria. The sample in the study was 82 mothers, 41 mothers who had babies with LBW as the case group, and 41 mothers of babies who were not LBW as the control group. The selected sample with inclusion criteria in the form of data on the cohort register is filled in, single pregnancy, live birth babies, and babies who do not experience congenital defects and abnormalities while the exclusion criteria include the incomplete cohort register of babies born and Gemelli (twins). The ratio of cases and controls is 1:1 with a total of 82 subjects born out of 664 babies born at the Situbondo Health Center. The variables of this study are parity, maternal Hb levels, maternal age during pregnancy, maternal KEK status, interpregnancy intervals, and LBW infant status. Secondary data validity was carried out by looking at the completeness of the cohort register of babies born. The secondary data came from monthly reports from village midwives to the health center through the holder of the KIA (Maternal and Child Health) program. The health center will validate data from the village midwife by tracking cases. Furthermore, the health center will submit a data report to the health office. The Chi-Square test was used to analyze the correlation between variables. Ethical feasibility research published by the Health Research Ethics Commission of the Faculty of Dentistry, University of Jember No. 1496/UN25.8/KEPK/DL/2002.

RESULTS AND DISCUSSIONS

Relationship between Maternal Factors (Parity, Maternal Hb Levels, Maternal Age, Maternal Nutritional Status (KEK), Pregnancy Spacing) and the Incidence of LBW Babies In 2020 at the Situbondo Health Center

Most pregnant women are at an age that is not at risk for giving birth to LBW babies, amounting to 31 people (75.6%). The parity condition of most pregnant women is non-risk parity, namely having 2-3 children, amounting to 29 (70.7%). Pregnancy spacing shows that the majority of subjects have non-risk pregnancy spacing (>2 years), amounting to 37 people (90.2%). Maternal nutritional status (KEK) shows that the majority of subjects have non-risk nutritional status, KEK, amounting to 24 people (58.5%). The Hb levels of pregnant women are mostly in the risk category (<11 g/dL), amounting to 23 people (56.1%). These results can be seen in more detail in Table 1.

Analysis between the variable of maternal Hb levels and LBW using the chi-square test showed a significant relationship with an OR value of 3,088 in the 95% confidence interval (1.240-7.692). Meanwhile, the variables of the number of children born (parity), maternal age, maternal KEK status during pregnancy, and pregnancy spacing were not significantly related to the incidence of LBW babies in 2020 at the Situbondo Health Center.

Table 1. Analysis of the relationship between maternal factors (parity, maternal hb levels, maternal age, kek status of pregnant women, interval between pregnancies) with the occurrence of LBW babies in 2020 at the Situbondo Health Center

Variables	BBLR (Case)		No LBW (Control)		p value	Odds ratio (CI 95%)
	n=41	%	n=41	%		
Mother's Age						
At risk (<20 years and >35 years)	10	24.4	5	12.2	0.253	2,323
No Risk (20-35 years)	31	75.6	36	87.8		(0.717-7529)
Parity						
At risk (1 and >3)	12	29.3	15	36.6	0.638	0.717
No Risk (2-3)	29	70.7	26	63.4		(0.283-1.810)
Pregnancy Spacing						
At risk (<2 years)	4	9.8	8	19.5	0.349	0.446
No Risk (≥2 years)	37	90.2	33	80.5		(0.123-1.618)
Maternal Nutritional Status (KEK)						
At risk (23.5 cm)	17	41.5	8	19.5	0.055	2,922

Variables	BBLR (Case)		No LBW (Control)		p value	Odds ratio (CI 95%)
	n=41	%	n=41	%		
No Risk (≥23.5 cm)	24	58.5	33	80.5		(1,084-7,873)
Mother's Hb Level						
At risk (<11 g/dl)	23	56.1	12	29.3	0.026*	3,088
No Risk (≥11 g/dl)	18	43.9	29	70.7		(1,240-7,692)

KEK = Chronic Energy Deficiency
Hb = Hemoglobin
BBLR = Low birth weight
CI 95% = Confident Interval 95%
*Statistical analysis results are significant/proven

The incidence of LBW babies is influenced by maternal age. Maternal age is a factor that reflects maturity and experience in decision-making to carry out certain actions or activities[14]. The results of the study in Table 1 show that pregnant women at the Situbondo Health Center from the 2020 Cohort register data, the majority of subjects have an age that is not at risk in the two groups. In line with the study by Sujianti (2018), most of the subjects were of a non-risk age, namely in the case group 60 (67.4%) subjects and in the control group 99 (71.1%) subjects[15].

When comparing the case and control groups of pregnant women with risky ages (<20 years and >35 years), the results showed that pregnant women in the case group gave birth to more LBW babies. Rahfiludin et al., (2017)[16] explains pregnant women aged <20 years and >35 years are associated with the occurrence of LBW babies. Pregnant women aged less than 20 years have a high risk of giving birth to LBW babies because the mother's reproductive organs are not fully mature and ready for the pregnancy process, resulting in affecting the blood flow supply to the cervix and uterus. Mothers aged >35 years, the aging factor causes the embryo produced in women aged over 35 years to sometimes have obstacles when attached to the endometrium, this can increase the risk of abortion or miscarriage, low birth weight, babies born prematurely, babies with defects and abnormalities in chromosomes, and disorders in the mother's health[17].

LBW babies in 2020 at the Situbondo Health Center were born to pregnant women in the non-risk age group (20-35 years). In addition to the mother's age during pregnancy, other factors cause this to happen, namely medical history, placenta, environmental factors, fetal factors, and socio-cultural factors. In addition, the results of this study also stated that the majority of pregnant women with non-risk ages also gave birth to babies who did not experience LBW. This is because the age of 20-35 years is a mature condition in terms of reproductive age and is physically and psychologically healthy so that the occurrence of LBW and premature babies can be prevented[18].

Maternal age was not significantly associated with the occurrence of LBW babies in 2020 at the Situbondo Health Center. The results of this study are in line with the research by Sujianti (2018), which explains that age is not related to the occurrence of LBW babies. An OR value of 1.272 was obtained, meaning that there is a 1.27 times chance for pregnant women with an age that is not at risk of giving birth to an LBW baby when compared to pregnant women with an age that is at

risk[15]. In line with the research by Kusumawati and Septiyaningsih (2020), the incidence of LBW at Cilacap Regional Hospital in 2014 was not related to maternal age[19]. However, this study contradicts the research from Rahfiludin et al., (2017) which explains the incidence of LBW is related to maternal age <20 years and >35 years[17]. This study shows results that contradict the theory that states there is a relationship between maternal age and the incidence of LBW babies. This is because other causal factors influence the incidence of LBW. It is known that there are several other causal factors for the incidence of LBW babies besides maternal factors, namely the placenta, environment, and the condition of the fetus. All of these factors are interrelated and cannot be separated into the causes of babies being born with LBW[14].

The number of children ever born by a mother, either alive or dead, is the definition of Parity[20]. Pregnant women with parity 2-3 are in a safe parity condition, while parity that is at risk of experiencing LBW babies is mothers who have parity 1 and >3[21]. Table 1 shows the results of the majority of pregnant women at the Situbondo Health Center having a parity status that is not at risk in both sample groups. This is in line with the research from Kusumawati and Septiyaningsih (2020) that the majority of subjects with parity were not at risk in the case group, namely 22 (48.9%) subjects, while the same thing happened in the control group, namely 36 (80%) subjects[19]. The Chi-Square test showed that parity was not related to the occurrence of LBW babies in 2020 at the Situbondo Health Center. The results of this research are in line with Apriani et al., (2021) with a p-value of 0.23 >0.05, indicating that parity is not related to the occurrence of LBW[22]. The condition of mothers with parity status 1 is considered to have low knowledge and experience about pregnancy, so it affects the mother's readiness in terms of mental and physical in facing pregnancy, such as affecting the examination of the fetus' health in the womb and the unpreparedness of the condition of organ function during pregnancy. While for the condition of mothers who have parity >3, many are found with anemia and body conditions often have looseness in the uterine wall which causes tears, this condition causes pregnant women to give birth to LBW babies[17]. From the results of this study, the potential for LBW babies occurs in pregnant women with risky parity and also pregnant women with non-risky parity. This happens because mothers with parity 2-3 times still experience complex psychological and physical adjustments, and lack of information related to childbirth that has the potential to affect the risk of complications and abnormalities such as LBW, dystocia (difficulty in the

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delivery process) which is unavoidable[19,23]. In addition, the condition of mothers with parity >3 are considered to have more experience in caring for babies, the mother's readiness to face pregnancy both mentally and physically, and not all pregnant women with high parity have risk factors[22]. Therefore, the possibility of LBW babies does not only apply to pregnant women with a history of high parity but also to pregnant women with a history of parity that is not at risk. Several other factors that also affect parity include type of work, level of education, socio-culture, economic conditions, and knowledge of the mother[14].

Pregnancy Spacing

Following the appeal of the BKKBN (National Family Planning Health Agency), a good and safe pregnancy interval is 2 years or more, because a short pregnancy interval can result in the mother not fully recovering from the previous birth[24,25]. Based on Table 1, most pregnant women at the Situbondo Health Center, Situbondo Regency from the 2020 Cohort Register Data in both sample groups have a non-risk pregnancy interval. This is in line with the research by Putri and Rifdi (2022) which explains that the majority of mothers in both sample groups have a non-risk pregnancy interval. Thus, the results are clear that the mother's pregnancy interval is not the only risk factor for LBW, because LBW can be caused by other factors such as pregnancy problems, fetal conditions, or maternal factors that can also be influenced by indirect factors that can prevent or influence the occurrence of giving birth to LBW babies[24].

The results of statistical tests show that the incidence of LBW in 2020 at the Situbondo Health Center was not significantly related to the spacing of pregnancies. This is in line with the research by Putri and Rifdi (2022) with a p-value of 1.00 > 0.05 explains that the pregnancy interval is not related to the occurrence of LBW[24]. The results of the study at the Situbondo Health Center are not in line with the theory put forward by Monita et al., (2016) which states that pregnant women with a pregnancy interval of less than 2 years are at risk of giving birth to LBW babies. Long labor, suboptimal fetal growth, and potential for bleeding during labor because the mother's uterus has not recovered properly are some of the risks when pregnancy occurs with a pregnancy interval of <2 years. Thus, a good and safe pregnancy interval for pregnant women is less than 2 years, this is because the body's condition and reproductive organs can rest in repairing organs to face the next pregnancy period[26,1].

In Situbondo Health Center, there is a routine ANC pregnancy check-up service. In line with the research by Putri and Rifdi (2022) stated that the distance between pregnancies is not necessarily a risk factor for LBW babies, because there are still other causes that are problems during the mother's pregnancy, from the mother's factors to the fetus that can affect the occurrence of giving birth to LBW babies[24]. There are ANC pregnancy check-up services for pregnant women carried out by the Health Center. This aims to improve the mental readiness and physical health of pregnant women to be optimal, so that mothers can face the postpartum period, childbirth, exclusive breastfeeding, and the mother's health can return to production well, and the mother and baby are born safely. As well as there is also nutritional monitoring and classes for pregnant women, as well as the provision of vitamins. So that pregnant women with a risky distance between pregnancies at the Health Center by getting ANC service treatment can be reduced so that prevention of mothers giving birth to LBW can be overcome[24].

Maternal Nutritional Status (KEK)

Pregnant women with KEK (Chronic Energy Deficiency (KEK) are a condition of pregnant women whose nutritional needs are not met, caused by an imbalance in nutritional intake between protein and energy, pregnant women with KEK during the perinatal period have a risk of sudden death or a risk of giving birth to a LBW baby[27]. The results of the study are in Table 1 the majority of pregnant women at the Situbondo Health Center, Situbondo Regency from the 2020 Cohort Register Data, namely in both sample groups, mothers have a nutritional status (KEK) that is not at risk. This is in line with the research by Suindri and Mauliku (2021) explained that of the 30 subjects in the case group, the majority did not experience KEK, as many as 18 (41.9%) subjects, and of the 30 subjects in the control group, the majority did not experience KEK, as many as 25 (58.1%) subjects[28]. This is also in line with the research Herwati et al., (2021) that not only pregnant women with KEK nutritional status can give birth to LBW babies but also found a figure of 24% of LBW babies born to mothers with normal nutritional status because several factors affect mothers with normal nutritional status in giving birth to LBW babies[29]. KEK conditions are often associated with the economic status of the family. If the economic status is low, it often causes food purchasing power to decrease to meet the required intake, it greatly affects both the quantity and quality of the food to be consumed. If this continues, it will affect the nutritional status of the mother which will get worse. It is also important to know that nutritional status is more influenced by several other factors such as hereditary, environmental, and physical activity[30].

Maternal nutritional status (KEK) was not significantly related to the incidence of LBW babies in 2020 at the Situbondo Health Center. This is in line with the results of statistical tests with a p-value of 0.127 > 0.05 in the research by Rahfiludin et al., (2017) which indicates that maternal nutritional status (KEK) is not related to the occurrence of LBW babies16. In line with the research Khulafa'ur R et al., (2019) shows that there is no relationship between nutritional status and the occurrence of LBW babies, because not all mothers with poor nutritional status will experience the birth of LBW babies, likewise not all mothers with good, sufficient, excessive, or even obese nutritional status will give birth to babies with normal birth weight[31].

Pregnant women with KEK are a condition of pregnant women who lack nutritional intake, namely protein and energy for a long time, so the nutritional intake of pregnant women is not sufficient and does not match their needs. This has an impact on changes in the body of pregnant women, both mentally and physically, which are not perfect as they should be[32]. The results of

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research at the Situbondo Health Center showed that most pregnant women have a nutritional status (KEK) that is not at risk. Other factors such as genetics, environment, and physical activity affect the nutritional status of pregnant women at the Situbondo Health Center. In addition to these factors, economic status is often associated with the nutritional status of pregnant women[33]. KEK is influenced by direct and indirect factors. Direct factors such as consumption patterns and infectious diseases, while factors that play an indirect role include food availability in the family, education level, family income, and knowledge[34,35].

Mother's Hb Level

The condition of maternal Hb levels of less than 11 g during the first and third trimesters, and in the second trimester less than 10 g is an indication of anemia in pregnant women[36]. The results of Table 1 show that at the research site, the majority of pregnant women at the Situbondo Health Center, Situbondo Regency from the 2020 Cohort Register Data, namely the majority of subjects in the group of mothers with LBW babies had risky hemoglobin levels during pregnancy, while in the group of mothers with non-LBW babies had non-risky Hb levels. This is in line with research by Putri and Rifdi (2022) which states that of the 29 subjects in the case group, most of them experienced anemia (51.7%). While in the control group, of the 29 subjects, 79.3% did not experience anemia. Low Hb levels in pregnant women are likely due to the low number of ANC visits which are a means of distributing Fe Tablets and also followed by low compliance in taking Fe tablets. Both of these things have an impact on low Hb levels and are risk factors for LBW babies. Iron has a very important role in the nervous system, namely the process of metabolism, neurotransmitters, myelination, and nerve dendritogenesis. A body that experiences iron deficiency will affect the behavior, cognitive function, and growth and development of a baby. The risk of perinatal and infant mortality will increase in iron deficiency conditions during pregnancy[37].

The results of the Chi-Square analysis showed that maternal hemoglobin levels were significantly related to the incidence of LBW babies in 2020 at the Situbondo Health Center. An OR value of 3.088 was also obtained in the 95% Confident Interval (1.240-7.692), meaning that pregnant women with a risky hemoglobin level category have a 3 times greater risk of giving birth to LBW babies than pregnant women with a non-risk Hb level category. This is in line with the results of the Chi-Square test with a p-value of 0.029 <0.05 in the study by Putri and Rifdi (2022) which explains that maternal hemoglobin levels are related to the occurrence of LBW babies, an OR value of 4.107 was also obtained in the 95% confidence interval (1.292-13.057), meaning that pregnant women with a risky hemoglobin level category have a risk of 4.1 times greater when compared to pregnant women who have a non-risk hemoglobin level[24].

Hemoglobin (Hb) levels below 11 g/dL are an indicator of anemia in pregnancy. Pregnant women during pregnancy experience blood thinning due to increased blood supply to the fetus. If a pregnant woman experiences anemia, there will be a disruption of the oxygenation process and nutrient flow to the fetus, causing fetal weight gain to be hampered and at risk of LBW babies[38]. In line with the research by Agustin and Africa (2022) stated that anemia is related to the occurrence of LBW babies in the Muara Bunai Health Center work area (p-value = 0.007 < 0.05). Pregnant women with Hb levels <11 g/dL experience obstacles in the blood supply from the mother to the fetus, so that the distribution of nutrients to the fetus inhibits its growth and development[39].

Based on the results of the study at the Situbondo Health Center, it is known that the Health Center has provided Fe tablets following the provisions for pregnant women to be taken. The provision of Fe tablets has been carried out by the Health Center optimally through Antenatal Care (ANC) Services. However, the lack of active participation of mothers in ANC services affects the coverage rate of Fe tablets. Khatimah et al., (2022) stated that compliance in taking Fe tablets is related to the Hb levels of pregnant women[40]. However, in the Situbondo Health Center, there was a refusal to take Fe tablets for various reasons, even though compliance with consuming Fe tablets for pregnant women is an important factor in increasing Hemoglobin levels and preventing anemia. Factors that influence the level of compliance of pregnant women in consuming Fe tablets regularly include health worker services, husband's support, low frequency of ANC visits, motivation, knowledge, education level, and side effects of Fe tablets. This causes a decrease in the compliance of pregnant women to routinely consume Fe tablets every day, so the purpose of providing Fe tablets is not fully achieved[40].

Based on research at the Situbondo Health Center, pregnant women's participation in ANC is still not optimal and regular. Most pregnant women at the Situbondo Health Center only come to ANC in the second and third trimesters. In line with the research Nurmasari and Sumarmi (2019) explains that if the irregularity of pregnant women in carrying out ANC services is because pregnancy checks only occur in the second and third trimesters, this study also found that pregnant women who routinely make ANC visits are at lower risk of experiencing anemia compared to pregnant women who are inconsistent in following ANC services. Pregnant women who do not routinely carry out ANC services are 4 times more at risk of suffering from anemia[41]. Yunita et al., (2018)[42] explained that ANC visits influenced the level of compliance in consuming Fe tablets in pregnant women in the Tirtajaya Health Center Work Area, Bajuin District in 2017. ANC visits in pregnant women aim to conduct early detection of the risk of anemia by measuring hemoglobin levels in the first and third trimesters. From the results of the study at the Situbondo Health Center, pregnant women should participate more in ANC visits and comply with consuming Fe tablets according to the rules. Pregnancy checks should be carried out by pregnant women at least 6 times and consume Fe tablets regularly and according to the rules of health workers to minimize anemia during pregnancy which can have adverse effects on both the fetus and the mother[43].

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The incidence of anemia in pregnant women in 2020 at the Situbondo Health Center was also influenced by the habits of consuming food or eating patterns of pregnant women, not liking types of vegetables and seafish, and the existence of myths or taboos for pregnant women who are not allowed to consume several types of animals such as squid and shrimp. In research conducted by Yusran and Pratiwi (2022) explains the pattern of food consumption related to the occurrence of anemia in pregnant women. Some factors that cause anemia in pregnant women are a low understanding of pregnant women regarding foods that are high in iron content, lack of knowledge about foods and drinks that are beneficial or should be avoided for consumption, morning sickness in pregnant women that often interferes with the nutritional intake of pregnant women at breakfast which can cause decreased appetite, limited food consumption or limited variety of types of food consumed, and lack of nutritional intake of pregnant women both in quantity and type so that it does not comply with the recommendations for balanced nutrition[44]. There are myths about pregnant women or taboo foods during pregnancy for pregnant women at the Situbondo Health Center. In line with research conducted by Ningtyias and Kurrohman (2020) that there are taboos for pregnant women in the Pedhalungan community, namely foods rich in protein (shrimp, eggs, chicken liver, and fish), the taboos for pregnant women are only symbolic without knowing the benefits of the prohibited foods[45].

CONCLUSIONS

A significant relationship was found between anemia in pregnant women and the incidence of LBW babies in 2020 at the Situbondo Health Center. There needs to be education regarding the importance of Fe Tablets so that they are consumed regularly during pregnancy with an effective consumption method, namely by drinking it before going to bed to reduce nausea and not consuming it with food or drinks containing tannin and caffeine such as tea or coffee. Meanwhile, in parity, maternal age, maternal nutritional status (KEK), and the distance between pregnancies, there was no significant relationship with the incidence of LBW babies in 2020 at the Situbondo Health Center. Further research is expected to analyze the relationship between maternal factors and the area of residence, economic status, and education level using primary data.

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CONFLICT OF INTEREST AND FUNDING DISCLOSURE

AUTHOR CONTRIBUTIONS

NW: methodology, investigation, writing–original draft; FWN: conceptualization, methodology, supervision, writing–review and editing; S: methodology; formal analysis, review and editing.

REFERENCES

1. WHO. *Global Nutrition Targets 2025: Low Birth Weight Policy Brief*. (World Health Organization, 2014).
2. Putri, A. W., Pratitis, A., Luthfiya, L., Wahyuni, S. & Tarmali, A. Faktor Ibu terhadap Kejadian Bayi Berat Lahir Rendah. *HIGEIA* **3**, 55–62 (2019).
3. Haryanti, S. Y., Pangestuti, D. R. & Kartini, A. Anemia dan KEK pada Ibu Hamil sebagai Faktor Risiko Kejadian Bayi Berat Lahir Rendah (BBLR) (Studi di Wilayah Kerja Puskesmas Juwana Kabupaten Pati). *Jurnal Kesehatan Masyarakat* **7**, 322–329 (2019).
4. Rajashree, K., Prashanth, H. & Revathy, R. Study on the factors associated with low birth weight among newborns delivered in a tertiary-care hospital, Shimoga, Karnataka. *Int J Med Sci Public Health* **4**, 1287 (2015).
5. Hartiningrum, I. & Fitriyah, N. Bayi Berat Lahir Rendah (BBLR) di Provinsi Jawa Timur Tahun 2012-2016. *JBK* **7**, 97–104 (2019).
6. Adriani, M. *Peran Gizi Dalam Siklus Kehidupan*. (Kencana Prenadamedia Group, 2016).
7. Simbolon, D. Berat Lahir dan Kelangsungan Hidup Neonatal di Indonesia. *Kesmas: National Public Health Journal* **7**, 8–15 (2012).
8. Sitoayu, L. & Rumana, N. A. Faktor Determinan Kejadian Berat Bayi Lahir Rendah (BBLR) Pada Remaja Di Asia Selatan Dan Asia Tenggara Tahun 2005 – 2014 (Analisis Dengan Metode Structural Equation Model). *Jurnal INOHIM* **5**, 9 (2017).
9. Nur, R., A. Arifuddin, dan R. Novilia. 2016. Analisis Faktor Risiko Kejadian Berat Badan Lahir Rendah di Rumah Sakit Umum Anutapura Palu. Jurnal Preventif.7(1):29–42.
10. Putri, A. W., A. Pratitis, L. Luthfiya, S. Wahyuni, dan A. Tarmali. 2019. Faktor ibu terhadap kejadian bayi berat lahir rendah. HIGEIA. 3(1):55–62.
11. Novianti, S. dan I. S. Aisyah. 2018. Hubungan Anemia Pada Ibu Hamil dan BBLR. Jurnal Siliwangi. 4(1):6–8.
12. Dinas Kesehatan Provinsi Jawa Timur. *Profil Kesehatan Provinsi Jawa Timur*. (Dinas Kesehatan Provinsi Jawa Timur, 2019).
13. Dinas Kesehatan Kabupaten Situbondo. *Profil Kesehatan Kab. Situbondo Tahun 2019*. (Dinas Kesehatan Kabupaten Situbondo, 2019).
14. Nappu, S., Akri, Y. J. & Suhartik. Hubungan Paritas dan Usia Ibu dengan Kejadian BBLR di RS Ben Mari

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Malang. *Jurnal Ilmiah Obstetri Gynekologi dan Ilmu Kesehatan* **7**, 32–42 (2019).

15. Sujianti. Hubungan Usia Ibu Dengan Kejadian Bayi Berat Lahir Rendah (BBLR) di RSUD Cilacap. *Jurnal Kesehatan Al-Irsyad* **11**, 62–67 (2018).

16. Rahfiludin, M. Z., Haryanto, C. P. & Pradigdo, S. F. Faktor – Faktor Yang Berhubungan Dengan Kejadian Berat Badan Lahir Rendah (BBLR) Di Kabupaten Kudus (Studi di Wilayah Kerja Puskesmas Undaan Kecamatan Undaan Kabupaten Kudus Tahun 2015). *Jurnal Kesehatan Masyarakat* **5**, 322–331 (2017).

17. Lestari, R. D., Ulfa, I. M. & Mariyam, S. Hubungan Umur, Paritas, Dan Preeklampsia Dengan Kejadian Berat Badan Lahir Rendah Di Rsud Dr. H. Moch. Ansari Saleh Banjarmasin. *Dinamika Kesehatan* **6**, 12 (2015).

18. Susanto, Y. & Darto, J. Hubungan Antara Anemia Dan Usia Ibu Terhadap Kejadian Bayi Berat Lahir Rendah Di RSUD Labuang Baji Makassar 2019. *JKDPelamonia* **3**, 124–129 (2020).

19. Kusumawati, D. D. & Septiyaningsih, R. Hubungan Paritas dengan Kejadian BBLR di RSUD Cilacap Tahun 2014. *Jurnal MID-Z* **3**, 7–9 (2020).

20. Hariyadi, D., Ichtiyati, F. & Marlenyati. Faktor-Faktor Yang Mempengaruhi Kejadian BBLR di RSUD Dr. Soedarso Pontianak. *Jurnal Vokasi Kesehatan* **1**, 154–160 (2015).

21. Evasari, E. & Nurmala, E. Hubungan Umur, Paritas dan Status Gizi Ibu dengan Kejadian BBLR. *Jurnal Obstretika Scientia* **4**, 453–471 (2017).

22. Apriani, E., Subandi, A. & Mubarok, A. K. Hubungan Usia Ibu Hamil, Paritas dan Usia Kehamilan dengan Kejadian BBLR di RSUD Cilacap. *Trends Of Nursing Science* **2**, 45–52 (2021).

23. Kurniati, E., Kolifah & Novita, M. Hubungan Paritas Dengan Berat Badan Lahir Rendah Di Wilayah Kerja Puskesmas Bareng Kabupaten Jombang Tahun 2012. *Jurnal Metabolisme* **2**, 1–5 (2013).

24. Putri, N. T. & Rifdi, F. Faktor Yang Berhubungan Dengan Kejadian Berat Badan Lahir Rendah. *VoM* **11**, 66–79 (2022).

25. Suparyanto. *Berat Bayi Lahir*. (EGC, 2012).

26. Monita, F., Suhaimi, D. & Ernalia, Y. Hubungan Usia, Jarak Kelahiran Dan Kadar Hemoglobin Ibu Hamil Dengan Kejadian Berat Bayi Lahir Rendah Di RSUD Arifin Achmad Provinsi Riau. *Jom FK* **3**, 1–17 (2016).

27. Kartini, K. Risiko Penyakit Infeksi terhadap Kejadian Kekurangan Energi Kronik (KEK) pada Ibu Hami di Puskesmas Mekar Kota Kendari. *HIJP* **9**, 10–14 (2017).

28. Suindri, N. N. & Mauliku, J. Hubungan Kurang Energi Kronik Pada Ibu Hamil Dengan Bayi Berat Lahir Rendah. *Infokes* **11**, 360–366 (2021).

29. Herwati, M., Prastika, D. A. & Martanti, L. E. Hubungan Antara Status Gizi Ibu Hamil Dengan Berat Badan Bayi Lahir. *Jurnal Sains Kebidanan* **3**, 67–73 (2021).

30. Nurani, N. N., Suindri, N. N. & Erawati, N. L. P. S. Hubungan LILA dan Umur Ibu Hamil dengan Kejadian Bayi Berat Badan Lahir Rendah di Wilayah Kerja Puskesmas Blahbatu I Tahun 2010 Sampai Dengan Tahun 2012. *Jurnal Ilmu Kebidanan* **3**, 19–29 (2016).

31. Khulafa'ur R, L., Amnah, R. & P, B. Hubungan Status Gizi Ibu Hamil Dengan Bayi Berat Badan Lahir Rendah (BBLR) Di Rsud Gambiran Kota Kediri. *j.kebidanan* **4**, 1–7 (2019).

32. Kemenkes RI. *Pegangan Fasilitator Kelas Ibu Hamil*. (Kementerian Kesehatan RI, 2019).

33. Nurani, N. N., Suindri, N. N. & Erawati, N. L. P. S. Hubungan LILA dan Umur Ibu Hamil dengan Kejadian Bayi Berat Badan Lahir Rendah di Wilayah Kerja Puskesmas Blahbatu I Tahun 2010 Sampai Dengan Tahun 2012. *Jurnal Ilmu Kebidanan* **3**, 19–29 (2016).

34. Solihah, I. A. & Nurhasanah, S. Hubungan Riwayat Kekurangan Energi Kronik (KEK) Selama Masa Kehamilan Dengan Kejadian BBLR Di Wilayah Kerja Puskesmas Cipendeuy Tahun 2018. *Jurnal Kesehatan Aeromedika* **5**, 89–94 (2019).

35. Kristianasari. *Gizi Ibu Hamil*. (Nuha Medika, 2010).

36. Agustin, A. D. & Afrika, E. Faktor-Faktor Yang Berhubungan Dengan Kejadian Berat Badan Lahir Rendah (Bblr) Di Wilayah Kerja Puskesmas Muara Burnai. *Jurnal Kesehatan Masyarakat* **6**, 1042–1049 (2022)

37. Fitriany, J. & Saputri, A. I. Anemia Defisiensi Besi. *AVERROUS* **4**, 1–14 (2018).

38. Novianti, S. & Aisyah, I. S. Hubungan Anemia Pada Ibu Hamil Dan BBLR. *Jurnal Siliwangi* **4**, 6–8 (2018).

39. Agustin, A. D. & Afrika, E. Faktor-Faktor Yang Berhubungan Dengan Kejadian Berat Badan Lahir Rendah (Bblr) Di Wilayah Kerja Puskesmas Muara Burnai. *Jurnal Kesehatan Masyarakat* **6**, 1042–1049 (2022).

40. Khatimah, H., Setiawati, D. & Haruna, N. Hubungan Faktor Risiko Kejadian Anemia pada Ibu Hamil Trimester Ketiga. *UMI Medical Journal* **7**, 10–19 (2022).

41. Nurmasari, V. & Sumarmi, S. Hubungan Keteraturan Kunjungan Antenatal Care dan Kepatuhan Konsumsi Tablet Fe dengan Kejadian

e-ISSN: 2580-1163 (Online)
p-ISSN: 2580-9776 (Print)
Widowati et al. | Amerta Nutrition Vol. 8 Issue 3 (September 2024). 368-375

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Anemia pada Ibu Hamil Trimester III di Kecamatan Maron Probolinggo. *Amerta Nutr* **3**, 46–51

42. Yunita, N., Supiyati, S. & Isdiana, E. Faktor-Faktor Yang Mempengaruhi Kepatuhan Ibu Hamil Mengkonsumsi Tablet Zat Besi (Fe) Di Wilayah Kerja Puskesmas Tirtajaya Kecamatan Bajuin Tahun 2018. *Jurkessia* **8**, 148–160 (2018).

43. Kemenkes RI. *Pedoman Pelayanan Antenatal, Persalinan, Nifas dan Bayi Baru Lahir di Era Adaptasi Kebiasaan Baru*. (Kementerian Kesehatan RI, 2020).

44. Yusran, S. & Pratiwi, P. R. Faktor-Faktor Yang Berhubungan Dengan Kejadian Anemia Pada Ibu Hamil di Wilayah Kerja Puskesmas Lepo-Lepo Kota Kendari Tahun 2022. *Gizi dan Kesehatan Indonesia* **3**, 1–6 (2022).

45. Ningtyias, F. W. & Kurrohman, T. Food taboos and recommended foods for pregnant women: the study of phenomenology in pendhalungan society. *IOP Conf. Ser.: Earth Environ. Sci.* **485**, 1–6 (2020).