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Factors Related to Low Birth Weight (LBW) Incidence at RSIA Masyita Makassar

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ABSTRACT

Low Birth Weight (LBW) is a newborn whose birth weight is <2500 grams. LBW can occur in premature and term babies who experience growth restriction during pregnancy. Data from RSIA Masyita, in 2020 there were 33 mothers giving birth. The aim of this research is to determine the factors associated with the incidence of low birth weight babies. This research uses analytical methods with a Cross Sectional Study approach to determine factors related to the incidence of LBW with a population of 412 people and a sample of 203 people using Simple Random Sampling. This research was carried out at RSIA Masyita Makassar from January to December 2021. In general, the results of the research obtained were that there was a relationship between age, parity, gestational spacing and gestational pregnancies on the incidence of LBW based on the results of statistical tests using Chi-Square to obtain a P value for the maternal age variable. = 0.000 < α = 0.050, there is a relationship between maternal age and the incidence of LBW. The parity variable has a value of P = 0.001 < α = 0.050, there is a relationship between parity and the incidence of LBW. The maternal pregnancy distance variable has a value of P = 0.000 < α = 0.050, there is a relationship between pregnancy distance and LBW. The gemeli pregnancy variable has a value of P = 0.000 < α = 0.050, there is no relationship between gemeli pregnancy and LBW. The conclusion is that four variables, namely maternal age, parity, pregnancy spacing, and pregnancies are related to the incidence of LBW at RSIA Masyita Makassar. Suggestions for future researchers related to LBW are to conduct research with different methods, variables and samples.

Keywords: Age, Parity, Distance of Pregnancy, Gemeli

1. INTRODUCTION

Low Birth Weight (LBW), or Berat Badan Lahir Rendah (BBLR), refers to the birth of a baby with a weight of less than 2,500 grams. This condition may occur due to the baby having a short gestational age (premature birth) or a weight that is not appropriate for the gestational age (Admin dan Reni, 2021). Risk factors for the occurrence of LBW in Indonesia include maternal age being less than 20 years or over 35 years, parity, the mother's condition during pregnancy (pregnancy complications and malnutrition), a history of LBW in the mother, closely spaced pregnancies, babies with congenital anomalies, twin pregnancies, malnutrition, anemia, preeclampsia or hypertension, and placental disorders that hinder Intra Uterine Growth Retardation (IUGR) (Prabhakara, 2019).

Efforts to prevent and control LBW can be undertaken through several measures. This includes providing sufficient health education to pregnant women about LBW. Additionally, it is possible to conduct supervision and monitoring, as well as taking steps to prevent hypothermia in infants and aiding in achieving normal growth. Other measures include providing cost-free therapy that can be administered by mothers, assessing the nutritional status of pregnant women, performing calculations and preparing steps for antenatal care, and monitoring the condition of infants from the womb that have experienced

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intrauterine growth retardation (Rahfiluddin et al., 2017).

According to the World Health Organization (WHO), in 2019, the global infant mortality rate was 7,000 newborns dying every day (Jayanti et al., 2020).

The Infant Mortality Rates (IMR) in various Southeast Asian Nations (ASEAN) countries in 2015 were as follows: Indonesia 22 per 1,000 live births, the Philippines 22 per 1,000 live births, Vietnam 17 per 1,000 live births, Thailand 11 per 1,000 live births, Brunei 1000009 H, Malaysia 6 per 1,000 live births, and Singapore 2 per 1,000 live births (Handayani, Fitriani dan Lestari, 2019).

According to the Indonesian Demographic and Health Survey (SDKI) in 2017, the infant mortality rate in Indonesia remains high, although it has decreased to 24 per 1,000 live births. Indonesia is ranked ninth globally, with a prevalence of 15.5% for Low Birth Weight (LBW) among newborns every year (Karimah dan Wicaksono, 2018).

According to the Health Profile of South Sulawesi Province, the number of live births in 2019 was 152,729 or 99.97%, and the number of Low Birth Weight (BBLR) infants was 7,059 or 4.62%. The highest number of cases were in Makassar City with 1,625 cases, followed by Bone Regency with 438 cases, Wajo with 386 cases, and Gowa Regency with 341 cases (Dinas Kesehatan Provinsi Sulawesi Selatan, 2015).

The data obtained from the Inpatient Patient Registry at the Dr. Tadjuddin Chalid Central General Hospital in Makassar is examined on an annual basis. The infant mortality rate due to Low Birth Weight (BBLR) increased significantly in 2018 by 3.9%, in 2019 by 11.4%, and in 2020 by 41.6% (Layuk, 2021).

The prevalence of Low Birth Weight (BBLR) worldwide is estimated at 15%, with a range of 3.3% to 38%. It more frequently occurs in developing countries or those with low socio-economic status. The proportion of BBLR by Health Center Region in Palembang City in 2017 was highest in the 7 Ulu Health Center Region, with 21 female infants affected (Dinkes Kota Palembang, 2017).

According to the report from the Bogor City Health Office over three years, the Tegal Gundil Health Center area has had an unstable prevalence of Low Birth Weight (BBLR) cases from year to year. In 2015, the prevalence of BBLR in infants was 3.1%, in 2016 it decreased to 0%, and in 2017, cases of infants with BBLR re-emerged with an increase to 2.1% (Dinkes Kota Bogor, 2015).

In 2015, the percentage of infants with Low Birth Weight (BBLR) in South Sulawesi increased, with 4,697 cases, accounting for 3.23% of the total live births, which numbered 149,986 (Dinkes Sulsel, 2016).

Based on the medical records from the Mother and Child Hospital (RSIA) Masyita in Makassar for the period of January to December 2020, there were a total of 33 babies born, with 14 babies diagnosed with Low Birth Weight (BBLR), accounting for 42.4%. During the period of January to December 2021, there were a total of 412 babies born, and 79 babies (19.1%) were diagnosed with BBLR.

2. RESEARCH METHODS

This study used an analytical method with a Cross-Sectional Study approach to determine the relationship between maternal age, parity, pregnancy interval, and twin pregnancies with the occurrence of low birth weight infants at Masyita Hospital in Makassar in 2022. The research was conducted at Masyita Hospital in Makassar from January to December 2021. The inclusion criteria included newborns with normal birth weight and those with low birth weight (BBLR), while the exclusion criteria were newborns with BBLR who had other medical complications or a decrease in consciousness. The population in this study consisted of all mothers who gave birth to BBLR and normal birth weight babies at Masyita Hospital, totaling 412 individuals. The sample for this study was comprised of newborns born at Masyita Hospital in Makassar in 2021, with a total of 203 individuals. The sampling technique used was Simple Random Sampling, where the researcher randomly selected 203 respondents from the population of Masyita Hospital in Makassar. The research process was conducted based on predetermined methods and sampling techniques from January to December 2021. This research has received ethical approval with the reference number B/005/LPPM/IX/2023.

Data analysis and processing in this study were performed using Univariate and Bivariate Analysis to assess the percentage of each variable and analyze the relationships between variables. Data processing was carried out using a computer program, involving steps such as editing, coding, and data entry.

3. RESULTS AND DISCUSSION

Table 1. The distribution of respondents based on age at RSIA Masyita Makassar

Age	N	%
(<20 Years and >35 Years	42	20,7%
(20-35 Years)	161	79,3%
Total	203	100%

Table 1 shows the distribution of respondents based on age. The majority fall into the age categories of (<20 years and >35 years), which accounts for 42 individuals (20.7%), while a smaller portion falls into the age range of (20-35 years), with a total of 161 individuals (79.3%).

Table 2. The distribution of respondents based on education at RSIA Masyita Makassar.

Education	n	%
Elementary school	15	7,4%
Junior high school	46	22,7%
Senior high school	85	41,9%
Higher education	57	28,1%
Total	203	100%

Table 2 displays the distribution of respondents based on their education. The majority of respondents have completed high school (SMA), totaling 85 individuals (41.9%), while a smaller percentage have an elementary school (SD) education, with 15 individuals (7.4%).

Table 3. The distribution of respondents based on occupation at RSIA Masyita Makassar

Occupation	n	%
Employee	76	37,4%
Unemployed	127	62,6%
Total	203	100%

Table 3 presents the distribution of respondents based on their occupations. The majority of respondents are unemployed, numbering 127 individuals (62.6%), while a smaller percentage are employed, totaling 76 individuals (37.4%).

Table 4. The distribution of respondents based on the birth weight of newborns at RSIA Masyita Makassar

Weight	n	%
Normal	124	61,1%
BBLR	79	38,9%
Total	203	100%

Table 4 shows the distribution of respondents based on the birth weight of newborns. The majority of newborns have normal birth weight, with a total of 124 (61.1%), while a smaller portion of respondents have low birth weight, totaling 79 (38.9%).

Table 5. The distribution of respondents based on maternal parity at RSIA Masyita Makassar

Parity	n	%
Non Risk	160	78,8%
Risk	43	21,2%
Total	203	100%

Table 5 shows that among the 203 respondents, the majority have non-risky parity, which includes 160 individuals (78.8%), while a smaller portion have risky parity, totaling 43 individuals (21.2%).

Table 6. The distribution of respondents based on pregnancy spacing at RSIA Masyita Makassar

Pregnancy Spacing	n	%
Non Risk	119	58,6%
Risk	84	41,4%
Total	203	100%

Table 6 indicates that among the 203 respondents, the majority have a non-risky pregnancy interval, which includes 119 individuals (58.6%), while a smaller portion have a risky pregnancy interval, totaling 84 individuals (41.4%).

Table 7. The distribution of respondents based on twin pregnancies at RSIA Masyita Makassar

Twin Pregnancy	n	%
Twin	14	6,9%
Non Twin	189	93,1%
Total	203	100%

Table 7 shows that among the 203 respondents, the majority had non-twin pregnancies, totaling 189 individuals (93.1%), while a smaller portion had twin pregnancies, totaling 14 individuals (6.9%).

Table 8. The Relationship between maternal age and the occurrence of BBLR at RSIA Masyita Makassar in 2021

Maternal Age	Babies Born				Total		P Value
	Normal		BBLR				
	n	%	n	%	n	%	
At Risk (<20 Years - >35 Years)	10	23,8	32	76,2	42	100,0	0,000
Not At Risk (20-35 Years)	114	70,8	47	29,2	161	100,0	
Total	124	61,1	79	38,9	203	100,0	

Table 8 shows that out of a total of 203 respondents, those with mothers at risk and experiencing Low Birth Weight (BBLR) amounted to 32 (76.2%), while those without BBLR were 10 (23.8%) out of a total of 42 respondents. Furthermore, among mothers without risk and not experiencing BBLR, there were 114 (70.8%), and those with BBLR were 47 (29.2%) out of 161 respondents. The statistical test using the Chi-Square test yielded a p-value (0.000) > the significance level α (0.05). This indicates that Ha is accepted, and Ho is rejected, meaning there is a relationship between maternal age and the prevalence of BBLR at RSIA Masyita Makassar.

Table 9. The Relationship between Parity and the Occurrence of BBLR at RSIA Masyita in 2021

Parity	Babies Born				Total		P Value
	Normal		BBLR				
	n	%	n	%	n	%	
At Risk	17	39,5	26	60,5	43	100,0	0,001
Not At Risk	107	66,9	53	33,1	160	100,0	
Total	124	61,1	79	38,9	203	100,0	

Table 9 shows that out of a total of 203 respondents, those with risky parity and experiencing Low Birth Weight (BBLR) were 26 (60.5%), while those without BBLR were 17 (39.5%) out of a total of 43 respondents. Furthermore, among those with non-risky parity and not experiencing BBLR, there

were 107 (66.9%), and those with BBLR were 53 (33.1%) out of 160 respondents. The results of the statistical test using the Chi-Square test revealed a p-value (0.001) > the significance level α (0.05). This indicates that Ha is accepted, and Ho is rejected, meaning there is a relationship between parity and the occurrence of BBLR at RSIA Masyita Makassar.

Table 10. The Relationship between Pregnancy Spacing and the Occurrence of BBLR at RSIA Masyita in 2021

Pregnancy Spacing	Babies Born				Total		P Value
	Normal		BBLR				
	n	%	n	%	n	%	
At Risk	37	44,0	47	56,0	84	100,0	0,000
Not At Risk	87	73,1	32	26,9	119	100,0	
Total	124	61,1	79	38,9	203	100,0	

Table 10 reveals that out of a total of 203 respondents, those with a risky pregnancy interval and experiencing Low Birth Weight (BBLR) were 47 (56.0%), while those without BBLR were 37 (44.0%) out of a total of 84 respondents. Furthermore, among those with a non-risky pregnancy interval and not experiencing BBLR, there were 87 (73.1%), and those with BBLR were 32 (26.9%) out of 119 respondents. The results of the statistical test using the Chi-Square test yielded a p-value (0.000) > the significance level α (0.05). This indicates that Ha is accepted, and Ho is rejected, which means there is a relationship between the pregnancy interval and the prevalence of BBLR at RSIA Masyita Makassar.

Table 11. The Relationship between Twin Pregnancies and the Occurrence of BBLR at RSIA Masyita in 2021

Twin Pregnancies	Babies Born				Total		P Value
	Normal		BBLR				
	n	%	n	%	n	%	
Twin Pregnancies	0	0	14	100,0	14	100,0	0,000
Non-Twin Pregnancies	124	65,6	65	43,4	189	100,0	
Total	124	61,1	79	38,9	203	100,0	

Table 11 indicates that, out of a total of 203 respondents, those with risky twin pregnancies and experiencing Low Birth Weight (BBLR) were 14 (100.0%) out of 14 respondents. In contrast, those with non-risky twin pregnancies and not experiencing BBLR were 124 (65.6%), while those with BBLR were 79 (38.9%) out of 189 respondents. The results of the statistical test using the Chi-Square test yielded a p-value (0.000) > the significance level α (0.05). This indicates that Ha is accepted, and Ho is rejected, meaning there is a relationship between twin pregnancies and the occurrence of BBLR at RSIA Masyita Makassar.

Discussion

The Relationship between Maternal Age and the Incidence of Low Birth Weight (BBLR)

Based on the research results from the 203 respondents in total, it can be observed that in the high-risk age category, there were 32 mothers (76.2%) who gave birth to low birth weight (BBLR) infants and 10 (23.8%) who gave birth to normal weight infants out of a total

of 42 (100%). In contrast, out of the total of 161 (100%) mothers in the low-risk age category, there were 47 mothers (29.2%) who gave birth to BBLR infants, and 114 (70.8%) who gave birth to normal weight infants.

After being analyzed using the Chi-Square statistical test, a p-value of (0.000) was obtained, which is less than the significance level α (P<0.05). This indicates that Ha is accepted, and Ho is rejected, meaning there is a relationship between maternal age and the occurrence of BBLR at RSIA Masyita Makassar.

The age of the mother during pregnancy is one of the factors that influence the continuity of pregnancy and the safety of childbirth. Meanwhile, an unsafe pregnancy and childbirth occur when the mother is 35 years old or older. Mothers under 20 years old have a higher risk of fetal growth problems because they are in a growth phase that requires a significant amount of nutrition, which must be shared between the mother and the fetus. The development of their reproductive organs and biological functions is also not yet optimal (Reni, 2021).

The results of the research conducted at RS Muhammadiyah Palembang found that out of 96 respondents, 29 (30.2%) were in the high-risk pregnancy age category, while 67 (69.8%) were in the low-risk pregnancy age category (Budiarti, 2020).

Manuaba (2010) explains that pregnancy age <37 weeks (Preterm Birth) is one of the main factors associated with the occurrence of Low Birth Weight (BBLR).

Furthermore, their emotions and mental state are not mature enough, which often leads to complications. In addition to being at high risk for those under 20 years of age, being over 35 years of age is also considered a high-risk age due to biological changes associated with degenerative diseases. This condition can disrupt fetal growth, leading to the birth of infants with Low Birth Weight (BBLR) (Ferinawati & Sari, 2020).

The Relationship Between Parity and the Incidence of Low Birth Weight (BBLR)

Based on the research results from the 203 respondents in total, it can be observed that in the non-risky parity category and not experiencing BBLR, there were 107 mothers (66.9%), while those experiencing BBLR were 53 (33.1%) out of a total of 160 (100%). In contrast, in the risky parity category and experiencing BBLR, there were 26 (60.5%), and not experiencing BBLR were 17 (39.5%) out of a total of 43 (100%).

After being analyzed using the Chi-Square statistical test, a p-value of (0.001) was obtained, which is less than the significance level α (P<0.05). This indicates that Ha is accepted, and Ho is rejected, meaning there is a relationship between parity and the occurrence of BBLR at RSIA Masyita Makassar.

High parity has an impact on the emergence of various health problems, both for the mother and the newborn child. Repeated pregnancies and births can lead to damage to the blood vessels of the uterine wall and a weakening of the flexibility (elasticity) of tissues that repeatedly stretch during pregnancy. This can result in tendencies for abnormalities in fetal growth and placental position. It's worth noting that fetal growth may lead to the birth of infants with low birth weight (Handayani et al., 2019).

Parity 2-3 is considered the safest in terms of maternal mortality. High parity (>3) is associated with a higher maternal mortality rate. The higher the mother's parity, the poorer the condition of her uterus. This is due to the reduced uterine contraction caused by the decreased uterine function resulting from frequent pregnancies and childbirth (Siswati, 2015).

The most common risk for premature birth is associated with grandemultipara parity, which is due to the influence of uterine muscles that start to lose their function, potentially leading to Low Birth Weight (BBLR) (Siswati, 2015).

This is supported by a study conducted by Putri dkk (2017) at Puskesmas Undaan. The Chi-Square test results showed a P-value of 0.02, indicating that P-value < 0.05. Therefore, Ho is rejected, meaning there is a significant relationship between maternal parity and the occurrence of Low Birth Weight (BBLR). The OR result indicates 3.64, and the CI does not include the number 1, which means that mothers with parity >2 are a risk factor for the occurrence of BBLR. The OR suggests that

mothers with parity >2 are 3.64 times more likely to give birth to a BBLR baby compared to mothers with parity ≤2 children.

The Relationship Between Pregnancy Interval and the Incidence of Low Birth Weight (BBLR)

Based on the research results from the 203 respondents in total, it can be observed that in the high-risk pregnancy interval category and experiencing BBLR, there were 47 (56.0%), while those not experiencing BBLR were 37 (44.0%) out of a total of 84 respondents. Furthermore, in the non-risky pregnancy interval category and not experiencing BBLR, there were 87 (73.1%), and those with BBLR were 32 (26.9%) out of 119 respondents.

From the results of the statistical test using the Chi-Square test, a p-value of (0.000) was obtained, which is less than the significance level α (0.05). This indicates that Ha is accepted, and Ho is rejected, meaning there is a relationship between the pregnancy interval and the prevalence of Low Birth Weight (BBLR) at RSIA Masyita Makassar. The pregnancy interval significantly affects the health of both the mother and her fetus. A woman needs 2-3 years to recover physiologically after one pregnancy or childbirth, and preparing for pregnancy too soon indicates that the uterus is not ready for embryo transfer.

Premature childbirth increases the health risk for pregnant women, especially when supported by poor socioeconomic status. Recovery doesn't just require time physically but also mentally. High-risk pregnancies with intervals of less than 2 years can be reduced or prevented by family planning within 30 months to prevent unplanned pregnancies. Some of these high-risk situations are associated with unplanned pregnancies (Abdullah dan Anissa, 2014).

A short pregnancy interval will not provide a mother with enough time to recover her physical condition after a previous childbirth. Pregnant women with an unhealthy physical condition are one of the factors contributing to maternal and infant mortality, as well as the risk of disruptions to the reproductive system. A disrupted reproductive system can hinder the growth and development of the fetus being carried, thereby affecting the birth weight (Trihardiani dan Puruhita, 2011).

This is supported by research conducted by Tanjung dkk (2018), at Padangsidimpuan City Regional General Hospital, where the probability value (p) was found to be 0.002, which is less than 0.05. The analysis of the relationship between pregnancy interval and the occurrence of Low Birth Weight (BBLR) with an OR value of 3.083 (95%) indicates that the pregnancy interval is a risk factor leading to the occurrence of BBLR.

The Relationship Between Twin Pregnancy and the Incidence of Low Birth Weight (BBLR)

Based on the research results from the 203 respondents in total, it can be observed that in the high-risk twin pregnancy category and experiencing BBLR, there were 14 (100.0%) out of a total of 14 respondents. Meanwhile, in the non-risky twin pregnancy category and not experiencing BBLR, there were 124 (65.6%), and those with BBLR were 79 (38.9%) out of 189 respondents.

From the results of the statistical test using the Chi-Square test, a p-value of (0.000) was obtained, which is greater than the significance level α (0.05). This indicates that Ha is accepted, and Ho is rejected, meaning there is a relationship between twin pregnancy and the incidence of Low Birth Weight (BBLR) at RSIA Masyita Makassar.

Twin babies often have low birth weight because they have to share nutrients with their siblings while in the womb. To prevent this, pregnant mothers of twins must be able to meet the nutritional needs, which are generally different from those of a single fetus pregnancy. Optimizing the nutrition of pregnant mothers of twins aims to promote the optimal growth and development of the fetuses and reduce pregnancy complications. Iron requirements during pregnancy can reduce the risk of anemia, premature birth, and hypertension during pregnancy. Additionally, the birth weight of twins is generally lower than that of a single fetus pregnancy, even when the gestational age is the same. The average weight of one fetus in a twin pregnancy is 1000 grams less than that in a single pregnancy. The weight of fetuses in twin pregnancies is usually not the

same; one of the children may weigh 50 to 1000 grams more (Nur et al., 2021)

This is consistent with the results of Masitoh (2014) research, which showed that 58.3% of the respondents with twin pregnancies were at risk of experiencing Low Birth Weight (BBLR). The chi-square test resulted in a p-value of 0.000, indicating a significant relationship between twin pregnancies and the occurrence of BBLR. The OR value obtained was 22.8, which means that mothers with twin pregnancies have a 22.8 times higher risk of giving birth to a baby with BBLR compared to mothers with single pregnancies.

The same research findings were presented by Rohayati (2004) stating that twins are more likely to be born with BBLR (16%) compared to non-twin births with BBLR (2%). The chi-square test results also show a significant relationship between twin births and the occurrence of BBLR.

CONCLUSION

The results of the statistical tests using Chi-Square for the variables of maternal age obtained a value of P = 0.000, which is less than α = 0.050, indicating a relationship between maternal age and the occurrence of BBLR. For the variable of parity, the value of P = 0.001 is also less than α = 0.050, indicating a relationship between parity and the occurrence of BBLR. Regarding the variable of maternal pregnancy spacing, the value of P = 0.000 is less than α = 0.050, signifying a relationship between pregnancy spacing and the occurrence of BBLR. However, for the variable of twin pregnancies, the value of P = 0.000 is less than α = 0.050, indicating no relationship between twin pregnancies and the occurrence of BBLR. This indicates that there is a relationship between maternal age, parity, pregnancy spacing, and the occurrence of twin pregnancies with BBLR at RSIA Masyita Makassar.

RECOMMENDATION

For future research, it is suggested to use more varied research methods, increase the number of respondents to a larger sample size, and consider different variables to be investigated.

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