THE RELATIONSHIP BETWEEN MATERNAL AGE AND PARITY WITH THE INCIDENCE OF LOW BIRTH WEIGHT (LBW) AT WALED HOSPITAL, CIREBON

Irman Permana[1*], Muhammad Daffa Shidqi[2], Witri Pratiwi[3]
Departement of Child Health, Faculty of Medicine, Universitas Swadaya Gunung Jati-Waled *Public Hospital*, Cirebon, *West Java*, Indonesia[1], *Clinical Clerkship Program*, *Faculty of Medicine*, Universitas Swadaya Gunung Jati-Waled *Public Hospital*, Cirebon, *West Java*, Indonesia[2], *Department of Community Medicine and Public Health*, *Faculty of Medicine*, Universitas Swadaya Gunung Jati, Cirebon, *West Java*, Indonesia[3]
**Corresponding Author :* irmanneo2018@gmail.com

ABSTRAK

Usia ibu dan paritas merupakan faktor penting yang mempengaruhi pertumbuhan janin dan hasil kelahiran, termasuk risiko bayi berat lahir rendah (BBLR). Penelitian ini bertujuan untuk menganalisis hubungan antara usia ibu dan paritas dengan kejadian BBLR di Rumah Sakit Waled, Cirebon, guna memberikan wawasan dalam upaya peningkatan kesehatan ibu dan bayi. Penelitian ini bertujuan untuk menganalisis hubungan antara usia ibu dan paritas dengan kejadian BBLR di Rumah Sakit Waled, Cirebon. Metode yang digunakan adalah observasional analitik dengan desain cross-sectional. Sampel penelitian terdiri dari 312 responden yang dipilih melalui teknik simple random sampling, dengan data yang diperoleh dari sumber sekunder. Analisis data dilakukan menggunakan uji korelasi Chi-Square dan regresi logistik. Hasil analisis bivariat menunjukkan bahwa hubungan antara usia ibu dan paritas dengan kejadian BBLR menunjukkan adanya hubungan yang signifikan. Penelitian ini menyimpulkan bahwa usia ibu dan paritas berpengaruh secara signifikan terhadap kejadian BBLR di Rumah Sakit Waled, di mana sebagian besar ibu termasuk dalam kategori usia dan paritas yang tidak berisiko, sementara sebagian kecil berada dalam kategori berisiko. Sebagian besar bayi lahir dengan berat normal (63,1%), sedangkan 36,9% mengalami BBLR. Analisis statistik menunjukkan hubungan yang signifikan antara usia ibu dan BBLR (p = 0,000) serta antara paritas dan BBLR (p = 0,000). Odds Ratio (OR) menunjukkan bahwa usia ibu (OR = 7,048) memiliki pengaruh lebih besar terhadap BBLR dibandingkan paritas (OR = 6,581). Oleh karena itu, upaya penurunan kasus BBLR perlu difokuskan pada peningkatan kesadaran kesehatan ibu, terutama bagi kelompok usia berisiko, serta perawatan kehamilan yang optimal untuk mengurangi resiko akibat paritas.

Kata kunci **:** berat badan lahir rendah, paritas, usia ibu

ABSTRACT

Maternal age and parity are important factors influencing fetal growth and birth outcomes, including the risk of low birth weight (LBW). This study aims to analyze the relationship between maternal age and parity with the incidence of LBW at Waled Hospital, Cirebon. The research method used is analytical observational with a cross-sectional design. The study sample consisted of 312 respondents selected through a simple random sampling technique, with data obtained from secondary sources. Data analysis was conducted using the Chi-Square correlation test and logistic regression. Bivariate analysis results indicated a significant relationship between maternal age and parity with the incidence of LBW. This study concludes that maternal age and parity significantly affect the incidence of LBW at Waled Hospital, where most mothers fall into the non-risk category, while a small proportion are in the risk category. The majority of newborns had normal birth weight (63.1%), while 36.9% experienced LBW. Statistical analysis showed a significant relationship between maternal age and LBW (p = 0.000) as well as between parity and LBW (p = 0.000). The Odds Ratio (OR) indicated that maternal age (OR = 7.048) had a greater influence on LBW compared to parity (OR = 6.581). Therefore, efforts to reduce LBW cases should focus on increasing maternal health awareness, particularly among high-risk age groups, and ensuring optimal prenatal care to mitigate parity-related risks.

Keywords ***:*** *maternal age, parity, low birth weight*

INTRODUCTION

Infant Mortality Rate is a crucial measure of public health, reflecting the overall well-being and healthcare quality in a population. A high IMR indicates challenges in maternal and child health, including inadequate prenatal care, poor nutrition, limited access to healthcare services, and high rates of infectious diseases. Globally, the IMR remains a significant concern, with 37 deaths per 1,000 live births reported by WHO in 2015. In the ASEAN region, Indonesia had the highest IMR at 22 per 1,000 live births in the same year, highlighting the need for improved healthcare interventions, such as better maternal education, enhanced neonatal care, and increased access to medical facilities to reduce infant mortality rates (Mouliza & Pratiwi, 2019).

Neonatal mortality remains a major global health concern, with 45% of under-five deaths in 2015 occurring during the neonatal period, according to WHO. Among the leading causes, low birth weight (LBW) complications were the most significant, accounting for 16% of neonatal deaths. LBW increases an infant's vulnerability to infections, respiratory distress, and developmental complications, making it the primary cause of death in the early life period. Other contributing factors included intrapartum-related complications (11%), sepsis (7%), congenital anomalies (5%), pneumonia (3%), other causes (3%), and tetanus (1%). These statistics highlight the urgent need for improved maternal and neonatal care, particularly in addressing LBW through better prenatal nutrition, healthcare access, and early medical interventions to reduce neonatal mortality rates (Mouliza & Pratiwi, 2019).

The Infant Mortality Rate (IMR) in West Java experienced an increase from 1,575 cases in 2019 to 1,649 cases in 2020, according to the West Java Health Office. Among the regions, Garut recorded the highest number of cases at 156, while Cirebon City had the lowest with only 3 cases. Cirebon Regency contributed 76 cases, indicating a relatively higher proportion of IMR compared to other regions in West Java (Sakti, 2020). Teenage pregnancies often result in LBW due to the mother's incomplete physical development, inadequate nutritional intake, and a higher likelihood of pregnancy complications. On the other hand, advanced maternal age increases the risk of chronic conditions such as hypertension, which can impair placental function and fetal growth. These age-related factors contribute to restricted fetal development, increasing the chances of LBW. Additionally, the combination of high parity and extreme maternal age further increases the risk of LBW. Mothers who experience multiple pregnancies at an advanced age face greater risks due to the cumulative physical strain from previous pregnancies and age-related complications. Insufficient spacing between pregnancies may also hinder the mother's full recovery, potentially leading to nutritional deficiencies that negatively affect fetal growth. Therefore, maternal health interventions should focus on promoting optimal pregnancy spacing and raising awareness about the risks associated with high parity and maternal age to reduce the incidence of LBW (Manurung & Helda, 2021).

Several studies also show that age affects the incidence of LBW. According to research conducted by Jisuk Bae, et al., in 2011, and Yang, Q., in 2016, revealed in they research that age and parity play important roles in the incidence of low birth weight. It is evident that the incidence of LBW in Indonesia, West Java, and Cirebon Regency is relatively high. While previous research has explored risk factors for LBW, limited studies have focused on this relationship in the local context, particularly in this hospital. By analyzing maternal age and parity as key determinants, this study aims to provide valuable insights into how these factors influence LBW cases, helping to identify at-risk groups and improve maternal and neonatal health strategies.

METHOD

This study falls within the scope of Nutrition Science, Midwifery Science, Public Health Science, and Child Health Science. This use analytical approach with a cross-sectional design.

The sample consisted of medical records from mothers who gave birth at the hospital in 2020, selected through simple random sampling. A total of 312 respondents were selected using the Slovin formula. Data collection from medical records to ensure accuracy and completeness. The collected data were analyzed through univariate analysis to describe respondent characteristics, bivariate, and multivariate analysis. This comprehensive approach allowed for a thorough investigation of the key determinants of LBW.

RESULTS

This study was conducted at Waled Regional Hospital in Cirebon Regency from November 2021 to June 2022.

Table 1. Univariate Analysis

Variable	Frequency	Percentage
Maternal Age		
At Risk	72	23,1%
Not at risk	240	76,9%
Parity		
Riskless	128	41%
No risk	184	59%
Low Birth Weight (LBW)		
Yes	115	36,9%
No	197	63,1%
Total	**312**	**100%**

The univariate test shows that most respondents were not at risk based on maternal age, with 240 (76.9%) respondents, while 72 (23.1%) respondents were categorized as at risk. The parity variable indicates that most respondents had non-risk parity, with 184 (59%) respondents, while 128 (41%) were at risk. Regarding low birth weight (LBW), there were more respondents without LBW, with 197 (63.1%), compared to 115 (36.9%) respondents with LBW.

Table 2. Relationship Between Maternal Age and LBW Incidence

Variable		Low Birth Weight		Total	*p-value*
		Yes	**No**		
Mother's Age	Age at Risk <20 and >35 years	46	26	72	0,000
	Non-Risk Age 20-35 years	69	171	240	
	Total	**115**	**197**	**312**	

Table 2 presents the Chi-Square test results, indicates a significant association between maternal age and the incidence of LBW at Waled Regional Hospital, Cirebon, in 2020.

Table 3. Relationship Between Parity and LBW Incidence

Variable		Low Birth Weight		Total	*p-value*
		Yes	**No**		
Parity	Risky	73	55	128	0,000
	No Risky	42	142	184	
Total		**115**	**197**	**312**	

Table 3 presents the Chi-Square test results, showing a p-value of 0.000 (< 0.05), which indicates a significant association between parity and the incidence of LBW at Waled Regional Hospital, Cirebon, in 2020.

Table 4. Multivariate Analysis Results of Maternal Age and Parity Affecting LBW Incidence at Waled Regional Hospital, Cirebon Regency

Variabel	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for Exp(B) (Lower)	95% C.I. for Exp(B) (Upper)
Maternal Age	1.953	0.330	34.968	1	0.000	7.048	3.690	13.465
Parity	1.884	0.290	42.296	1	0.000	6.581	3.730	11.612
Constant	-5.776	0.850	46.137	1	0.000	0.003	-	-

The multivariate test results show that the variable Maternal Age has an Exp(B) value of 7.048, while the Parity variable has an Exp(B) value of 6.581. Among the two variables, Maternal Age has the greatest influence on LBW.

DISCUSSION

Analysis of the Relationship Between Maternal Age and the Incidence of Low Birth Weight (LBW) at Waled Regional Hospital, Cirebon Regency

Based on the research on the relationship between maternal age and parity with the incidence of low birth weight (LBW) at Waled Regional Hospital, Cirebon Regency. Maternal factors contributing to LBW include nutritional status during pregnancy, maternal age, pregnancy spacing, and parity (Azamti et al., 2018). However, this finding contrasts with a study by Yulia in 2021, which found that among 30 at-risk mothers, 16 (53.3%) delivered LBW babies, compared to 14 (46.7%) who did not. Among 50 non-risk mothers, 26 (52%) delivered LBW babies, while 24 (48%) did not (Widiastuti & Nasifah, 2021). According to theory, pregnancy at a young age poses risks due to the immaturity, which are not yet fully developed for conception. This can have adverse effects on the mother's health and hinder fetal growth and development. Similarly, pregnancy at an older age is also considered high-risk, as the mother's health may begin to decline, potentially impacting fetal development (Susilo, 2017).

This aligns with the theory that mothers below the age of 20 or above 35 have not yet reached optimal mental and emotional maturity, which can lead to a lack of attention to nutritional needs. Inadequate nutrition intake can weaken the immune system (Amini et al., 2018). Young mothers may have underdeveloped reproductive organs and insufficient physiological function. Additionally, their emotional and mental maturity may not be sufficient to fully respond to their pregnancy, leading to complications. On the other hand, pregnancy in mothers over 35 is not recommended due to the emergence of diseases like hypertension, benign tumors, and degenerative conditions. Labor at this age may face difficulties due to weak uterine contractions and spine issues (Wahyuni et al., 2021). This study aligns with other research. A study at Dr. H Koesnadi Bondowoso Hospital found that among 44 stroke patients, most were aged 50-65 years (17 respondents, 38.6%), followed by respondents over 65 years (14 respondents, 31.8%), and those aged 24-50 years (13 respondents, 29.5%). Similar results showed that most stroke patients were aged 50-65 years.

Analysis of the Relationship Between Parity and the Incidence of Low Birth Weight (LBW) at Waled Regional Hospital, Cirebon Regency

Parity refers to the number of children a mother has delivered. The safest parity is 2-3 children, while higher parity (>4) increases the risk of complications. Grande MultiPara refers to mothers who have delivered four or more children. Frequent pregnancies weaken the uterus, increasing the risk of complications during labor. Low parity (one child) can also pose risks due and knowledge in handling complications during pregnancy, labor, and the postpartum period (Komariah & Nugroho, 2020). The research findings as presented in Table 5, indicate that mothers with non-risk parity are more likely to give birth to babies with normal birth weight.

Support by Khoiriah (2017), which found that among 41 respondents with high parity, 20 (48.8%) had low birth weight (LBW) babies, compared to 12 (24%) among 50 respondents with low parity. This supports the theory that higher parity increases the risk of LBW due to factors such as uterine blood vessel damage and reduced nutrient circulation to the fetus (Khoiriah, 2017).

The more pregnancies a woman experiences, the more iron she loses, leading to anemia, which can result in premature delivery and hinder fetal growth (Widiastuti & Nasifah, 2021). First-time pregnancies often pose a higher risk of complications for the baby, which may be associated with the mother's lack of experience in prenatal care, inadequate nutritional intake, and poor anemia management. Similarly, mothers who have more than four children may experience a decline in reproductive function, insufficient nutrition, and fatigue, all of which can contribute to the incidence of LBW (Widiastuti & Nasifah, 2021). According to theory, high parity or multiple pregnancies increase the risk of low birth weight (LBW) due to damage to the blood vessels in the uterine wall. As a result, babies born to mothers with multiple pregnancies are at a higher risk of being underweight at birth, which can have long-term health implications (Nurhayati et al., 2020). Mothers with more than four children often experience decreased reproductive function, inadequate nutrition, and fatigue, which can contribute to the occurrence of LBW. On the other hand, first-time pregnancies carry a higher risk about prenatal care, proper nutrition intake, and the inability to manage anemia effectively. These factors can negatively impact both maternal health and fetal development, increasing the likelihood of adverse pregnancy outcomes.

Multivariate Analysis of Maternal Age and Parity Variables Affecting Low Birth Weight (LBW) at Waled Regional Hospital, Cirebon Regency

The research conducted at Waled Regional Hospital, Cirebon, found that maternal age had a stronger relationship with the studied variable compared to parity. This is indicated by the Exp(B) value of 7.048 for maternal age, which is higher than the Exp(B) value of 6.581 for parity. A higher Exp(B) value suggests that maternal age has a greater influence on increasing the likelihood of a particular condition compared to parity. Therefore, maternal age is a more dominant factor in determining the risk or tendency examined in this study. At an age below 20 years, adolescence marks the transition from childhood to adulthood, and the reproductive system, such as the ovaries, is not yet fully functional. For pregnancies above 35 years, the body's organ function, including the reproductive system, begins to decline. Pregnancy after 35 years is not recommended due to the reduced function of the reproductive organs, which affects fetal development. Conditions such as heart disease, anemia, and hypertension are common after 35 years (Hayati, 2019).

CONCLUSION

This study analyzed the relationship between maternal age, parity, and the incidence of low birth weight (LBW) at Waled Regional Hospital. The findings indicate that maternal age and parity significantly influence the risk of LBW. Mothers who are too young or too old, as well as those with very low or high parity, tend to have a higher risk of delivering babies with low birth weight. These results highlight the importance of maternal health monitoring during pregnancy to prevent LBW and improve infant health outcomes. The findings indicate that the majority of mothers were in the non-risk age group (76.9%) and had non-risk parity (59%), while a smaller proportion fell into the risk category. Similarly, most newborns (63.1%) were not classified as LBW, whereas 36.9% were born with LBW. Statistical analysis demonstrated a significant association between maternal age and the incidence of LBW, as well as between parity and the incidence of LBW. Furthermore, the Odds Ratio (OR) analysis demonstrated that

maternal age (OR = 7.048) had a greater influence on LBW compared to parity (OR = 6.581). These results suggest that maternal age plays a more critical role in determining the likelihood of LBW compared to parity. Based on these findings, efforts to reduce LBW cases should focus on improving maternal health awareness, particularly for mothers in the risk age group, and ensuring optimal pregnancy care to minimize the impact of parity-related risks.

ACKNOWLEDGMENT

We would like to express our sincere gratitude to all those who contributed to this research. Our appreciation goes to Waled Hospital, Cirebon, for providing the necessary facilities and support, as well as to all participants who took part in this study. We also extend our thanks to Universitas Swadaya Gunung Jati, particularly the Faculty of Medicine, for their guidance and academic support. Lastly, we acknowledge the valuable contributions of colleagues and reviewers whose insights have helped improve this research.

REFERENCES

Amini, A., Pamungkas, C. E., & Harahap, A. P. H. P. (2018). Usia Ibu Dan Paritas Sebagai Faktor Risiko Yang Mempengaruhi Kejadian Anemia Pada Ibu Hamil Di Wilayah Kerja Puskesmas Ampenan. *Midwifery Journal: Jurnal Kebidanan UM. Mataram*, *3*(2), 108–113.

Azamti, B., Fithriana, D., & Andrayani, N. (2018). Hubungan Usia dan Paritas Ibu Dengan Kejadian Berat Bayi Lahir Rendah (BBLR) di Ruang Bersalin Rsud Praya Lombok Tengah. *PrimA: Jurnal Ilmiah Ilmu Kesehatan*, *4*(1), 51–58.

Hayati, S. N. (2019). Hubungan Usia Ibu Primipara Dengan Kejadian Bayi Berat Lahir Rendah (BBLR). *DIII Keperawatan*.

Khoiriah, A. (2017). Hubungan antara usia dan paritas ibu bersalin dengan bayi berat lahir rendah (BBLR) di rumah sakit islam Siti Khadijah Palembang. *Jurnal Kesehatan*, *8*(2), 310–314.

Komariah, S., & Nugroho, H. (2020). Hubungan pengetahuan, usia dan paritas dengan kejadian komplikasi kehamilan pada ibu hamil trimester III di rumah sakit ibu dan anak aisyiyah samarinda. *KESMAS UWIGAMA: Jurnal Kesehatan Masyarakat*, *5*(2), 83.

Manurung, P., & Helda, H. (2021). Hubungan riwayat komplikasi saat hamil dengan kejadian berat badan lahir rendah (BBLR) di Indonesia. *Jurnal Epidemiologi Kesehatan Indonesia*, *4*(2), 51–56.

Mouliza, N., & Pratiwi, D. (2019). Hubungan Umur, Paritas Dan Pemeriksaan Kehamilan Dengan Bayi Berat Lahir Rendah. *Window Of Health: Jurnal Kesehatan*, 277–284.

Nurhayati, N., Hamang, S. H., & Thamrin, H. (2020). Faktor Risiko Umur, Paritas, dan Lingkar Lengan Atas Ibu Hamil terhadap Kejadian Berat Badan Lahir Rendah. *Window of Midwifery Journal*, 31–38.

Sakti, B. H. G. (2020). Upaya sektor kesehatan masyarakat dalam tantangan bonus demografi di Jawa Barat. *Dinas Kesehatan Provinsi Jawa Barat*, 1–39.

Susilo, D. H. (2017). Hubungan Usia Ibu Dengan Kejadian Berat Bayi Lahir Rendah. *Oksitosin: Jurnal Ilmiah Kebidanan*, *4*(2), 123–128.

Wahyuni, W., Fauziah, N. A., & Romadhon, M. (2021). Hubungan usia ibu, paritas dan kadar hemoglobin dengan kejadian bayi berat lahir rendah (BBLR) di RSUD Siti Fatimah Provinsi Sumatera Selatan tahun 2020. *Jurnal Keperawatan Sriwijaya*, *8*(2), 1–11.

Widiastuti, Y., & Nasifah, I. (2021). *Hubungan usia ibu dan paritas dengan kejadian BBLR di Puskesmas Samuda Kabupaten Kotawaringin Timur Provinsi Kalimantan Tengah*. Universitas Ngudi Waluyo.