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Analysis of Risk Factors for Low Birth Weight Babies (LBW) in the Working Area of RSU Bahteramas, Southeast Sulawesi

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Abstract: This study aims to analyze the risk factors for LBW events at Bahteramas General Hospital in Southeast Sulawesi in 2020. This type of research is an analytic descriptive study with a case-control design. This research was conducted at Bahteramas General Hospital in Southeast Sulawesi in 2020. This research was conducted to collect secondary data, namely patient medical records. The sample in this study were mothers who gave birth to LBW babies, and the control sample in this study were mothers who gave birth to babies who were not LBW, with a total sample of 136 samples consisting of 68 case samples and 68 control samples. Data were analyzed using the Odds Ratio test. The results of this study showed that maternal age was a risk factor for LBW with OR = 3,16 (1,57-6,90; 95%), maternal parity was a risk factor with OR = 2,07 (1,00-4,25; 95%), and petting is also a risk factor for LBW with OR = 5,03 (1,05-24,24; 95%). Maternal age, maternal parity, and obesity are risk factors for LBW events in the Working Area of RSU Bahteramas, Southeast Sulawesi, in 2020.

Keywords: LBW, mothers age, mothers parity, gemeli

1. Introduction

The Infant Mortality Rate (IMR) is an indicator commonly used to determine the degree of public health at the provincial and national levels. In addition, programs in Indonesia have focused a lot on efforts to reduce IMR. In 2020, it is expected that IMR and Under-5 Mortality Rates will decrease by two-thirds in the period 2001-2020. Based on this,

Indonesia is committed to reducing the Infant Mortality Rate from 68 to 23 per 1.000 live births in 2020 (1).

Babies with low birth weight make an important contribution to infant mortality (2). In addition, low birth weight infants (LBW) is one of the many health problems that will play an important role in improving the quality of human resources in the future (3). LBW will also slow down the growth and mental development of children and have an effect on decreasing Intelligence Quetiens (4).

The LBW mortality rate (birth weight less than 2500 grams) in Indonesia ranges from 9-30%, varies from one region to another and is one of the factors that influence perinatal and neonatal mortality (5). One of the reasons for the high perinatal and neonatal mortality rate in Indonesia is LBW (birth weight less than 2500 grams). In 2014, in Indonesia, the percentage of LBW was 11,1%, and in Southeast Sulawesi, the percentage was 10,4% (6).

In 2017, in the city of Kendari, the number of live births was 5,150 babies, with the number of LBW babies reaching 84 (1,63%), and in 2018, the incidence of LBW reached 95 cases (1,66%) or an increase of 0,3% (7) while in 2019 the incidence of LBW reached 0,17% or 95 cases of live births. Based on data obtained from the delivery room at the Bahteramas General Hospital in Southeast Sulawesi Province, in 2017 the number of cases of stillbirths with a weight <2500 g was 46 babies, with LBW cases of live births reaching 145 cases, in 2018 the babies were stillborn weighing body weight <2500 gr as many as 49 babies, with LBW cases living reaching 155 cases and in 2019 there was an increase in stillbirths weighing <2500 gr as many as 42 babies, where there was an increase in the number of LBW cases reaching 158 cases (Annual report Delima room maternity) in 2019).

Based on the data above, we can conclude that LBW is a case that must receive attention because it is a very important problem because LBW has a risk of contributing to infant mortality, especially during the perinatal period. Low Birth Weight Babies (LBW) are generally less able to absorb new environmental pressures, which can result in stunted growth and development and can even interfere with their survival (8). In addition, it will also increase the risk of morbidity and mortality for babies because they are vulnerable to lower respiratory tract infections, learning disorders, behavioural problems and so on (1).

2. Materials and Methods

This research is an analytical study with a Case-Control Study design which is also called retrospective research; descriptive observation aims to carry out a descriptive exploration of health phenomena in society, both related to the effects of a causal process, without analyzing how and why these phenomena occur which is based on observations of existing disease events (already occurring) making it possible to analyze two specific groups, namely: (1) the case group, namely the group suffering from the disease/affected by the study, compared to (2) the control group (management group)) namely those who do not suffer/are not affected by the effects of the study (9).

3. Results and Discussion

3.1. Characteristics of Respondents

This research was conducted on mothers who gave birth at Bahteramas Hospital who were recorded in the medical records in 2020. The data was obtained from the medical records, where the patient's medical record number matched the patient's registration book.

Table 1. Distribution of Research Subjects Based on Class of Treatment at RSU Bahteramas.

No	Class	LBW Status at RSU Bahteramas	
		Case	Control
1	Class 1	8	8
2	Class 2	11	11
3	Class 3	49	49
Amout		**68**	**68**

Source: Processed Data, 2020

3.2. Univariate Analysis

3.2.1. LBW Events

Based on Table 2 below, it shows that the 136 samples studied were divided into 2 (two) groups, namely 68 case groups and 68 control groups**.**

Table 2. Distribution of Research Subjects Based on the Incidence of LBW in the Working Area of Bahteramas General Hospital

No	Birth Weight	Amount	
		n	%
1.	BBLR	68	50
2.	BBLN	68	50
Amount		136	100

Source: Processed Data, 2020

3.2.2. Mothers Age

Based on Table 2 below shows that of the 136 subjects studied, it was found that in the case group, there were 45 babies (66,18%) born to mothers aged <20 years and > 35 years and 23 (33,82%) babies born to mothers aged 20-35 years. Whereas in the control sample, it was found that there were 26 (38,24%) babies born to mothers aged <20 years and > 35 years and 42 (61,76%) babies born to mothers aged 20-35 years.

Table 3. Distribution of risk factors for maternal age and the incidence of LBW at Bahteramas General Hospital

No	Birth Weight	Amount	
		n	%
1.	BBLR	68	50
2.	BBLN	68	50
Amount		136	100

Source: Processed Data, 2020

3.2.3. Parity

Based on Table 4 below shows that of the 136 samples studied, it was found that in the case group, there were 50 (73,53%) babies born to mothers with parity one and ≥ 4 and 18 (26,47%) babies born to mothers with parity 2-3. In control cases, there were 39 (57,35%) babies born to mothers who had parity one and ≥ 4 and 29 (42,65%) babies born to mothers with parity 2-3.

Table 4. Distribution of risk factors for parity with the incidence of LBW in Bahteramas General Hospital

No	Parity	LBW Events				Amount
		Casus	%	Control	%	
1.	High Risk	50	73,53	40	57,35	89
2.	Low Risk	18	26,47	29	42,65	47
Amount		68	100	68	100	136

Source: Processed Data, 2020

3.2.4. Gemeli

Table 5 below shows that of the 136 samples studied, it was found that in the case group, there were 9 (14,71%) samples born with gemeli (multiple pregnancies with two fetuses) and 59 (85,29%) samples with singleton pregnancies. Meanwhile, in the control group table, there were two samples (2,94%) who were born with exited and 66 (97,06) samples who were born alone.

Table 5. Distribution of the risk factors for delirium with the incidence of LBW in Bahteramas General Hospital

No	Gemeli	Amount (n)				Amount
		Case	%	Control	%	
1.	High Risk	9	14,71	2	2,94	11
2.	Low Risk	59	85,29	66	97,06	125
Amount		68	100	68	100	136

Source: Processed Data, 2020

3.3. Bivariate Analysis

3.3.1. Analysis of the Risk Factors of Gestational Age on the Incidence of LBW

Based on table 6 below, shows that of the 136 subjects studied, it was found that in the case group, there were 45 babies (66,18%) born to mothers aged <20 years and > 35 and 23 (33,82%) babies who were born to mothers aged 20-35 years. Whereas in the control sample, it was found that there were 26 (38,24) babies born to mothers aged <20 years and > 35 years and 42 (61,76%) babies born to mothers aged 20-35 years.

Table 6. Analysis of risk factors for maternal age with the incidence of LBW at Bahteramas General Hospital

No	Mother Age	LBW Events				Amount	OR	CI	
		Case	%	Control	%			LL	UL
1.	Age < 20 and 35	45	66,18	26	38,24	71	3,16	1,57	6,37
2.	Age 20-35	23	33,82	42	61,76	66			
Amount		68	100	68	100	136			

Source: Processed Data, 2020

The statistical test results obtained an odds ratio value of 3,16 with a 95% confidence level. The OR value is in the interval 1,57-6,37, which shows the value between the upper

limit and lower limit, which does not include a value of 1, then Ho is rejected, H1 is accepted, and the risk posed is said to be significant. The OR value of 3,16 means that pregnant women aged <20 years and > 35 years during pregnancy have 3,16 times the risk of giving birth to LBW babies compared to pregnant women aged 20-35 years.

3.3.2. Analysis of parity risk factors for LBW events

Table 7 above shows that of the 136 samples studied, it was found that in the case group, there were 50 (73,53%) babies born to mothers born with parity one and ≥ 4 and 18 (26,47%) babies born to mothers with parity 2-3. In control cases, there were 39 (57,35%) babies born to mothers who had parity one and ≥ 4 and 29 (42,65%) babies born to mothers with parity 2-3.

Table 7. Analysis of risk factors for maternal parity with LBW events at Bahteramas General Hospital

No	Parity	LBW Events				Amount	OR	CI	
		Case	%	Control	%			LL	UL
1.	Parity 1 and ≥ 4	50	73,53	39	57,35	88			
2.	Parity 2-3	18	26,47	29	42,65	48	2,07	1,00	4,25
	Amount	68	100	68	100	136			

Source: Processed Data, 2020

The statistical test results obtained an odds ratio value of 2,07 with a 95% confidence level. The OR value is in the interval 1,00-4,25, which shows the value between the upper limit and lower limit, which does not include a value of 1, then H0 is rejected, H1 is accepted, and the risk posed is said to be significant. The OR value of 2,39 means that pregnant women with a parity of 1 and more than 4 have a 2,07 risk of giving birth to LBW babies compared to mothers with a parity of 2-3.

3.3.3. Analysis of the Risk Factors for Gemelis on LBW Events

The table above shows that of the 136 samples studied, it is known that in the case group, there were 9 (14,71%) samples which were born with gemeli (multiple pregnancies with two fetuses) and 59 (85,29%) samples with singleton pregnancies. Meanwhile, in the control group, there were two samples (2,94%) who were born with exited and 66 samples (97,06%) who were born alone.

Table 8. Analysis of the risk factors for pregnant women with low birth weight babies at Bahteramas General Hospital

No	Gemeli	LBW Events				Amount	OR	CI	
		Case	%	Control	%			LL	UL
1.	Gemeli	9	14,71	2	2,94	11			
2.	First	59	82,29	66	97,06	125	5,03	1,05	24,24
Amount		68	100	68	100	136			

Source: Processed Data, 2020

The statistical test results obtained an odds ratio value of 5,03 with a 95% confidence level. The OR value is in the interval 1,05 – 24,24, which shows the value between the upper

limit and lower limit, which does not include a value of 1, then H0 is rejected, H1 is accepted, and the risk posed is said to be significant. The OR value of 5.03 means that babies born with gemeli multiple pregnancies have 5,3 times the risk of being born with LBW compared to single babies.

3.4. Risk factors for maternal age with LBW events

The statistical test results obtained an odds ratio value of 3.16 with a 95% confidence level. The OR value is in the interval 1,57-6,37, which shows the value between the upper limit and lower limit, which does not include a value of 1, then Ho is rejected, H1 is accepted, and the risk posed is said to be significant. The OR value of 3,16 means that pregnant women aged <20 years and > 35 years during pregnancy have 3,16 times the risk of giving birth to LBW babies compared to pregnant women aged 20-35 years.

The age risk factor has a very close influence on the development of the female reproductive organs. The healthy reproductive age for a woman to give birth to a child is between the ages of 20-35 years (10). The effect of age on the occurrence of LBW is related to the biological and psychological development of the mother. Pregnancy under the age of 20 is a high-risk pregnancy because, at a young age, the mother's reproductive organs are not ready to accept the presence of the fetus and support its development. In addition, the mother is also not ready psychologically because, at this age, the mother's emotions tend to be mentally unstable and immature, so she easily experiences shocks, which results in a lack of attention to meeting the needs of nutrients during pregnancy. Meanwhile, at the age of over 35 years, the endometrium is less fertile and increases the likelihood of suffering from congenital disease, which results in the health of the mother and the development and growth of the fetus she is carrying and is at risk of experiencing premature pregnancy (11).

The results of this study are in line with research conducted by Suetra in Kendari City in 2017, which stated that pregnancy before the age of 20 years and over 35 years of age 5,81 or almost six times have a risk of giving birth to LBW babies compared to mothers who give birth at the age of 20-35 years old. Research conducted by Ningsih at RSIA Siti Fatimah Makassar suggests that mothers who give birth at the age of under 20 years and after the age of 35 years have a 6,92 times greater risk compared to mothers who give birth at the age of 20-35 years.

3.5. Risk factors for parity with LBW events

The statistical test results obtained an odds ratio value of 2,07 with a 95% confidence level. The OR value is in the interval 1,00-4,25, which shows the value between the upper limit and lower limit, which does not include a value of 1, then H0 is rejected, H1 is accepted, and the risk posed is said to be significant. The OR value of 2,39 means that pregnant women with a parity of 1 and more than 4 have a 2,07 risk of giving birth to LBW babies compared to mothers with a parity of 2-3.

In general, LBW increases with increasing maternal parity. The risk for the occurrence of LBW is high at parity one, then decreases at parity 2 or 3, then increases again at parity 4 (12). Parity affects the duration of labour and the incidence of complications. Mothers with primapara (giving birth for the first time) have a high risk because it is related to experience. At parity 1, the mother still has no experience giving birth and lacks information about childbirth, so the abnormalities and complications experienced are quite large. In addition, preterm labour is more common in first pregnancies (13).

Mothers who give birth too often have risks for their health as well as for the health of their fetus. Mothers with high purity are said to be at risk because, at high parity, there can be damage to the uterine blood vessels and affect the circulation of nutrients to the fetus, where the number of nutrients will be reduced and can cause growth and development disorders in the fetus which will be born with LBW (14). This research is in line with research conducted by Astari at al. (15), which stated that mothers with parity one or having their first child for the first time have a 1,32 times greater risk compared to mothers with parity 2-3. Likewise, research conducted by Arsyi and Besral (4) said that mothers who gave birth at parity one or greater than 4 had a 2,369 times greater risk than mothers who gave birth at parity 2-3.

3.6. Risk factors for rumble with LBW events

The statistical test results obtained an odds ratio value of 5,03 with a 95% confidence level. The OR value is in the interval 1,05-24,24, which shows the value between the upper limit and lower limit, which does not include a value of 1, then H0 is rejected, H1 is accepted, and the risk posed is said to be significant. The OR value of 5,03 means that babies born with gemeli multiple pregnancies have 5,3 times the risk of being born with LBW compared to single babies.

Multiple pregnancies or twin pregnancies are pregnancies with two or more fetuses. Multiple pregnancies affect both the mother and the fetus, including the mother's need for substances increases, causing anaemia and deficiency of other substances to the fetus, namely shorter gestational age with an increase in the number of fetuses in twin pregnancies: 25% in gemeli, 50% in triplets, 75 % on quadruplets who will be born four weeks before term. So, the possibility of premature babies is high.

The results of this study are in line with a study conducted by Arsyi and Besral (4), where mothers who gave birth to twins had a 3,18 times greater risk than mothers who gave birth to single babies. The results of this study are also supported by Asari at al. (15) the theory put forward by Wahyuningrum at al. (1), which says that the weight of the fetus from twin pregnancies is not the same. Generally, there is a difference between 50 - 1000 gr. In addition, there is an unequal distribution of blood circulation. As a result, the growth of the two fetuses is different. This depends on the severity of perinatal problems, such as gestational age (the lighter and lower the baby's weight, the higher the mortality rate), accompanying complications (asphyxia/ischemia, respiratory distress syndrome, intraventricular haemorrhage, infection, and others).

Conclusions

The odds ratio of age-related LBW was 3,16, indicating a 3,16 times higher risk in pregnant women <20 years and >35 years compared to 20-35 years. Parity had an odds ratio of 2,07, indicating a 2,07 times higher risk in pregnant women of parity one and > four compared to parity 2-3. Gemeli had an odds ratio of 5,03, indicating a 5,03 times higher risk for LBW in twin pregnancies compared to singletons. Thus, age, parity, and twin pregnancy are risk factors for LBW.

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Conflicts of Interest

The authors declare no conflict of interest.

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