



Factors Associated with The Incidence of Low Birth Weight

Eka Rati Astuti*

Jurusan Kebidanan, Poltekkes Kemenkes Gorontalo, Indonesia

ratiastuti10@gmail.com

DOI: <http://doi.org/10.29080/jhsp.v5i1.517>

Received : Maret 2021 , Accepted: Juli 2021 ,Published: September 2021

Keywords

Low Birth Weight
;
Mother's Age ;
Parity ;
Birth Spacing.

Abstract

Low birth weight (LBW) is one of the causes of infant mortality. LBW babies can be caused by internal and external factors. This research aims to determine the factors associated with the incidence of low birth weight. This research is a retrospective study with a case control approach. The population is all mothers who gave birth in Puskesmas Kayu Kunit in South Bengkulu Regency throughout 2019, as many as 129 people, consisting of 14 babies with LBW and 115 babies with normal birth weight. The sample of this study was 28 people consisting of 14 babies who experienced LBW and 14 babies who were not LBW. Secondary data were obtained from maternal cohort and infant cohort and cases of data the incidence of low birth weight and the risk of pregnant women. Analysis of data using statistical test Chi-Square with a 95% confidence level. The analysis shows that the factors of low birth weight are maternal age ($p=0.002$), maternal parity ($p=0.006$), and pregnancy distance ($p=0.02$). In conclusion, factors associated with the incidence of low birth weight are maternal age, maternal parity, and pregnancy distance in the Puskesmas Kayu Kunit.

Introduction

Neonatal mortality as a main indicator for the health of children. The neonatal mortality rate is the number of neonatal deaths per 1,000 live births. Most of the causes of mortality are problems that occur during the neonatal period (age 0-28 days). Neonatal problems include asphyxia, low birth weight (LBW), and infection (1). The prevalence of LBW varies greatly in many parts of the world from 7.2% in developed countries and 17.3% in Asia. Of the 20.5 million LBWs born in 2015, more than half were born in Asia (2).

The Indonesian Health Profile shows that throughout 2019 out of 29.322 under-five deaths, 69% (20.244 deaths) of them occurred in the neonatal period, and of all reported deaths, 80% (16.156 deaths) occurred in the first six days of life. Meanwhile, 21% (6.151 deaths) occurred at the age of 29 days-11 months and 10% (2.927 deaths) occurred at the age of 12-59 months. The most common causes of neonatal death were LBW 35,3%, asphyxia 27.0%, congenital abnormalities 12,5%, sepsis 3.5%, tetanus neonatorum 21,4%, and other causes 0,3%. The highest prevalence of LBW in Indonesia occurred in East Java Province as many as 1.239 infants and the lowest in North Kalimantan Province with 39 infants while for Bengkulu Provinces as many as 65 infant (3). Puskesmas Kayu Kunit is the health center with the highest incidence of LBW in South Bengkulu. The high number of LBW in Puskesmas Kayu Kunit, it is necessary to analyze the factors that influence the LBW incidence so that appropriate management can be planned in accordance with factors that influence it.

Neonatal with disabilities or growth and developmental disorders, learning disabilities, low intellectual ability, and frequent behavior-related disorders are among the effects of LBW. In addition to its neonatal impact, LBW also has an impact on families. High caution should be exercised by the family especially against various infections. That is respiratory tract infections, gastrointestinal infections, and malnutrition. LBW can also affect the social and economic condition of the family because the cost of LBW baby care is greater than normal baby care (4).

LBW babies can be caused by internal and external factors. Internal factors include maternal and fetal factors. Maternal factors include maternal age, parity, birth distance, maternal health status, and chronic energy deficiency status. Fetal factors such as congenital malformations, uterine infections, twin births, premature, and placental factors. While external factors, among others: education, employment, socio-economic, socio-cultural, quality of antenatal care, and physical environment (exposure to cigarette smoke, exposure to radiation, and toxic substances) (5). LBW increased in risk-aged women (<20 years and > 35 years). At the age of <20 years, the female reproductive tract is immature for the process of pregnancy and healthy delivery. Meanwhile, at the age of > 35 years, the reproductive organs undergo a decline in their function because the degenerative process affects the transport of nutrients from mother to fetus which affects the disruption of fetal growth in the uterus (6).

LBW babies have a greater probability of being born by mothers with high parity. This is because repeated pregnancies cause the uterus is not ready to receive the next pregnancy. In addition, repeated pregnancies have an impact on endometrial vascular damage that affects the flow of nutrients to the fetus so that the amount of nutrients is reduced compared to previous pregnancies. This situation can trigger a LBW incident (7).

The ideal birth distance is 2 years or more, because the birth distance is short or causes a mother is not enough to restore her body condition after giving birth before. Pregnancy of pregnant women greatly affects the weight of the unborn baby. A mother whose pregnancy is said to be at risk of becoming pregnant in less than two years because it can cause conception disorders. Common conception disorders are immaturity, prematurity, congenital malformations, or fetal birth with LBW. This condition is caused by a lack of blood supply of nutrients and oxygen to the placenta which will affect the function of the placenta to the fetus. This is one of the factors that cause the weakness and death of mothers and babies born (5).

Based on the results of the preliminary survey conducted with the review of medical records at the Puskesmas Kayu Kunit in October-December 2019, there are three babies born with low birth weight, which after following up was known from the three babies, the two mothers were aged 19 years and one mother at the age of 37 years. Two mothers with primiparous and one mother with grandemultipara (four children). Two mothers with a pregnancy distance of <2 years (one person with a distance of 1 year 6 months and one person with a distance of 1 year 2 months) and one person with a pregnancy distance > 2 years (three years). There has been no research conducted at Puskesmas Kayu Kunit about LBW. Based on the above background, researchers are interested in researching the factors associated with the incidence of low birth weight.

Methods

This type of research is quantitative research. This research method is retrospective with a case control approach that is an analytical study that studies the causes of events or events retrospectively, in the field of health a disease occurrence is identified now and then exposure or causes are identified in the past [8]. The population in the study is all mothers who have babies born alive in the working area of the Puskesmas Kayu Kunit South Bengkulu Regency in 2019 as many as 129 people consisting of 14 babies with LBW and 115 non-LBW babies. It was known previously that the sample of LBW cases was 14 babies, so the control group will also be taken with the same number of 14 babies from the group of babies who are not LBW. This control sampling will be carried out at simple random sampling where each individual in the population has the same opportunity to be sampled.

This research was conducted in Puskesmas Kayu Kunit South Bengkulu. This study was conducted in November 2020. In this study, researchers first identify variables related to LBW incidents, identify cases, select a sample as a control and perform retrospective measurements to see the causes or risk factors of LBW and then analyze by comparing proportions between variables from cases research with control variables. The data used in this study are secondary data namely maternal cohort and infant cohort. Data analysis used statistical test with a significance level of 0.05 with the provision that the relationship was said to be meaningful if value <0.05 and the relationship was said to be meaningless if value >0.05 using the chi-square formula which was displayed in SPSS for Windows 20.0.

Results

1. Univariate Analysis

a. Mother Age

Table 1. Frequency Distribution of Maternal Age in the Working Area of Puskesmas Kayu Kunyit South Bengkulu Regency

No	Mother's Age	n	(%)
1	Risk	11	39.3
2	Not Risk	17	60.7
Total		28	100.0

Based on table 1 above, it was obtained from 28 mothers, most of whom were not at risk, namely 17 people (60.7%).

b. Mother's Parity

Table 2. Distribution of Mother Parity Frequency in the Working Area of the Puskesmas Kayu Kunyit, South Bengkulu Regency

No	Mother's Parity	N	(%)
1	Risk	10	35.7
2	Not Risk	18	64.3
Total		28	100.0

Based on table 2 above, it was obtained from 28 mothers, most of them with no risk parity, namely as many as 18 people (64.3%).

c. Maternal Pregnancy Distance

Table 3. Distribution of Pregnancy Distance Frequency in the Working Area of the Puskesmas Kayu Kunyit, South Bengkulu Regency

No	Pregnancy Spacing	N	(%)
1	Risk	13	46.4
2	Not Risk	15	53.6
Total		28	100.0

Based on table 3 above, it was found that from 28 mothers, most of them had a risky pregnancy interval, namely as many as 15 people (53.6%).

d. The Incidence of Low Birth Weight

Table 4. Distribution of Incidence of Low Birth Weight in the Working Area of the Puskesmas Kayu Kunyit, South Bengkulu Regency

No	The Incidence of Low Birth Weight	n	(%)
1	Low Birth Weight	14	50.0
2	Not Low Birth Weight	14	50.0
Total		28	100.0

Based on table 4 above, there were 14 LBW and non LBW babies respectively (50%).

2. Bivariate Analysis

a. Cross tabulation between maternal age and LBW incidence

Table 5. Cross tabulation between maternal age and incidence of low birth weight in the working area of the Puskesmas Kayu Kunyit, South Bengkulu Regency

Area of the Puskesmas Raya Rukhyt, South Bengkulu Regency										
		The Incidence of Low Birth Weight				Total				
No	Mother's Age	Low Birth Weight		Not Low Birth Weight		n	%	χ^2	ρ	OR
		n	%	n	%					
1	Risk	10	90.9	1	9.1	11	100			
2	Not Risk	4	23.5	13	76.5	17	100	9.5	0.002	32.5
Total		14	50.0	14	50	28	100			

Table 5 shows that out of 11 mothers with age at risk, most of them gave birth to LBW babies, as many as 10 people (90.9%), while of the 17 mothers with no risk age, most of them gave birth to babies who were not LBW, namely 13 people (76.5%). The results of statistical tests using the chi-square test showed the value of ρ (0.002) $< \rho$ (0.05), which means that there was a relationship between maternal age and the incidence of LBW in the work area of the Puskesmas Kayu Kunyit, South Bengkulu Regency with an OR value of 32.5 which means mothers with a risk age have a 32.5 times greater chance of giving birth to LBW babies compared to mothers whose ages are not at risk.

b. Cross tabulation between mother's parity and LBW incidence

Table 6. Cross tabulation between maternal age and incidence of low birth weight in the working area of the Puskesmas Kayu Kunyit, South Bengkulu Regency

		The Incidence of Low Birth Weight				Total				
No	Mother's Parity	Low Birth Weight		Not Low Birth Weight		n	%	χ^2	ρ	OR
		n	%	n	%					
1	Risk	9	90.0	1	10.0	10	100			
2	Not Risk	5	27.8	13	72.2	18	100	7.6	0.006	23.4
Total		14	50.0	14	50	28	100			

Table 6 shows that out of 10 mothers with parity at risk, most of them gave birth to LBW babies, namely 9 people (90%), while out of 18 mothers with no parity risk, most of them gave birth to babies who were not LBW, namely as many as 13 people (72.2%). The results of statistical tests using the chi-square test show the value of ρ (0.006) $< \rho$ (0.05), which means that there is a relationship between maternal parity and the incidence of LBW in the work area of the Puskesmas Kayu Kunyit, South Bengkulu Regency with an OR value of 23.4. This means that mothers with parity at risk have a 23.4 times greater chance of giving birth to LBW babies compared to mothers whose parity is not at risk.

c. Cross tabulation between pregnancy distance and LBW incidence

Table 7. Cross tabulation between the distance between pregnancy and the incidence of low birth weight in the working area of the Puskesmas Kayu Kunyit, South Bengkulu Regency

Weight in the working area of the Puskesmas Raya Ranyiq, South Bengkulu Regency										
		The Incidence of Low Birth Weight				Total				
No	Pregnancy Spacing	Low Birth Weight		Not Low Birth Weight		n	%	χ^2	ρ	OR
		n	%	N	%					
1	Risk	10	76.9	3	23.1	13	100			
2	Not Risk	4	26.7	11	73.3	15	100	5.1	0.02	9.2
Total		14	50.0	14	50	28	100			

Table 7 shows that of the 13 mothers with a pregnancy distance at risk, most of them gave birth to LBW babies, namely 10 people (76.9%). Meanwhile, of the 15 mothers with no risk of pregnancy, most of them gave birth to babies who were not LBW, as many as 11 people (73.3%). The results of statistical tests using the chi-square test show the value of ρ (0.02) $< \rho$ (0.05), which means that there is a relationship between pregnancy distance and the incidence of LBW in the work area of the Puskesmas Kayu Kunyit, South Bengkulu Regency. With an OR value of 9.2, which means that mothers with a pregnancy interval at risk have a 9.2 times greater chance of giving birth to LBW babies compared to mothers whose pregnancy spacing is not at risk.

Discussion

The results showed that out of 11 mothers at risk age, most of them gave birth to LBW babies (90.9%). According to the researchers, the conditions above indicate that the mother's age has a contribution to the incidence of LBW, which is shown in mothers with more risk of giving birth to LBW compared to mothers with no risk age. Maternal age is closely related to reproductive conditions, where at the age of <20 years the reproductive organs are not yet fully developed and the mother is also still in the growth stage so that the intake of nutrients is not only used for fetal growth and development. This can lead to LBW. Whereas at the age of > 35 years, the physical and reproductive organs have deteriorated so that it is no longer optimal for the occurrence of conception and the chances of LBW occurring are higher (7).

There are also 9.1% of pregnant women of risk age who did not give birth to LBW. This situation is because even though the mother's age is at risk, the mother tries to fulfill her nutritional needs during pregnancy properly so that the nutritional needs of the mother and her fetus are met and LBW birth can be avoided [9]. The results also showed that mothers with no risk of birth mostly gave birth to babies who were not LBW (76.5%). This condition indicates that the mother's age can contribute to the birth of a newborn with a normal weight. The age not at risk between 20-35 years allows the condition of the uterus to be ready for fertilization so that the mechanism of pregnancy in the body can work well, one of which is the ability of the umbilical cord to deliver nutritional intake to the fetus so that fetal needs are met (8).

However, the results of the study also showed that 23.5% of mothers with no risk age gave birth to LBW. According to other studies, this condition illustrates that the incidence of LBW is not only influenced by age but also influenced by other factors, such as illness that accompanies pregnancy or lack of nutritional intake during pregnancy (9). Mother's age at birth is determinant of LBW among tribal population (10).

Based on the results of statistical tests using the chi-square test, it shows the value of ρ (0.002) $< \rho$ (0.05), which means that there is a relationship between maternal age and the incidence of low birth

weight in the work area of Puskesmas Kayu Kunit, South Bengkulu Regency with an OR value of 32.5 which means that mothers with a risky age have a 32.5 times greater chance of giving birth to LBW babies compared to mothers whose ages are not at risk (11).

The results of this study are in line with the results of research conducted by Hidayati in 2016 which stated that there was a significant relationship between maternal age at childbirth and the incidence of LBW. The results of the analysis also showed an OR value of 2.68 which means that mothers who give birth with unhealthy reproductive age have a 2.68 times higher risk of giving birth to LBW babies compared to mothers who give birth with healthy reproductive age. Mothers aged <20 years are at risk of giving birth to LBW babies because they have an underdeveloped uterus and a short cervix which increases the risk of infection. Young mothers tend to give birth to smaller babies because they are still in their infancy and development, so mothers and babies are fighting over each other for nutrition. Whereas at the age of > 35 years, even though the mother is experienced, her body condition and health have begun to decline so that it can affect fetal growth. In addition, the mother's organs at this age have experienced a decline in function (8).

The above statement was supported by Nurlaila in 2019 which stated that pregnant women aged less than 20 years and more than 35 years are at risk of giving birth to LBW babies. Based on the results of research in developing countries, it shows that mothers with advanced age (35 to 49 years) have a much greater risk of giving birth to LBW babies than younger mothers. Women > 35 years of age are more likely to have an increased risk of developing pregnancy complications than younger women, such as gestational diabetes, placenta previa, breech presentation, which are the causes of LBW delivery.

The results showed that mothers with parity were at risk for the majority of giving birth to LBW babies (90%). According to researchers, this condition indicates that maternal parity has an important role in the process of fetal growth and development in the womb. Women with parity at risk tend to experience complications in pregnancy so that this condition will cause disruption in fetal growth, one of which is LBW. This occurs because the ability of the uterus to provide nutrients for pregnancy decreases so that nutrition distribution between the mother and the fetus is hampered (5).

There is also a small proportion of women with parity at risk who do not give birth to LBW (10%). This situation is possible if the mother performs antenatal care regularly during her pregnancy so that risk factors in maternal pregnancy can be monitored and handled early on so that the mother can prevent the occurrence of LBW from the beginning of pregnancy (7). This research is also in accordance with research in Rappang which stated that the characteristics of mothers who gave birth to babies with low birth weight were multiparous mothers (12).

The results also showed that mothers with parity were not at risk for the majority of giving birth to babies who were not LBW (72.2%). This condition indicates that the reproductive organs are still optimal for undergoing the pregnancy process and accepting the presence of the fetus. In addition, the skills and abilities of mothers in carrying out self-care and their fetuses during pregnancy are good enough based on previous pregnancies so that LBW birth can be avoided (13).

There is no risk parity that gives birth to LBW (27.8%). This is due to other factors such as lack of nutritional intake, lack of iron which causes anemia in pregnancy which causes LBW [9]. The results of statistical tests using the chi-square test showed the value of p ($0.006 < p$ (0.05), which means that there is a relationship between maternal parity and the incidence of low birth weight in the work area of the Kayu Kunit Health Center, South Bengkulu Regency with an OR value of 23.4 which means mother with parity at risk have a 23.4 times greater chance of giving birth to LBW babies compared to mothers whose parity is not at risk.

The results of this study are in line with research conducted by Hidayah in 2019 that there is a relationship between maternal parity and the incidence of low birth weight in RSUD Majalengka which is shown from the calculated X^2 value of 35.94 while the X^2 table with $df = 1$ and $\alpha = 0.05$ of 3.841. High parity will have an impact on the emergence of health problems for both the mother and the fetus. One of the health effects that may arise from high parity is the incidence of LBW. The above conditions are supported by the theory that in grandemultipara pregnancy (high parity) there is a deterioration in the elasticity of the tissue which has been stretched repeatedly by pregnancy so that it tends to develop abnormalities in the location or abnormalities of fetal growth that can cause LBW [13]. This is also confirmed by Sarwono's opinion that a high amount of parity has a greater risk of giving birth to LBW babies. pregnancy women with high parity are at risk of perinatal death because repeated pregnancies make the uterus not ready to accept the next pregnancy (14).

The results showed that mothers with a pregnancy interval at risk mostly gave birth to LBW babies (76.9%). This condition is caused by mothers with gestational intervals <2 years, the uterus has not yet returned to perfection to experience the pregnancy process. One of the effects is the not optimal ability of the uterus to deliver nutrients to the fetus which causes LBW birth. There is a possibility that the mother still has to breastfeed so that the intake of nutrients in the mother's body is not sufficient to meet the growth and development needs of her fetus (15).

In addition, there were also mothers with a risky pregnancy interval who did not give birth to LBW (23.1%). This is due to the prevention that has been done by the mother in the form of monitoring the health and development of her pregnancy by doing antenatal care regularly so that there is no LBW [17]. This study is also in accordance with research in Padang which stated that maternal age and parity affected the incidence of low birth weight (16). Research in Sinjai shows that parity affects the incidence of LBW (17).

The results also showed that mothers with no risk of pregnancy, most of them gave birth to babies who were not LBW (73.3%). This condition is possible because the distance > 2 years, the mother's condition has recovered physiologically from the previous pregnancy and childbirth so that the uterus's ability to undergo the pregnancy process has also returned to optimal (9).

In addition, there were also mothers with no risk of pregnancy who gave birth to LBW (26.7%). This condition indicates that there are other factors that can cause the birth of LBW in addition to the distance of pregnancy, for example complications in pregnancy, mothers with multiple pregnancies or diseases that accompany pregnancy (13).

The results of statistical tests using the chi-square test show the value of p (0.002) $< p$ (0.05), which means that there is a relationship between pregnancy distance and the incidence of LBW in the work area of the Kayu Kunyit Community Health Center, South Bengkulu Regency with an OR value of 9.2 which this means that mothers with a pregnancy interval at risk have a 9.2 times greater chance of giving birth to LBW babies compared to mothers whose pregnancy spacing is not at risk. Short pregnancy intervals mean that pregnant women have not had enough time to recover from their previous postpartum body condition. Pregnant women with this condition are the cause of death for mothers and babies born and the risk of reproductive disorders. A compromised reproductive system will inhibit the growth and development of the fetus so that it has a major effect on fetal body weight as well as a lack of blood, oxygen, and nutrition supply to the placenta, thus affecting the function of the mother's placenta on the fetus (11). The above statement is supported by the theory put forward by Proverawati which states that pregnancy spacing is said to be risky if pregnant for less than two years because it can cause interference with conception, frequent immaturity, prematurity, congenital defects, or the fetus is born with LBW. This situation is caused by a lack of blood, nutrition, and oxygen supply to the placenta which will affect the placenta's function in the fetus. This is one of the factors causing morbidity and mortality of mothers and babies born. The smaller the distance between two pregnancies, the greater the risk of giving birth to LBW. These incidents were caused by complications of antepartum hemorrhage, premature labor, and severe anemia (9).

Conclusion

Based on the results of research that has been conducted on the determinants of LBW incidence in the work area of the Puskesmas Kayu Kunyit, South Bengkulu Regency, it can be concluded that factors associated with the incidence of low birth weight are maternal age, maternal parity, and pregnancy distance.

This study has limitations, including the limited number of respondents, not considering antenatal care factors, pregnancy complications, and nutritional intake of pregnant women. It is suggested to the next researchers to be able to look at these factors so that the research on the determinants of LBW incidence is more perfect.

Acknowledgments

Thank you to the Puskesmas Kayu Kunyit, South Bengkulu Regency and all those who have helped so that this research can run well. Hopefully the results of this research can be useful for the community, especially pregnant women and women who give birth.

References

1. Fajriana, Amima, Buanasita A. Faktor Risiko yang Berhubungan dengan Kejadian Bayi Berat Lahir Rendah di Kecamatan Semampir Surabaya. *Media Gizi Indonesia*. 2018;71–80.
2. World Health Organization. World Health Statistics 2019 Monitoring Health for The SDGs Sustainable Development Goals. 2019.
3. Primadi O, Budijanto D, Hardhana B. *Profil Kesehatan Indonesia Tahun 2019*. Jakarta; 2020.
4. Ai Y, Rukiyah. *Asuhan Kebidanan I*. Jakarta: Trans Info Media; 2014.
5. Proverawati A, Ismawati C. *Berat Badan Lahir Rendah (BBLR)*. Yogyakarta: Nuha Medika; 2010.
6. Mahdalena, Shinta, Astuti T, Vitrianingsih. Faktor-faktor yang Berhubungan dengan Kejadian BBLR. *Journal Health*. 2017;5(2):250–7.
7. Hidayati I, Warsiti, Rokhanawati D. Faktor-faktor yang Mempengaruhi Kejadian Bayi Berat Lahir Rendah (BBLR) di RSUD Prambanan. Yogyakarta [Internet]. 2016; Available from: <http://digilib.unisayogya.ac.id/2004/1/NASKAH>
8. Nurlaila. *Perawatan Metode Kanguru*, Edisi I. Yogyakarta: Leutikaprio; 2019.

9. Sohibien GPD, Yuhan RJ. Determinan Kejadian Berat Badan Lahir Rendah (BBLR) di Indonesia. *asks*. 2019 Oct 8;11(1):1.
10. Kumari N, Algur K, Chokhandre PK, Salve PS. Low birth weight among tribal in India: Evidence from National Family Health Survey-4. *Clinical Epidemiology and Global Health*. 2021 Jan;9:360–6.
11. Hidayah FN. Analisis Faktor-Faktor yang Berhubungan dengan Terjadinya Bayi Berat Lahir Rendah (BBLR). *JK [Internet]*. 2019 Oct 30 [cited 2021 Sep 4];9(2). Available from: <http://journal.akpb.ac.id/index.php/JK/article/view/85>
12. Syahriani, Tahir M, Sabria. Karakteristik Ibu yang Melahirkan Bayi Berat Lahir Rendah. *Jurnal Ilmiah Kesehatan Iqra*. 2018;6(1):41–7.
13. H CP, P SF, Rahfiludin MZ. 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*. 2017;5(1):322–31.
14. Sarwono P. Ilmu Kebidanan. Jakarta: Bina Pustaka Sarwono Prawirohardjo; 2014.
15. Mahdalena S, Astuti T, Vitrianingsih. Faktor-faktor yang Berhubungan dengan Kejadian BBLR. *J Heal*. 2017;5(2):250-257.
16. Febrianti R. Faktor-Faktor Risiko yang Mempengaruhi Kejadian Berat Badan Lahir Rendah (BBLR) di RSUP DR. M. Djamil Padang Tahun 2019. *SCJ*. 2019 May 23;8(1):464–9.
17. Mutmainna. Determinan Kejadian Berat Badan Lahir Rendah (BBLR) di Puskesmas Balangnipa Kecamatan Sinjai Utara Kabupaten Sinjai Tahun 2016. UIN Alauddin Makassar; 2017.