THE CORRELATION BEETWEEN MOTHER'S NUTRITIONAL STATUS AND PARITY WITH THE INCIDENT OF LOW BIRTH WEIGHT (LBW) AT A PUBLIC HEALTH CENTER SURABAYA

Fransiska Niken Hapsari[1] iD *, Astika Gita Ningrum [1]* iD *, Muhammad Ardian Cahya Laksana [1]* iD *, Widati Fatmaningrum[1]* iD

[1] Midwife Education Study Program, Faculty of Medicine,
Universitas Airlangga, Surabaya.
[2]Departement of Obstetric and Gynecology, Faculty of Medicine,
Universitas Airlangga, Surabaya, Indonesia
[3]Departement of Public Health and Preventive, Faculty of Medicine,
Universitas Airlangga, Surabaya, Indonesia
Correspondence address:
Jl. Mayjen Prof. Dr. Moestopo No.47, Surabaya 60132
Email :
astika.gita.n@fk.unair.ac.id

Abstract

Background: One of the highest causative factors of neonatal death in Indonesia is low birth weight (LBW), around 7,150 (35.3%) cases. Even though the trend of LBW incidents in East Java is decreasing, in the city of Surabaya itself the death rate due to LBW has increased from 31 deaths to 51 deaths. Simomulyo Public Health Center was ranked first with the highest incidence of LBW in Surabaya with 45 cases in 2019. Even though there was a decrease in cases in 2020, the death rate actually increased from 1 death to 4 deaths. WHO (2017) defines LBW as babies born weighing $\leq$ 2500 gr. Nutritional status and parity are two of the many risk factors for LBW. Knowing the causal relationship with the occurrence of LBW is important to do at the public Health Center as a first step in preventing LBW in the future. **Method:** This research is quantitative with an analytical observational design using a cross-sectional approach. Samples were taken using probability sampling techniques, namely random sampling. The total samples taken were 96 samples. **Result:** The results of the research was found that there was a relationship between nutritional status and the incidence of LBW with a value of p=0.005 (p<0.05) and the relationship between parity and the incidence of LBW with a value of p=0.001 (p < 0.05). **Conclusion:** there is a correlation between nutritional status and parity and the incidence of LBW at the Simomulyo Public Health Center Surabaya.

keyword: LBW, nutritional status, parity

INTRODUCTION

One indicator of the success of health development in a country is to reduce the Maternal Mortality Rate (MMR) and also Infant Mortality Rate (IMR) (Kemenkes, 2020). In 2015, approximately 20 million newborns, an estimated 14.6% of all babies born globally that year, suffered from LBW (UNICEF, 2019). The results of the 2017 Indonesian Demographic and Health Survey (SDKI) showed that the Neonatal Mortality Rate (AKN) was 15 per 1000 live births and the IMR was 24 per 1000 live births (Profil Kesehatan Indonesia, 2018). Based on Indonesian health profile data, it shows that the highest cause of neonatal death is LBW, namely 7,150 (35.3%) cases (Kemenkes, 2020).

In East Java, the number of infant deaths was 3,614 babies (Dinkes Prov. Jatim, 2020). The factors that influence IMR in East Java are the number of health centers, percentage of poor population, LBW and percentage of birth attendants (Cabral et al., 2019). The trend in the incidence of LBW in East Java tends to decrease. This is shown by the decrease in the number of LBW deaths from 1,164 deaths and 20,627 LBW incidents in 2020 to 987 deaths and 18,665 LBW incidents in 2021 (Profil Kesehatan Prov. Jawa Timur, 2020; Profil Kesehatan Prov. Jawa Timur, 2021). Meanwhile in Surabaya, the death rate due to LBW increased in 2020 to 51 deaths from 31 deaths in 2019 (Profil Kesehatan Kota Surabaya, 2019; Profil Kesehatan Kota Surabaya, 2020). Likewise with the incidence of LBW incidents in Surabaya, although it decreased to 394 in 2021 from the previous 550 in 2020, the percentage of LBW incidents increased from 3.7% in 2020 to 3.8% in 2021 (Profil Kesehatan Prov. Jawa Timur, 2020; Profil Kesehatan Prov. Jawa Timur, 2021). A working area in one of the sub-districts in Surabaya, namely the Simomulyo Public Health Center, had the first rank with the highest incidence of LBW in the city of Surabaya with an incidence of 45 cases (3.82%) (Profil Kesehatan Kota Surabaya, 2019). Even though it decreased to 13 cases (1.19%) in 2020, the death rate actually increased from 1 case in 2019 to 4 cases in 2020 (Profil Kesehatan Kota Surabaya, 2020).

The WHO definition (2017) regarding LBW is as a baby born weighing ≤ 2500 grams. In childhood, babies with lower body weight (LBW) have a higher risk of stunting, lower intellectual capacity, which can pose a threat to the quality of

human resources in the future, and can even cause death. Various factors can influence the occurrence of LBW, including maternal factors and fetal factors. Maternal factors that predispose the incidence of LBW include the mother's age at pregnancy being too young or too old (35 years), nutritional status, diseases directly related to pregnancy, interval between pregnancy, maternal parity, socio-economic conditions while foetal factors that can influence are multiple pregnancies, infections and chromosomal abnormalities (Wahyuni et al., 2021).

The nutritional status of the mother is closely related to the incidence of LBW, it is because the fetus obtains nutrition for growth and development from the nutrition consumed by the mother. In other words, the quality of the baby is very dependent on the mother's nutritional status of the fetus conceived during pregnancy (Mardiaturrahmah, 2020).

Meanwhile, mothers who have a high parity status can increase the risk of LBW. This is because every pregnancy followed by childbirth will lead to abnormalities in the uterus. Repeated pregnancies will also affect the circulation of nutrients to the fetus, this situation causes fetal growth disorders resulting in LBW. Knowing the causal relationship with the occurrence of LBW is important to do at the Public Health Center as a first step in preventing LBW in the future. Therefore, this study aims to determine the relationship between nutritional status and maternal parity with the incidence of LBW at the Simomulyo Public Health Center Surabaya.

METHOD

This research is a quantitative research using an analytical observational research design, when the researcher only makes observations of the variables studied without carrying out treatment and using a cross-sectional approach. Data was taken in August 2023. The samples from this study were mothers who underwent ANC examinations and gave birth at the Simomulyo Public Health Center Surabaya in January – December 2022, there were 96 samples in total using random sampling techniques from 123 total populations. Data were taken from the mother's medical records and analyzed univariate and bivariate using spearman test with a confidence level of 95%.

RESULT AND DISCUSSION

Result

In general, the majority of mothers who undergo ANC and give birth at the Simomulyo Public Health Center Surabaya come from Javanese ethnicity, are Muslim and housewives with more than 78% percentage. From the data that has been collected, the characteristics of the respondents are obtained in the form of the age of the respondents in this study which is in the range 17 - 42 years.

Table 1 Frequency Distribution of Nutritional Status of Mothers Who Undergo ANC and Give Birth at the Simomulyo Public Health Center Surabaya in January – December 2022.

Parity	Frequency	Percentage (%)
Underweight	5	5
Normal	61	64
Overweight	25	26
Obesitas	5	5
Total	96	100

Table 1 shows that only 5 out of 96 respondents (5%) of mothers who undergo ANC and gave birth at the Simomulyo Public Health Center Surabaya were mothers in the underweight BMI category.

Table 2 Parity Frequency Distribution of Mothers Who Undergo ANC and Give Birth at Simomulyo Public Health Center Surabaya in January – December 2022

Parity	Frequency	Percentage (%)
Primiparous	27	28
Multiparous	69	72
Grandemultiparous	0	0
Total	96	100

Table 2 shows that almost half of the respondents, namely 27 (28%) mothers who undergo ANC and gave birth at the Simomulyo Public Health Center Surabaya, were mothers with primiparous parity.

Table 3 Frequency Distribution of LBW Events from Mothers Who Undergo ANC and Give Birth at the Simomulyo Public Health Center Surabaya in January – December 2022

Birth Weight	Frequency	Percentage (%)
LBW	7	7
Non LBW	89	93
Total	96	100

Table 3 shows that only 7 of the 96 respondents (7%) weighed babies from mothers who gave birth at the Simomulyo Public Health Center Surabaya had LBW.

Table 4 Correlation between nutritional status and LBW incidence at Simomulyo Public Health Center Surabaya for the period January – December 2022

Birth Weight	Nutritional Status								Total		p value	r
	Underweight	%	Normal	%	Overweight	%	Obesity	%	N	%		
LBW	2	2	5	5,3	0	0	0	0	7	7,3		
Non LBW	3	3,1	56	58,3	25	26	5	5,3	89	92.7	0,005	0,284
Total	5	5,1	61	63,6	25	26	5	5,3	96	100		

Table 4 shows that of the 96 mothers who gave birth at the Simomulyo Public Health Center Surabaya, 7 (7.3%) of the babies born were LBW and came from 2 (2%) mothers with underweight nutritional status and 5 (5.3%) mothers with underweight nutritional status. The results of the research were analyzed bivariate using the IBM SPSS Statistics 25 program with the Spearman test, obtained a value of p=0.005 (p<0.05) which means there is a relationship between nutritional status and the incidence of LBW at the Simomulyo Public Health Center Surabaya. In the results of the contingency coefficient (r) between the variable incidence of LBW and nutritional status, it has a value of 0.284, which means that the relationship between the incidence of LBW and nutritional status has a low correlation.

Table 5 Correlation between parity and LBW incidence at Simomulyo Public Health Center Surabaya for the period January – December 2022

Birth Weight	Parity						Total		p value	r
	Primiparous	%	Multiparous	%	Grandemultiparous	%	N	%		
LBW	6	6,2	1	1	0	0	7	7,2		
Non LBW	21	21,9	68	70,9	0	0	89	92.8	0,001	0,326
Total	27	28,1	69	81,9	0	0	96	100		

Table 5 shows that of the 96 mothers who gave birth at the Simomulyo Public Health Center Surabaya, 7 (7.2%) babies were born with LBW and came from 6 (6.2%) mothers with primiparous parity and 1 (1%) mother with multiparous parity. The results of the research were analyzed bivariate using the IBM SPSS Statistics 25 program with the Spearman correlation test, obtained a value of p=0.001 (p<0.05) which means there is a relationship between parity and the incidence of LBW at the Simomulyo Public Health Center Surabaya. In the results of the contingency coefficient (r) between the variable incidence of LBW and nutritional status, it has a value of 0.326, which means that the relationship between the incidence of LBW and nutritional status has a low correlation.

Discussion

The nutritional status of the mother greatly influences the mother's ability to provide nutrition for herself and the fetus. If the mother's nutrition is in optimal condition, then the mother will have the ability to provide adequate nutrition for the baby, so that the risks in pregnancy will be reduced, meanwhile, if the mother cannot fulfill the nutrition optimally, then the fetus will also not get adequate nutritional intake, causing its growth to be obstructed and the risk of pregnancy and childbirth such as LBW will increase (Pramudieta, 2019). The results of this study also represent that the incidence of LBW does not only occur in mothers with underweight BMI because it was also found that 5 out of 7 mothers who gave birth to LBW had a normal BMI. In mothers with normal nutritional status, the incidence of LBW can be influenced by various other factors. Several studies indicate that the factors causing LBW are multifactorial. For example, mother-related factors include demographics; race, education, occupation, physical activity, behavior; smoking habits and alcohol consumption. Meanwhile, biomedical factors include body weight, maternal age, interval between pregnancy, obstetric history, mobility

during pregnancy, blood pressure and hemoglobin levels during pregnancy. Meanwhile, factors related to the fetus include gemelli pregnancy, chromosomal abnormalities, and hydramnios (Ani et al., 2020). In other words, maternal risk nutritional status has a significant impact on the incidence of LBW, but nutritional status does not have the biggest influence on the occurrence of LBW and can be influenced by other risk factors. This is proven by the occurrence of several cases of LBW in mothers with normal nutritional status.

Meanwhile, for parity, parity 2 and 3 are considered safer from the point of view of maternal mortality. Because at this parity, the mother is considered to have sufficient knowledge and experience regarding pregnancy and childbirth and is in good physical condition so that the risk of LBW incidents can be prevented (Prawirohardjo, 2019). Risk parities such as 1 and ≥ 4 can increase the risk of preterm birth, thereby impacting the incidence of LBW. In parity 1 or primipara, this is related to the mother's lack of experience in pregnancy, which can lead to a lack of maternal knowledge about providing adequate nutrition for both mother and baby and can give rise to the risk of LBW. Meanwhile, according to Fitriani and Lestari (2019), high parity can also increase the possibility of complications because it can result in abnormalities in the uterus and disruption in the circulation of nutrients to the fetus. Another risk at high parity is bleeding which can occur due to abnormalities in the blood vessels and scar tissue resulting from repeated pregnancies and childbirth and can affect the tensile strength of the uterus. In this study, data was obtained on one mother with multiparous parity who experienced an LBW event, but no data was obtained on mothers with grand multiparous parity, so the risk parity was only represented by mothers with primiparous parity. However, this is also in line with research conducted by Riska, et al. (2020), namely that primiparous parity is related to the occurrence of LBW with $P = 0,001$ and OR 4 (95%CI 2,004-8,704) shows that there is a strong relationship between parity and primiparous with a LBW incidence with a risk 4 times greater. In other words, maternal risk parity has a significant influence on the incidence of LBW, but parity does not have the biggest influence on the occurrence of LBW and can be influenced by other risk factors. This is proven by the occurrence of several cases of LBW in multiparous mothers who are not included in the risk category.

Nutritional status and parity take a mutually sustainable role in the baby's weight gain during pregnancy. This is because the mother's parity can also determine the mother's nutritional status during pregnancy. If the interval of the parities are short, then the mother does not have enough time to prepare optimal nutrition for the next fetus conceived and can lead to LBW.

CONCLUSION AND SUGGESTION

There is a correlation between nutritional status and parity and the incidence of LBW at the Simomulyo Public Health Center Surabaya with Spearman test values of 0.005 and 0.001 respectively. For future researchers, this research can be developed in depth by involving data supporting and with variables, instruments and statistical testing techniques to obtain more specific results.

ACKNOWLEDGMENT

There was some research supporting data that was not recorded completely in the patient medical records obtained by the researchers, such as; latest educational history, occupation and interval between pregnancies so that researchers could not analyze the variables more deeply in terms of the more diverse characteristics of the respondents.

REFERENCE

Ani, F. A., Umaroh, & Hardjanti, T. S. (2020). 'Faktor-Faktor Yang Berhubungan Dengan Berat Badan Lahir Rendah (BBLR) Di Wilayah Kerja UPTD Puskesmas Toroh 1 Kabupaten' http://repository.poltekkes-Grobogan.smg.ac.id.index.php?p=show_detail&id=22203&keywords=

Cabral, A. H. *et al.* (2019) 'Pemodelan Faktor yang Mempengaruhi Angka Kematian Bayi di Jawa Timur dengan Menggunakan Geographically Weighted Regression', *Snhrp: Seminar Nasional Hasil Riset dan Pengabdian*, (2019: Seminar Nasional Hasil Riset dan Pengabdian Ke-II (SNHRP-II)), pp. 37–49. Available at: https://snhrp.unipasby.ac.id/prosiding/index.php/snhrp/article/view/39/7

Dinas Kesehatan Kota Surabaya (2020) 'Profil Kesehatan Surabaya 2020', 3(April), pp. 49–58.

Dinkes Jatim (2021) 'Profil Kesehatan Dinas Kesehatan Provinsi Jawa Timur 2021', *Dinas Kesehatan Provinsi Jawa Timur*, pp. 1–149.

Dinkes Jawa Timur (2020) 'Profil Kesehatan Provinsi Jawa Timur 2019', *Dinas Kesehatan Provinsi Jawa Timur*, pp. 1–73. Available at: www.dinkesjatengprov.go.id.

Fitriani, Herlin, And Cahaya Indah Lestari. 2019. "Hubungan Umur Ibu Dan Paritas Dengan Kejadian Bblr Di Wilayah Puskesmas Wates Kabupaten Kulon Progo *." 4(2):2015–18

Kemenkes RI (2020) 'Indikator Program Kesehatan Masyarakat dalam RPJMN dan Renstra Kementerian Kesehatan 2020-2024', *Katalog Dalam Terbitan. Kementerian Kesehatan RI*, pp. 1–99. Available at: https://kesmas.kemkes.go.id/assets/uploads/contents/attachments/ef5bb48f4 aaae60ebb724caf1c534a24.pdf.

Mardiaturrahmah, M. and Anjarwati, A. (2020) 'Kejadian Bayi Berat Lahir Rendah (BBLR) Pada Ibu Hamil dengan Anemia', *Jurnal Kebidanan dan Keperawatan Aisyiyah*, 16(1), pp. 34–43. doi: 10.31101/jkk.841.

Nuzula, R. F., Dasuki, D. and Kurniawati, H. F. (2020) 'Hubungan Kehamilan Pada Usia Remaja Dengan Kejadian Berat Bayi Lahir Rendah (Bblr) Di Rsud Panembahan Senopati', *Jurnal Kesehatan Samodra Ilmu*, 11(2), pp. 121–130. doi: 10.55426/jksi.v11i2.115.

Pramudieta, E. *et al.* (2019) 'Hubungan Status Gizi Ibu Saat Hamil Dengan Berat Lahir Bayi di Wilayah Kerja Puskesmas Pegantenan Pamekasan', *Jurnal Manajemen Kesehatan Indonesia*, 7(3), pp. 181–185. doi: 10.14710/jmki.7.3.2019.181-185.

Prawirohardjo Sarwono (2019). 'Buku Ilmu Kebidanan'. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo.

Supariasa I.D.N., Bakri, B., Fajar I. (2016). 'Penilaian Status Gizi' (Edisi Revisi). Jakarta:Penerbit Buku Kedokteran EGC.

United Nations Children's Fund and World Health Organization (2019) 'Low Birthweight Estimates: Levels and trends 2000-2015', *The Lancet Global Health*, 7(7), pp. e849–e860.

Wahyuni, Winda Trie, Ahmad Wisnu Wardhana, A. Y. R. (2021) 'Hubungan Anemia,Usia Ibu, Paritas dan Jarak Kehamilan dengan Kejadian Berat Badan Bayi Lahir Rendah di RSUD Abdul Wahab Sjahranie Samarinda', *Fakultas Kedokteran Universitas Mulawarman, Indonesia*, 6(1), pp. 1–15.