



RESEARCH ARTICLE

RISK OF THE LOW BIRTH BABY WEIGHT (LBW) (CASE STUDY AT COMMUNITY HEALTH CENTER)

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ABSTRACT

The incidence of Low Birth Weight (LBW) in Tanjungharjo Community Health Center Bojonegoro (6.60%) is higher than the prevalence of LBW in Bojonegoro (4.72%). The purpose of this study was to analyze the risk factors for pregnant women against LBW in Tanjungharjo Bojonegoro Health Center. Method. This study was an observational analytic study, a case-control study design, conducted retrospectively. The population is mothers who give birth to babies in 2018 at the Tanjungharjo Health Center. Case comparison: control sample is 1: 2, i.e. 20:40. Test analysis with chi square test, while multivariate analysis using multiple logistic regression. The results of the study: showed that the variables affecting the incidence of LBW infants were age and anemia in pregnant women. Variables that had no effect were education, parity women's occupation, regularity of ANC examinations and LBW history. The results of multivariate analysis found 4 factors included in the final modeling, namely the age of pregnant women, anemia of pregnant women, maternal parity and regularity of ANC examination. Risk factors that significantly influence the incidence of LBW are age ($P = 0.009$) and anemia ($P = 0.014$). Age (Exp. B: 21,706) is more dominant influence on the incidence of LBW compared to anemia (Exp. B: 4,906). Based on these results the researchers suggest that the Health Service Institution needs to reorganize strategies to reduce the incidence of LBW infants, namely by maturing marital age, pregnancy in a healthy reproductive age period and prevention of anemia in WUS.

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INTRODUCTION

Low Birth Weight Babies (LBW) are babies born weighing less than 2500 grams. LBW is still a serious public health problem, because of its short-term and long-term effects on health (WHO, 2014). The factors that most play a role in LBW are maternal factors, fetal factors and placental factors (Wisnu, 2018). Of these three factors, maternal factors are the most easily identified. Maternal factors related to LBW include maternal age, birth spacing, previous LBW history, presence of chronic diseases (anemia, hypertension, diabetes mellitus), socioeconomic factors (low socioeconomic, strenuous physical work, lack of antenatal care, unwanted pregnancy) and other factors (smoking mothers, drug addicts, and alcohol) (Astuti, Nursalam, Devy, & Etika, 2019). However, the factors that exist in one region are different from one another, depending on geographical, socioeconomic, and cultural factors. LBW can have long-term effects on children's growth and development in the future. The impact of babies born with low weight is growth will be slow, tendency to have a lower intellectual appearance than babies with normal birth weight. LBW can experience mental and physical disorders at the age

of further growth and development that requires high maintenance costs. There are not just one cause of LBW, so prevention is sometimes difficult. We can reduce the prevalence of LBW in society by encouraging all adolescent girls' health care and getting all pregnant women to receive comprehensive antenatal care, improving the nutritional status of pregnant women and stopping smoking habits in pregnant women (Anggraeni, 2012). It is recommended to mothers to get pregnant / give birth between the ages of 20 - 35 years. Counseling of husband and wife to ensure that birth spacing is around 2-3 years. The general objective of this study was to analyze the risk factors for pregnant women (maternal characteristics, anemia, parity, regularity of the ANC and the history of maternal / family birth with LBW on the incidence of LBW infants.

RESEARCH METHODS

This type of research is an observational analytic study with a case control study design that was conducted retrospectively. The case study population was all mothers who gave birth to babies with LBW. Research site in the working area of Tanjungharjo Bojonegoro Community Health Center, 2018. Population of 22 mothers who gave birth to babies with LBW. While the control population was all mothers who gave birth to babies with a normal birth weight of 396.

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Sampling of cases with purposive sampling, while the way of control sampling is by simple random sampling and purposive sampling. Data is collected using a closed questionnaire, by sending respondents to the midwife in the local village. The data of this study were analyzed descriptively to find the frequency distribution of each variable. Chi square test was used to determine the effect of each variable on the incidence of LBW infants. To determine the effect of joint exposure of several risk factors that influence the incidence of LBW infants used is a multiple logistic regression test.

RESULTS AND DISCUSSION

Bivariate analysis test: Chi square test analysis results of the influence of risk factors on the incidence of LBW infants can be seen in table 1.

The results of the analysis test it can be seen that:

- Variables that significantly influence ($p < 0.005$) on the incidence of LBW infants are age and anemia characteristics.
- Age of pregnant women who are at risk, namely unhealthy reproductive age, 16.714 times more risk to give birth to LBW babies compared to pregnant women with healthy reproductive age.
- Pregnant women with anemia are 3,955 times more likely to give birth to LBW babies compared to non-anemic pregnant women.
- Variables that did not significantly influence ($p > 0.005$) on LBW infants were education, occupation, regularity of ANC examination and LBW delivery history..

Multivariate analysis test: The results showed that the variables that had a p value < 0.25 were age, anemia, parity and regularity of ANC examination, so that the four variables mentioned above were eligible for multivariate analysis test. The results of multivariate logistic regression analysis of the influence of risk factors for pregnant women on LBW infants are shown in table 2. The results showed that the risk factors for pregnant women that significantly influenced the incidence of LBW infants were age ($P = 0.009$) and anemia ($P = 0.014$). Age (Exp. B: 21,706) is more dominant influence on the incidence of LBW infants compared with anemia (Exp. B: 4,906).

DISCUSSION

Age of pregnant women is a risk factor for LBW (Sholicha H., 2016). LBW is related to the level of education. The life of a mother is related to female reproductive organs (Nurhayati, 2017). A healthy and safe reproductive age is 20-35 years. Pregnancies over the age of 35 have experienced a decline in physiological and reproductive functions in general. These are the things that produce children born with low birth weight (Proverawati A, 2010). The age of women giving birth less than 20 years was reported to have influenced the occurrence of LBW (Ganesh Kumar S., Harsha Kumar H.N., 2010). Young age to be a mother often makes these young mothers lack knowledge, education, experience, income and strength compared to mothers at a young age must bear the effects of judgment and often make an already difficult situation worse

(WHO, 2014). Factors affecting LBW include the nutritional status of the mother during pregnancy, anemia and gemmelli (Sulistiyorini D., 2015). Anemia of trimester I and II pregnant women increases the risk of low birth weight babies at Wangaya Denpasar Hospital also found that anemia of trimester I and II pregnant women increases the risk of LBW events (Labir I.K., Widarsa I.K.T., 2013). Iron nutrient anemia occurs due to insufficient nutrients absorbed from daily food for the formation of red blood cells, causing an imbalance between the distribution of oxygen to the tissue, which will reduce tissue metabolism, fetal growth will be delayed and result in LBW (Trihardiani, Ismi, 2011). Hem iron derived from animal food is more abundant and can be absorbed directly because it is ferro-shaped than fermented non-ferrous iron from plant foods (Utama T.A., Listiana N., 2013). Consumption of vegetables, especially green vegetables will contribute to iron (non-hem) which also plays a role in increasing HB levels (Banhidy F., 2011).

There is an age relationship, and no parity relationship with LBW events (Shabanikiya, Jafari, Gorgi, Seyedin, & Rahimi, 2019). Parity of a woman can affect the shape and size of the uterus (Cunningham F.G., Leveno K., Bloom S., Hauth J., Rouse D., 2010)., where the LBW risk of maternal and child mortality will increase if the distance of giving birth is too close, because the physical condition of the mother and uterus, especially with a short distance will cause the mother to be too tired due to pregnancy, childbirth, breastfeeding, caring for her child continuously (H, 2014).

In addition, mothers with high parity can cause placental and fetal implantation sites to be disrupted (Hermani Triredjeki, 2020). Other studies mention the relationship between Antenatal Care (ANC) examination and the incidence of low birth weight babies (LBW) (Nurhayati, 2017). ANC examination of pregnant women who are done early will easily find out the problems experienced by mothers during pregnancy and will more quickly take action that should be done to save the mother and fetus. The influence of regular ANC (Ante Natal Care) can influence medical travel to mothers as well as a lot of counseling about nutrition during pregnancy and childbirth action plans that can be given to mothers with poor obstetric history, have high parity and tight birth spacing (Labir I.K., Widarsa I.K.T., 2013).

LBW history is one of the dominant factors that lead to LBW birth. Mothers who have a history of LBW birth are 3.3 times more at risk of having LBW (Darmayanti S., Wilopo A., 2010). Preterm births and LBW tend to repeat in families, where families of mothers with a LBW history 3-4 times more at risk of LBW birth than mothers who have do not have a history of LBW (Ristrini, 2014). Anemia and parity are the most influential risk factors for LBW events (Chundrayetti E, Yulistini (2012). During pregnancy, there is relative anemia in the mother, ie hemodilution, which is the addition of a relative plasma volume greater than the volume of red blood cells. Hemodilution is a physiological adaptation to the circulatory system of pregnant women to meet the great needs of the uterus and fetus with hypertrophic vascular system (Cunningham F.G., Leveno K., Bloom S., Hauth J., Rouse D., 2010). Other rare causes are hemoglobinopathy, infamamasi process, chemical toxicity and malignancy (Utami, Susilaningrum, & Nursalam, 2019).

Table 1. Effect of riskfactors on the incidence of LBW infants

No	Variable	Asymp. Sig. (2-sided)	Estimate	Common Odds Ratio	
				Lower Bound	Upper Bound
		<i>p</i>			
1.	Characteristics of Pregnant Women	0,012	16,714	1,846	151,347
	a. Age of pregnant women				
	b. Education Pregnant women	0,097	0,394	0,131	1,186
	c. Occupation Pregnant women	0,412	1,714	0,473	6,212
2.	Anemia in pregnant women	0,017	3,955	1,275	12,269
3.	Parity	0,134	2,333	0,771	7,059
4.	Regularity of ANC examination	0,170	3,083	0,618	15,390
5.	LBW delivery history	0,473	2,111	0,275	16,213

Table 2. Multivariate Analysis Results Effects of riskfactors for pregnant women (age and anemia) on the incidence of LBW infants

No	Variable	P	Exp(B)	95.0% C.I. for EXP(B)	
				Lower	Upper
1	Age of Pregnant Women	0,009	21,706	2,144	219,768
3	Anemia in Pregnant Women	0,014	4,906	1,376	17,496

Conclusion

Based on the results of research and discussion described in the previous chapter, the following conclusions can be drawn:

- Characteristics of pregnant women that influence the incidence of LBW infants are the age of pregnant women. Age of pregnant women who are at risk, namely unhealthy reproductive age is 16.714 times more likely to give birth to LBW babies compared to pregnant women with healthy reproductive age.
- Anemia in pregnant women significantly influences the incidence of LBW infants. Pregnant women with anemia are 3.955 times more likely to give birth to LBW babies compared to pregnant women who are not anemic.
- Maternal parity does not significantly influence the incidence of LBW infants.
- The regularity of ANC examination of pregnant women does not significantly influence the incidence of LBW infants.
- Maternal / family history of labor did not significantly influence the incidence of LBW infants.
- Risk factors for pregnant women that significantly influence the incidence of LBW infants are the age of pregnant women (P = 0.009) and anemia in pregnant women (P = 0.014). Age of pregnant women (Exp. B: 21,706) is more dominant influence on the incidence of LBW infants compared to the effect of anemia on pregnant women (Exp. B: 4,906).

Suggestion

- Health Service Institutions need to re-arrange strategies to reduce the incidence of LBW infants, namely by increasing access to pregnancy prevention for FAC (Fertile Age Couples), especially for FAC with unhealthy reproductive age and maturation of the marriage age as well as preventing and controlling anemia in FAC through family support, leaders community / health cadre and related service / institution.

- Future research agenda can be carried out by conducting research on health human resources in the prevention of LBW infants.

REFERENCES

- Abdulmuthalib, 2010. *Kelainan Hematologik, Ilmu Kebidanan Sarwono Prawirohardjo*. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo.
- Affandi B., Albar E. 2011. *Kontrasepsi, Ilmu Kandungan*. Ed.3th. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo.
- Amalia, L.M., Sayono, 2015. *Faktor resiko kejadian abortus Rumah Sakit Islam Sultan Agung Semarang J. Kesehat. Masy. Indones*, 10 91)23-9
- Anggraeni, S. 2012. Analisis Proses Perbaikan Peayanan Kualitas Antenatal dengan metode Client Oriented Provider Effcent (COPE). *Journal Administrasi Dan Kebijakan Kesehatan*, 10(1).
- Astuti, E. S., Nursalam, N., Devy, S. R., & Etika, R. 2019. Mother's independence model within caring for low birth weight babies at home after hospital care based on mother factors, family support, and social support. *Indian Journal of Public Health Research and Development*, 10(10), 1685–1690. <https://doi.org/10.5958/0976-5506.2019.03085.7>
- Banhidy F., C. 2011. Iron deficiency anemia Pregnancy outcomes with or Without iron supplementation. *Nutrition. Pii*, 2(7), 65–72.
- Cunningham F.G., Leveno K., Bloom S., Hauth J., Rouse D., S. C. 2010. *Obstetri William* (23rd ed.). Jakarta: EGC.
- Darmayanti S., Wilopo A., N. S. 2010. Pengaruh Kenaikan Berat Badan Rata-rata Per Minggu pada Kehamilan Trimester II dan III Terhadap Resiko Berat Badan Bayi Lahir Rendah. *Berita Kedokteran Komunitas*, 1(26), 40–46.
- Ganesh Kumar S., Harsha Kumar H.N., J. S. 2010. Determinan of low birth weight A case control study in a district hospital in Karnataka. *The Indian Journal of Pediatrics*, 77(87).
- H, J. 2014. Hubungan Antara Umur dan Paritas Ibu Bersalin dengan Kejadian Berat Badan Lahir Rendah. *Gema Bidan Indonesia*, 8(2).
- Hermani Triredjeki, H. S. 2020. *Research article analysis of village midwife performance in handling neonatal asphyxia*. 07, 6797– 6800.

- Labir I.K., Widarsa I.K.T., S. K. 2013. Anemia ibu hamil trimester I dan II meningkatkan risiko kejadian berat bayi lahir rendah di RSUD Wangaya Denpasar. *Open Access & Peer Reviewed Multidisciplinary Journal of Public Health and Preventive Medicine. Midwives Through Complete Fulfillment of Maternal and Child Health (MCH) Bookin Bangkalan East*. 2013(17), 215–225.
- Nurhayati, R. 2017. Kejadian Berat Badan Lahir Rendah Di desa Tinelo Kabupaten Gorontalo dan Faktor Yang Mempengaruhinya. *J Gizi Pangan*, 12(1), 49–54. <https://doi.org/DOI: 10-25182/jg.2017.12.1.49-54>
- Proverawati A. 2010. *Berat Badan Kahir Rendah*. Yogyakarta: Nuha Medika.
- Ristrini, O. 2014. *Effort to Enhance Early Detection for Vulnerable Pregnancy by*
- Shabanikiya, H., Jafari, M., Gorgi, H. A., Seyedin, H., & Rahimi, A. 2019. Developing a practical toolkit for evaluating hospital preparedness for surge capacity in disasters. *International Journal of Disaster Risk Reduction*, 34, 423–428. <https://doi.org/10.1016/j.ijdr.2018.12.011>
- Sholicha H., S. S. 2016. Analisis resiko kejadian BBLR pada primigravida. In *e journal*.
- Sulistiyorini D., S. S. P. 2015. Analisis Faktor-Faktor Yang Mempengaruhi Kejadian BBLR Di Puskesmas Pedesaan Kabupaten Banjarnegara Tahun 2014. *Jurnal Penelitian/Journal for Research. Banjarnegara: Unit Penelitian Dan Pengabdian Masyarakat (UP2M) Politeknik Banjarnegara*, 1(1).
- Trihardiani, Ismi, P. 2011. *Faktor Resiko Kejadian BBLR di Wilayah Kerja Puskesmas Singkawang Timur dan Utara Kota Singkawang*. Unair.ac.id. Media Gizi Indonesia.
- Utama T.A., Listiana N., S. D. 2013. Perbandingan zat besi dengan tanpa vitamin C terhadap Kadar Hemoglobin Wanita Usia Subur. *Jurnal Kesehatan Masyarakat*, 1(7), 344–348.
- Utami, S., Susilaningrum, R., & Nursalam. 2019. The effect of health promotion based on the health promotion model with a peer group approach regarding the utilization of maternal and child health handbook. *Indian Journal of Public Health Research and Development*, 10(10), 1987–1992. <https://doi.org/10.5958/0976-5506.2019.03139.5>
- WHO. 2014. *Feto-Maternal Nutrition Targets 2025: Low Birth Weight Policy Brief*. Geneva: WHO.
- Wisnu, N. T. 2018. The Use of Role Play Method in Efforts to Improve Capability of Posyandu Cadres. *Health Notions*, 2(7), 775–778.
