



Martono Utomo &lt;mrmartono73@gmail.com&gt;

---

**IJRP Paper Submission: October 2021 Edition**

3 messages

**IJRP Paper Submission: October 2021 Edition** <bonk@ijrp.org>

Mon, Oct 4, 2021 at 2:19 PM

Reply-To: bonk@ijrp.org

To: mrmartono73@gmail.com

Dear **Martono Tri Utomo**,

Thank you for the research paper submission towards IJRP October 2021 Edition. The manuscript will undergo peer and formal review rounds within IJRP reviewer's network. Each submitted article is assigned a mandatory fifteen days of review period and the results will be notified accordingly.

**Save below information for further communication.**

Paper Title: "Analysis of Maternal Factors Affecting The Incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java"

Paper Reference ID: : 1008611020212317

**Author List**

#	Author Name	Author Email	Corresponding Author
1	Zulfa Nurusyafa Arofatulloh	<a href="mailto:zulfa.nurusyafa.arofatulloh-2018@fk.unair.ac.id">zulfa.nurusyafa.arofatulloh-2018@fk.unair.ac.id</a>	No
2	Martono Tri Utomo	<a href="mailto:mrmartono73@gmail.com">mrmartono73@gmail.com</a>	Yes
3	Linda Dewanti	<a href="mailto:lindaperisdiono@yahoo.com">lindaperisdiono@yahoo.com</a>	No

--

*Sincerely,*  
Editorial Assistant  
<https://ijrp.org/>

# Analysis of Maternal Factors Affecting The Incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java

Zulfa Nurusyafa Arofatulloh<sup>1</sup>, Martono Tri Utomo<sup>2\*</sup>, and Linda Dewanti<sup>1,3</sup>

<sup>1</sup>Department of Midwifery Education, Faculty of Medicine University Airlangga 60132, Surabaya, East Java, Indonesia

<sup>2</sup>Department of Child Health, Faculty of Medicine University Airlangga 60132, Surabaya, East Java, Indonesia

<sup>3</sup>Department of Public Health And Preventive Medicine, Faculty of Medicine University Airlangga 60132, Surabaya, East Java, Indonesia

<sup>2</sup>Email : mrmartono73@gmail.com

---

## Abstract

**Background:** Low birth weight (LBW) babies are one of the health problems that are a serious concern in several developing countries. Low birth weight (LBW) is a condition when a baby is born weighing < 2500 grams. LBW contributes 60%-80% of all neonatal deaths in the world. LBW can be caused by factors originating from the mother, fetus or from the surrounding environment. This study aims to analyze maternal factors that influence the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro, East Java. **Methods:** This research method is observational analytic with a case control research approach. The number of samples was 52 (26 groups of cases and 26 control groups), the sampling technique of the case group used total sampling and the control group used simple random sampling with the determination of inclusion criteria and exclusion criteria. The independent variables were Chronic Energy Deficiency (CED), maternal weight gain during pregnancy, gestational age at birth, comorbidities (anemia and pre-eclampsia), parity, pregnancy interval, and frequency of Antenatal Care (ANC). The dependent variable consisted of the case group (LBW) and the control group (Not LBW). The research data is secondary data in the form of a cohort of mothers and toddlers in January-December 2020. Data analysis is in the form of univariate and bivariate analysis. Statistical tests in the form of Chi-Square test and Fisher's Exact Test. **Results:** statistical test results obtained Chronic Energy Deficiency (CED) status  $p(\text{sig})=0,100$ , maternal weight gain during pregnancy  $p(\text{sig})=0,006$ , gestational age at birth  $p(\text{sig})=0.014$ , comorbidities (anemia and preeclampsia) anemia  $p(\text{sig})=1.247$  and preeclampsia  $p(\text{sig})=0.490$ , parity  $p(\text{sig}) = 0.554$ , gestational interval  $p(\text{sig})=0.056$ , frequency of Antenatal Care (ANC)  $p(\text{sig})=0.026$ . **Conclusion:** there is a correlation between maternal weight gain during pregnancy, gestational age at birth and frequency of Antenatal Care (ANC) and there is no significant correlation between Chronic Energy Deficiency (CED), comorbidities (anemia and preeclampsia), parity and distance pregnancy on the incidence of LBW at Kanor Health Center, Bojonegoro , East Java.

**Keywords:** Low Birth Weight Babies;Maternal Risk Factors;Health Problems

---

## I. Introduction

Low birth weight (LBW) is a condition where the baby at birth weighs <2500 grams [1]. Measurement of this baby's weight should ideally be carried out a few hours after the baby is born, before significant postpartum weight loss occurs [2]. The incidence of low birth weight babies (LBW) is one of the health problems that is still a concern in various countries, especially developing countries with low socioeconomic status. The weight of the baby at birth will affect the welfare of the baby itself and will have an important effect on growth and development as well as opportunities for defense in the future [3]. Babies weighing <2500 grams when they are born will make babies vulnerable to exposure to the surrounding environment. This situation makes LBW babies often get general complications, both short-term general complications and long-term general complications [4].

The incidence of low birth weight babies (LBW) is influenced by several factors, the factors that influence the incidence of LBW are very diverse. These factors can come from the mother, the condition of the fetus and environmental factors. Maternal factors may include age, parity, pre-pregnancy body mass index, hemoglobin level, poor obstetric history (history of stillbirth/neonatal death in previous pregnancies, three or more spontaneous abortions), pre-eclampsia, and compliance with maternal visits [5]. The fetal factors that may be a factor in the incidence of LBW are related to the pathological condition of the fetus that affects the growth and development of the intrauterine fetus, so that the baby is

born with low weight [6]. Conditions that can be a factor in the incidence of LBW include multiple pregnancies, hydramnios, chromosomal abnormalities, congenital defects and TORCH infections (Toxoplasma, Rubella, Cytomegalovirus and Herpes) in pregnancy [7]. In addition to maternal and fetal factors, there are also environmental factors which include exposure to cigarette smoke, both active and passive smokers, educational status and the economic status of mothers and families that affect maternal health status [8].

The incidence of low birth weight babies (LBW) contributes 60-80% of all neonatal deaths in the world, according to the global prevalence of LBW cases reaching 15.5% which means that 20 million LBW babies are born each year, and 95% of them are in developing countries. Developing [9]. The results of the study of seven multicenter areas in Indonesia obtained LBW rates with a susceptibility of 2.1-17.2%, while in East Java the infant mortality rate (IMR) and neonatal mortality rate (NMR) showed an absolute number of 4,016 babies died per year and was 4,338 children under five die per year [10]. According to statistical records, from the province of East Java from 2020 to June, Bojonegoro Regency was ranked 2nd after Jember Regency with the highest number of IMR in East Java. This case was dominated by the incidence of neonatal complications of 60% [11]. Neonatal complications include prematurity and/or low birth weight (LBW) infants, newborn infections, and infants with asphyxia. According to the Bojonegoro District Health Office report, 2020 LBW and prematurity still the main causes of infant mortality in Bojonegoro district. Data from the East Java statistical agency, Bojonegoro district, has 811 LBW cases out of 16,785 baby births in Bojonegoro district [12].

The results of the initial survey at the Kanor Health Center conducted in March 2021. It is estimated that the number of LBW in January-December 2020 reached 39 cases out of 799 births, with the number of births per month between 20-30 births assisted by midwives at the Kanor Health Center. Meanwhile, the infant mortality rate at the Kanor Public Health Center reached 8 cases from January to December 2020. From the survey results, it was also found that the characteristics of the population in Kanor sub-district, Bojonegoro district are village residents whose majority still believe in the ancestral culture that developed in the community. One of these cultures is the existence of dietary restrictions on the mother during her pregnancy, the dietary restrictions that are followed by the mother are allegedly able to affect the welfare of the mother and fetus during pregnancy. From this explanation, it is necessary to have this study with the aim of analyzing maternal factors that influence the incidence of low birth weight babies (LBW) at Kanor Health Center, Bojonegoro Regency. The hypothesis of this study is that there is a relationship between Chronic Energy Deficiency (CED), maternal weight gain during pregnancy, gestational age at birth, comorbidities (anemia and preeclampsia), exposure to cigarette smoke, parity, pregnancy interval, and frequency of Antenatal Care (ANC) to the incidence of low birth weight babies (LBW) at Kanor Health Center, Bojonegoro , East Java.

## **II. Method**

This research is an observational analytic research type with a case control approach. The population in this study were all mothers who gave birth with the incidence of low birth weight (LBW) with a total of 39 cases and mothers who gave birth without LBW in January-December 2020 at the Kanor Health Center, Bojonegoro Regency, East Java. The sampling technique used is non-probability sampling with sampling in the case group (LBW) using total sampling and in the control group (not LBW) using simple random sampling. With a ratio of 1:1, there were 52 samples consisting of 26 case groups and 26 control groups.

The independent variables in this study were Chronic Energy Deficiency (CED), maternal weight gain during pregnancy, gestational age when the baby was born, comorbidities (anemia and preeclampsia), exposure to cigarette smoke, parity, pregnancy interval, and frequency of Antenatal Care (ANC). The dependent variable consisted of the case group (LBW) and the control group (Not LBW). In this study, the data used were secondary data in the form of cohort data for mothers and children under five who were recorded at the Kanor Health Center. Processing techniques include editing, coding, entry, cleaning,

data tabulation and data analysis. Data analysis in this study used univariate and bivariate analysis. Bivariate analysis used statistical tests in the form of Chi-Square test and Fisher's Exact Test.

### III. Result

Respondents in this study were 52 respondents consisting of 26 case groups, namely mothers who gave birth to low birth weight babies (LBW <2500 grams) and the control group, namely mothers who gave birth to babies with low birth weight (not LBW 2500 grams). The following table provides an overview of the characteristics of mothers who are respondents in this study:

Table 1. General Characteristics of Research Subjects in the Case Group and Control Group at Kanor Health Center, Bojonegoro Regency, East Java

Characteristics		N	%
<b>Mother's Age</b>	20-34 Years	44	84,62
	≥ 35 Years	8	15,38
<b>LBW</b>	LBW	26	50
	Not LBW	26	50
<b>BMI Before Pregnancy</b>	Underweight (<18,5)	8	15,38
	Normal (18,5-24,9)	35	67,31
	Overweight (25,0-29,9)	7	13,46
	Obesity (≥30)	2	3,85
<b>Weight during childbirth</b>	<50 Kg	3	5,77
	50-60 Kg	24	46,15
	>60 Kg	25	48,08
<b>Height</b>	Short 145 cm	3	5,77
	Not Short >145 cm	49	94,23
<b>Gestational Age when the Baby is Born</b>	Term (≥37 weeks)	37	71,15
	Premature (<37 weeks)	15	28,85
<b>Chronic energy deficiency (CED)</b>	CED (<23,5 cm)	12	23,08
	Not CED (≥23,5 cm)	40	76,92
<b>Weight Gain</b>	Normal	27	51,92
	Abnormal	25	48,08
<b>Parity</b>	Primipara	17	32,69
	Multipara and Grande Multipara	35	67,31
<b>Pregnancy Distance</b>	Close (<2 years)	4	7,69
	Not Close (≥2 years old and Primipara)	48	92,31
<b>Comorbidities (Anemia and Preeclampsia)</b>	Anemia	23	44,23
	No Anemia	29	55,77
	Preeclampsia	2	3,85
	No Preeclampsia	50	96,15
<b>Frequency of Antenatal Care (ANC)</b>	Standard (≥4 Times)	29	55,77
	Non-standard (<4 times)	23	44,23

Table 2. The Correlation of Chronic Energy Deficiency (CED) to the Incidence of Low Birth Weight Babies (LBW)

Chronic energy deficiency (CED)	Birth Weight				Chi-square Test p(sig)
	LBW		Not LBW		
	N	%	N	%	
<b>CED (MUAC&lt;23,5)</b>	9	34,62	3	11,54	0,100
<b>Not CED (MUAC ≥23,3)</b>	17	65,38	23	88,46	

From table 2 it is found that  $p(\text{sig}) > 0.05$ , it can be interpreted that there is no significant correlation between chronic energy deficiency (CED) and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

Table 3. The Correlation of Maternal Weight Gain During Pregnancy to the Incidence of Low Birth Weight Babies (LBW)

Weight Gain	Birth Weight				Chi-square Test p(sig)
	LBW		Not LBW		
	N	%	N	%	
<b>Abnormal</b>	18	69,23	7	26,92	0,006
<b>Normal</b>	8	30,77	19	73,08	

From table 3 it is found that  $p(\text{sig}) < 0.05$ , it can be interpreted that there is a significant correlation between maternal weight gain during pregnancy and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

Table 4. The Correlation of Gestational Age at Birth to Low Birth Weight (LBW) Babies

Gestational Age	Birth Weight				Chi-square Test p(sig)
	LBW		Not LBW		
	N	%	N	%	
<b>Premature (&lt;37 Weeks)</b>	12	46,15	3	11,54	0,014
<b>Term (≥37 Weeks)</b>	14	53,85	23	88,46	

From table 4 it is found that  $p(\text{sig}) < 0.05$ , it can be interpreted that there is a significant correlation between gestational age when the baby is born and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

Table 5. The Correlation of comorbid disorders (anemia and preeclampsia) to the incidence of low birth weight babies (LBW)

Anemia comorbid disorders	Birth Weight				Chi-square Test p(sig)
	LBW		Not LBW		
	N	%	N	%	
No Anemia	12	46,15	17	65,38	1,247
Anemia	14	53,85	9	34,62	
Preeclampsia comorbid disorders	Birth Weight				Chi-square Test p(sig)
	LBW		Not LBW		
	N	%	N	%	
No Preeclampsia	24	92,31	26	100	0,490
Preeclampsia	2	7,69	0	0	

From table 5 it is found that  $p(\text{sig}) > 0.05$ , it can be interpreted that there is no significant correlation between comorbid disorders (anemia and preeclampsia) with the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

Table 6. The Correlation of Parity to the Incidence of Low Birth Weight (LBW) Babies

Parity	Birth Weight				Chi-square Test p(sig)
	LBW		Not LBW		
	N	%	N	%	
Primipara	10	38,46	7	26,92	0,554
Multipara and Grande Multipara	16	61,54	19	73,08	

From table 6 it is found that  $p(\text{sig}) > 0.05$ , it can be interpreted that there is no significant correlation between parity and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

Table 7. The Correlation between Pregnancy Distance and Low Birth Weight (LBW) Infants

Pregnancy Distance	Birth Weight				Fisher's Exact Test p(sig)
	LBW		Not LBW		
	N	%	N	%	
Close (<2 Years)	1	6,25	3	15,79	0,610
Not Close ( $\geq 2$ Years)	25	93,75	23	84,21	

From table 7 it is found that  $p(\text{sig}) > 0.05$ , it can be interpreted that there is no significant correlation between gestational distance and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

Table 8. The Correlation of Antenatal Care (ANC) Frequency to the Incidence of Low Birth Weight (LBW) Babies

<i>Antenatal Care (ANC) Frequency</i>	<i>Birth Weight</i>				<i>Chi-square Test</i>
	<i>LBW</i>		<i>Not LBW</i>		
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	
<b>Non-standard (&lt;4 Times)</b>	16	61,54	7	44,23	0,026
<b>Standard (≥4 Times)</b>	10	38,46	19	55,77	

From table 8 it is found that  $p(\text{sig}) < 0.05$ , it can be interpreted that there is no significant correlation between the frequency of antenatal care (ANC) with the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

#### IV. Discussion

##### 4.1 *The Correlation of Chronic Energy Deficiency Status (KEK) to the Incidence of Low Birth Weight Babies (LBW)*

Determination of DEC is based on the measurement of upper arm circumference (MUAC), mothers who have  $MUAC < 23.5$  belong to mothers with DEC status, mothers who have  $MUAC \geq 23.5$  belong to mothers with no DEC status. Table 2 shows that mothers who gave birth to LBW and mothers who gave birth to non-LBW were equally dominated by mothers who had no DEC status. Supported by the results of statistical tests using the chi-square test  $p(\text{sig}) > 0.05$  which means that there is no significant correlation between chronic energy deficiency (DEC) status and the incidence of low birth weight (LBW) infants at the Kanor Health Center, Bojonegoro regency, East Java.

The results of research such as research conducted by H., Cynthia Putri, P., Siti Fatimah, and M., Zen Rahfiludin (2017) which found that there was no correlation between chronic energy deficiency (CED) status and the incidence of LBW in the work area Public health center Undaan, Undaan Subdistrict, Kudus Regency with  $p(\text{sig}) = 0.127$  [13]. However, the results of the study are not in line with the research conducted by Fatimah and Yuliani (2019) which found that there was a correlation between chronic energy deficiency (CED) status and the incidence of LBW in the work area Public health center Rajadesa  $p(\text{sig}) = 0.000$  [14]. The MUAC measurement in Indonesia can be used to measure nutrition in early pregnancy, the MUAC measurement in Indonesia is a tool to measure nutritional estimates in early pregnancy for the mother and this method is considered effective because in general women in Indonesia do not know their pre-pregnancy weight so that BMI cannot be known for determine the nutritional status of the mother [15].

##### 4.2 *The Correlation of Maternal Weight Gain During Pregnancy To The Incident Of Low Birth Weight Babies (LBW)*

Maternal weight gain during pregnancy was calculated from weight at the end of pregnancy minus weight at the beginning of pregnancy, weight gain was adjusted for weight gain according to the mother's body mass index (BMI). From table 3, mothers who gave birth to LBW were dominated by mothers who had insufficient weight gain, while mothers who gave birth to not LBW were dominated by mothers who had sufficient weight gain. Supported by the results of statistical tests using the chi-square test  $p(\text{sig}) < 0.05$ , which means that there is a significant correlation between maternal weight gain and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro regency, East Java.

The results of this study are in line with research conducted by Asniatin (2017) which states that there is a correlation between weight gain during pregnancy and the incidence of LBW at the Sentolo I

Health Center Kulon Progo with  $p(\text{sig}) = 0.011$  [16]. However, this is not in line with the research conducted by Salsabila (2018) which stated that there was no correlation between weight gain during pregnancy and the incidence of LBW in Dr. Soewandhie hospital Surabaya with  $p(\text{sig})=0.494$  [17]. Maternal weight gain during pregnancy is often associated with components during pregnancy, namely components in the fetus and tissues in the mother [18].

#### 4.3 *The Correlation of Gestational Age at Birth to Low Birth Weight Babies (LBW)*

Gestational age is defined as the gestational age at the termination of a pregnancy. Gestational age at birth is divided into 3, namely preterm gestational age (<37 weeks), term gestational age ( $\geq 37$  weeks) and gestational age postterm gestational age (> 42 weeks). From table 4, it is found that at term gestational age (<37 weeks) it is dominated by mothers who give birth to LBW, while at term gestational age ( $\geq 37$  weeks) it is dominated by mothers who give birth to LBW. Supported by the results of statistical tests using the chi-square test  $p(\text{sig}) < 0.05$ , which means that there is a significant correlation between gestational age at birth and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro regency, East Java.

The results of this study are in line with Septiani and Ulfa (2018) which states that there is a correlation between gestational age when the baby is born with the incidence of LBW in the working area of the Peudada Public Health Center, Bireuen Regency with a value of  $p(\text{sig}) = 0.012$  [19]. The results of this study are also in line with the research of Purwanto and Wahyuni, (2016) which states that there is a correlation between gestational age when the baby is born and the incidence of LBW at the Kedangsari Mother and Child Hospital in Surabaya [20].

#### 4.4 *The Correlation of Comorbid Disorders (Anemia and Preeclampsia) to the Incidence of Low Birth Weight Babies (LBW)*

Disorders of comorbidities can be seen from the health history records of pregnant women. From table 5 it is found that in mothers who gave birth to low birth weight and had history of anemia there were 14 respondents and in mothers who did not have history of anemia there were 12 respondents. Mothers who gave birth without LBW were dominated by mothers who did not have the history of anemia. Based on the statistical test using the chi-square test  $p(\text{sig}) > 0.05$ . Meanwhile, in preeclampsia comorbid disorders, mothers who gave birth to LBW and gave birth to non-LBW were dominated by mothers who did not have comorbidities of preeclampsia. Based on the statistical test using the chi-square test  $p(\text{sig}) > 0.05$ . From these results, it can be concluded that there is no significant correlation between comorbid disorders (anemia and preeclampsia) on the incidence of low birth weight babies (LBW) at Kanor Health Center, Bojonegoro regency, East Java.

The results of this study are in line with the research of Irawati, Suyatmi Nova (2020) which showed that there was no correlation between anemia and LBW in Wirun Village, Mojolaban District, Sukoharjo Regency with  $p(\text{sig})=0.266$  [21]. However, this is not in line with the results of the research by Pratiwi, Ismail and Rokhanawati (2018) which showed that there was a correlation between anemia and the incidence of LBW in Banjarnegara regency by showing  $p(\text{sig})$  of 0.000 [22]. The results of this study are in line with Lestari, Ulfa and Maryam (2015) which stated that there was no correlation between preeclampsia and the incidence of LBW in Dr. H. Moch. Ansari Saleh hospital Banjarmasin with  $p(\text{sig})=0.539$  [23]. However, this study is not in line with Sari (2021) who found that there was a correlation between preeclampsia and LBW mothers with  $p(\text{sig})=0.000$  [24].

#### 4.5 *The Correlation of Parity to the Incidence of Low Birth Weight Babies (LBW)*

Parity is measured by how many mothers experience labor. Parity is divided into 3, namely primiparous mothers (first time giving birth), multipara (delivery 1 to 5 times), and grande multipara (delivery 6 times). From table 6 it is found that mothers who gave birth to LBW, as many as 10



respondents had primiparous status and 16 respondents had multipara status. In mothers who gave birth without LBW, 7 respondents were primiparous and 19 respondents were multipara. And none of the respondents had grande multipara status. Based on the results of statistical tests, the results of the chi-square test were  $p(\text{sig}) > 0.05$ . From these results, it can be concluded that there is no significant correlation between parity and the incidence of low birth weight babies (LBW) at Kanor Health Center, Bojonegoro Regency, East Java.

The results of this study are in line with Salsabila's research (2018) which shows that there is no significant correlation between parity and the incidence of LBW in Dr. Soewandhie Surabaya hospital with a large  $p(\text{sig})=0,364$  [17]. However, the results of the study are not in line with the research by Handayani, Fitriani and Lestari (2019) which found that there was a significant correlation between parity and the incidence of LBW in the Wates Health Center area of Kulon Progo Regency with a large  $p(\text{sig})=0.037$  [25]. according to statistics, mothers who have parity or the number of deliveries  $> 4$  times will tend to increase the risk of experiencing complications in pregnancy [26].

#### *4.6 The Correlation between Pregnancy Distance and Low Birth Weight (LBW) Infants.*

The pregnancy interval in this study was categorized into two, close ( $< 2$  years) and not close ( $\geq 2$  years and primipara). From table 7, it is found that mothers who gave birth to LBW and mothers who gave birth to not LBW were both dominated by mothers whose pregnancies were not too close apart. Based on the results of statistical tests using fisher's exact test,  $p(\text{sig}) > 0.05$ . From these results, it can be concluded that there is no significant correlation between gestational distance and the incidence of low birth weight (LBW) babies at Kanor Health Center, Bojonegoro Regency, East Java.

The results of this study are in line with the research of Jayanti, Dharmawan and Aruben (2017) which showed that there was no correlation between the distance of pregnancy and the incidence of LBW in the work area of the Bangetayu Health Center Semarang City in 2016 with a large  $p(\text{sig}) = 0.171$  [27]. However, these results are not in line with Saraswati's research (2017) which has the result that there is a correlation between the distance of pregnancy and the incidence of LBW in Dr. Wahidin Sudiro Husodo Hospital, Mojokerto Regency [28]. In theory, mothers who have too short a pregnancy interval will increase the risk of pregnancy such as bleeding complications during pregnancy, premature delivery, severe anemia which leads to low birth weight [29].

#### *4.7 The Correlation between Antenatal Care (ANC) Frequency and the Incidence of Low Birth Weight Babies (LBW)*

The frequency of antenatal care (ANC) was calculated from the number of pregnant women who made ANC visits. Antenatal care guidelines (ANC) used in this study were at least 4 times during pregnancy. According to the Regulation of the Minister of Health of the Republic of Indonesia in 2014 concerning Health Services for the Pre-pregnancy, Pregnancy, Childbirth, and Postnatal Periods, Implementation of Contraceptive Services, and Sexual Health Services, it is stated that K4 visits to ANC are one of the indicators of maternal health during pregnancy. Table 8 shows that mothers who gave birth to LBW were dominated by mothers who had ANC frequencies that were not up to standard ( $< 4$  times) while mothers who gave birth to not LBW were dominated by mothers who had ANC frequencies according to standards ( $\geq 4$  times). Based on the results of statistical tests, the results of the chi-square test  $p(\text{sig}) < 0.05$ , which means that there is a significant correlation between the frequency of antenatal care (ANC) and the incidence of low birth weight (LBW) babies at the Kanor Health Center, Bojonegoro Regency, Java. East.

The results of this study are in line with the research of Fatimah, Utama and Sastri (2017) which states that there is a correlation between the frequency of ANC and the incidence of LBW in Dr. M Djamil Padang hospital with a large  $p(\text{sig})=0.026$  [30]. These results are also in line with the research of Riyanto, Juhaeriah and Meitriani (2019) which states that there is a correlation between the frequency

of ANC and the incidence of LBW at the Rajamandala Health Center, West Bandung Regency in 2018 with a large  $p(\text{sig})=0.0001$  [31]. Antenatal care (ANC) is one of the efforts to increase early detection of the risk of complications that may occur to the mother during pregnancy that affect the welfare of the fetus. With ANC services at each local health service, it is expected to improve the welfare of the mother and the fetus she contains until delivery [32].

## V. Conclusion

Based on the results of the analysis and discussion that have been discussed previously, regarding the correlation between Chronic Energy Deficiency (CED), maternal weight gain during pregnancy, gestational age at birth, comorbidities (anemia and preeclampsia), parity, pregnancy interval, and frequency of Antenatal Care (ANC) on the incidence of LBW at the Kanor Health Center, Bojonegoro Regency, East Java, in conclusion is :

1. There is no significant correlation between Chronic Energy Deficiency (CED) status in pregnant women and the incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java with  $p(\text{sig})=0,100$ .
2. There is a significant correlation between maternal weight gain during pregnancy and the incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java with  $p(\text{sig})=0.006$ .
3. There is a significant correlation between gestational age at birth and the incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java with  $p(\text{sig})=0.014$ .
4. There is no significant correlation between the status of comorbidities (anemia, preeclampsia) and the incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java with  $p(\text{sig})$  anemia = 1,247 and  $p(\text{sig})$  preeclampsia = 0.490 .
5. There is no significant correlation between maternal parity status and the incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java with  $p(\text{sig})=0.554$ .
6. There is no significant correlation between pregnancy distance and the incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java with  $p(\text{sig})=0.610$ .
7. There is a significant correlation between the frequency of Antenatal Care (ANC) on the incidence of Low Birth Weight Babies (LBW) at Kanor Health Center, Bojonegoro Regency, East Java with  $p(\text{sig})=0.026$ .

## VI. Acknowledgements

The author would like to express his deepest gratitude to the head of the Kanor Health Center, Bojonegoro Regency, East Java who has given permission to conduct research in that place, the supervisor who has guided during the research process and preparation of this manuscript and the researcher does not forget to thank his parents and friends. Researchers who have provided support for researchers to complete this research well.

## References

- [1] L. M. Stevens, C. Lynn, and R. M. Glass, "Low birth weight," *J. Am. Med. Assoc.*, vol. 287, no. 2, p. 270, 2002, doi: 10.1001/jama.287.2.270.
- [2] C. L. Cutland *et al.*, "Low birth weight: Case definition & guidelines for data collection, analysis, and presentation of maternal immunization safety data," *Vaccine*, vol. 35, no. 48. Elsevier Ltd, pp. 6492–6500, Dec. 04, 2017, doi: 10.1016/j.vaccine.2017.01.049.
- [3] I. Hartiningrum and N. Fitriyah, "Bayi Berat Lahir Rendah (BBLR) di Provinsi Jawa Timur Tahun 2012-2016," *J. Biometrika dan Kependud.*, vol. 7, no. 2, p. 97, 2019, doi: 10.20473/jbk.v7i2.2018.97-104.
- [4] Stanford Children Health, "Low Birth Weight," 2018. <https://www.stanfordchildrens.org/en/topic/default?id=low-birthweight-90-P02382> (accessed Apr. 08, 2021).
- [5] G. Singh, R. Chouhan, and K. Sidhu, "Maternal factors for low birth weight babies," *Med. J. Armed Forces India*, vol. 65, no. 1, pp. 10–12, 2009, doi: 10.1016/S0377-1237(09)80045-2.

- [6] A. Khan, F. D. Nasrullah, and R. Jaleel, "Frequency and risk factors of low birth weight in term pregnancy," *Pakistan J. Med. Sci.*, vol. 32, no. 1, pp. 138–142, 2016, doi: 10.12669/pjms.321.8120.
- [7] D. Widianingsih, "Faktor-Faktor Yang Mempengaruhi Kejadian Bayi Berat Lahir Rendah Pada Ibu Melahirkan Di Ruang Perinatologi Rumah Sakit Umum Daerah 45 Kuningan," *keperawatan*, 2011.
- [8] A. Fajriana and A. Buanasita, "Faktor Risiko Yang Berhubungan Dengan Kejadian Bayi Berat Lahir Rendah Di Kecamatan Semampir Surabaya," *Media Gizi Indones.*, vol. 13, no. 1, p. 71, 2018, doi: 10.20473/mgi.v13i1.71-80.
- [9] "WHO | Care of the preterm and low-birth-weight newborn," *WHO*, 2018, Accessed: Nov. 05, 2020. [Online]. Available: [http://www.who.int/maternal\\_child\\_adolescent/newborns/prematurity/en/](http://www.who.int/maternal_child_adolescent/newborns/prematurity/en/).
- [10] Dinkes Provinsi Jawa Timur, "Profil Kesehatan Jawa Timur 2018," *Dinas Kesehat. Provinsi Jawa Timur*, p. 100, 2019, [Online]. Available: [https://www.google.com/search?client=firefox-b-d&ei=zxpWXtieKq6c4-EPzvSfyAs&q=profil+kesehatan+jawa+timur+2018&oq=profil+kesehatan+jawa+timur+2018&gs\\_l=psy-ab.3..0i7i30l10.98332.105008..105951...0.4..0.1459.7810.2-1j0j2j2j2j3.....0....1..gws-wiz.....0i](https://www.google.com/search?client=firefox-b-d&ei=zxpWXtieKq6c4-EPzvSfyAs&q=profil+kesehatan+jawa+timur+2018&oq=profil+kesehatan+jawa+timur+2018&gs_l=psy-ab.3..0i7i30l10.98332.105008..105951...0.4..0.1459.7810.2-1j0j2j2j2j3.....0....1..gws-wiz.....0i).
- [11] Dinkes Kabupaten Bojonegoro, "Dinas Kesehatan Kabupaten Bojonegoro," 2020. <https://dinkes.bojonegorokab.go.id/berita/baca/49> (accessed May 22, 2021).
- [12] "BPS Provinsi Jawa Timur." <https://jatim.bps.go.id/statictable/2019/10/09/1675/jumlah-bayi-lahir-bayi-berat-badan-lahir-rendah-bblr-dan-bergizi-kurang-di-provinsi-jawa-timur-menurut-kabupaten-kota-2018-.html> (accessed Nov. 05, 2020).
- [13] C. P. H, siti F. P, and Z. R. M, "Faktor-Faktor yang Berhubungan Dengan Kejadian erat Badan Lahir Rendah (BBLR) Di Kabupaten Kudus," *J. Kesehat. Masy.*, vol. 5, 2017.
- [14] S. Fatimah and N. T. Yuliani, "Hubungan Kurang Energi Kronis (Kek) Pada Ibu Hamil Dengan Kejadian Berat Bayi Lahir Rendah (Bblr) Di Wilayah Kerja Puskesmas Rajadesa Tahun 2019," *J. Midwifery Public Heal.*, vol. 1, no. 2, 2019, doi: 10.25157/jmph.v1i2.3029.
- [15] D. E. Ariyani, E. L. Achadi, and A. Irawati, "Validitas Lingkar Lengan Atas Mendeteksi Risiko Kekurangan Energi Kronis pada Wanita Indonesia," *Kesmas Natl. Public Heal. J.*, vol. 7, no. 2, p. 83, 2012, doi: 10.21109/kesmas.v7i2.67.
- [16] N. Asniatin, "Hubungan Pertambahan Berat Badan Ibu Selama Hamil Dengan Kejadian Bayi Berat Lahir Rendah," *poiliteknik kesehatan kementerian kesehatan yogyakarta*, 2017.
- [17] J. H. Salsabila, "Karya Tulis Ilmiah Faktor Risiko Yang Mempengaruhi Kejadian Bayi Dengan Berat Lahir Rendah (BBLR) Di RSUD DR. M.Soewandhie Surabaya," Universitas Airlangga, 2018.
- [18] D. Ifalaha and F. I. Wulandari, "Hubungan Penambahan Berat Badan Ibu Selama Hamil Dengan Berat Badan Bayi Baru Lahir Di RB An-Nuur Karanganyar," *J. Ilm. Rekam Medis dan Inform. Kesehat.*, vol. 5, no. 2, pp. 23–33, 2015.
- [19] M. Septiani and M. Ulfa, "Faktor-Faktor yang Berhubungan dengan Kejadian BBLR di Wilayah Kerja Puskesmas Pseudada Kabupaten Bireuen," *J. Healthc. Technol. Med.*, vol. 4, no. 2, p. 258, 2018, doi: 10.33143/jhtm.v4i2.214.
- [20] A. D. Purwanto and C. U. Wahyuni, "Hubungan Antara Umur Kehamilan, Kehamilan Ganda, Hipertensi dan Anemia Dengan Bayi Berat Lahir Rendah (BBLR)," *J. Berk. Epidemiol.*, vol. 4, no. 3, pp. 384–395, 2016, doi: 10.20473/jbe.v4i3.
- [21] S. N. Irawati, "Hubungan Anemia Dan Kekurangan Energi Kronis (KEK) Pada Ibu Hamil Dengan Kejadian Bayi Berat Lahir Rendah (BBLR) Di Desa Wirun Kecamatan Mojolaban Kabupaten Sukoharjo," Universitas Muhammadiyah Surakarta, 2020.
- [22] A. M. Pratiwi, D. Ismail, and D. Rokhanawati, "Hubungan Anemia Pada Ibu Hamil Dengan Kejadian Bayi Berat Badan Lahir Rendah Di Kabupaten Banjarnegara," 'Aisyiyah Yogyakarta, 2018.
- [23] R. D. Lestari, I. M. Ulfa, and S. Maryam, "Hubungan Umur, Paritas, dan Preeklampsia dengan Kejadian Berat Badan Lahir Rendah di RSUD Dr. H. Moch. Ansari Saleh Banjarmasin," *J. Din. Kesehat.*, vol. 6, no. 1, pp. 95–106, 2015, [Online]. Available: [http://akbidsarimulia.ac.id/ejurnal/download.php?file=reny dl dan ika mu 95-106.pdf](http://akbidsarimulia.ac.id/ejurnal/download.php?file=reny%20dan%20ika%20mu%2095-106.pdf).
- [24] A. I. Sari, "Hubungan Ibu Preeklamsia dengan Kejadian BBLR di RSD Balung Kabupaten Jember," *Ovary Midwifery J.*, pp. 77–80, 2021, [Online]. Available: <http://www.ovari.id/index.php/ovari/article/view/30>.
- [25] F. Handayani, H. Fitriani, and C. I. Lestari, "Hubungan Umur Ibu Dan Paritas Dengan Kejadian Bblr

- Di Wilayah Puskesmas Wates Kabupaten Kulon Progo,” *Midwifery J. J. Kebidanan UM. Mataram*, vol. 4, no. 2, p. 67, 2019, doi: 10.31764/mj.v4i2.808.
- [26] I. Kumalasari, R. S. Tjekyan, and M. Zulkarnain, “Faktor Resiko Dan Angka Kejadian Berat Badan Lahir Rendah (Bblr) Di Rsup Dr. Mohammad Hoesin Palembang Tahun 2014,” *J. Ilmu Kesehatan Masy.*, vol. 9, no. 1, pp. 41–52, 2018, doi: 10.26553/jikm.2018.9.1.41-52.
- [27] F. A. Jayanti, Y. Dharmawan, and R. Aruben, “Faktor-Faktor yang Berhubungan dengan Kejadian Berat Badan Lahir Rendah di Wilayah Kerja Puskesmas Bangetayu Kota Semarang Tahun 2016,” *J. Kesehat. Masy.*, vol. 5, no. 4, pp. 812–822, 2017.
- [28] C. Saraswati, “Hubungan Jarak Kehamilan Dengan Kejadian BBLR Di RSUD Dr. Wahidin Sudrio Husodo Kab. Mojokerto,” Sekolah Tinggi Ilmu Kesehatan Insan Cendekia Medika Jombang, 2017.
- [29] U. Yniantini, “Hubungan Antara Usia dan Jarak Kehamilan Sebelumnya Dengan Berat Bayi Lahir Rendah Di RS Gunung Kidul Yogyakarta Tahun 2016,” Universitas Aisyiyah Yogyakarta, 2017.
- [30] N. Fatimah, B. I. Utama, and S. Sastri, “Hubungan Antenatal Care dengan Kejadian Bayi Berat Lahir Rendah pada Ibu Aterm di RSUP Dr. M. Djamil Padang,” *J. Kesehat. Andalas*, vol. 6, no. 3, p. 615, 2017, doi: 10.25077/jka.v6.i3.p615-620.2017.
- [31] A. Riyanto, J. Juhaeriah, and A. N. Meitriani, “Kejadian Berat Bayi Lahir Rendah Di Puskesmas Rajamandala Kabupaten Bandung Barat Tahun 2018 ( Studi Data Sekunder ),” vol. 2, no. 1, pp. 104–112, 2019.
- [32] W. Nuraisya, “Deteksi Risiko Tinggi Kehamilan Pada Pelayanan ANC Terpadu di Puskesmas Bendo Kabupaten Kediri,” *J. Kesehat. Andalas*, vol. 7, no. 2, pp. 240–245, 2018.



Martono Utomo &lt;mrmartono73@gmail.com&gt;

## IJRP October 2021 Edition: Letter of Acceptance

2 messages

**IJRP October 2021 Edition: Letter of Acceptance** <bonk@ijrp.org>

Wed, Oct 6, 2021 at 3:43 PM

Reply-To: bonk@ijrp.org

To: zulfa.nurusyafa.arofatulloh-2018@fk.unair.ac.id, mrmartono73@gmail.com, lindaperisdiono@yahoo.com

Dear Author,

We are delighted to inform that your research paper has been Accepted for Publication in International Journal of Research Publications (IJRP) **October 2021** Edition.

\*\* Please send total registration fee- **41.96 USD** (40 USD Registration fees+ 1.96 USD for PayPal transaction fees) to our PayPal account: "[editor.ijrp@gmail.com](mailto:editor.ijrp@gmail.com)" or click here to visit the Payment [Link](#)

Note: Since we have selected a limited number of papers for the **October 2021** , Can you do the formalities by **20 Oct 2021** If you have any query, please let us know ASAP.

**Paper Title: "Analysis of Maternal Factors Affecting The Incidence of Low Birth Weight (LBW) at Kanor Health Center, Bojonegoro Regency, East Java"**

**Paper Reference ID : 1008611020212317**

### Reviewer Comments:

Status: **Accepted**

Reason: **Conclusion: There is a correlation between maternal weight gain during pregnancy, gestational age at birth and frequency of Antenatal Care and there is no significant correlation between Chronic Energy Deficiency (CED), comorbidities (anemia and preeclampsia), parity and distance pregnancy on the incidence of LBW. The sample size of this study is small. The next study with a large sample size to confirm this relationship better.**

### REFEREE'S REPORT: SUMMARY SHEET:

EVALUATION CRITERIA	SCORE(0-10)
1. Relevance of Topic	6
2. Scholarly Quality	5
3. English Usage	6
4. Use of Theory	6
5. Novelty and Originality of the idea	6

6. Technical Content and Correctness	5
7. Critical Qualities	5
8. Clarity of Conclusions	5
<b>Total Score</b>	<b>6</b>

\*\* Please take note, plagiarism of the final manuscript should be less than 30%

**The important deadlines regarding publication are as follows:**

**Camera-ready paper submission: 20 Oct 2021**

**Copyright transfer: 20 Oct 2021**

**You are requested to re-submit your paper as Camera Ready Copy (CRC) in DOC/ DOCX and/or Latex file format conforming to the prescribed [IJRP Paper Template](#) on or before **20 Oct 2021**. (Login to your ijrportal to upload final/camera-ready manuscript and copyright form)**

You can login with your Email Address and Password. After login, you can Upload Final Manuscript, copyright form, Donation Payment Receipt.

**Your Paper ID: 1008611020212317**

**Login URL:** <http://ijrp.org/login>

If you forget your Email Address and password, You can also Upload Final Manuscript, copyright form, Donation Payment Receipt with the below link.

<https://ijrp.org/journalfileUplaod/08f0d2307a32581e42042e8281de287a47395f08>

**Your Paper ID : 1008611020212317**

--  
Sincerely,  
Editorial Assistant  
International Journal of Research Publications  
<http://www.ijrp.org/>