

# Correlation Between Ante Natal Care and Low Birth Weight in Indonesia

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## ABSTRACT

This research was conducted to see whether there is a correlation between ante natal care and low birth weight. The study was conducted on secondary data using a cross sectional design. The results of the study show that: 1. Respondents who gave birth to infants with a status not below 2500 grams 24,585 babies (94.2%) and those who gave birth with LBW status were 1527 infants (5.8%). Respondents who visited ANC were compliant with 23,013 mothers (88.1%), while respondents who did not visit ANC were not complied with 3,099 mothers (11.9%). It can be concluded that the difference in pregnant women who do not perform ANC at least 4 meetings has a LBW percentage greater than 1%. 2. There is a significant and unidirectional relationship between the compliance of ANC visits of pregnant women with LBW events in Indonesia from the 2013 RISKESDAS data.

**Keywords:** *Ante Natal Care, Low Birth Weight, Correlation*

## 1 INTRODUCTION

Low Birth Weight (LBW) refers to babies who have a birth weight < 2,500 gram (WHO, 1992). LBW can cause birth asphyxia, aspiration of amniotic fluid, hypoglycemia and hyponatremia. Baby weight of 1,500-2,500 grams has been shown to have a mortality rate of 5-10 times higher than in normal babies (Manji et al., 1998). During 2005-2010, LBW incidents in ASEAN countries were 21.0% in the Philippines, 11.0% in Malaysia, Cambodia and Laos, 9.0% in Indonesia, 7.0% in Thailand and 5.0% in Vietnam (Wardlaw, 2004). LBW incidents reflect social developments a country's economy (WHO, 2004). LBW infant mortality is as high as 1% when compared to normal babies with only 0.2% mortality rate (WHO, 2007). This can reflect that improving the care of pregnant women in the health sector can improve the quality of life which will help reduce mortality in a country. Inadequate health care for pregnant women can cause various adverse effects on mother and child.

Maternal and child health problems have been considered as indicators of health service performance. In Southeast Asia, 28% of 1-month-old infant mortality comes from infection and 20% from preterm birth and LBW (WHO, 2016). LBW is generally used as an important health status indicator for developing health policies in a country. Important

factors related to LBW are maternal factors, such as socioeconomic, food consumption behavior, calorie intake, maternal health and prenatal care.

Ante Natal Care (ANC) is a treatment that pregnant women get from health workers during pregnancy. Treatment includes meeting with a doctor or midwife to consult about pregnancy until birth. According to WHO, the ANC is recommended to improve the quality of care in order to reduce the risk of death at birth, complications at birth and low birth weight. This treatment also gives women experience about positive and healthy pregnancy procedures. The formulation of the problem is whether there is a correlation between ANC compliance with LBW in Indonesia. The purpose of this study was to determine the correlation between ANC compliance with LBW in Indonesia.

## 2. LOW BIRTH WEIGHT

According to WHO, LBW is defined as a birth weight of less than 2500 grams. LBW also continues to be a globally significant public health problem and is associated with a series of short-term and long-term consequences (WHO, 2012). Measurement of birth weight is obtained from the first fetus or baby born with living conditions. These measurements are made within the first hour of life (WHO, 2004). An important indicator for measuring a baby's health is

using LBW data because there is a correlation with illness and mortality.

LBW is a baby weighing less than 2500 grams without regard to gestational age. Very low birth weight babies (BLSR) are babies whose weight is less than 1500 grams. Low birth weight babies (BLER) are babies whose birth weights are less than 1000 grams.

The body shape of a small baby with a low body weight can make it difficult for the baby to digest food intake, affecting the nutritional status and low body strength so that it is susceptible to infectious diseases. This affects the child's growth and development and can cause stunting and tends to cause cognitive impairment. Babies with LBW have a high risk factor for hypertension, heart disease and diabetes after reaching the age of 40 years.

Premature and intrauterine growth retardation problems or Intrauterine growth restriction are the main causes of LBW events. Premature is a condition where the baby is born prematurely, which is under 9 months 10 days or before 37 weeks of pregnancy. Based on data from WHO, the chance of babies born prematurely reaches 18% of all births in the world. Intrauterine growth restriction is a neonate born with a clinical picture of malnutrition and growth retardation in the uterus, regardless of percentile birth weight. Various interrelated complex factors such as maternal factors also greatly affect the baby's weight at birth. Premature birth and IUGR can be associated with medical conditions that interfere with placental efficiency, fetal development or growth or general health and maternal nutrition.

Maternal risk factors that influence LBW events include the following:

- **Mother's job**

Research shows the work of pregnant women influences the incidence of LBW, where heavy workloads, long work hours, heavy work can trigger the release of stress hormones (norepinephrine and cortisol) which can cause damage to the hypothalamic pituitary axis (HPA) which is very detrimental during the first trimester those who have heavy physical work have a 5 times greater risk of giving birth to a baby with LBW than sitting office jobs.

- **Mother's age gave birth**

The age of pregnant women does not significantly risk the incidence of LBW, where both pregnant women at reproductive age (20-35 years old) and pregnant women at high risk age (> 35 years) have the same chance of giving birth to a baby with LBW. Pregnancy at maternal age <20 years is not yet optimal for childbirth and is not mentally ready.

- **ANC visit**

ANC is a treatment that pregnant women get from health workers during pregnancy. Treatment includes meeting with a doctor or midwife to consult about pregnancy until birth.

The Indonesian Ministry of Health, 2010 established the ANC as a standard of health services for pregnant women consisting of: weighing, upper arm circumference (LiLA) to determine chronic lack of energy (KEK), blood pressure, high uterine fundus, Calculate heart rate Determine fetal presentation Determine the presentation of fetus immunization tablet added blood (iron tablets), laboratory tests Determine the presentation of the fetus.

- **Effective IEC**

The frequency of antenatal care is at least 4 times during pregnancy, (K4. Confirmation of effective education information is carried out at each antenatal visit which includes maternal health, clean and healthy lifestyle, the role of husband / family in pregnancy and delivery planning, danger signs for pregnancy, childbirth and postpartum, balanced nutritional intake, symptoms of infectious and non-communicable diseases, offers to conduct HIV counseling and testing in certain areas (high risk), Early Breastfeeding Initiation and exclusive breastfeeding, postpartum birth control, and immunization.

- **Mother's Chronic Energy Deficiency Status**

One indicator to determine maternal nutritional status is through the size of the upper arm circumference (LiLA)  $\leq 23.5$  cm, where it can be used to determine the state of energy deficiency in a long time (chronic) in women of childbearing age (WUS) and pregnant women<sup>27</sup> Malnutrition in pregnant women can have a negative impact on the birth weight of babies. Understanding the nutritional needs of pregnant women will also increase healthy babies born with normal weight. Lack of nutrition in a pregnant woman increases the risk of ill health in birth-related babies.

- **Age of gestation**

Gestational age is the age of pregnancy. The only difference is gestational age measured in weeks, from the first day of a woman's menstrual cycle to a certain time<sup>28</sup>. In a previous study conducted at RSUP DR. M. Djamil Padang<sup>29</sup>. It was found that there was a significant correlation between gestational age with infant birth weight (p value = 0.038) indicating a less strong correlation (r = 0.113) and positive patterned. The research shows that the older the pregnancy the heavier the babies are born and vice versa.

- **Socio-Economic**

Socio economic describes the level of social, occupational and educational differences. Assessment of one's income can be seen from the work of that

person. Low income can affect nutrient intake and access to health services that are less than perfect which can lead to the possibility of LBW. Access to health services affects the health of the fetus from a cost factor that if it is insufficient for a mother to get inappropriate facilities. A place that is far from the place of access to health services causes a mother to not make enough ANC visits and increases the risk of fetal discomfort. In addition, socioeconomic also influences the nutritional intake that the mother assumes which will have an impact on fetal development.

- Parity

According to the BKKBN, 2011 Parity is the large number of children ever born. The large number of children ever born is possible to influence the shape of the uterus going forward. The condition of changes in the uterus affects the ability of the fetus during in Indonesia registered at Riskesdas 2013 was 58,947 thousand pregnancy which can have a bad effect when the baby is born<sup>30</sup>. Multiparous parity has a higher risk of having a baby with LBW than primiparous parity. This is due to various factors, women with multiparous parity tend not to pay attention to nutrition and the ability of the uterus to support fetal development at multipara parity is not as good as in primiparous parity.

- Nutrition in the First Thousand Days of Life (1000 HPK)

According to the Indonesian Ministry of Health, the First Thousand Day of Life is the period since the child in the womb is calculated from the time of conception until a child is two years old, which is 270 days during the womb and 730 days during the first two years after birth. This phase is referred to as the golden period because during this period a very rapid brain growth occurs. Malnutrition in this period will result in damage or stunted growth that cannot be repaired in the next lifetime. Sufficient nutrition during the womb will make the fetus grow and be born as a healthy and strong baby and perfect in three stages of development and growth.

The nutritional status of the mother during pregnancy can determine birth weight. Pregnant women with poor nutritional status or experiencing Chronic Energy Deficiency (KEK) tend to give birth to LBW babies, which are characterized by birth weights of less than 2500 grams. Therefore, the intake of maternal nutrients such as protein, fat, vitamins, and other nutrients sufficient during pregnancy, especially in the third trimester when the organs in the fetus are developing rapidly, can prevent the lack of supply of nutrients to the fetus through the placenta, so that can reduce the risk of LBW in infants.

### 3. METHOD

Observational analytic research and using cross sectional design. The data collected are secondary data from the 2013 individual RISKESDAS questionnaire (RKD13.IND) which includes pregnancy history and childbirth health and also LBW data for infants, a total sample of 58,947 across all provinces in Indonesia visited by the public health data collection team but after the do cleansing to filter the completeness of the data, 26,112 samples were obtained. The research variables are ANC adherence in pregnant women (independent variable) and LBW infants (dependent variable) (RKD13.IND block 1c29). The population of all data on pregnant women in Indonesia registered at Riskesdas 2013 was 58,947 thousand.

### 4. RESULT

The results of the study of the population recorded as many as 58,947 thousand but the sample used 26,112 thousand after cleansing the data based on the completeness of the data

Table 1. Results of percentage LBW data

Baby's Weight was born	Amount	Percentage (%)
Not LBW	24585	94.2
LBW	1572	5.8
Total	26112	100

Out of 26112 mothers, 94.2% of babies born in Indonesia with low birth weight and only 5.8% of babies born in Indonesia with birth weight below < 2500 g of the total data analyzed from Riskesdas data for women giving birth with a living condition.

Table 2. The percentage results of ANC data

ANC visit	Amount	Percentage (%)
Fulfilled	23013	88.1
Not fulfilled	3099	11.9
Total	26112	100

Mothers who visited ANC were fulfilled (at least 4 times) by 88.1%, ANCs that were not fulfilled 11.9% of 26112 pregnant women at the 2013 Riskesdas data Table 4. Relations of LBW and ANC

		ANC compliance	LBW
ANC compliance	Correlation coefficient	1.000	0.013*
	Sig. (2-tailed)	-	0.036
	N	26112	26112

LBW	Correlation coefficient	0.013*	1.000
	Sig. (2-tailed)	0.036	.
	N	26112	26112

The correlation between the independent variable and the dependent variable was tested using chi-square and obtained  $P < 0.05$  so that it can be concluded that there is a correlation between ANC compliance with LBW events. This interprets that ANC compliance or at least 4 visits will reduce the incidence of LBW

The direction of the relationship that uses correlations from Spearman's rho shows that the coefficient number between the ANC and LBW compliance variables is positive at 0.036, so the relationship between the two variables is unidirectional, thus it can be interpreted if the ANC Compliance score is good then the birth weight will be good.

**5. DISCUSSION**

In the research it has been explained that there are many causative factors that can cause LBW events, for example, various interrelated complex factors such as maternal factors affecting the baby's weight at birth such as placental efficiency, maternal age, maternal health and maternal nutrition that can cause LBW<sup>22</sup>. If a pregnant woman does not make enough ANC visits it can have a direct and long term negative impact. LBW is a very influential factor in the possibility of morbidity, mortality during the first month or year of life, as well as disability or illness in the newborn to children and if in a long time can also affect health in adulthood <sup>17,18</sup>. Long-term LBW can cause chronic illness as well as a decline in body function in childhood but it also tends to cause impaired slow cognitive development compared to babies who have normal birth weight.

The means to prevent and monitor diseases that can cause LBW events is the ANC. Pathological pregnancy occurs gradually or can be said not to have a sudden effect on the body's organs. Complete ANC compliance from the first to the third trimester will increase early detection of symptoms and the risk of danger during pregnancy or safety of the fetus or pregnant woman<sup>31</sup>. Not only causative factors but also predisposing factors and accompanying diseases will also be recognized early so that maximum efforts can be made to prevent indications of more severe symptoms of maternal pregnancy.

Based on the results of research conducted from data corroborated from Riskesdas 2013 that the dominant birth weight is birth weight with numbers that are not low weighing > 2500 gram as much as 94.2% with the total percentage of babies born with low counted weight of 5, 8%. Data analysis research on pregnant women who did ANC with a minimum of 4 visits of 88.1% and less than 4 times of 11.9%.

This study was conducted to determine the relationship of ANC visit compliance with LBW incidents using Riskesdas questionnaire results in 2013. The research respondents were all data on pregnant women and all data on birth weight of babies recorded at Riskesdas 2013. Respondents recorded amounted to 58,947 thousand and samples were taken using total sampling technique. Before analyzing the data from Riskesdas, cleansing is done to delete if there is incomplete data because to do a bivariate analysis requires complete data from two variables. Analysis of the relationship between free and bound variables was performed with the chi-square test and was obtained with  $P < 0.05$  so that it could answer the hypothesis that there was a relationship between ANC visit compliance with LBW events. It also interprets that compliance with ANC visits can reduce the incidence of LBW.

Based on the analysis of the Odds Ratio, it is found that the ANC Good examination enhances the chances of a Normal Birth Weight. This study is in line with research conducted by Brown, et al (2007) 36 on ANC and perinatal outcomes in Kwale district, Kenya that pregnant women who do regular pregnancy checks give birth to babies of normal weight (Odds Ratio 4.39). Other studies are titled Risk factors for preterm and low birthweight terms in Ahmedabad, India. that there is a relationship between ANC and LBW-preterm visits with scores (Odds ratio 7).

Odds Ratios indicate the likelihood that results will occur given a particular exposure, compared to the likelihood of results occurring without that exposure. Research According to Sistirani (2008) 37 about maternal factors and the quality of antenatal care that is at risk for LBW events, a study of mothers who did ANCs to health workers and gave birth at Banyumas Regional Hospital in 2008 found that poor quality of antenatal care was a risk factor for LBW (Odds Ratio) 5,85), the quality of antenatal service is assessed from the quality of health workers, environmental quality, frequency of visits, inspection activities according to 7T service standards (weigh BB, measure TFU, measure TD, administer TT, give Fe tablets, PMS test, colloquium) and health education and communication. According to Nazifah, et al (2013) 38 concerning factors related to the incidence

of low birth weight babies in the city of Pariaman, West Sumatra province in 2011-2012, there is a significant relationship between the frequency of antenatal care with the incidence of LBW (Odds Ratio 2.16) which meaning that pregnant women who check for pregnancies that are not according to standards have a 2-fold risk of giving birth to LBW babies compared to pregnant women who check for pregnancies according to standards.

## 6. CONCLUSION

Based on the results of the study, it was found that respondents who gave birth to babies with status not below 2500 grams were 24,585 babies (94.2%) and those who gave birth with LBW status were 1,527 babies (5.8%). Meanwhile, respondents who performed ANC obediently were 23,013 mothers (88.1%), while respondents who performed ANC were not compliant were 3,099 mothers (11.9%). The difference between pregnant women who did not perform ANC at least 4 times had a LBW percentage greater than 1%. There is a significant and direct relationship between compliance with ANC visits by pregnant women and the incidence of LBW in Indonesia from the 2013 RISKESDAS data.

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