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Relationship between Antenatal Care Compliance and Low Birth Weight in Indonesia

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ABSTRACT

The incidence of low birth weight in Indonesia from 2005-2010 was 7%[3], reflecting the country's socioeconomic development. This study aims to determine if there is a relationship between ANC visit compliance with LBW events. This is descriptive research with a cross-sectional design. The study population was all individuals in the 2013 Riskesdas sample of pregnant women who had data on giving birth to low birth weight babies. Data collected included the frequency of ANC visits with the questionnaire code RKD13.IND IC11 and birth weight of infants less than 2500g in the IC29 block. There was a significant and positive relationship between compliance with ANC visits of pregnant women and LBW events in Indonesia from RISKESDAS data 2013, which was analyzed with chi-square P = 0.036 <a (0.5). Low birth weight babies with mothers fulfilled ANC compliance which is equal to (5.7%) and ANC compliance that is not fulfilled leaves a more significant percentage of LBW birth outcomes by (6.7%)

Keywords: Pregnant women, Antenatal visits, Low birth weight

INTRODUCTION

Low birth weight (LBW) refers to infants with a birth weight <2,500 grams [1]. LBW can cause congenital affixation, aspiration of amniotic fluid, hypoglycemia, and hyponatremia. Infants weighing 1,500-2,500 grams have been shown to have a mortality rate 5-10 times higher than normal infants [2]. During 2005–2010, the incidence of LBW in ASEAN countries was 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 [3]. The LBW incident reflects the socioeconomic development of a country [4]. The mortality of LBW infants is as high as 1% compared to normal infants, with only a 0.2% mortality rate [5]. It may reflect that improving the care of pregnant women in the field of health 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 indicators of health service performance. In Southeast Asia, 28% of 1 -month -old infant mortality comes from infection, 20% from premature birth, and LBW [6]. LBW is generally used as an essential indicator of health status for health policy development in a country [7]. Significant factors associated with LBW are maternal factors, such as socioeconomic, food consumption behavior, caloric intake, maternal health, and prenatal care [8; 9].

Ante Natal Care (ANC) is a treatment that pregnant women get from a health worker during pregnancy. Treatment includes a meeting with a doctor or midwife to consult about the pregnancy until birth [10]. According to the WHO, the ANC is

recommended to improve the quality of care to reduce the death risk at birth, complications at birth, and low birth weight. This treatment also gives women an experience of positive and healthy pregnancy procedures [11].

This study aims to understand the frequency distribution of LBW in Indonesia, the concept of the frequency distribution of ANC compliance in Indonesia, and the relationship between ANC compliance and LBW in Indonesia.

LITERATURE REVIEW

According to the WHO, LBW is a birth weight of fewer than 2500 grams. LBW is a globally significant public health problem associated with short -and long-term consequences [12]. Birth weight measurements are obtained from when the fetus or baby is born alive. The measure is done in the first hour of life. The Ministry of Health of the Republic of Indonesia (2010) defined babies born weighing less than 2500 grams as weighed at birth until the first 24 hours at birth [13]. It is an essential indicator for measuring infant health using LBW data because it is associated with pain and mortality rates.

The classification of LBW in infants is: a) LBW is an infant weighing less than 2500 grams regardless of gestational age; b) deficient birth weight infants (BBLSR) are infants whose birth weight is less than 1500 grams; and c) deficient birth weight infants (BBLER) are infants whose birth weight is less than 1000 grams [14]. The body shape of a tiny baby with a low weight can make it difficult for the baby to digest the intake that is consumed, so it will be difficult to gain weight and low immunity so that it is easy to get infected. LBW is a highly influential factor in the likelihood of illness, mortality in the first month or year of life, disability from birth to childhood, and if, in the long run, it can affect health in adulthood [15].

Based on research, LBW can cause chronic diseases and decreased body function in the long term in childhood. It also tends to cause slow cognitive developmental disorders compared to infants with average birth weight [16]. The incidence of stunting increases at one to two years. Factors that affect stunting include mainly because the child has an infectious disease, the child LBW, and the provision of inappropriate supplements according to age. Previous research found that 9.5% of LBW infants and 22% of them experienced stunting [17]. The impact of infants with LBW will last from generation to generation; children with a history of LBW will have fewer anthropometric measurements on their development and significantly impact stunting. If babies with LBW do not die early at birth, LBW babies risk developing slower than babies born with average weight. In addition to developmental disorders, individuals with a history of LBW have high-risk factors for the development of hypertension, heart disease, and diabetes after reaching the age of 40 years [18].

Premature and intrauterine growth retardation problems and growth restriction are the leading causes of LBW [19]. Early is a condition in which the baby is born prematurely, i.e., under nine months, ten days, or before 37 weeks of pregnancy. The WHO data shows that the chance of a baby being born prematurely reaches 18% of all births worldwide. Intrauterine growth restriction is a neonate born with a clinical picture of malnutrition and growth retardation in the uterus, regardless of the percentile of birth weight [20]. Various interrelated factors, such as maternal factors, also affect the baby's weight at birth. Premature birth and IUGR may be associated with medical conditions that interfere with placental efficiency, fetal development or growth, or maternal general health and nutrition.

Maternal risk factors affect the incidence of LBW include maternal occupation, maternal age at birth, ANC visit [21; 22]. Malnutrition in women of childbearing age (WUS) and pregnant women in pregnant women can adversely affect the baby's birth weight.

Understanding the nutritional needs of pregnant women will also increase a healthy baby born with an average weight. Lack of nutrition in a pregnant mother increases the risk of poor health in a healthy baby at birth. Gestational age is the age of the pregnancy. The only difference is that gestational age is measured in weeks, from the first day of a woman's menstrual cycle to a particular time. In previous research conducted at RSUP, DR. M. Djamil Padang [23] found that there is a significant relationship between gestational age and birth weight of the baby (p-value = 0.038) showed a less intense relationship (r = 0.113) and cheerful pattern. The study showed that the older the gestational age, the heavier the baby is born and vice versa.

Socioeconomics describes the level of social, employment, and educational disparities. The assessment of a person's income can be seen from the person's work. Low payments can affect nutritional intake and poor access to health care which can lead to the possibility of LBW. Access to health services affects fetal health from a cost factor that, if insufficient, a mother can get inadequate facilities. Living too far from access to health services causes a mother not to receive enough ANC visits and increases the risk of fetal health. In addition, socioeconomics is also influential in the nutrient intake that the mother assumes will impact fetal development.

According to BKKBN, 2011 Parity is the number of children ever born. The large number of children that have ever been born makes it possible to influence the shape of the uterus in front of it. The changing condition of the uterus affects the ability of the fetus during pregnancy which can have a detrimental effect when the baby is born [24]. Multipara parity had a higher risk of giving birth to a baby with LBW than primipara parity. It is due to various factors. Women with multipara 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 at primipara parity.

According to the Ministry of Health of the Republic of Indonesia, the First Thousand Days of Life is the period of the child in the womb calculated from conception until a child is two years old, which is 270 days during the period in the womb and 730 days during the first two years after birth [25]. This phase is called the golden period because of rapid brain growth. Malnutrition in this period will result in damage or growth retardation that can not be repaired in later life. Adequate nutrition during pregnancy will make the fetus grow and be born as a healthy, strong, and perfect baby in three phases of development and growth.

Maternal nutritional status during pregnancy can determine birth weight. Pregnant women with poor dietary quality or those with Chronic Energy Deficiency (KEK) are more likely to give birth to LBW babies, characterized by birth weight of fewer than 2500 grams [26]. Therefore, maternal nutrient intake includes protein, fat, vitamins, and adequate nutrients during pregnancy, especially in the third trimester when the fetal body's organs are developing rapidly. It can prevent a lack of nutrient supply to the fetus through the placenta, reducing the risk of LBW in infants.

RESEARCH METHOD

This type of research is observational analytical research and uses a cross-sectional design that only highlights one period of time. The data collected are secondary data taken from the individual RISKESDAS questionnaire (RKD13.IND), including pregnancy history, puerperal health, and baby LBW data. This type of research is descriptive with a cross-sectional design. The data used for this research is Riskesdas 2013 with the details of the questionnaire RKD13.IND. In Riskesdas 2013 by the Litbangkes Agency, 58,947 samples were found across all provinces in Indonesia visited by the public health data collection team. Still, after the cleansing to filter the completeness of the data, 26,112 samples were obtained. The population of all pregnant women data in Indonesia

registered in Riskesdas 2013 is 58,947 thousand. The large sample count was performed using the Total sampling formula, which means that the entire population was used as the research sample. After cleansing (excluding incomplete data) the data, a large selection of 26,112 thousand was found. Data collection was done by officers of the local District/City Health Office consisting of four interviewers, and one became the team leader. Data collection methods included interviews with respondents by data collection officers to obtain information on place identification and notification of household members (region, age, gender, marital status, education, employment, and economic status), and pregnancy status. Furthermore, the questionnaire for the interview was first tested to find out the problems in the level of difficulty, language comprehension, health terms, and question flow. Stages are performed after the required data is collected, namely editing, coding, scoring, and tabulating. The data analysis technique used in this research is descriptive, which will be shown as an illustrative table. In addition, this study also implemented bivariate analysis using the chi-square formula with a significance limit of p <0.05.

RESULT AND DISCUSSION

The study results will be described sequentially using univariate and bivariate analysis. Univariate analysis was used to determine the frequency distribution of respondents based on adherence to ANC visits in pregnant women in Indonesia and the image of the frequency distribution of low birth weight data (<2500g) in Indonesia. Bivariate analysis was used to determine the relationship between ANC visit compliance in pregnant women with the incidence of LBW in Indonesia. The recorded population is 58,947 thousand, but the sample used 26,112 thousand after cleansing the data based on the completeness of the data.

Table 1. Percentage results of LBW data

Birth Weight	Total	%
Not LBW	24585	94.2
LBW	1572	5.8
Total	26112	100

The table above illustrates that of the 26,112 mothers, as many as 94.2% of babies born in Indonesia with low birth weight, and only 5.8% of babies born in Indonesia with a birth weight below <2500g of the total data analyzed from maternal Riskesdas data giving birth with living conditions.

Table 2. Percentage results of ANC data

ANC visit	Total	%
Fulfilled	23013	88.1
Not met	3099	11.9
Total	26112	100

From the above data, it can be described that mothers who made ANC visits were completed (at least four times) very dominant by 88.1% compared to ANC visits that were not met by 11.9% of 26112 pregnant women Riskesdas data in 2013.

The Relationship between ANC Compliance of Pregnant Women with LBW Incidents in Indonesia was recorded in the Riskesdas 2013 questionnaire. The analysis results using a 2 x 2 congestion table representing the number of ANC visits and LBW incidents.

Table 3. Results of cross-tabulation of LBW and ANC

ANC compliance	No LBW Total	LBW Total	*Total*	*P Value*
Fulfilled	21693	1320	*23013*	*0.036*
	94%	5,7%	*100%*	
Not met	2892	207	*3099*	
	93.3%	6,7%	*100%*	
Total	*24585*	*1527*	*26112*	
	94.2%	*5,8%*	*100%*	

In the table above, the ANC compliance met in Indonesia with birth weight (not LBW) amounted to 21693, about 94%, and 5.7% with LBW, which is 1320. In ANC compliance that is not met, the percentage is more significant with LBW birth weight of 6, 7%.

The relationship between the independent and dependent variables was tested using chi-square and obtained P <0.05 to conclude a relationship between ANC compliance and the incidence of LBW. It interprets that

an ANC -compliant visit at least four times will reduce the incidence of LBW.

Table 4. Spearman's rho correlations

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

***. Correlation is significant at the 0.05 level (2-tailed).**

The direction of the relationship using correlations from spearman's rho shows that the coefficient between ANC and LBW compliance variables has a positive value of 0.036. Hence, the relationship between the two variables is one-way, so it can be interpreted that if the ANC compliance score is good, the birth weight will be good.

In research, it has been explained that many causal factors can cause the occurrence of LBW. For example, various complex, interrelated factors such as maternal factors affect the baby's weight at birth, such as placental efficiency, maternal age, general health, maternal occupation, and maternal nutrition that can cause LBW. If a pregnant mother does not make enough ANC visits, it can have both direct and long-term negative impacts. LBW is a very influential factor in the likelihood of illness, mortality in the first month or year of life, disability or disease from birth to childhood, and can also affect health in adulthood [27; 28]. Long-term LBW can cause chronic infection and decreased body function in childhood, and it also tends to cause slow cognitive developmental disorders compared to infants with average birth weight.

The means for preventing and monitoring diseases or possible causes of LBW are with the ANC. Pathological pregnancy occurs gradually or can be said not to have a sudden effect on body organs. Performing full ANC compliance from the first to third trimesters will increase the early detection of symptoms and the risk of danger signs during pregnancy or the safety of the fetus and pregnant woman [29]. Not only the causative factors but also the predisposing factors and the participating diseases will also be identified from the beginning so that maximum efforts can be made to prevent the indications of more severe symptoms of maternal pregnancy.

The dominant birth weight is the birth weight with a calculated number not low weighing> 2500 grams as much as 94.2% with the percentage of babies born with a low birth weight of 5, 8% [26]. Data analysis on pregnant women who performed ANC with a minimum of 4 visits by 88.1% and less than four times by 11.9%. This study was conducted to determine the relationship between ANC visit compliance and LBW incidents using data from the Riskesdas questionnaire in 2013. The respondents were all pregnant women data, and all baby birth weight data were recorded in Riskesdas 2013. The respondents numbered 58,947 thousand, and samples were taken using the total sampling technique before analyzing the data from riskesdas. Done cleansing to remove if there is incomplete data because performing bivariate analysis requires complete data from two variables. Analysis of the relationship between independent and dependent variables was served with a chi-square test and results with P <0.05 to answer the hypothesis that there is a relationship between ANC visit compliance and LBW incidence. It also interprets that compliance with ANC visits could reduce the incidence of LBW.

Based on the analysis of the Odds Ratio, it is found that a good ANC examination can increase the chances of Normal Birth Weight. Pregnant women who underwent regular pregnancy screening gave birth to babies with average weight (Odds Ratio 4.39). Another study entitled Risk factors for preterm and term low birthweight in Ahmedabad, India. There is a relationship between ANC and LBW-preterm visits with value (Odds ratio 7).

The odds Ratio here explains the measure of the relationship between exposure and

outcome. The Odds Ratio indicates the probability that a product will occur given a particular orientation compared to the likelihood that an effect will happen in the absence of that exposure. A study of mothers who performed ANC to health workers and gave birth in Banyumas Hospital in 2008 found that poor quality of antenatal services is a risk factor for LBW (Odds Ratio 5.85). The quality of antenatal services is assessed from the quality of health workers, the quality of the environment, the quality of the frequency of visits, and inspection activities according to 7T service standards (BB weight, TFU measure, TD measure, TT administration, Fe tablet administration, PMS test, meeting speech) as well as communication and health education. There is a significant relationship between the frequency of pregnancy examinations with the incidence of LBW (Odds Ratio 2.16). It means pregnant women who check for non-standard pregnancies have twice the risk of giving birth to LBW babies compared to pregnant women who match non-standard pregnancies.

CONCLUSION

Respondents who gave birth to babies with status, not below 2500 grams, 24,585 babies (94.2%), and those who gave birth with LBW status amounted to 1527 babies (5.8%). Respondents who visited the ANC were counted as compliant were 23,013 mothers (88.1%), while respondents who conducted the ANC were not as compliant were 3,099 mothers (11.9%). It can be concluded that the difference of pregnant women who did not do ANC at least four times had a greater LBW percentage. There is a significant and one-way relationship between the compliance of ANC visits of pregnant women with the incidence of LBW in Indonesia from RISKESDAS 2013 data with chi-square analysis with significance ($p < 0.05$). Thus, after finding out about the pregnancy, pregnant women should perform examinations at least four times regularly, following applicable recommendations.

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