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The Relationship of Integrated Antenatal Care (ANC) Examination to The Incidence of Low Birth Weight (LBW) at Harapan Bunda Hospital, Batam City

Suhada¹✉, Anisya Selvia¹, Dedy Siska¹

¹ Program Study of Bachelor of Midwifery and Professional Midwife Education, Institut Kesehatan Mitra Bunda, Batam City, Riau Islands, Indonesia

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Abstrak

Low birth weight infants (LBW) are infants who weigh less than 2500 grams at birth regardless of the gestation period and can occur in full-term or premature infants. LBW is one of the most common causes of infant mortality in Batam City in 2022. This study aims to determine the relationship of integrated antenatal care examination to the incidence of LBW at Harapan Bunda Hospital Batam in 2023. This type of research uses a retrospective study with secondary data in the form of medical records of laboring mothers in January-October 2023 taken at Harapan Bunda Hospital. The population used in this study were mothers who gave birth to LBW babies. Sampling with total sampling and the number of research samples obtained was 96 samples. Data analysis used was univariate and bivariate analysis. Bivariate analysis used the Chi-Square statistical test. The results showed that 38 mothers had complete antenatal care who experienced LBW and 58 mothers who had incomplete antenatal care who experienced LBW. There is a relationship between antenatal care and the incidence of low birth weight at Harapan Bunda Hospital Batam in 2023 with a p-value of 0.027. It is expected that health workers and midwives can socialize with the community, especially pregnant women, about the importance of conducting antenatal care visits at least 6 times during pregnancy.

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Corresponding Author:

✉ Suhada

Program Study of Bachelor of Midwifery and Professional Midwife Education, Institut Kesehatan Mitra Bunda, Batam City, Riau Islands, Indonesia

Email: hada2514@gmail.com

1. INTRODUCTION

Health development is one of the efforts to improve the quality of human resources (HR). The government's efforts to improve health status are contained in the National Medium-Term Development Plan and the Strategic Plan of the Ministry of Health of the Republic of Indonesia for 2020-2024 which focuses on maternal and child health issues, stunting control, disease prevention, and control, Community Movement and governance of health system strengthening. The maternal and child health problems in Indonesia include the high maternal mortality rate, neonatal mortality, and nutritional problems for children under five (Kemenkes RI, 2020).

Infant mortality rate (IMR) is the number of deaths of infants under 1 year of age (0-11 months) (including neonatal deaths) per 1,000 live births in a given year. In 2021, the global neonatal IMR was 17 out of 1,000 infants (Databoks, 2022). Based on World Bank data, Indonesia's neonatal IMR (0-28 days old) was 11.7 out of 1,000 live-born babies in 2021 (Databoks, 2022). This figure increased in 2022, namely 16.85 per 1,000 live births, and nationally has not yet reached the National Medium-Term Development Plan target in 2022, namely 18 per 1000 live births. However, the National Medium-Term Development Plan target in 2024 has been achieved, namely 16 per 1,000 live births (Badan Pusat Statistik, 2023). The IMR in Riau Islands Province in 2021 was 7.5 per 1,000 live births. This figure increased in 2022 to 13.31 per 1,000 live births. The IMR of Riau Islands Province in 2022 is the result of the 2020 Long Form Population Census (Badan Pusat Statistik, 2023).

According to data from the Dinas Kesehatan Kota Batam in 2022, the number of infant deaths (IMR) in Batam City was around 2.67%, the number of neonatal deaths (IMR) was around 2.19% and the number of under-five deaths (IMR) was around 2.28%. Based on the cause, total neonatal deaths (0-28 days) were caused by low birth weight (LBW) as many as 30 cases, asphyxia 19 cases, congenital abnormalities 10 cases, Covid-19 1 cases, and as many as 13 cases. Post neonatal infant deaths aged 29 days-11 months were caused by pneumonia in 3 cases, congenital abnormalities in 1 case, and others in 12 cases (Dinkes Kota Batam, 2023).

The causes of LBW differ in different places such as in more developed areas where low birth weight is associated with prematurity (defined as babies born before 37 weeks of gestation) as a result of high maternal age, smoking, multiparity, and Caesarean section. Whereas in less developed regions it is caused by poor fetal growth associated with poor maternal nutrition before and during pregnancy (UNICEF & WHO, 2019).

One of the things that contribute to LBW is the frequency of the Antenatal Care Examination (ANC). ANC frequency is the number of visits by mothers during pregnancy to competent health workers to conduct pregnancy examinations during pregnancy (Inpresari & Pertiwi, 2021). ANC visits 6 times are very important for pregnant women so that health workers can monitor and ensure maternal health and child development, improve and maintain physical and mental health, recognize early complications and disabilities, and prepare for full-term delivery. The impact of the lack of ANC visits is that it can cause a lack of knowledge in pregnant women in maintaining health during pregnancy and fetal growth and development (Suryani, 2020). Pregnant women need to do ANC pregnancy checks regularly. By conducting ANC visits regularly, the cause of LBW can be known earlier (Inpresari & Pertiwi, 2021).

WHO explains that Low Birth Weight (LBW) is a baby who is born weighing $\leq 2,500$ grams regardless of the gestational period at the time of birth. In 2022 about 13 out of 100 mothers who gave birth to a live-born child (ALH) and the last one was born with LBW in the last three years tends to increase. Based on the percentage of mothers who gave birth to LBW in Indonesia in 2020-2022, it is 12.58% from the previous 12.27% in 2021 and

11.37% in 2020. The high incidence of LBW in Indonesia is contributed by the high rate of LBW at the provincial level.

According to the percentage of LBW in Riau Islands Province in 2022 increased to 10.20% from 9.40% in 2021. Based on age group, mothers with the highest percentage of children born with LBW are in the 15-19 years and 45-49 years groups with a percentage of 17.84 percent and 16.93 percent respectively (BPS, 2022).

Based on data obtained at the Batam City Regional General Hospital, the number of babies with LBW in January-December 2021 was 126 cases (22%). Meanwhile, data from January to December 2022 showed that the number of LBW cases was 87 cases (16%) (RS Umum Daerah., 2023). Meanwhile, data obtained from Harapan Bunda Hospital in January-December 2021 showed that there were 1,880 infant cases with an incidence of LBW of 218 cases (11.5%). And in January-December 2022, there were 2,057 infant cases with an LBW incidence rate of 248 cases (12%). Data obtained for LBW cases at Harapan Bunda Hospital from January to June 2023 amounted to 96 cases (10%) of 926 births (RS Harapan Bunda., 2023).

Based on the comparison of data obtained at the two Batam City Hospitals in 2021-2022, it was found that the highest number of LBW cases occurred at Harapan Bunda Hospital. The incidence of LBW in Harapan Bunda Hospital Batam has not yet reached the national target of reducing the LBW rate in the National Medium-Term Development Plan for 2020-2024, which is 4% and in 2025, which is 3% (Bappenas, 2019).

There are still many pregnant women who do ANC not according to the minimum standard as recommended by the government, which is previously a minimum of 4 visits to 6 antenatal visits, this is indicated based on the coverage of pregnancy check-up visits according to the standard has not reached the global (90%) or national target (85%). The first K1 coverage in Indonesia is 98.0%, the national K4 coverage is 88.8% and the K6 coverage is 63%. The number of pregnant women who make K6 ANC visits in Indonesia according to the standard has not yet reached the National Medium-Term Development Plan target of 63% of the 2021 target of 85%. Meanwhile, according to the province in 2021, the coverage of K1 in Riau Islands Province is 85.6%, K4 82.1, and K6 62.3%. The K4 pregnant women service in Riau Islands shows that nationally it has not reached the 2021 National Medium-Term Development Plan target of 82.1% of the 85% target. (Kemenkes RI., 2022). In 2022 the coverage of the first visit of pregnant women (K1) in Batam City was 95.56%, K4 90.56%, and K6 75.53%. The data shows that the coverage of K6 ANC visits is not optimal (Dinkes Kota Batam., 2022).

Related to the impact caused by LBW, of course, preventive efforts are needed so that LBW does not occur and at the same time can emphasize IMR. One of the efforts that can be done to prevent LBW is with integrated pregnancy check-ups or ANC services and the utilization of pregnancy check-up services can monitor the condition of the mother's pregnancy so that it develops properly and normally, by conducting ANC regularly at least 6 visits during pregnancy can detect abnormalities in the fetus, monitor nutritional fulfillment and complications during pregnancy and avoid risk factors for giving birth to LBW as early as possible (Nasution, 2021).

According to WHO, to reduce IMR and reduce disability experienced by newborns can be done through high-quality antenatal care according to recommendations or better known as integrated ANC by conducting ANC examinations at least 6 times assisted by trained health workers, postpartum care and newborn care (World Health Organization, 2017).

The government has also regulated in regulation of the minister of health RI Number 97 of 2014, a pregnant woman needs to obtain integrated antenatal care where health services are carried out through the provision of services and educational information communication (EIC) including stimulation and nutrition so that pregnancy lasts healthy

and the fetus is born healthy and smart, early detection of problems, diseases and complications of pregnancy and the implementation of antenatal care according to the standard quantity of visits at least 4 times and get a minimum quality of service 10T. Related to this policy, a mother is required to have her pregnancy checked regularly at a health facility. So that health workers can monitor the development and condition of the mother and fetus.

The results of research conducted by Sunarni et al (2018) with the title Completeness of Antenatal Care (ANC) with the Incidence of LBW at the Ciamis Regency Hospital showed that pregnant women with incomplete pregnancy checks had a 10 times greater chance of LBW with complete ANC. In this study, pregnant women with complete ANC and normal birth weight (not LBW) because a mother who often conducts pregnancy checks (ANC) will reduce the risk of LBW because the mother will always control her pregnancy so that she knows the development of her own fetus.

According to research by Fatimah et al. (2018) with the title Relationship between Antenatal Care and the Incidence of low birth weight babies in Aterm Mothers at Dr. M. Djamil Padang Hospital stated that one of the things that played a role in causing LBW was the frequency of antenatal care. This is because antenatal care visits are an important indicator in increasing vigilance and monitoring the nutritional health of the mother during pregnancy and the fetus. This study states that pregnant women with ANC visits less than 4 times have a risk of 3.692 times giving birth to LBW compared to mothers with ANC visits ≥ 4 times. This can be caused by not monitoring the complications, nutrition, and health of the mother and fetus during pregnancy until childbirth so that it disrupts fetal growth and causes low birth weight babies.

The results of Astuti's research (2020) entitled The Relationship between Antenatal Care and the Incidence of Low Birth Weight in the Seginim Health Center Working Area, South Bengkulu Regency show that pregnant women who do incomplete antenatal care have an 8 times greater chance of experiencing LBW than pregnant women who do complete antenatal care.

Based on this description, it is known that antenatal care has a relationship with the birth weight of the baby. However, some studies say there is no relationship between antenatal care and the birth weight of the baby and this study uses the standard quantity as recommended by WHO. Therefore, further research is needed on the relationship between antenatal care behavior and a baby's birth weight at Harapan Bunda Hospital Batam City.

2. METHOD

This study will be conducted at Harapan Bunda Hospital Batam in October 2023. It is a quantitative observational analytic study utilizing a retrospective method with secondary data obtained from medical records at Harapan Bunda Hospital Batam. The sampling technique used in this study is total sampling, ensuring that the sample represents the population. The research variables are categorized into two types: the independent variable and the dependent variable. The independent variable is the Integrated Antenatal Care Examination, and the dependent variable is Low Birth Weight (LBW). Data analysis will employ both univariate and bivariate analyses. Univariate analysis will be used to determine the frequency distribution of integrated antenatal care and the incidence of LBW, while bivariate analysis will aim to determine the relationship between integrated antenatal care examination and the incidence of LBW at Harapan Bunda Hospital Batam. The chi-square test will be used for the analysis, with a significance level of $\alpha = 0.05$.

3. RESULTS AND DISCUSSION

Table 1. Distribution of Maternal Age Characteristics of LBW Infants at Harapan Bunda Hospital 2023.

Age	Frequency (n)	Percentage (%)
20-35 years	73	76,0
<20 years	6	6,3
>35 years	17	17,6
Total	96	100.0

Based on table 1, the age distribution of mothers shows that the age that is not at risk is more with a total of 73 people (76.0%) and the number of ages at risk is 23 people (23.9%).

Table 2. Distribution of Maternal Education Characteristics of LBW Infants at Harapan Bunda Hospital 2023

Education	Frequency (n)	Percentage (%)
Hight	11	11,5
Intermediate	82	85,4
Basic	3	3,1
Total	96	100.0

Based on table 2, it shows that the mother's education in the middle category is more with a total of 82 people (85.4%), higher education as many as 11 people (11.5%) and basic education as many as 3 people (3.1%).

Table 3. Distribution of Maternal Occupational Characteristics of LBW Infants at Harapan Bunda Hospital 2023.

Work	Frequency (n)	Percentage (%)
Working	33	34,4
Not Working	63	65,6
Total	96	100.0

Based on table 3, it shows that the mother's work in the non-working category is more with 63 people (65.6%) than the working category as many as 33 people (34.4%).

Table 4. Distribution of Maternal Income Characteristics of LBW Infants at Harapan Bunda Hospital 2023.

Income	Frequency (n)	Percentage (%)
Hight	15	15,4
Low	81	84,4
Total	96	100.0

Based on table 4, it shows that the mother's income in the low category is more with a total of 81 people (84.4%) compared to a high income as many as 15 people (15.4%).

Table 5. Distribution of LBW Characteristics by category at Harapan Bunda Hospital Batam 2023

Infant birth weight	Frequency (n)	Percentage (%)
Low Birth Weight (LBW)	72	79,2
Very Low Birth Weight (VLBW)	9	5,2
Extreme Low Birth Weight (ELBW)	15	15,6
Total	96	100.0

Based on the table above shows that the category of birth weight of babies, where LBW is higher in the amount of 72 babies (79.2%) compared to the number of Very Low Birth Weight (VLBW) as many as 9 babies (9.2%) and Extreme Low Birth Weight (ELBW) as many as 15 babies (15.6%).

Table 6. Distribution of Completeness of Integrated Antenatal Care Examination Visits at Harapan Bunda Hospital Batam 2023.

Integrated ANC Completion	Frequency (n)	Percentage (%)
Complete	38	39,6
Not Complete	58	60,4
Total	96	100.0

Based on table 6, it shows that the incomplete integrated ANC examination was obtained by 58 people (60.4%) and the complete number was 38 people (39.6%).

Table 7. Cross tabulation of the relationship between integrated ANC examination and the incidence of LBW at Harapan Bunda Hospital in 2023.

ANC Terpadu	Baby's Birth Weight						p-Value
	LBW		VLBW		ELBW		
	N	%	N	%	N	%	
Lengkap	34	89,5	2	5.3	2	5.3	0,027
Tidak Lengkap	38	65,5	7	12,1	13	22.4	
Total	72	75,0	5	5.2	15	15.6	

Table 7 shows that for the category of complete integrated ANC examination, LBW was 89.5%, VLBW and ELBW 5.3%. While in the category of incomplete ANC examination, LBW was found to be 65.5%, VLBW 12.1% and ELBW 22.4%. In the Chi-Square test obtained a significant number or probability value (0.027), it can be concluded that in this study it is significant, meaning that there is a significant relationship between the mother's integrated ANC examination and the incidence of LBW because the value of $p = 0.027$ ($p < 0.05$) and in the study hypothesis H_0 is accepted.

DISCUSSION

1. Relationship between Integrated Antenatal Care Examination and LBW Incidence

Based on the results of the study some mothers gave birth to LBW, most of the respondents obtained an integrated ANC examination (34%), and most of those who did not conduct an integrated ANC examination (38%). In the integrated ANC examination, there are services with quality and quantity standards.

The quantity standard obtained was 30% of respondents who made antenatal visits ≥ 6 times and 70% of mothers who made antenatal visits ≤ 6 times. While in the 10T quality service on weighing weight and measuring, 95% of respondents weigh weight and measure height and 5% others who do not do weighing weight and measuring. In the examination of Fundus Uteri Height (FUH), Fetal Heart Rate (FHR), and Upper Arm Circumference (UAC), 98% of respondents were examined and 2% were not. In Tetanus Toxoid (TT) immunization screening, about 86% of mothers had complete TT immunization and 14% were incomplete. In the provision of Fe tablets, about 98% of mothers take Fe tablets regularly and 23% do not. In laboratory examinations, about 92% of mothers conducted examinations according to standards and 8% did not. In counseling services, 92% of mothers received counseling and 8% did not. While in pregnancy exercises about 90% of mothers did not do pregnancy exercises and 10% did not.

The results of this study are in accordance with the theory (Komarudin et al, 2020)

that one of the things that plays a role in causing low birth weight babies is the frequency of antenatal care. This is because antenatal care (ANC) visits are an important indicator in increasing vigilance and monitoring the nutritional health of the mother during pregnancy and the fetus. Pregnant women with less than 6 ANC visits will be at risk of giving birth to a low birth weight baby. This can be caused by not monitoring the complications, nutrition, and health of the mother and fetus during pregnancy until childbirth, thus disrupting fetal growth and causing low birth weight babies.

This research is supported by several previous studies, namely research conducted by Astuti (2020) with the title Antenatal Care Relationship with the Incidence of Low Birth Weight in the Seginim Health Center Working Area, South Bengkulu Regency which states that pregnant women who do incomplete antenatal care have an 8 times greater chance of experiencing LBW than pregnant women who do complete antenatal care. This study is not in line with research conducted by Kurniasari et.al., (2023) entitled The Relationship between Antenatal Care Birth Distance and Preeclampsia with LBW Incidence at Ogan Ilir Regional General Hospital which states that there is no relationship between antenatal care and LBW incidence.

According to the researcher, the incomplete antenatal care visits of pregnant women or less than 6 times are due to the mother's compliance in conducting integrated antenatal care visits. Compliance of each individual is influenced by age, socioeconomic status, occupation, and knowledge.

Pregnancy examination at integrated ANC is the right step for pregnant women to detect problems during pregnancy to prevent complications during labor from occurring (Nuraisya, 2018). Every pregnant woman receives antenatal care according to standards which include quantity standards and quality standards. The quantity standard is a visit 6 times during the pregnancy period (K6) with a minimum provision of 1 time in the first trimester (0-12 weeks of gestation), 2 times in the second trimester (12-24 weeks of gestation), and 3 times in the third trimester (24 weeks of gestation until delivery), as well as a minimum of two examinations by a doctor during the first visit in the first trimester and the fifth visit in the third trimester. Meanwhile, the quality standard is antenatal care that fulfills the 10T (Kemenkes RI., 2022).

4. CONCLUSION

Based on the results of the research and discussion of the Relationship between Integrated Antenatal Care (ANC) Examination and the Incidence of Low Birth Weight (LBW) at Harapan Bunda Hospital Batam City in 2023, it can be concluded that most of the respondents were 20-35 years old, middle education, not working and low income. Most of the respondents did incomplete integrated antenatal care examination and a small number of respondents did complete integrated antenatal care examination. Most of the respondents gave birth to babies with LBW and a small proportion of Very Low Birth Weight (VLBW) and Extreme Low Birth Weight (ELBW). And there is a relationship between integrated antenatal care examination and the incidence of LBW.

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