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Research Article

Pregnancy and Neonatal Outcomes: A Study During the COVID-19 Pandemic

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Abstract.
During the COVID-19 pandemic, there were many large-scale restrictions on routine services, including maternal and neonatal health services. This study used a correlational design to analyze the relationship between pregnancy during COVID-19 and the neonate's condition. Samples are pregnant women between 2020 and 2021, totaling 108 samples obtained by random sampling. Data collection used questionnaires, structured interviews, and documentary studies. The approach used was a retrospective about Ante Natal Care visits during COVID-19 with the birth weight of the baby. Data analysis was performed using the Chi-square. There is a relationship between pregnant women's and babies' weight during COVID-19 with a p-value of 0.016 and an OR of 3.967 (95% CI 1.22-12.879). In addition, the number of respondent visits is also related to babies' birth weight (P-value of 0.004 with OR 168 (95% CI 0.045-0.625). Meanwhile, the size of the mother's upper arm circumference and blood pressure is unrelated to the baby's birth weight. During the COVID-19 period, restrictions on Ante Natal Care visits caused pregnancies to become out of control. Lack of education about nutrition and stress levels of pregnant women contributes to pregnancy outcomes.

Keywords: baby's birth weight, covid 19 period, pregnant women

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1. Introduction

Pregnancy is a sensitive period for women in their life cycle. Hormonal changes resulting from adaptation to fetal growth and development in the womb result in physical and psychological changes (1). Physical and psychological changes during pregnancy can be a stressor that causes anxiety in pregnant women (2). Every pregnant woman must receive ante-natal care services according to WHO protocol recommendations, and this is important so that complications during pregnancy can be identified early (3).

During the COVID-19 pandemic, there were many large-scale restrictions on almost all routine services, including maternal and newborn health services. WHO has also set rules regarding antenatal care (ANC) services for pregnant women (4,5). As a

group was vulnerable to transmission of COVID-19, mothers are not recommended to frequent ANC visits to health services (2,3). Mothers are expected to be able to independently identify complaints and abnormalities that occur in their pregnancy (5). This condition causes the development and health of the mother and baby cannot to be monitored optimally. Mothers and babies are significantly at risk of experiencing pregnancy complications and growth disorders which will impact the outcome of the mother's subsequent pregnancy (4,6).

Data on the impact of pregnant women with COVID-19 in US medical centers for 2020-2021 report that COVID-19 has increased mortality, the need for intubation and ventilation, and admission to intensive care units by 2.1%. Meanwhile, a study in Canada stated that pregnant women during the COVID-19 period experienced a 21.4% tendency to be obese, required 20% intensive care, and experienced premature labor by 12.2% (4).

The Minister of Health of the Republic of Indonesia Number 43 of 2016 Article 2 concerning Minimum Service Standards in the Health Sector states that the statement of integrated antenatal care standards is "Every pregnant woman gets antenatal care according to standards (7,8). WHO protocol policies strongly influence ANC services during the Corona Virus Disease 2019 (Covid19) pandemic. The protocol regulates how pregnant women access health facilities during a pandemic based on existing protocols and maximizes telemedicine use. In addition, the concern about pregnant women being exposed to COVID-19 and the call to stay at home resulted in decreased visits to health facilities (7). This study aims to analyze pregnancy and neonatal outcomes during the COVID-19 pandemic.

2. Materials and Methods

This study uses a retrospective cross-sectional approach to pregnant women during the COVID-19 pandemic. The population is all pregnant women in the I, II, and III trimesters recorded in the April 2020-December 2021 period; 108 pregnant women were involved in this study using the random sampling technique in East Java. They were collecting data using a structured questionnaire that has been tested for validity and reliability, with variables being the number of visits by pregnant women, arm circumference, mother's weight, blood pressure, and baby's weight. Data analysis was done with chi-square to assess the proportion comparison between the independent and dependent variables.

3. Result

Based on demographic data, it was found that the education of most respondents was primary school 43.5%, with the majority of respondents' pregnancy status being pregnant with their first child (88%). When viewed from the ethnic group, most of the respondents are Madurese (77.8%). The blood pressure data found that some respondents were in a risk group of 66.7%.

The study results in table 2 show a relationship between pregnant women's and babies' weight during the covid pandemic with a p-value of 0.016 and an OR of 3.967 (95% CI 1.22-12.879). In addition, the number of respondent visits is also related to babies' birth weight with a P-value of 0.004 with OR 168 (95% CI 0.045-0.625). Meanwhile, the size of the mother's upper arm circumference and blood pressure is unrelated to the baby's birth weight.

TABLE 1: Demographics of pregnant women during the pandemic (n=108).

Variable	Frequency	Percentage
Education Primary school Junior high school Senior high school	47 23 38	43.5 21.5 35.2
Pregnancy status First pregnancy Second pregnancy More than 2	95 9 4	88 8.3 3.7
Ethnicity Javanese Madurese	24 84	22.2 77.8
ANC visit In accordance Not followed	50 50	50 50
Blood pressure No risk Have risk	36 72	33.3 66.7
Conjunctiva Anemic No anemic	85 23	78.7 21.3
Upper arm circumference Normal Less or more	95 13	88 12
Pregnant woman's weight Normal Abnormal	91 17	84.3 15.7
Birth weight Normal Abnormal	91 17	84.3 15.7

4. Discussion

The increase in maternal weight during pregnancy can affect the baby's birth weight. Weight gain during pregnancy is a form of body adaptation because a new individual is growing in the mother's womb (9). In the third trimester, approximately 90% of maternal weight gain is used for fetal growth, placenta, and amniotic fluid. In the first trimester,

TABLE 2: The relationship between weight, ANC visits, upper arm circumference, and blood pressure on the weight of newborns during the covid 19 pandemic (n=108).

Variable	birth weight		P value	OR	95 % CI
	low	normal			
A pregnant woman's weight					
Normal	6	11	0,016	3,967	1,22 - 12,879
Abnormal	11	80			
ANC Visit					
in accordance	3	51	0,004	168	0,045 - 0,625
it is not following	14	40			
Upper arm circumference					
Normal	4	9	0,116	2,803	0,75 - 10,43
Less or more	13	82			
Blood pressure					
No risk	3	33	0,213	3,210	0,95 - 11,23
Risk	14	58			

almost entirely is part of the mother, while in the second trimester, as much as 60% is part of the mother (9,10).

The Indonesian Ministry of Health stated that the weight gain of pregnant women usually ranges from 9-12 kg, while fat deposits in the mother's body are around 3-3.5 kg (11). Maternal weight gain during pregnancy positively correlates with the baby's birth weight (9,12). Pregnant women must meet the need for balanced nutrition during pregnancy so that the baby is born healthy. During the COVID-19 pandemic, pregnant women were very limited in accessing health services, and this was because pregnant women were a group that was vulnerable to contracting COVID (5,13). This condition could cause the mother not to be able to know the progress of her pregnancy correctly. Inappropriate eating patterns during the pandemic and activity restrictions cause weight gain during pregnancy and cannot be monitored properly (14). Limiting ANC activities in essential services and hospitals strongly impacts pregnant women (15).

Antenatal Care (ANC) examination is an essential part of the initial screening of the condition of the baby to be born(6). Poor quality of antenatal care can have an impact on fetal growth and development. Examining upper arm circumference and blood pressure during ANC is a screening to determine the risks pregnant women and fetuses face. Upper arm circumference is one of the screenings to measure the nutritional status of pregnant women (16). If it is less than 23.5 cm, the pregnant woman is considered to be chronically lacking in energy, so pregnant women can be at risk of giving birth to

low birth weight (LBW) babies. This study found that some respondents had an average upper arm circumference of 23.5 cm, as many as 88% (5,16).

Another essential examination during ANC is the measurement of blood pressure. Hypertension in pregnant women is one of the causes of maternal and infant mortality (17). This situation occurs because hypertension in pregnant women can damage the blood vascular system, thereby interfering with exchanging oxygen and nutrients through the placenta from the mother to the fetus (18). This can lead to placental prematurity, which results in slow fetal growth. In addition, constricting blood vessels in pregnant women who suffer from hypertension will increase uterine muscle tone (19). The results of this study indicate that 66.7% of respondents' blood pressure during the pandemic period is a risk group. This condition may be reinforced by high social stressors during the pandemic and activity restrictions so that mothers do not receive education from health workers about the health of their pregnancy. Hypertension during pregnancy can cause complications such as hypofibrinogenemia, hemolysis, brain hemorrhage, eye disorders, pulmonary edema, liver necrosis, HELLP syndrome, and kidney disorders which are significantly at risk of increased maternal and infant morbidity and mortality (20–23).

5. Conclusion

There is a relationship between the mother's weight and the number of ANC visits with the baby's birth weight. More intensive supervision is needed for pregnant women to identify the mother's health and the fetus's development.

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