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Original Research

Factors Associated with the Incidence of Anemia in Pregnant Women at Risk of Stunting in Batanghari Regency

Faktor-Faktor yang Berhubungan dengan Kejadian Anemia Ibu Hamil Berisiko Stunting di Kabupaten Batanghari

Ismi Nurwaqiah Ibnu[1]*, Silvia Mawarti Perdana[1], Kasyani[1]
[1]Program Study of Public Health Science, Universitas Jambi, Jambi, Indonesia

* Email corresponding author: ismiibnu@unja.ac.id

Abstract: *The nutritional status of pregnant women is a factor that can influence stunting in toddlers as seen from the status of upper arm circumference measurements in the 3 month period of pregnancy. Based on the results of the 2021 Indonesian nutritional status survey, stunting in Batanghari Regency decreased to 24%, and in the 2022 Indonesian nutritional status survey, stunting in Batanghari Regency increased to 26%. Therefore, pregnancy is a critical period, which can affect the continuity of life in the future. Research Method: quantitative research through analytical observational with a cross sectional design. This research was conducted in the Community Health Center Work Area in Batanghari Regency, which is based on the highest prevalence of stunting in toddlers in 2022 in Batanghari Regency. The duration of the research was approximately 8 (eight) months from March to November 2023. The number of samples in this study was 245 pregnant women. The inclusion criteria in this study were pregnant women in the second trimester and third trimester. Research results show that the prevalence of anemic pregnant women in Batanghari Regency is 40.4%. Factors that influence pregnant women with anemia which are statistically significant are family income, upper arm circumference of pregnant women, body mass index of pregnant women, TT injection services, blood pressure check services. , services for administering blood supplement tablets, uterine fundus height services. Suggestion: increase access to health services for pregnant women, so that pregnant women will be exposed to information about the impact of anemia and improving nutritional and health status in other aspects can influence the anemia status of pregnant women*

Key word: Anemia, Risk Factor, Pregnant Woman, health service, antenatal care.

1. INTRODUCTION

Pregnant women are one of the groups that are vulnerable to nutrition. Various impacts can occur during the growth process of the fetus that will be born. During the growth period of the fetus, pregnancy is a process that plays an important role. The nutritional status of the mother is very important (1). Nutritional status is the main thing in determining whether a pregnant mother can go through her pregnancy well. Therefore, this pregnancy period is a critical period, which can affect the continuation of the next life. Various things can happen during pregnancy such as abortion, pregnancy complications, bleeding, infection, pre-eclampsia/eclampsia, obstructed labor, all of which can endanger the lives of the mother and fetus (2).

According to research conducted by (Parulian et al., 2016) the nutritional status of pregnant women is a factor that can influence stunting in toddlers as seen from the status of upper arm circumference measurements in the 3-month pregnancy period. Maternal factors such as maternal education, History of chronic energy deficiency

during pregnancy, then parenting patterns and variations in the provision of Complementary Breast Milk Food (MPASI) showed that in Indah's study (3) were risk factors that caused stunting in Gorontalo Regency. (4) also stated that poor maternal nutrition can cause obstacles to fetal growth and infectious diseases during pregnancy can cause premature birth, so these two conditions are important contributors to stunting in early childhood.

Based on the results of the Jambi Province Riskesdas, maternal health services in Batanghari Regency, namely the proportion of ideal K1 examinations is only 86.91% and ANC K4 is only 59.54%, the proportion of ownership of Maternal and Child Health Book's is only 63.91% of pregnant women. The proportion of premature birth history is 22.15%, the proportion of LBW is 5.99% higher than the proportion of LBW at the Jambi provincial level of only 2.55%., the proportion of short birth length in Batanghari Regency is 39.02% (birth length below 48 cm). The proportion of pregnant women who receive Supplemental Food Program for pregnant women is only 25.37%. Pregnant women who receive Blood Supplement Tablets (TTD) as many as 90 tablets are only 34.56%. The prevalence of Chronic Energy Deficiency for pregnant women in Batanghari Regency is 0%, but in non-pregnant women it is 11.48% (5) (6).

Nutritional status of toddlers in Batanghari Regency, namely the prevalence of malnourished toddlers is 5.56%, undernourished toddlers 16.72%, overnourished toddlers 7.17%. The prevalence of short toddlers in Batang Hari Regency is 32.97%. Based on the results of the 2021 Indonesian nutritional status survey, stunting in Batanghari Regency decreased to 24%, and the 2022 Indonesian nutritional status survey, stunting in Batanghari Regency increased to 26%, and became the district with the highest prevalence of stunting in Jambi Province (7). The prevalence of thin toddlers in Batanghari Regency is 14.82% (8).

The normal upper arm circumference is 23.5 cm, pregnant women who have an upper arm circumference below this can be said to have chronic energy deficiency. Malnutrition can have bad consequences for the mother and fetus. Malnutrition can cause the mother to suffer from anemia, the blood supply that delivers oxygen and food to the fetus will be hampered, and cause the fetus to experience growth and development disorders. Therefore, recognizing the signs of pregnant women at risk of stunting is very important for preventing babies from being born stunted. Erni Rukmana et al conducted a cohort study of Stunting Risk Factors in Children Aged 6-24 Months in Bogor, West Java, revealing that birth weight and father's education were significantly related to stunting ($p < 0.05$) with ORs of 4.192 and 1.807 respectively with a proportional relationship and stunting risk factors (9). Oktarina and Sudiarti conducted a cross-sectional study in Sumatra to analyze stunting risk factors in toddlers aged 24-59 months. The results showed a prevalence of stunting in children of 44.1%. Significant risk factors for stunting among subjects ($p<0.05$) were maternal height (OR=1.36), fat intake (OR=1.30), family size (OR=1.38), and drinking water source (OR=1.36) (10).

Cohort studies state that pregnant women with poor nutritional status, anemia, low weight gain during pregnancy, short stature, parity more than 4 times, too young age of pregnant women (less than 20 years), and too close spacing between pregnancies are some of the risk factors for giving birth to a stunted generation(11). Supported by environmental conditions, family factors, socio-cultural conditions, inadequate infrastructure services worsen the growth and development of children who are born stunted (12). Batanghari Regency is a regency with the highest prevalence of stunting

in Jambi Province, in addition to the health problems of pregnant women (anemia, chronic energy deficiency, consumption of iron tablets) are also far from the program target, the problem of consuming high-risk foods, low consumption of fruits and vegetables, low physical activity, healthy lifestyles and poor personal hygiene, low immunization, will have an impact on the severity of stunting in toddlers and children. Therefore, this study examines the factors related to the incidence of anemia in pregnant women at risk of stunting in Batanghari Regency.

2. METHODS

The type of research used in this study is quantitative research through analytical observation with a cross-sectional design. This study was conducted in the Health Center Working Area in Batanghari Regency, namely where based on the prevalence of stunting in toddlers in 2022, the highest was in Batanghari Regency. The duration of the study was approximately 8 (eight) months from March to November 2023.

The population in this study were all pregnant women in Batanghari Regency in 2023, namely 5455 pregnant women. The sampling technique used the Multistage random sampling technique. From 19 Health Centers in Batanghari Regency, 8 Health Centers were randomly selected as primary sampling units (PSU) for the sampling area. The number of pregnant women samples from 8 Health Centers in Batanghari Regency were selected proportionally according to the sample size calculation. The number of samples in this study was 245 pregnant women.

The inclusion criteria in this study were pregnant women in the second and third trimesters (13 weeks-32 weeks), domiciled in Batanghari Regency, and willing to be samples in this study. The exclusion criteria in this study were a) Suffering from infectious diseases such as tuberculosis, malaria, thalassemia. b) Suffering from non-infectious diseases such as: heart disease, diabetes mellitus, cancer, chronic kidney disease. c) Suffering from acute and chronic bleeding. The research instruments used were questionnaires on the characteristics of pregnant women, household and environmental health questionnaires, measurements of upper arm circumference, measurements of pregnant women's blood hemoglobin, anthropometric measurements, semi-qualitative FFQ interviews.

3. RESULTS

Table 1 below presents the distribution of characteristics of pregnant women respondents in Batanghari Regency based on the nutritional status of pregnant women, seen from the Upper Arm Circumference as many as 17.6% of pregnant women experience Chronic Energy Deficiency. Based on the Body Mass Index, as many as 15.5% of pregnant women are thin, and as many as 40.4% of pregnant women experience Anemia (Hb levels in the blood are less than 11 mg / dl).

Table 1. Distribution of respondents according to the nutritional status variable of pregnant women in Batanghari Regency in 2023

Nutritional status variables	**Frequency**	
	N	**%**
Nutritional Status of Pregnant Women Based on Upper Arm Circumference		
Pregnant Women with Chronic Energy Deficiency	43	17,6

Normal	202	82,4
Nutritional Status of Pregnant Women Based on Body Mass Index		
Pregnant Women Are Thin	38	15,5
Normal BMI	207	84,5
Nutritional Status of Pregnant Women Based on Hemoglobin Levels		
Anemia	99	40,4
Normal	146	59,6

Source: Processed Primary Data, 2023

Table 2. Relationship of Risk Factors to the Incidence of Anemia in Pregnant Women in Batanghari Regency in 2023

Research Variables	Anemia Occurrence in Pregnant Women		p.value	PR (CI)
	Anemia (n, %)	Normal (n, %)		
age of pregnant mother				
Pregnant women at risk age	46 (43,0)	61 (57,0)	0,513	1,119 (0.826-1,517)
Normal	53 (38,4)	85 (61,6)		
education level				
Low education	24 (36,9)	41 (63,1)	0.557	0.886 (0.617-1.272)
High education	75 (41,7)	105 (58,3)		
Family income				
Low Income	57 (36,1)	101 (63,9)	0.032	0,747 (0,553-1,009)
Sufficient Income	42 (48,3%)	45 (51,7)		
Number of Family members				
Big Family	86 (40,0)	129 (60,0)	0,843	0,923 (0,594–1,434)
Small family	13 (43,3)	17 (56,7)		
Number of births				
Multipara	82 (39,8)	124 (60,2)	0.723	0,913 (0,615-1,355)
Primipara	17 (43,6)	22 (56,4)		
Upper Arm Circumference				
Chronic Energy Deficiency	25 (58,1)	18 (25,6)	0,011	1,587 (1,162-2,168)
Normal	74 (36,6)	128 (63,4)		
BMI				
Thin	24 (63,2)	14 (36,8)	0,004	1,743 (1,288-2,359)
Normal	75 (36,2)	132 (63,8)		
Cigarette Smoke Exposure				
Yes	80 (40,2)	119 (59,8)	1,000	1,027 (0,700-1,508)
No	19 (41,3)	27 (58,7)		
Receiving Blood Supplement Tablets				
No	54 (39,7)	82 (60,3)	0,896	0,962 (0,709-1,305)
Yes	45 (41,3)	64 (58,7)		
Tetanus injection service				
No	60 (51,3)	57 (48,7)	0,001	1,683 (1,227-2,308)
Yes	39 (30,5)	89 (69,5)		
Measurement of body weight/height				
No	4 (66,7)	2 (33,3)	0,225	

Yes	95 (39,7)	144 (60,3)		1,677 (0,933-3,016)
Blood pressure check				
No	5 (83,3)	1 (16,7)	0,041	2,119 (1,433-3,132))
Yes	94 (39,3)	145 (60,7)		
Administration of blood-boosting tablets				
No	7 (77,8)	2 (22,2)	0,033	1,995 (1,359-2,929)
Yes	92 (39,0)	144 (61,0)		
uterine fundus height examination				
No	55 (49,5)	56 (50,5)	0,009	1,509 (1,111-2,050)
Yes	44 (32,8)	90 (67,2)		

Source: Processed Primary Data, 2023

Table 2 describes several factors that influence pregnant women with anemia that are statistically significant, namely family income, upper arm circumference of pregnant women, body mass index of pregnant women, tetanus injection services, blood pressure check services, iron supplementation tablet services, and uterine fundus height services.

4. DISCUSSION

The high level of anemia in pregnant women is certainly very worrying and is a clinical and public health challenge to carry out efforts to anticipate, prevent and handle risk factors for stunting in newborn babies. Pregnant women have an increased risk of anemia due to changes in blood plasma volume and the amount of iron consumed in food is insufficient, so additional iron tablets are needed to prevent the effects of anemia in pregnancy. Pregnant women need more iron and should receive additional iron supplements (13). However, if a woman is pregnant with decreased iron stores, iron supplementation often fails to prevent iron deficiency. Although iron absorption increases rapidly after 20 weeks of gestation, the effects of reduced fetal growth due to iron deficiency in the first trimester persist despite subsequent iron supplementation (14). Weight gain during pregnancy is increased by the fetus, amniotic fluid, placenta, blood, enlarged uterus and breasts. Anemia affects both the mother and the fetus. Our research proves that pregnant women who do not receive iron tablets during their pregnancy are at risk of experiencing anemia twice as much as those who receive iron tablets (15) (11). In line with this, pregnant women who do not receive other antenatal care services are also at risk of experiencing anemia compared to pregnant women who receive services. Health services include tetanus injections, blood pressure checks, and uterine fundus height checks (16).

The results of this study indicate that when pregnant women receive pregnancy services as mentioned earlier, at that time pregnant women are reminded by health workers to always maintain their pregnancy health including how to prevent anemia. By checking the pregnancy indicators regularly, pregnant women can easily control the indications of pregnancy (17).

This study proves that there is a significant relationship between family income and the incidence of anemia in pregnant women. Families with low socioeconomic levels (poor families) have a much higher risk of having stunted children compared to families

with high socioeconomic levels. However, based on research, family socioeconomics is not significant in determining maternal factors that cause stunting in children. However, socioeconomic indicators can have an indirect effect on the occurrence of stunting through other indicators that form maternal and child factors, such as nutritional status, anemia during pregnancy, birth weight, and consumption of complementary foods (18). Families with low incomes are more likely to experience nutritional deficiencies and anemia during pregnancy. Mothers with poor nutritional status during pregnancy will have babies with low birth weight (19). In addition, families with low socioeconomic levels tend not to pay attention to their nutritional adequacy during adolescence and during pregnancy, thus inhibiting fetal growth and development. Some factors such as adolescent pregnant mothers who are less able to guarantee adequate nutritional intake for their fetuses because the mother is still in the growth stage and pregnant adolescent mothers will compete for nutrition with fetal development so that the fetus is more at risk of being born with a lower birth weight compared to mothers who are old enough and well-nourished (20). This is also in line with pregnant women who experience chronic energy deficiency at risk of 1.5 times experiencing anemia, as well as pregnant women with a thin BMI at risk of 1.7 times experiencing anemia. This proves the existence of malnutrition in the long term, which is indicated by a small upper arm circumference and a small BMI, so pregnant women in Batanghari Regency have long experienced malnutrition, namely starting from entering puberty and as young women, which ultimately risks causing anemia during pregnancy.

Nutritional status indicators are significantly maternal factors that influence the occurrence of anemia. In this study, nutritional status indicators were assessed based on body mass index (BMI) and mid-upper arm circumference (MUAC). The results of this study support previous studies that found that preconception maternal nutritional status affects fetal linear growth and the risk of stunting in the first 1,000 days. Lower BMI (<17.5 kg/m2 or <18.0 kg/m2) was significantly associated with a 1.3-fold increase in the risk of stunting in children (21). Other studies have also found that maternal malnutrition (measured by MUAC) is significantly associated with the severity of child malnutrition (P<0.05).27) Maternal malnutrition as seen from the MUAC indicator (MUAC limit <21 to 23 cm) is at risk of giving birth to newborns with low birth weight (OR, 1.9; 95% CI, 1.7–2.1) (22). In this study, the indicator of weight gain during pregnancy was significant in forming maternal factors that cause stunting. Pregnant women should pay attention to weight gain during pregnancy because it will affect fetal development. The Institute of Medicine recommends a range of total weight gain for pregnant women based on BMI (BMI <18.5 kg/m2 = 12.5–18 kg total gestational weight gain [TGWG]; BMI 18.5–24.9 kg/m2 = 11.5–16 kg TGWG; BMI 25–29.9 kg/m2 = 7–11.5 kg TGWG; and BMI>30 kg/m2 = 5–9 kg TGWG).29) If the mother experiences abnormal weight gain during pregnancy, it will affect fetal development (11).

5. CONCLUSION

There is a significant relationship between factors that affect pregnant women with anemia which are statistically significant, namely family income, upper arm circumference of pregnant women, body mass index of pregnant women, tetanus injection services, blood pressure examination services, iron supplementation services, uterine fundus height services. In this study we suggest increasing access to health services for pregnant women, thus pregnant women will be exposed to information

about the impact of anemia and improving nutritional status and health in other aspects can affect the anemia status of pregnant women.

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