

Risk Factors for Anemia among Pregnant Women in Rural Areas

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ABSTRACT

Anemia in pregnant women has a negative impact on both mother and fetus. The purpose of this study was to determine the risk factors for the incidence of anemia in pregnant women in the working area of the balai sepuak health center. This study used an analytic observational design with a case control approach. The population in this study amounted to 289 people. The sample in this study amounted to 62 people who were divided into two groups, namely the case group 31 people and the control group 31 people. Data analysis used chi-square test with 95% confidence level. The results showed that there was a significant relationship between knowledge (p value=0.000), fe tablet consumption (p value=0.010), husband support (p value=0.000), and ANC visits (p value=0.002), with the incidence of anemia in pregnant women. Unrelated variables were maternal age, parity, gestational age, and distance traveled. It is recommended to the health workers of Balai Sepuak Health Center to conduct socialization activities in the community, especially to pregnant women about the incidence of anemia in pregnant women and the impact of anemia on pregnancy, so that it is expected to overcome the incidence of anemia in pregnant women in the puskesmas working area.

ABSTRAK

Anemia pada ibu hamil berdampak buruk bagi ibu maupun janin. Tujuan Penelitian ini untuk mengetahui faktor risiko kejadian anemia pada ibu hamil di wilayah kerja puskesmas balai sepuak. Penelitian ini menggunakan desain observasional analitik dengan pendekatan case control. Populasi dalam penelitian ini berjumlah 289 orang. Sampel dalam penelitian ini berjumlah 62 orang yang dibagi menjadi dua kelompok yaitu kelompok kasus 31 orang dan kelompok kontrol 31 orang. Analisis data menggunakan uji chi-square dengan tingkat kepercayaan 95%. Hasil penelitian menunjukkan bahwa terdapat hubungan yang signifikan antara pengetahuan (p value=0,000), konsumsi tablet fe (p value=0,010), dukungan suami (p value=0,000), dan kunjungan ANC (p value=0,002), dengan kejadian anemia pada ibu hamil. Variabel yang tidak berhubungan yaitu umur ibu, paritas, jarak kehamilan, dan jarak tempuh. Disarankan kepada petugas kesehatan Puskesmas Balai Sepuak untuk melakukan kegiatan sosialisasi dimasyarakat khususnya kepada ibu hamil tentang kejadian anemia pada ibu hamil serta dampak dari anemia pada kehamilan, sehingga diharapkan dapat mengatasi kejadian anemia pada ibu hamil di wilayah kerja puskesmas.



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1. INTRODUCTION

Anemia is a condition in which the hemoglobin (Hb) level in the body is below the normal value according to a certain group of people¹. Anemia in pregnant women is bad for both mother and fetus. Anemia can cause health problems during pregnancy or during childbirth. The impact caused by anemia in pregnant women is a variety of complications to the mother, in the form of disorders during pregnancy (inadequate gestational weight gain, abortion, prematurity); disorders during childbirth (prolonged partus, bleeding); as well as disorders during the postpartum period (susceptible to infection and stress due to decreased immune system, low milk production); until the most severe is maternal death.

The world's anemic population is about 30% or 2.20 billion people, most of whom live in the tropics. Globally, the prevalence of anemia is about 51%². Overall, anemia occurs in 45% of women in developing countries and 13% in developed countries. In the US, 11% of pregnant women of childbearing age are anemic, while the percentage of pregnant women from poor families continues to increase with increasing gestational age (8% anemia in the first trimester, 12% anemia in the second trimester, and 29% anemia in the third trimester)³. According to WHO⁴, the global prevalence of pregnancy anemia reached 38.8% or about 32 million pregnant women experienced anemia, while the prevalence of anemia during pregnancy in Southeast Asia reached 48.2% and about 1.1% of them experienced severe anemia.

The prevalence of anemia in pregnant women in Indonesia increased compared to 2013, in 2013 as many as 37.1% of pregnant women were anemic, while in 2018 it increased to 48.9%⁵. In Sekadau District, the maternal mortality rate in 2014 was 147.1 and increased in 2015 to 203.7, in 2016 to 118.8, and in 2017 decreased to 92.14 per 100,000 live births⁶.

Based on the 2018 Riskesdas data, the number of pregnant women who experienced anemia was mostly at the age of 15-24 years at 84.6%, age 25-34 years at 33.7%, age 35-44 years at 33.6%, and age 45-54 years at 24%. The percentage of anemic pregnant women increased compared to the 2013 Riskesdas results, which was 37.1%. In 2017, the number of pregnant women who received Fe1 and Fe3 tablets was 86.13% and 75.93% respectively out of 4428 pregnant women in Sekadau District.

Anemia can be caused by several factors, both direct and indirect. Direct factors include adequate consumption of blood supplement tablets, pregnancy spacing, parity, nutritional status, and infectious diseases. The main cause of anemia is the lack of iron intake in food or blood supplement tablets.

Bakele's study in Ethiopia proved that low average monthly family income, birth spacing of less than two years, not taking iron supplements, and family size of more than 2 were independent predictors of anemia in pregnancy. Research in Yogyakarta proved that maternal age, frequency of ANC, and spacing of pregnancies were associated with the incidence of anemia in pregnant women⁷. Age and parity also have a relationship with the incidence of anemia based on Astriana⁸'s research in Ogan Komering Ulu, South Sumatra. Based on the results of Fatimah et al⁹'s research in South Sulawesi, there is a relationship between education and Fe tablet consumption on the incidence of anemia among pregnant women.

Based on preliminary studies conducted at Balai Sepuak Health Center, the data obtained in 2017 showed that the number of pregnant women who experienced

mild anemia and severe anemia was 27 pregnant women and there were 2 cases of maternal death in the working area of Balai Sepuak Health Center, Belitang Hulu District. Then in 2018, the number of pregnant women who experienced anemia decreased by 12 pregnant women, and in 2019 the number of pregnant women who experienced anemia increased by 17 pregnant women. Based on information from health workers, of all pregnant women who come to the Puskesmas, some of these pregnant women still do not know what anemia is and the impact of anemia on pregnant women. They usually come to the Posyandu only to check their pregnancy.

Based on the description above, the authors are interested in conducting research on Risk Factors for Anemia in Pregnant Women in the Working Area of the Balai Sepuak Health Center, Belitang Hulu District, Sekadau Regency so that prevention and control plans can be prepared.

2. METHODS

The type of research used is analytical observational, with the research design used case control which aims to determine the risk factors for the incidence of anemia in pregnant women in the working area of the balai sepuak health center. The population in this study amounted to 289 people. The sample in this study amounted to 62 people who were divided into two groups, namely the case group 31 people and the control group 31 people. The case sampling technique in this study was carried out by total sampling that met the sampling criteria. While control sampling is done by Accidental sampling.

The data analysis techniques used by the research are univariate analysis and bivariate analysis. In bivariate analysis, statistical data testing will be carried out to see whether there is a relationship between two variables. The statistical test used in this study is the Chi Square test with a 95% confidence level.

3. RESULTS

The results of the frequency of respondent characteristics from 62 pregnant women, found that 36 mothers (58%) had poor knowledge. In terms of age, 29 mothers (47%) were in the at-risk category. Pregnancy spacing showed that 11 mothers (17.7%) were in the at-risk category. For parity, 17 mothers (27.4%) were considered at risk. Distance traveled showed that 26 mothers (42%) had a long distance traveled. In terms of Fe tablet consumption, 35 mothers (56.5%) were non-compliant. Husband support was also a concern, with 35 mothers (56.5%) not receiving support. Lastly, 44 mothers (71%) did not have a complete ANC visit. For more details, please see table 1 below:

Table 1. Frequency Distribution of Respondents' Characteristics and Univariate Analysis

Characteristics	n = (88)	%
Mother's Knowledge		
Less Good	36	58
Good	26	42
Mother's Age		
At Risk	29	47
Not at Risk	33	53
Pregnancy Spacing		
At Risk	11	17,7
Not at Risk	51	82,3
Mother's Parity		
At Risk	17	27,4
Not at Risk	45	72,6
Distance traveled		
Deep	26	42
Near	36	58
Fe Tablet Consumption		
Non-compliant	35	56,5
Compliant	27	43,5
Husband Support		
Not in favor	35	56,5
Support	27	43,5
ANC visit		
Incomplete	44	71
Complete	18	29

The results showed that there was a significant relationship between knowledge (p value = 0.000) with the incidence of anemia in pregnant women. The results of this study are in accordance with the research of Lindung Purbadewi ¹⁰, with the title of research on the relationship between the level of knowledge about anemia and the incidence of anemia in pregnant women at the Moyudan Main Health Center, Sleman Regency, Yogyakarta City, which states that there is a relationship between knowledge and anemia in pregnancy.

The results showed that there was a significant relationship between consumption of Fe tablets (p value = 0.010) with the incidence of anemia in pregnant women. The results of this study are in line with Hidayah's research ¹¹ which states that there is a relationship between the compliance of pregnant women consuming Fe tablets with the incidence of anemia in Pageraji Village, Cilongok District, Banyumas Regency with the results of the statistical test P value = 0.005 (<0.05).

The results showed that there was a significant relationship between husband support (p value = 0.000) with the incidence of anemia in pregnant women. The results found by Inayah and Fitrahadi ¹² in 52 samples of pregnant women, where as many as 57.7% of husbands provided support to their wives. The results of our study showed that 24.3% of husbands did not provide support, this percentage is much smaller when compared to the results of research from Septiani¹³ which stated that 98.1% of

husbands did not provide support to pregnant women and research by Mulyanti, Mudrikatun, and Sawitry¹⁴ with the results of 56.7% of husbands also did not provide support to their pregnant wives, but it is necessary to increase husband's support for pregnant women because lack of support can affect the health of pregnant women.

The results showed that there was a significant relationship between ANC visits (p value = 0.002) with the incidence of anemia in pregnant women. This is also supported by research conducted by Ridwan Amirkudin entitled "Case Control Study of Biomedical Factors on the Incidence of Anemia in Pregnant Women at Bantimurung Health Center" which states that there is a significant relationship between ANC visits and the incidence of anemia and also obtained an OR value of 2.251 which means that ANC visits for pregnant women < 4 times are at greater risk of suffering from anemia. Variables that were not associated were maternal age (p value=0.309), parity (p value=1.000), gestational age (p value=0.508), and distance traveled (p value=0.440). For more details, please see table 2 below:

Table 2. Bivariate Analysis

Variables	Case		Control		p
	n	%	n	%	
Mother's Knowledge					
Less Good	27	87,1%	9	29%	0,000
Good	4	12,9%	22	71%	
Mother's Age					
At Risk	17	54,8%	12	41,9%	0,309
Not at Risk	12	45,2%	19	58,1%	
Pregnancy Spacing					
At Risk	7	22,6%	4	12,9%	0,508
Not at Risk	24	77,4%	27	87,1%	
Mother's Parity					
At Risk	8	25,8%	9	29%	1,000
Not at Risk	23	74,2%	22	71%	
Distance Traveled					
Deep	15	48,4%	11	35,5%	0,440
Near	16	51,6%	20	64,5%	
Fe Tab Consumption					
Non-compliant	23	74,2%	12	38,7%	0,000
Compliant	8	25,8%	19	61,3%	
Husband Support					
Not in favor	14	45,2%	21	67,7%	0,000
Support	17	54,8%	10	32,3%	
ANC visit					
Incomplete	28	90,3%	16	51,6%	0,002
Complete	3	9,7%	15	48,4%	

4. DISCUSSION

The Relationship Between Knowledge and the Incidence of Anemia in Pregnant Women

The results showed that there were 36 people (58.1%) who were included in the group of respondents who had low knowledge about anemia. While 26 respondents (41.9%) have high knowledge. Chi-square test results obtained p value = 0.000 ($p < 0.05$) then H_0 is rejected and H_a is accepted. So it can be concluded that there is a significant relationship between the level of knowledge and the incidence of anemia in pregnant women in the working area of the balai sepuak health center. This shows that the incidence of anemia in pregnant women in the Balai Sepuak Health Center working area is statistically influenced by knowledge factors. Mothers with low knowledge have an $OR = 16.500$, this means that mothers with low knowledge have a chance of 16.500 times to experience anemia compared to mothers who have high knowledge. The results of this study are in accordance with the research of Lindung Purbadewi and Yuliana Noor Setiawati Ulvie ¹⁰, with the title of research on the relationship between the level of knowledge about anemia and the incidence of anemia in pregnant women at the Moyudan Main Health Center, Sleman Regency, Yogyakarta City, which states that there is a relationship between knowledge and anemia in pregnancy. The better the knowledge of pregnant women about anemia, the mother will not experience anemia. According to Azwar ¹⁵, this is because a person's knowledge about something will affect his behavior. Anemia prevention behavior in pregnancy depends on the individual's understanding of the matter, so that it will encourage individuals to perform certain behaviors when needed. Knowledge is influenced by age, education level, previous childbirth experience. According to Sulistina that education affects the learning process, the higher a person's education, the easier it is for that person to receive information. In the results of the study, it is known that most of the pregnant women's education is high school, which means that the education of pregnant women is still in the middle education category, thus affecting their knowledge and attitudes. Pregnant women who have less knowledge will tend to ignore health and in the end will have actions that will harm themselves. Lack of knowledge can be exacerbated by a lack of information due to a wrong assumption or perception about anemia in pregnancy and the things that come with it. Information is one of the factors that influence a person's knowledge¹⁶. Information can stimulate a person, sources of information can be obtained from print media (newspapers, leaflets, posters), electronic media (television, radio, video), family, and other sources of information¹⁷. After a person gains knowledge from various sources of information, it will lead to attitudes and behaviors.

Relationship between maternal age and the incidence of anemia in pregnant women

The results showed that there were 29 people (46.8%) who were included in the group of respondents who had a mother's age at risk of anemia. While 33 respondents (53.2%) had a mother's age not at risk. The Chi-square test results obtained a value of $p = 0.309$ ($p > 0.05$) then H_0 is accepted and H_a is rejected. So it can be concluded that there is no significant relationship between maternal age and the incidence of anemia in pregnant women in the working area of the balai sepuak health center.

The results of this study are the same as a study conducted at the Bangtayu Health Center, Genuk sub-district, Semarang City in 2012 showing the Pearson

Product Moment Correlation test results that the relationship between maternal age and anemia in third trimester pregnant women has a Pearson Correlation of 0.215, so it can be concluded that there is a weak relationship with a positive relationship direction, namely the higher the age, the higher the anemia. While the p-value is 0.095 which indicates that there is no significant relationship between age and anemia in third trimester pregnant women.

This is because age is not the only factor that causes anemia but there are other factors, namely basic factors (socioeconomic, knowledge, education, and culture) and direct factors (consumption patterns of blood supplement tablets, infection and bleeding). The factor that is most likely to influence is parity because although pregnant women are of reproductive age (not at risk), the majority of pregnant women are nulliparous and primiparous (at risk).

The Relationship Between Pregnancy Spacing and the Incidence of Anemia in Pregnant Women

The results showed that there were 11 people (17.7%) who were included in the group of respondents who had a risky pregnancy distance regarding anemia. While 51 respondents (82.3%) had a non-risk pregnancy distance. The Chi-square test results obtained a value of $p = 0.508$ ($p > 0.05$) then H_0 is accepted and H_a is rejected. So it can be concluded that there is no significant relationship between the level of pregnancy spacing and the incidence of anemia in pregnant women in the working area of the balai sepuak health center. The absence of a relationship between pregnancy spacing and the incidence of anemia is due to more respondents who have a pregnancy spacing of more than 2 years, while a mother needs more than 2 years to restore her reproductive organs.

In accordance with the theory stating that a good pregnancy distance is more than 2 years so that the nutritional status of the mother improves and the iron needs of a mother can be fulfilled, as well as preparing her physical stamina before the next pregnancy. The distance between the last delivery and the next pregnancy should be between two to five years, a distance that is too close (less than 2 years) is associated with an increased risk of miscarriage, low birth weight babies (less than 2,500 grams), fetal death and infant death.

Pregnancies that are too close for a mother can increase the incidence of anemia because the mother's nutritional status has not recovered, besides that a mother can experience infections, premature rupture of membranes and bleeding¹⁸. Mothers with a pregnancy spacing of more than 2 years should have a higher than close pregnancy spacing to create a happy family because in such a family the mother can give attention according to the first child and the second pregnancy.

The results of this study are not in line with Yunita's research which states that there is a relationship between pregnancy distance and the incidence of anemia in pregnant women at the Kedawung 1 Health Center, Karang Malang District, Sragen Regency. with the results of the statistical test P value = 0.033 (<0.05). This is because in Yunita's research many respondents had risky pregnancy spacing, where most respondents experienced anemia.

Relationship between Parity and the Incidence of Anemia in Pregnant Women

The results showed that there were 17 people (27.4%) who were included in the group of respondents who had high parity about anemia. While 45 respondents (72.6%) have low parity. The Chi-square test results obtained a value of $p = 1.000$ ($p > 0.05$) then H_0 is accepted and H_a is rejected. So it can be concluded that there is no significant relationship between the level of parity and the incidence of anemia in pregnant women in the working area of the balai sepuak health center. Of the 23 pregnant women who had parity ≥ 3 , who had an age > 30 years as much as 91.3%.

The more children and the older a person's age will affect their reproductive system. In such a situation, it will be easy to experience complications / complications in pregnancy. Coupled with poor economic conditions. Fulfillment of nutrients is not in accordance with what is needed during pregnancy. This will aggravate the incidence of anemia. The number of parities of more than 3 is a factor in the occurrence of anemia associated with too close a pregnancy interval of <2 years, which is caused by too frequent pregnancies that can deplete the nutritional reserves of the mother's body. Mothers who come from low socioeconomic levels with a large number of children and close pregnancy spacing and are still breastfeeding for a long time without paying attention to nutrition during lactation will be very dangerous for their survival and often cause anemia.

This study also supports previous research conducted by Ononge et al (2014)¹⁹ which states that the relationship between parity and the incidence of anemia in pregnant women is not statistically significant.

The Relationship Between Mileage and the Incidence of Anemia in Pregnant Women

The results showed that there were 26 people (41.9%) who were included in the group of respondents who had a long distance to travel. While 36 respondents (58.1%) have a short distance to travel. The Chi-square test results obtained a value of $p = 0.440$ ($p > 0.05$) then H_0 is accepted and H_a is rejected. So it can be concluded that there is no significant relationship between mileage and the incidence of anemia in pregnant women in the working area of the balai sepuak health center.

Travel distance is a situation that must be passed from home to a health facility either on foot or using a vehicle. Distance is also the journey taken from the community's place to the health facility measured by time indicators and kilometer radius and infrastructure conditions. A short distance from a pregnant woman's residence or home will affect her interest and motivation to have her pregnancy checked.

According to Green, the availability and affordability of health resources is one of the factors that contribute to healthy behavior. This is in line with the research of Gamelia, Sistiarani, & Masfiah²⁰, who said that pregnant women with a distance and travel time to a health service place that is closer are 3x more likely to take good pregnancy care compared to pregnant women whose travel time is far to the health service place.

According to the researchers, distance of residence is one of the factors that influence a person's behavior in accessing available health service facilities. The greater the distance between residence and health services will further reduce the mother's motivation to access health facilities.

Relationship between Fe Tablet Consumption and the Incidence of Anemia in Pregnant Women

The results showed that there were 35 people (56.5%) who were included in the group of respondents who had non-compliant fe tablet consumption. While 27 respondents (43.5%) had compliant fe tablet consumption. Chi-square test results obtained p value = 0.000 ($p < 0.05$) then H_0 is rejected and H_a is accepted. So it can be concluded that there is a significant relationship between fe tablet consumption and the incidence of anemia in pregnant women in the working area of the balai sepuak health center. The variable of fe tablet consumption has an OR value = 4.552, this means that mothers with non-compliant category fe tablet consumption have a 4.552 times chance of experiencing anemia compared to mothers who have compliant category fe tablet consumption. There is a relationship between adherence to taking Fe tablets with the incidence of anemia in pregnant women. In this study, because many respondents were not compliant with taking Fe tablets, anemia occurred. In addition, age is one of the causes of anemia which is dangerous for pregnant women and fetuses, especially those over 35 years of age.

Adherence to taking iron tablets is measured by the accuracy of the number of tablets consumed, the accuracy of how to consume iron tablets, the frequency of consumption per day. Iron supplementation or administration of Fe tablets is one of the important efforts in preventing and overcoming anemia, especially iron deficiency anemia. Iron supplementation is an effective way because its iron content is complemented by folic acid which can prevent anemia due to folic acid deficiency. Compliant pregnant women consumed Fe tablets, including compliance with the number of tablets consumed, how to consume Fe tablets, time to consume Fe tablets, frequency of Fe tablets consumed. Pregnant women who obediently consume Fe tablets can be influenced by good knowledge of pregnant women about Fe tablets. A high level of maternal knowledge can form a positive attitude towards compliance in consuming Fe tablets, without knowledge about consuming Fe tablets, it is difficult for mothers to instill obedient habits in consuming Fe tablets.

The results of this study are in line with Hidayah's research ¹¹ which states that there is a relationship between the compliance of pregnant women taking Fe tablets with the incidence of anemia in Pageraji Village, Cilongok District, Banyumas Regency with the results of the statistical test P value = 0.005 (<0.05).

The Relationship Between Husband Support and the Incidence of Anemia in Pregnant Women

The results showed that there were 38 people (61.3%) who were included in the group of respondents who had unsupportive husband support. While 24 respondents (38.7%) had supportive husband support. The Chi-square test results obtained a value of p = 0.000 ($p < 0.05$) then H_0 is rejected and H_a is accepted. So it can be concluded that there is a significant relationship between husband's support and the incidence of anemia in pregnant women in the working area of the balai sepuak health center. The variable of husband's support has an OR value = 19.600, this means that mothers with unsupportive husband's support have a 19.600 times chance of experiencing anemia compared to mothers who have supportive husband's support.

The results found by Inayah and Fitrahadi ¹² in 52 samples of pregnant women, where as many as 57.7% of husbands provided support to their wives. The results showed that as many as 24.3% of husbands did not provide support, this percentage

is much smaller when compared to the results of research from Septiani which stated that 98.1% of husbands did not provide support to pregnant women and research by Mulyanti, Mudrikatun, and Sawitry ¹⁴ with the results of 56.7% of husbands also did not provide support to their pregnant wives, but it is necessary to increase husband's support for pregnant women because lack of support can affect the health of pregnant women. The impact of the husband's role can also reduce the level of anxiety experienced by pregnant women, the mental strength and confidence of pregnant women becomes higher in undergoing pregnancy, labor and after childbirth, but lack of support can make pregnant women think that they are alone so that it can cause pregnant women to experience anxiety because they have no place to vent their complaints. Anxiety experienced by pregnant women can affect the health of pregnant women and the fetus. Negative thoughts are bad for pregnant women and fetuses, so they can endanger their pregnancy.

Relationship between ANC visits and the incidence of anemia in pregnant women

The results showed that there were 44 people (71%) who were included in the group of respondents who had incomplete ANC visits. While 18 respondents (29%) had a complete ANC visit. Chi-square test results obtained p value = 0.002 ($p < 0.05$) then H_0 is rejected and H_a is accepted. So it can be concluded that there is a significant relationship between ANC visits and the incidence of anemia in pregnant women in the working area of the balai sepuak health center. The ANC visit variable has an OR = 8.750, this means that mothers with incomplete ANC visits have a chance of 8.750 times to experience anemia compared to mothers who have complete ANC visits.

The more regular the mother's ANC visits, the more likely she is to avoid the risk of anemia. ANC visits are an effort to maintain a healthy pregnancy through physical examination, supplementation and health counseling for pregnant women. Regular ANC visits are to immediately detect various pregnancy risk factors, one of which is anemia. With ANC, the mother's anemia condition will be detected earlier, because in the early stages of anemia in pregnant women rarely cause significant complaints.

The results of this study are in line with research conducted by Riyanto et.al ²¹ who found a relationship between the completeness of ANC with the incidence of anemia. In addition, this study is also in line with research conducted by Veny Nurmasari et al ²² which says that pregnant women who perform complete ANC services will have a lower risk of anemia compared to pregnant women with incomplete ANC. The results of Jufar's research ²³ showed that antenatal care is a protective factor, so there is still a need to improve the quality of service.

5. CONCLUSIONS

From the results of research on 62 respondents in the Balai Sepuak Health Center Working Area, it can be concluded that there is a relationship between maternal knowledge, Fe Tablet Consumption, Husband Support, and Threat Visits. Unrelated variables are maternal age, parity, pregnancy distance, and distance traveled.

It is expected for health workers to improve health services for pregnant women so that the health status of pregnant women can be improved so that the incidence of anemia can be avoided. And it is hoped that health workers will be more

active in providing information about the impact and prevention of anemia. Not only limited to iron tablets that can increase haemoglobin but food information that can help iron absorption needs to be conveyed to pregnant women.

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