Literature Review : Risk Factors of Anemia in Pregnancy Women

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ABSTRACT

In Indonesia, according to the results of Riskesdas (2018), the proportion of anemia in 2018 has increased to 48.9 % when compared to 2013 which was 37.1%. Anemia in pregnancy is a condition where a hemoglobin level is below 110 g / L in the first and third trimesters or a hemoglobin level below 105 g / L in the second trimester. Anemia during pregnancy will impact pregnancy, childbirth, and post-partum. The purpose of literature review is to summarize the risk factors of anemia in pragnancy women. Literature review was taken from 15 journals using a crosssectional study, population is pregnant women in the region. There are eight international journals and seven journals from Indonesia with the span of the last five years. Literature source was from Pubmed, BMC, and Google Scholar. There were 19 variables were statistically significant through bivariate and multivariate tests on the occurrence of anemia in pregnancy. These variables were age, ethnicity, education, parity, compliance with Fe tablets, economic status, nutritional status, trimester in pregnancy, gestational age, frequency of ANC, residence, income, family members, food insecurity, mother's diet, current clinical disease, parasitic infection, mothers do not use family planning, and body mass index (BMI).

Keywords: anemia, pregnancy, risk factors

INTRODUCTION

Anemia in pregnancy is very important to study because it has implications between the study and the population. As many as half of all pregnant women in low and middle income countries are diagnosed with anemia, affecting 32 million pregnant women worldwide (Daru et al., 2018). The prevalence of anemia in pregnancy differs greatly between continents, with the highest being Africa (55.8%) and Asia (41.6%), and the lowest in Europe (18.7%) and North America (6.1%), in general, as pregnancy continues, the prevalence of anemia also increases (Masakume et al., 2015). In Indonesia, according to the results of Riskesdas (2018), the proportion of anemia in 2018 increased to 48.9 when compared to 2013 which was 37.1. Anemia during pregnancy will impact pregnancy, childbirth, and post-partum.

Indonesia is one of the developing countries with the highest number of anemia sufferers. The prevalence of anemia in pregnant women is quite high, namely 37.1%, which means that it is close to serious public *health problems* (*severe health problems* are $\geq$ 40%) (Fikawati, 2015) . Based on the profile of the Ministry of Health (2015), the five biggest causes of maternal death in Indonesia are bleeding (30.3%), hypertension in pregnancy (HDK) (27.1%), infection (7.3%), prolonged labor/

obstruction (1 , 8%), and abortion (1.6 %). Of the five biggest causes of AKI in Indonesia, four of them are the impacts that occur when the mother is anemic, namely pregnant women experience bleeding, infection, prolonged labor and abortion. The negative effects of anemia on pregnant women and their fetuses are abortion, growth and development barriers and fetuses in the uterus, easy cord decompensation infection (HB <6 Gr%), hydatidiform mole, hyperemesis gravidarum, antepartum bleeding, premature rupture of membranes (PROM), intrauterine death, premature, low birth weight, birth with anemia can occur congenital defects and babies are prone to infection to perinatal death (Mandang et al, 2016).

The risk of anemia will increase in low- and middle-income countries (Daru et al, 2018). This is because more women experience iron deficiency, hemoglobinopathy, macronutrient deficiencies, and infections such as malaria, and HIV than high-income countries (Daru et al, 2018; Young, 2018). Anemia in pregnancy is easy to treat, but several studies have shown that maternal anemia can reduce the condition of both mother and baby. There are three main reasons for death due to anemia. First, anemia results from excessive blood loss during or after childbirth resulting in low haematological reserves; second, with reduced resistance to severe anemia and increased susceptibility to infection; and third, a hemoglobin (Hb) level of less than 4 g / dL is associated with a high risk of heart failure and death, especially during labor or 2 hours after delivery (Khaskhelii et al, 2016). Anemia is also an independent factor that causes babies to be born with low birth weight (Figueiredo et al, 2018).

According to research conducted by Daru et al (2018) on the risk of maternal death in women with severe anemia during pregnancy and post partum. The study assessed the relationship between anemia and maternal mortality with data from a multinational WHO survey on maternal and newborn health. Many factors influence the occurrence of anemia in pregnancy, such as maternal age> 25 years, multigravida, no history of contraceptive use, being in the third trimester, history of menstrual bleeding, low body mass index, history of current clinical disease, intestinal parasitic infection, and the economic side has low income (Gedefaw et al, 2015).

To overcome the problem of anemia in Indonesia, the government has launched an equal distribution of Fe tablets . Where the administration of iron tablet to pregnant woman can be divided tobe Fe I (Mining, a time mom get a tablet Fe), which got 30 tablets, Fe II get 30 tablets, and Fe III get 30 tablets during pregnancy, at least 90 tablets of iron during pregnancy (RISKESDAS, 2013). One of the goals of epidemiology is to see the determinants of disease that it can control the spread and health problems in the population. Several journals have been reviewed to see what factors or determinants will be the risk of anemia for pregnant women. Literature review will help to see, summarize, and analyze the risk factors that cause happens anemia in pregnant women.

METHODS
Research design
This type of research is a literature study. Sources data used in this study are secondary data, obtained from articles or previous research journals from internet sites that match the search term, namely risk factors of anemia in pregnancy, another search term used is risk factor OR risk association OR determinant AND anemia AND pregnancy.
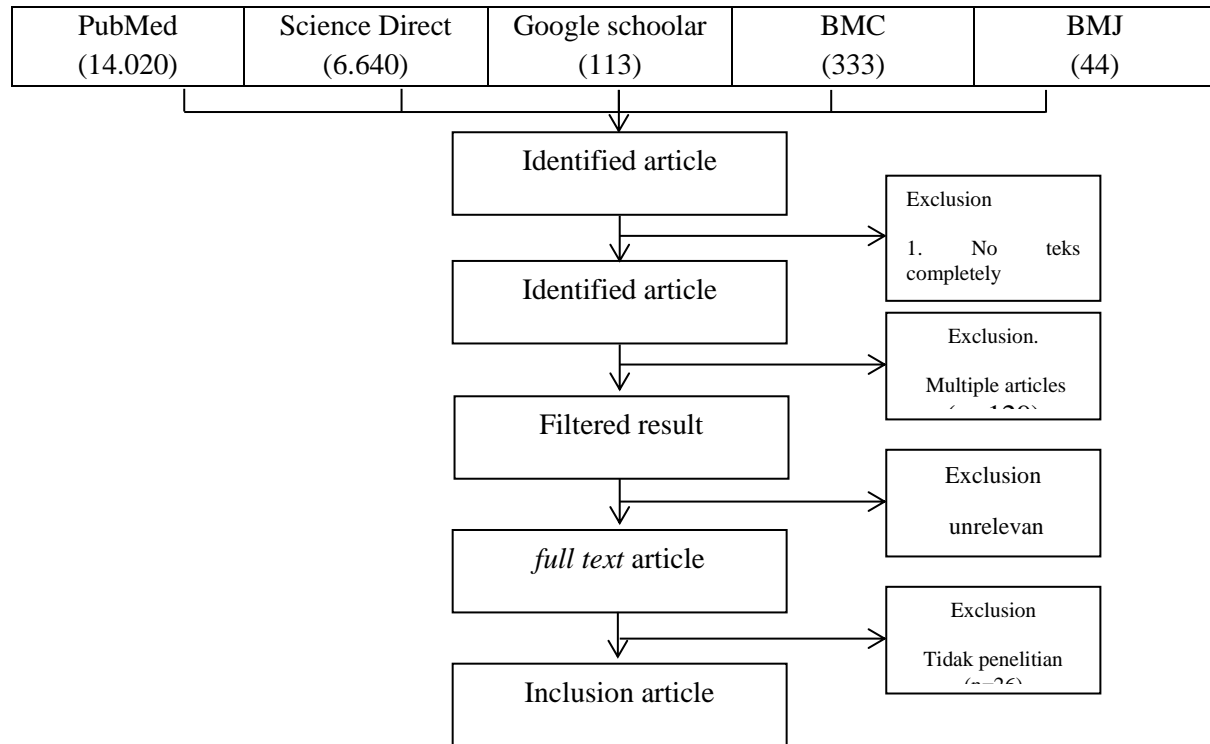### Variable Literature Review
Dependent variable is the incidence of anemia. Independent variables are age, education, parity, economic status, nutritional status, pregnancy in trimester I and II, ethnicity, pregnancy distance, frequency of ANC, residence, income, number of family members, food insecurity, maternal diet, clinical disease. at this time, parasitic infection, the mother does not use family planning, body mass index (BMI).
Search data base

Inclusion criteria: Research shows the factors that cause anemia in TM I, II, or III pregnancies. The research was conducted over 2015 used Indonesian or English journal. Research uses qualitative, quantitative study designs, or a combination of both. Cross-sectional design, *chi square* test and logistic regression. Exclusion criteria: No data or full text of the article were available. Researcher does not use a clear research method.

Table 1: Alogaritma Literature review

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PubMed (14.020)	Science Direct (6.640)	Google schoolar (113)	BMC (333)	BMJ (44)

Identified article

Exclusion
1. No teks completely

Identified article

Exclusion.
Multiple articles

Filtered result

Exclusion
unrelevan

full text article

Exclusion
Tidak penelitian

Inclusion article

Analysis of Study Criteria

Journals used international and national journals that use cross-sectional research design with chi -square test and logical regression test or both. The search using PICO is described below:

Population : pregnant woman

Intervention : Anemia

Comparison : No Anemia

Outcome : Some risk factor of anemia

RESULTS

Following are the variables found about the risk factors for anemia in pregnancy in 15 journals that have been reviewed, there are 35 variables found, 19 statistically significant variables are risk factors for anemia.

Table 2. Finding the risk factor s variables for anemia

No.	Variables found	Significant variable	Finding journals that significant	Not significant variable
1	Age	Age	4	
2	Ethnicity	Ethnicity	1	
3	Education	Education	6	
4	Parity	Parity	5	
5	Compliance with Fe tablets	Compliance with Fe tablets	7	
6	Economic status	Economic status	2	
7	Nutritional status	Nutritional status	3	
8	Trimester in pregnancy	Trimester in pregnancy	3	
9	Pregnancy distance	Pregnancy distance	2	
10	ANC frequency	ANC frequency	1	

11	Residence	Residence	2	
12	Income	Income	5	
13	Number of family members	Number of family members	3	
14	Food insecurity	Food insecurity	1	
15	Mother's diet	Mother's diet	1	
16	Current clinical disease	Current clinical disease	2	
17	Parasitic infection	Parasitic infection	1	
18	Not KB	Not KB	1	
19	BMI	BMI	1	
20	History of anemia			History of anemia
21	Smoking history			Smoking history
22	History of abortion			History of abortion

No		
23	Adequacy level of protein nutrition	Adequacy level of protein nutrition
24	Consume meat vegetables	Consume meat vegetables
25	Vitamin C adequacy level	Vitamin C adequacy level
25	Drinking tea	Drinking tea
27	Animal source foods	Animal source foods
28	Marital status	Marital status
29	Source of drinking water	Source of drinking water
30	Wear shoes consistently	Wear shoes consistently
31	Malaria infection	Malaria infection
32	Gestational age	Gestational age
33	Hemoglobin	Hemoglobin
34	Weight	Weight
35	Religion	Religion

DISCUSSION

Age

The results of the analysis of 5 studies indicate that age is a risk factor for anemia in pregnant women. In a study conducted by SL et al., (2019) that the age of pregnant women <25 years can increase the occurrence of anemia by 2 times and is statistically significant (p = 0.04) compared to those aged> 25 years. This has the same results as research conducted by Ammalia., At al (2018) high risk age in pregnant women has a tendency to 2 times greater and statistically significant (p = 0.03) to experience anemia than pregnant women with age at risk. low. The high risk ages referred to in the study were <20 years and> 35 years. Age can cause anemia because the age of the mother during pregnancy who is not in a healthy reproductive period (<20 years or> 35 years) is a risk factor for anemia in pregnancy, similar to research conducted by Sri Yunita (2017), it was found that age was statistically significant (p = 0.033). Research conducted by Dwi Astuti (2016) refers to age <20 years which statistically significant (p = 0.004) can cause anemia. Similar to research conducted by Gedefaw (2015), 15-24 year olds have nine times the risk of experiencing anemia.

When the age is <20 years, the reproductive organs are not mature enough to perform their functions and the hormonal system is still unstable compared to those aged> 20 years, with this unstable hormone system it is prone to anemia. Anemia in pregnant women aged < 20 years, it is possible that during adolescence or before pregnancy, iron deficiency has also been experienced so that it continues during pregnancy (SL et al., 2019). Thus, pregnant women aged <20 years need additional nutrition that is more than those aged 20-35 years because in addition to being used for themselves, they also have to share with their fetus for growth and development. Meanwhile, pregnant women aged> 35 years also need a large amount of nutrition because the organ function is weakening.

Etnicity

From the journals referred to, 1 journal was found that contained ethnic variables as a risk factor for anemia in pregnant women. According to research by SL et al., (2019), ethnicities from Malay and Indian are more likely to experience anemia twice and this is statistically significant (p = 0.00) than ethnicities from China. According to the study, due to differences in dietary practices and / or the ability of the absorption of iron can lead to iron deficiency in the proportion of ethnic Malay and Indian higher. This is because the Chinese ethnic group has a habit of consuming more meat, poultry and eggs, which these foods make a large contribution to sources of iron. Meanwhile, the Malay ethnic group has a low habit of consuming fruits and vegetables and has a lower intake of vitamin C, where the intake of vitamin C also contributes high in helping the body absorb iron. While Indian women tend to be vegetarians, non-heme absorption may be inhibited by *phytates* in vegetables and cereals.

Education

After conducting a review, there are 6 research journals that contain educational factors as a risk factor for anemia in pregnant women. The first study, namely (SL et al., 2019) is similar to the research conducted (Prahesti, 2016) where education in pregnant women can increase the risk of anemia by 2 times and is statistically significant (p = 0.02). research done by Yanti at al., (2015) said that education becomes a risk factor anemia in pregnant women as much as 3 times and statistically significant (p = 0.03). Furthermore, research conducted by Dwi Astuti., (2016) shows that low education (SD and SMP) has 11 times the risk of anemia and is statistically significant (p = 0.002) as well as research by Ullah et al., (2018) which is statistically significant (p = 0.01) and Purba et al (2018) statistically significant (p = 0.002). The education referred to in this research is pregnant women with low education (not attending school or completing primary school or completing junior high school or equivalent). The results showed that the lack of knowledge, understanding or awareness of iron deficiency will have an impact on the action of consuming iron-rich foods or taking iron supplements to improve maternal iron status. Pregnant women who have higher education can choose which foods contain lots of iron (Prahesti, 2017). Lack of information is also an obstacle to changing healthy

lifestyles, they prefer advice from their ancestors who are considered better and ignore suggestions from health workers, one of which is the habit of drinking milk which is thought to cause large babies (Yanti et al., 2015). The purpose of education is to change behavior, because according to Ammalia et al., (2018) , education is one of the factors that influence the formation of a person's behavior, these behaviors and actions are formed through a series of learning processes and are expected to last long and stay based on awareness.

Parity

From several journals that have been reviewed, there are 5 journals which state that parity is at risk of anemia in pregnant women. Parity is the number of mothers who have given birth to live children (Prahesti, 2017). Pregnant women with a history of pregnancy more than three or multiparity can cause anemia risk as much as two times and statistically significant (p = 0.046) compared with the new pregnant women pregnant with her first to the third (SL et al., 2019). This is also reinforced by research conducted by Ammalia et al., (2018) that multiparity can cause the risk of anemia in pregnant women 4 times and it is statistically significant (p = 0.05). Pregnant women who give birth to their third to fifth children have a risk of anemia 2 times compared to mothers who give birth to six and over have a 3 times higher risk of anemia (Lebso, 2017; Gedefaw, 2015). Research by Derso et al., (2017) also showed that multiparity> 5 had 5 times the risk of anemia and was statistically significant (P = 0.02). Multiparity reflects a reduced iron intake as the number of pregnancies increases. Every pregnancy and childbirth, there will be a change in muscle fibers to become connective tissue in the uterus, this can reduce the ability of the uterus. Parity 1 is a condition where the mother is weak and has just had a pregnancy, so there are many conditions that occur such as weakness, lack of appetite, and worry about the condition of the fetus so that they can experience anemia. Parity 2-3 is the safest parity in terms of maternal mortality compared to high parity (Amallia et al, 2018). Parity is also closely related to pregnancy spacing, if the pregnancy is too close or <2 years, then the body's organs are not ready for pregnancy (Prahesti, 2017). Pregnancy status can affect the degree of anemia, the more often a mother gives birth, the greater the risk of blood loss and an impact on reducing HB (Astuti, 2016).

Economic Status

Economic status was found in 2 journals where pregnant women with low economic status can cause anemia in pregnant women as much as 4 times higher than pregnant women with high economic status, it is confirmed by the existence of a significant statistical test p = 0.002 (Yanti et al., 2015) as well as the research of Lebso., (2019) that low economic conditions have a double risk of experiencing anemia. Low economic status has a higher prevalence of anemia than pregnant women with low economic status. Maybe pregnant women who have a low economy cannot buy food with good quality and sufficient quantity (Lebso, 2019). B ahan foods rich in iron found in food sources that contain good protein animal (chicken liver, fish, milk, eggs, and meat) or vegetable (tofu, tempeh, and legumes) and derived from green vegetables. The food sources that contain the most iron are those derived from animal protein which are quite expensive, the high cost of these foods makes it impossible for people with low family income to reach them (Yanti et al., 2015) . So that pregnant women cannot meet their nutritional needs during pregnancy more than before pregnancy.

Compliance with Fe

Based on the results of research that has been reviewed, the compliance factor of pregnant women taking Fe tablets has a very big effect on the incidence of anemia, there are 7 journals that examine there is a statistically significant relationship (p = 0.000) about adherence to taking Fe tablets with anemia in pregnant women, where the mother pregnant women who do not adhere to taking Fe tablets will increase the risk of anemia by 7 times compared to pregnant women who are compliant in consuming Fe tablets (Yanti et al, 2015). Lack of intake of Fe tablets has four times the risk of experiencing anemia and statistically significant (p = 0.003; 0.01) (SL et al., 2019; Gebreweld, 2018). Another study conducted by Astuti Dwi (2016) was statistically significant (p = 0.000) and had

14 times the risk of experiencing anemia if they did not comply with Fe tablets. Research is reinforced by Lebso (2019) that pregnant women who do not take Fe tablets 2 times have a risk of up to 6 times the risk (Derso, 2016) of experiencing pregnancy anemia. In the research above , it is explained that pregnant women need to consume Fe tablets during pregnancy, because the iron needs of pregnant women increase during pregnancy. Pregnant women experience dilution of red blood cells, so they need additional iron to increase the number of maternal and fetal blood cells. Iron is needed for *hemopobesis* (blood formation), which is in the synthesis of hemoglobin and can be conjugated with protein in the form of ferrous or ferric in the body, so it is needed especially pregnant women whose iron needs are increasing (Yanti et al., 2015) . Pregnant women who are obedient to take Fe tablets are influenced by other factors such as good maternal education, resulting in awareness to consume Fe tablets regularly. (Astuti, 2016). On the other hand, Fe has side effects such as nausea, vomiting, and heartburn where some pregnant women are unable to accept the side effects caused by the failure of mothers to take Fe tablets regularly.

Nutritional Status of Pregnant Women

Based on the research, nutritional status during pregnancy has a statistical effect (p = 0.00 0) on the occurrence of anemia in pregnant women (Purwaningtyas, 2017) and is strengthened by research conducted by Tanziha et al., (2016)   where mothers have nutritional status. poor or experiencing chronic energy deficiency (KEK) will experience a risk of 2 times compared to pregnant women with normal nutritional status . According to the study, this is due to physiological changes during pregnancy in the form of an increase in the volume of fluids and red blood cells and a decrease in the concentration of nutrient-binding proteins in the blood circulation, so that pregnant women who have nutritional disorders at the beginning of pregnancy are unable to meet their needs. during pregnancy and will have an impact on anemia during pregnancy.   KEK status can affect the health of mothers and babies, where mothers can experience anemia and babies can be born LBW and stunted. Based on Derso's research (2017), the nutritional status of pregnant women can be measured through the upper arm circumference where Lila is measured <23cm at risk of anemia and has 4 times statistical significance (p = 0.02).

Trimester in pregnancy

Based on the research found, research conducted by Gebreweld (2017), that pregnancy in the second trimester has a risk of 6 times and the third trimester 8 times the incidence of anemia compared to the initial trimester. This may be due to a 40-50% higher increase in maternal plasma volume against the red cell mass by 20-30% and to a decrease in hemoglobin concentration. This is similar to research by Lebso (2019) which states that second and third trimester pregnancies have a risk of anemia 3 times higher than the initial trimester, this is because calories and nutrients are increased to support increased metabolism of pregnant women, blood volume and nutrients to the fetus, this demand. most during the second and third trimesters of pregnancy. Meanwhile, in the early trimester, there is a decrease in iron absorption due to lower iron requirements. However, the second trimester of pregnancy iron absorption from food with iron availability increases by 1.9mg / day and the final trimester up to 5, mg / day. Anemia in the third trimester of pregnancy can cause the mother to become weaker and the iron in the blood is divided for fetal growth, thereby reducing the iron-binding capacity of the mother's blood (Prahesti, 2017).

Pregnancy distance

The risk factors for pregnancy anemia based on the results of research by Sri Yunita (2017) with a variable pregnancy interval were statistically significant (P = 0.003), which means that there is a relationship or influence on pregnancy anemia. The reason is due to repeated pregnancies in a short time so that the mother's iron reserves, which have not been recovered, are finally depleted for the needs of the next fetus. The more often a pregnant woman experiences pregnancy and childbirth, she will lose a lot of iron and become anemic. If the iron reserves are minimal, each pregnancy will deplete the body's iron stores and eventually cause anemia in the next pregnancy. Therefore, efforts need to be made so

that the distance between pregnancies is not too short, at least more than 2 years the shorter the pregnancy interval, the greater the maternal mortality for mother and child, especially if the distance <2 years occurs complications.

ANC frequency

Based on the results of research that has been reviewed, there is one journal that examines the risk factors for ANC frequency visits to be less statistically significant (p = 0.005) by Sri Yunita (2017) where pregnant women who routinely carry out antenatal care regularly have a lower risk of developing anemia than the mother. less regular ANC visits. On the other hand, ANC visits to produce a healthy pregnancy through physical examination, supplementation and health advice for pregnant women. Regular ANC visits can immediately detect various risk factors for pregnancy, one of which is anemia, so that routine ANC visits can minimize the anxiety of anemia because pregnant women have received iron and IEC supplements according to the complaints / risks of the mother's pregnancy.

Residence

There are 2 journals that show the variable of residence is a risk factor for anemia. Derso et al., (2017) with a significance level (p = 0.02) and pregnant women who live in rural areas are at 3 times the risk of pregnant women living in urban areas. The possibility of anemia living in rural areas is due to not having adequate latrines so that PHBS is less and anemia is easy. And in a study conducted by Derso et al., (2017) pregnant women who live in rural areas are still affected by public trust in bad food, access is difficult and the majority of rural communities receive education and counseling. Similar to Ullah Azmat's research, there was a significant relationship between pregnant women living in rural areas with anemia (p = 0.001). In rural areas, pregnant women who do not get information about pregnancy nutrition have an effect on the health of the mother and the fetus, including anemia. Pregnant women who routinely carry out prenatal care come from urban areas so that the prevalence of disease is more due to the increasing number of pregnant women who are conducting consultations (Cabral et al., 2015).

Income

Based on the results of journal reviews, there are 5 journals that state income variables are related to anemia (p = 0.02 and p = 0.001) (Derso et al., 2017; Ullah at al., 2018) Another study was conducted by Purba at al., 2018) there is significant (p = 0.002) between income and anemia similar to Prahesti's study, (2016) which is significant (p = 0.043) on anemia. The income that is meant, according to him, the income obtained by pregnant women with low economic conditions, it is possible that the nutritional intake obtained is less seen from the indicator of intake of red blood cell production. Most of the pregnant women have income below the UMR and the mothers do not work / IRT. Income below the UMR affects the availability of food. Where the research by Derso at al., (2017) states that low income has a risk of 3 times the same as the research conducted by Gedefaw at al., (2015) which states that low income has a 5 times risk of anemia. Income according to Prahesti., (2016) is not only used for consumption purposes but is also divided for daily needs. Food consumed is minimal, such as tofu, tempeh, crackers, and not consuming vegetables. This is what contributes to the cause of anemia because iron is not fulfilled properly. If the mother consumes vegetable protein, the need for iron is still not fulfilled during pregnancy, so it is still necessary to consume iron during pregnancy.

Family members

There were 3 studies that showed variables that were statistically significant (p = 0.046) conducted by Cabral at al., (2015). The unfavorable socio-economic conditions with a larger number of family members living in one house are proven to be a large number of the increasing prevalence of anemia, reinforced by low socio-economic conditions. Families of more than five families greatly influence the risk factors for anemia (Gedefaw, 2015) in line with the research by Ullah et al., (2018) that the number of members has a lot of influence on anemia.

Food insecurity

Based on the results of research by Cebral at al., (2015), food insecurity is significant to the incidence of anemia (p = 0.046) and has a double risk of anemia. Conditions of food insecurity related to anemia include limited or uncertain availability of sufficiently nutritious food, insurance, and the ability to buy food, food insecurity, and job instability. Studies show the relationship between food consumption and food security with low consumption of food producers and excessive carbohydrate consumption among children and their families are also food insecure. The relationship between anemia and food insecurity was found because food access and quality disrupt food consumption, especially iron sources.

Mother's diet

Research variables Maternal diet can affect the incidence of anemia found by ancient research at al., (2018) which was statistically significant (p = 0.01). The results of the study were the highest incidence of anemia in mothers who had unhealthy diet. The diet of pregnant women should be done in a better way, for example pregnant women have to choose a variety of foods consumed and varied. Most pregnant women who experience anemia due to increased nutritional needs but not balanced with the fulfillment of highly nutritious foods.

Current clinical disease

Based on the results of the review findings, there are 2 studies which state the same thing that clinical diseases currently affect pregnant women to experience anemia are reinforced by the findings of prahesti (2016) which are statistically significant (p = 0.062) and risk 0.31 to 6 times as found by Gedefaw (2015) against anemia. The more disease history, the greater the risk of anemia. Pregnant women who are pregnant are very sensitive to infections and infectious diseases. Disease in pregnant women, although not life threatening to the mother, can have harmful effects on the fetus. This disease can cause abortion, stunted fetal growth, fetal death in the womb, and congenital defects, infectious diseases that contracted pregnant women are usually unknown during pregnancy, and often only discovered after the baby is born with a defect. Infectious diseases caused by viruses can cause defects in the fetus while non-communicable diseases can cause pregnancy complications and increase fetal mortality. Pregnant women who are infected with diseases, will lack a lot of body fluids and other nutrients. Anemia during pregnancy can be caused by various factors including parasitic infection, malaria infection, and worm infection. Pregnant women who have clinical disease due to intestinal parasite infection (Gedefaw, 2015).

Parasitic infection

Based on the findings of Gedefaw (2015) study, parasite infection can be a factor in the incidence of anemia. Where intestinal parasites, especially hookworm infection, are well known among the poor. . Evidence suggests that coverage of maternal health program treatment in many countries has experienced increased intensity of hookworm infection associated with lower hemoglobin levels in pregnant women. It is also estimated that between a quarter and a third of pregnant women in sub-Saharan Africa are infected with hookworm and are at risk for hookworm-related infections . In the current study, women infected with hookworm were 2.7 times more likely to develop anemia than those not infected with intestinal parasites. Findings p research line carried out in various parts of Ethiopia and other countries that reported the possibility of anemia are more t Heigh in among women infected with hookworm. In addition, similar studies also show a higher likelihood of anemia among those who have worm infections with other intestinal parasites .

Does not use family planning

Research conducted by Gedefaw (2015) shows that mothers who do not do family planning have 5 times the risk of anemia. The prevalence of anemia is a public health problem, so an intervention strategy is needed to increase awareness of using contraceptive methods to reduce the risk of anemia.

Body Mass Index (BMI)

There is one study conducted by Gedefaw (2015) assessing low malnutrition pregnant women with BMI <18.5 kg / m2 as 9 times more likely to develop anemia than women with moderate or normal BMI. Due to the fact that anemia is a nutritional deficiency disorder.

CONCLUSION

Based on the results of reviews from 15 national and international journals , there are 19 statistically significant variables that are risk factors for anemia in pregnant women. These variables were age, ethnicity, education, parity, compliance with Fe tablets, economic status, nutritional status, trimester in pregnancy, pregnancy interval, frequency of ANC, rural residence, income, number of family members, food insecurity, mother's diet, current clinical disease, parasitic infection, mothers do not use family planning, body mass index (BMI).

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