analysis of factors affecting hemoglobin

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Analysis Of Factors Affecting Hemoglobin Levels In Pregnant Women

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ABSTRACT

Anemia is a condition of lack of hemoglobin (Hb) levels in the blood caused by a lack of intake of nutrients needed in the process of forming hemoglobin. [illegible] Deficiency (KEK), Infectious Diseases, Pregnancy Distance, Education and Knowledge

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1. Introduction

Anemia is a condition of lack of hemoglobin (Hb) levels in the blood caused by a lack of intake of nutrients needed in the process of forming hemoglobin. [1] Anemia is common throughout the world, especially in developing countries. In developing countries, anemia occurs in women by 45%, while in developed countries it is 13%. Anemia can be identified from low levels of hemoglobin in the blood from the threshold caused by low production of red blood cells (erythrocytes), increased erythrocyte damage and due to heavy blood loss during menstruation or due to accidents. There are several types of anemia but the most common is iron deficiency anemia. [2]

Anemia during pregnancy can increase the risk of fetal death during the prenatal period, the baby is born prematurely, the risk of postpartum hemorrhage, hypertension and heart failure during pregnancy, low birth weight/Berat Badan Lahir Rendah (BBLR)[3] About 10-20% of pregnant women in the world experience anemia during pregnancy, 75% are in developing countries. The prevalence of anemia in pregnant women in developing countries is 43% and 12% in pregnant women in developed countries. Maternal mortality due to anemia during pregnancy as a whole in the world 20-40% of 50,000 [4]. The results showed that 40% of maternal deaths were caused by bleeding during childbirth and an estimated 20% by low levels of hemoglobin (nutritional anemia) during pregnancy. Nutritional anemia can be caused by deficiency of ferrum, folic acid, vitamin B12 and vitamin A. Nutritional anemia in pregnancy 75% is caused by ferrum deficiency. Ferrum deficiency anemia often occurs because there is a twofold increase in the need for iron in pregnant women due to an increase in blood volume without expansion of plasma volume to meet the needs of the mother and fetal growth [5].

Children and women of childbearing age/wanita Usia Subur (WUS) are the group most at risk. The prevalence of anemia in children under five is 47%, pregnant women is 42% and in non-pregnant women aged 15-49 years is 30%. The World Health Organization (WHO) targets to reduce the prevalence of anemia in women of childbearing by 50% by 2025[6]. Riskesdas 2013 shows the percentage of anemia in women of childbearing 15-44 years is 35.3%.

Anemia due to ferrum deficiency can increase the risk to both of mother and baby. Supplementation is an important strategy in overcoming micronutrient deficiency in women. Data on micronutrient intake in women aged 15-49 years who gave birth to children in the 5 years prior

to the survey were based on background characteristics. The majority of women who gave birth during the five years prior to the survey received ferrum supplements during pregnancy for the delivery of their last child. Only one in three (33%) women received ferrum tablets according to the recommendations (90 days or more), 7% received 60-89 days and 31% received less than 60 days. The likelihood of ferrum intake for 90 days or more increases with age, education level and wealth quintile. Urban women are much more likely to take ferrum pills for at least 90 days than rural women 75% of anemia during pregnancy is due to ferrum deficiency. The need for ferrum is doubled in pregnant women. [7].

Ferrum deficiency affects the formation of hemoglobin (Hb) levels. This results in the inability of oxygen transport to all body tissues, so mothers with ferrum deficiency nutritional anemia need to be given substances that can form hemoglobin [2]. According to data from Basic Health Research, women's fruit and vegetable consumption behavior requires more replacement for the ferrum lost due to menstruation. Anemia in adolescent girls is a condition where the hemoglobin level in the blood is less than the normal limit, namely the normal Hb according to WHO is 12 g/dl (Arisman, 2010). What is meant by these young women is a period of transition from childhood to adulthood which is marked by physical and mental changes. These physical changes can be marked by the functioning of the reproductive organs such as the occurrence of menstruation [1].

Two billion people in the world suffer from ferrum deficiency anemia. Approximately 50% of cases of anemia are caused by ferrum deficiency. According to WHO,2011 the prevalence of anemia in pregnancy globally reaches 38.8% or around 32 million pregnant women experience anemia, while the prevalence of anemia during pregnancy in Southeast Asia reaches 48.2%. The prevalence of anemia in Indonesia from 2013 to 2018 has increased. The prevalence of anemia in pregnancy in Indonesia in 2013 was 37.1% and increased to 48.9% in 2018, while in 2018 it increased to 48.9% [8] In East Nusa Tenggara Province there are 46.2% of pregnant women who experience anemia, data from the City of Kupang 47 people who experience anemia [9] at the Betun Health Center in 2020 the number of pregnant women 750 people who have anemia 75 people although this is a decrease from 2020 but still quite high.

One alternative in meeting ferrum needs can be by consuming vegetables that contain ferrum. Ferrum can be found in vegetables, such as spinach (Amaranthus sp). Green vegetables such as spinach are a source of nonheme iron. Cooked spinach contains ferrum as much as 8.3 mg/100 grams. The ferrum contained in spinach is useful for the formation of hemoglobin in the blood [10] . The use of Moringa leaves as a nutritional supplement is increasingly widespread, as evidenced by the increasing number of reports of its use in various places, both in animals and humans. Hartati reported that a dose of 200 mg of Moringa liquid extract could reduce fasting blood glucose levels by 26.7 and OGTT by 29.9%. In pregnant women, giving 25 grams of Moringa leaf flour in a week [11] Based on the above, the authors are interested in conducting research on "Analysis of Factors Affecting Hemoglobin Levels in Pregnant Women".

2. Metods

The design of this research is the Literature Review method. The use of this method is related to the Covid-19 situation which limits researchers in data collection. A literature review study is a method used to collect data or sources related to a particular topic that can be obtained from various sources such as journals, books, internet and other references. This technique is carried out with the aim of revealing various theories that are relevant to the problems being faced/researched as reference material in the discussion of research results.

3. Result And Discussion

TABLE 1.
RESULTS LITERATURE REVIEW

No	Writer	Design	Types of dietary supplements	Sample	Method, duration of intervention	Results

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1	Maria Regina Moity Momengko [12]	Experimental Technique one group pretest and post test design	Traditional food Manado: Tinutuan	25 pregnant women	The provision of 90 tablets of Fe tablets by limiting the consumption of tea and coffee is added to the traditional Tinutuan menu. Tinutuan vegetables consist of a combination of [illegible] corn and rice consisting of macronutrients (carbohydrates) and micronutrients (vitamins and minerals)	Changes in the average Hb level of pregnant women before intervention 10.34 gr% increased to 11.30gr%. • There is an effect consuming tinutuan vegetables on hemoglobin levels pregnant women (p-value =0.00001)
2	Yulia Fitriani, Arih Tanggayuh, Tursilah [13]	Pre experiment [illegible] one group pre-post test design.	Guava juice	14 pregnant women trimester III	• Intervention to guava juice • Intervention for 7 days	• As much 57.1% of pregnant women before the guava juice intervention had levels of 42.9% have Hb levels 9 – 10.9 g% After intervention guava juice has 100% Hb level 11 g%/ Guava juice affects the Hb level of pregnant women third trimester (p-value 0.003)
3	Risza Choirunissa Destina Rennawati Mamirung [14]	• Quasi experiment • pretestposttest control group design.	Mung bean juice	• control group 32 pregnant women trimester III • Intervention group 32 pregnant women trimester III	• Interventions group: tablet Fe and mung bean juice; control group: Fe tablet	• There is a difference in levels hemoglobin pregnant women before and after giving intervention of Fe tablets and soybean extract (9.8906gr% to 10.7969gr%) Consumption of Fe tablets and mung beans can increase levels of

						hemoglobin pregnant women compared to pregnant women who only received Fe tablets (p-value =0.0001)
4	Rifa ni Zainaton Nasro [15]	• Quasy seaweed Eksperiment - design one group pretestpostte st	30 Pregnant mother have Hb < 10 g/dl.	• Pregnant women are given types of seaweed Eucheuma Sp • Intervention for 7 days.	Seaweed consumption for 7 days can increase the average Hb level from 8.04 g/dl to 10.72 g/dl (1.78 g/dl)	
5	Farida Ayu Yuliandari,Retno Kusuma D, Wilujeng Karraka Ratri [16]	Quasi experiment - Pretest-Posttest Design with Kontrol Group	Sweet potato (Ipomoea Batatas)	• Control group= 25 pregnant women trimester III • Intervention group = 25 pregnant women trimester III	• Sweet potatoes were given to the intervention group together Fe tablets • The control group was only given Fe tablets.	Hb levels of pregnant women before the intervention had an average of 10.8545 increased to 11.4310 (increase 0.58) - Consumption of sweet potatoes and Fe tablets (intervention) on Hb levels of pregnant women (p-value 0.000)

Based on the table shows that the ideal age of the mother in pregnancy is of 20-35 years and at that age there is less risk of pregnancy complications and has a healthy reproduction. This is related to the biological and psychological conditions of pregnant women. Because in this age group the biological development of reproduction is not optimal. In addition, pregnancy in the age group above 35 years is a high-risk pregnancy. Pregnant women over the age of 35 are also prone to anemia. This causes the body's power to begin to decrease and it is susceptible to various infections during pregnancy that pregnant women aged less than 20 years and more than 35 years are 74.1% suffer from anemia and pregnant women aged 20-35 years are 50.5 % suffer from anemia. Women who are less than 20 years old or more than 35 years old, have a high risk of getting pregnant, because it will endanger the health and safety of pregnant women and their fetuses, are at risk of bleeding and can cause the mother to experience anemia.

The emergence of nutritional problems in pregnant women, such as the incidence of KEK, can't be separated from the social, economic, and bio-social conditions of pregnant women and their families such as education level, income level, food consumption, age, parity, and so on. Measurement of upper arm circumference/Lingkaran Lengan Atas (LILA) is a way to determine the risk of Chronic Energy Deficiency (KEK) in Women of Childbearing/Wanita Usia Subur (WUS). The LILA measurement can't be used to monitor changes in nutritional status in the short term. Upper arm circumference (LILA) measurement can be used for the purpose of screening the nutritional

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status of Chronic Energy Deficiency/kurang energi kronis (KEK). Detection of KEK with a low LILA size reflects a lack of energy and protein in daily food intake which is usually accompanied by a deficiency of other nutrients, including iron.

Ferrum is an important element in maintaining the immune system so that it is not susceptible to disease. According to research, people with Hb levels <11 g/dl have low levels of white blood cells (to fight bacteria). A person can get anemia due to increased body needs due to physiological conditions (pregnancy, blood loss due to accidents, post-surgery or menstruation), the presence of chronic or infectious diseases (hookworm infection, malaria, tuberculosis). Pregnant women are very sensitive to infections and diseases. Some of them, although not life threatening to the mother, can have a harmful impact on the fetus. Among them, can lead to abortion, fetal growth is stunted, the baby dies in the womb, and congenital defects. Infectious diseases suffered by pregnant women are usually not known during pregnancy. It was only known after the baby was born with a disability. In conditions infected with the disease, pregnant women will lack a lot of body fluids and other nutrients. Diseases suffered by pregnant women greatly determine the quality of the fetus and the baby to be born. Maternal diseases in the form of infectious diseases can affect the health of the fetus if the placenta is damaged by bacteria or viruses that cause disease. Infectious diseases caused by viruses can cause defects in the fetus while non-communicable diseases can cause pregnancy complications and increase fetal mortality by 30%.

The highest proportion of deaths occurred in mothers with a parity of 1 – 3 children and if viewed according to the distance of pregnancy, it turned out that the distance of less than 2 years showed a higher proportion of maternal deaths. A pregnancy distance that is too close causes the mother to have a short time to restore the condition of her uterus so that it can return to its normal condition. Previously, Pregnant women with a distance that is too close are at risk of anemia in pregnancy. Because pregnant women's iron reserves are recovered. Finally, they are reduced for the needs of the fetus they contain.

The education that a person undergoes has an influence on increasing thinking skills, in other words, someone with higher education will be able to make more rational decisions, generally open to accept changes or new things compared to individuals with low education. The low level of education of pregnant women affects the acceptance of information so that knowledge about anemia and the factors associated with it is limited, especially knowledge about the importance of ferrum. Several observations have shown that most of the anemia suffered by the community is due to malnutrition, which is commonly encountered in the regions, rural areas with malnutrition or malnutrition. Pregnancy and childbirth are close together, and pregnant women with low education and socioeconomic status, factors that influence anemia status are low education levels.

Women need Ferrum higher than men because menstruation occurs with bleeding of 50 to 80 cc every month and ferrum loss of 30 to 40 mg. In addition, pregnancy requires additional ferrum to increase the number of red blood cells and form fetal and placental blood cells. The need for ferrum in pregnant women is on average close to 900 mg. This requirement consists of, about 300 mg needed for the fetus and placenta and another 500 mg used to increase maternal hemoglobin , approximately 200 mg will be excreted through the intestines, urine and skin. Food for pregnant women every 100 calories will produce about 9-10 mg of iron [3](**Jannah**). Obedience of pregnant women is seen from mothers who take 10 Fe tablets in each month of their pregnancy.

4. Conclusion

Based on the description above about what the analysis of the factors that affect hemoglobin levels in pregnant women concludes because mother's age, Chronic Energy Deficiency, infectious disease, pregnancy interval, education and obedience.

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