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Management of Anemia in Pregnant Women with Non-Pharmacological Methods: Literature Review

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ABSTRACT

Pregnancy is a physiological process in a woman. A pregnant woman will experience changes in her body system during pregnancy. Pregnant women will be susceptible to anemia due to several things such as hemodilution and lack of iron intake. Anemia is included in a global problem which in Indonesia itself has a relatively high incidence rate, namely 48.9% in 2018, so an effective strategy is needed to overcome this problem. The aim of this research is to determine the non-pharmacological management of anemia in pregnancy. The method used was a literature review of 10 research articles contained in computerized databases (Google Scholar and Wiley) in the last 5 years using the keywords anemia, anemia management, non-pharmacology and pregnancy. As a result, non-pharmacological treatment of pregnancy with anemia can be done by consuming tomato herbal tea, chayote, mung bean juice, vegetable juice combined with various other ingredients such as spinach-lime-honey juice, dates, tempeh, and jackfruit seed milk, because the high vitamin C and iron contained in it make it a good source of nutrients to increase hemoglobin production and maintain body health. The conclusion is, vitamin C and iron are an ideal combination of compounds to overcome anemia in pregnant women, because iron helps the production of hemoglobin and vitamin C increase iron absorption, thereby helping to overcome and prevent anemia and improve the health of the mother and fetus

Keywords:pregnancy with anemia, anemia management, non-pharmacology.

INTRODUCTION

A woman will experience a physiological process in her life, namely pregnancy. During the pregnancy period, various systems of the mother's body will change.(Islamic & Ariyanti, 2019). Various changes will be experienced by the mother during this period, from physical to psychological.(AC Putri et al., 2024). Pregnant women will experience significant physiological changes such as hemodilution. This physiological change occurs because of the large increase in

blood plasma volume compared to erythrocytes of around 30-40%(Igbinosa et al., 2022). The hemodilution process results in decreased hemoglobin (Hb) levels in the blood, which is called anemia.(Ali et al., 2020).

Anemia is a health problem that is still a global concern. Data obtained fromIndonesian Health Survey (2023), currently the incidence of anemia in pregnant women on a national scale is 27.7%, which shows a decrease compared to 2018, which was 48.9%.(BPS, 2021). Meanwhile, in Central Java the incidence rate reached 27.61% with a target reduction of 22% in 2023.(Governor's Regulation, 2023). In addition to hemodilution, pregnant women are susceptible to anemia due to several things, such as the type of food consumed is less diverse and less nutritious, iron deficiency, chronic energy deficiency (CED), iron loss due to infections such as malaria, and repeated pregnancies in a close time. In developing countries, the incidence of anemia is associated and connected with several factors, including low levels of knowledge, parity of more than 5 times, not routinely doing ANC, pregnancy spacing that is too close, the wrong way to consume Fe tablets, and low nutritional and economic status.(Oktaviana et al., 2022). This is in line with what was expressed(Mariana et al., 2018)in(Gustanela & Pratomo, 2022)that the causes of anemia in pregnant women can be divided into two categories, namely direct and indirect causes, with the direct causes being compliance with iron consumption, bleeding, and infectious diseases. While knowledge, education, socio-economic, culture, ANC visits, number and spacing of pregnancies, nutritional patterns, and age are included in the indirect causes.

Pregnancy with anemia will have adverse effects, such as increasing the risk of infection, decreasing immunity, miscarriage/abortion, premature birth, low birth weight (LBW), and intrauterine fetal death (IUFD) if the pregnant mother experiences severe anemia. In addition, it will affect the growth and development of the fetus and the high potential for complications in pregnancy and childbirth to become a serious problem that leads to death in the mother and child.(Ministry of Health, 2020).

There are two ways to provide intervention or management for pregnant women with anemia, namely pharmacological and non-pharmacological methods. According to the World Health Organization(WHO, 2017)quoted from(Fauzianty

& Sulistyaningsih, 2022)Pregnant women who experience anemia can be prevented and overcome by consuming blood-boosting tablets (TTD) which contain 30-60 mg of iron and 0.4 mg of folic acid. Iron itself is a macro substance that is responsible for the synthesis of red blood cells.(Khoiriah & Latifah, 2020)and according to(Prawirohardjo, 2010)in(Delyka et al., 2022)The function of folic acid in pregnant women is to form 1/3 of red blood cells.

For prevention and non-pharmacological management, it is recommended to make foods containing iron and protein as part of the daily diet, for example consuming fish, poultry, meat, eggs, green vegetables such as spinach, orange or yellow fruits such as corn, red fruits such as beets, and also nuts. Foods from plants contain non-heme iron, the content of non-heme iron obtained from plants will be absorbed by the body 1-10%. Therefore, it is also necessary to have food content that increases the effectiveness of iron absorption such as vitamin C.(Ministry of Health of the Republic of Indonesia, 2023). According to(Yanagisawa et al., 2009)which is quoted in(Krisnanda, 2020)Vitamin C functions 4 times more in absorbing nonheme iron. So, if iron is combined with vitamin C, it can be used as an additional intervention to help the formation of Hb in the blood of pregnant women who experience anemia.(Ismi Wahyuni & Sukmawati, 2021).

METHOD

This study was compiled based on a literature review method that contains a lot of information related to the management of pregnant women with anemia non-pharmacologically from national and international articles. This literature review uses references with systematic search technology in computerized databases (Google Scholar and Wiley). The keywords used are pregnancy with anemia, anemia management, and non-pharmacological. Then the retrieval or screening of publications from 2019 to 2024 or the last 5 years was carried out. Overall, 10 articles were obtained that were relevant to the keywords and publication screening.

RESULTS AND DISCUSSION

After conducting a search, 10 articles were found containing anemia management using non-pharmacological methods as follows.

Table 1. Review of the sources reviewed

No	Title, Author, Year	Research Design	Variables	Results
1	Increasing Hemoglobin Levels in Pregnant Women with Anemia Through Intervention of Tomato Herbal Tea Consumption(Aprilia Wardani & Herlina, 2024).	Pre-experimental with one group pre-posttest design	The provision of tomato herbal tea intervention as an independent variable and the Hb levels of pregnant women suffering from anemia were used as the dependent variable.	This study proves that tomato consumption intervention can increase hemoglobin levels in pregnant women.
2	Effectiveness of Chayote Consumption on Increasing Hemoglobin in Pregnant Women(Ismi Wahyuni & Sukmawati, 2021).	*Quasy-experimental*with paired sample t-test	Chayote and hemoglobin in pregnant women suffering from anemia	The findings of this study are that there is an increase in Hb levels in pregnant women who consume chayote. Before consuming chayote, the average Hb was 9.7g/dL and afterward

				it was 10.9g/dL.
3	*Mung Bean Juice Consumption to Pregnant Women with Mild Anemia* (Martini & Kurnia Dewi, 2021).	The instrument used is Varney's 7-step care, using a descriptive model with a case study.	Green bean extract with Hb levels of Mrs. L	After monitoring 4 times in 1 month, the results showed that there was an increase in hemoglobin from 10g/dL to 11g/dL. Green bean extract has been proven to have a positive effect in increasing hemoglobin (Hb) levels in pregnant women.
4	Effectiveness of Combination Therapy of Spinach Juice, Lime, Honey, with Fe on Increasing Hemoglobin Levels in Pregnant Women with Anemia at the Cikampek Health Center UPT(Rusmiati et al., 2021).	*Quasy-experiment*with paired sample t-test and independent t-test.	The increase in Hb levels in pregnant women with anemia is the dependent variable with the administration of a	This study found that Hb levels changed before and after the intervention. Hb levels before the intervention had an

			combination of spinach-lime juice and honey as the independent variable.	average of 10.207g/dL, with a range of values from 9.3g/dL to 10.8g/dL. After the intervention, the average Hb became 12.753g/dL with the lowest Hb being 11.9g/dL and the highest Hb being 13.3g/dL.
5	Effectiveness of Giving Dates on Increasing Hemoglobin Levels in Pregnant Women with Anemia(Sinta Sumitran, 2023).	Experimental with paired t-test and t-independent test	Giving dates as an independent variable with an increase in Hb in pregnant women with anemia as a dependent variable	The findings of this study are that dates can be used as an alternative to treat anemia. The average Hb levels in the control group before and after testing were 10.090g/dL

				and 10.210g/dL, while in the group given date intervention were 10.100g/dL and 11.310g/dL.
6	Tempeh Can Increase Hemoglobin (Hb) Levels in Pregnant Women(Indrasari & Agustina, 2021).	*Quasi-experiment*with t-independent	Provision of tempeh as an independent variable and pregnant women with anemia as a dependent variable	The findings of this study are that giving tempeh can increase Hb levels. The average Hb of the group given tempeh intervention was 1.2833g%. Meanwhile, the control group that was not given tempeh experienced a lower increase in Hb levels, which was 0.7222g%.

7	*Jackfruit Seeds Milk Administration Increased Hemoglobin Levels in Third Trimester Pregnant Women at Bangetayu Health Center, Semarang, Indonesia* (Meiranny et al., 2024).	*Quasi-experimental*with chi-square and t-independent using SPSS software	Giving jackfruit seed milk as an independent variable and increasing Hb in pregnant women with anemia as a dependent variable	The results of the study showed that the group given additional intervention, namely concrete milk, experienced an increase in hemoglobin (Hb), which initially averaged 10.2g/dL to 10.7g/dL. The increase in Hb in the control group, which initially averaged 12.2g/dL to 12.4g/dL
8	*Improvement of Hemoglobin Levels in Pregnant Women with Anemia Through Dragon Fruit Consumption*(Rahmiati et al., 2023).	*Quasi-experimental*with independent t-test and paired t-test.	Giving dragon fruit as an independent variable and increasing Hb in pregnant women with anemia as a	This study found that there was a significant difference in Hb levels before and after being

			dependent variable	given a combination of Fe tablets with dragon fruit, which was 1.1692 g% and compared to Fe tablets alone was 0.7077 g%.
9	Consumption of Iron Tablets and Red Guava Juice to Increase Hemoglobin Levels in Pregnant Women with Anemia(Yanti et al., 2024).	Experimental with paired independent samples t-test	Consumption of Fe tablets and red guava juice as independent variables and increase in Hb of pregnant women with anemia as dependent variable	This study provides evidence that there is a difference in the increase in hemoglobin between the control group and the treatment group, with a p value = 0.000.
10	The Effect of Consuming Ambon Bananas (Musa Accuminata) Plus Fe Tablets Compared to Fe Tablets to Overcome Anemia in Pregnant	*True-Experiment*with Independent T-Test	Fe tablets and Ambon bananas and pregnant women with anemia	This study found that the Hb of pregnant women increased effectively

	Women in the Working Area of Guguk Panjang Health Center, Bukittinggi City in 2018(Aulia, 2023)	when consuming Fe tablets accompanied by Ambon bananas compared to consuming Fe tablets alone.

Based on the literature above, anemia in pregnant women can be treated non-pharmacologically using various methods, such as:

1. Giving tomato herbal tea. Tomato herbal tea is an innovation for pregnant women who do not like the sour taste of tomatoes. The iron content in tomatoes that have been processed into tea is not much different from fresh tomatoes. In 180 grams of tomatoes there is 27mcg of folic acid, 0.49mg of iron, and 24.6mg of vitamin C. Tomatoes are rich in vitamin C which can help increase the absorption of iron in the body. When consumed together with iron, the vitamin C in tomatoes will form a complex ascorbic acid that accelerates the absorption of iron and increases the production of red blood cells in pregnant women.(Aprilia Wardani & Herlina, 2024).
2. Consuming chayote. One example of a food ingredient that has many health benefits is chayote (Sechium edule a). Not only does it have health benefits, chayote also has complete and balanced nutritional content, making it highly recommended for consumption to maintain the health of pregnant women and fetuses. In 100 grams of chayote contains approximately 0.2-0.6 mg of iron(Nasution & Sartika Daulay, 2022)and vitamin C as much as 4.6 mg(Vieira et al., 2022). Iron consumed with vitamin C can increase the efficiency of iron absorption in the body, so it can help increase Hb levels in pregnant women with anemia. Iron plays an important role as a

hemoglobin former and vitamin C will increase iron absorption making this combination work very effectively.(Ismi Wahyuni & Sukmawati, 2021).

3. Consuming green bean juice. Green beans are one type of bean that is high in iron so it is very good for consumption by pregnant women who need increased iron levels in the body. Green beans contain 6.7mg of iron per 100 grams. Green bean juice is a processed product that is effective in serving green beans. Green bean juice is made by pounding or mashing it first and then filtering it to separate the water and pulp to produce a nutritious juice or drink(Martini & Kurnia Dewi, 2021).
4. Consuming combined juices. The combination of spinach-lime-honey juice is considered quite effective in increasing the amount of hemoglobin levels for pregnant women who experience anemia because spinach itself is high in iron content, which is 3 grams of iron/100 grams of spinach. In addition to being rich in iron, spinach also has other very important vitamins and minerals, such as vitamins A and C, calcium, protein, phosphorus and many more.(Elshabrina, 2018) (Rusmiati et al., 2021).
5. Eating dates. Dates are an option to help meet iron needs during pregnancy, with the note that maximum results will be obtained if dates are consumed regularly. Dates contain 0.9 mg of iron and carbohydrates/100g of dates, this can be interpreted that the iron and carbohydrate content in dates is quite high. In addition, dates also contain vitamin C, tryptophan, vitamin B6, zinc, magnesium, and the hormone oxytocin(Sinta Sumitran, 2023).
6. Eating tempeh. Tempeh contains iron in the form of ferro (Fe2+) so that the body will absorb it easily. The process of iron absorption in the intestine involves the oxidation of Fe2+ which then binds to apoferritin, forming ferritin. This ferritin will then be distributed into the plasma, allowing the process of hemoglobin formation in the spinal cord through the transferrin process.(RF Putri et al., 2015) (Indrasari & Agustina, 2021).
7. Consuming jackfruit seed milk or concrete milk. Jackfruit seeds are rich in vitamins and minerals. In concrete milk, per 100 grams, there are components such as calcium as much as 39.2461mg, protein 0.6088mg, carbohydrates 8.0848mg, phosphorus 38.9844mg, iron 3.0124mg, and

vitamin C 13.8274mg(Meiranny et al., 2024). Vitamin C and iron are very important nutrients for pregnant women, because they can prevent and overcome anemia. The function of iron is to produce red blood cells and overcome hemodilution in pregnancy. Vitamin C is tasked with facilitating the body to be able to absorb iron optimally. If iron and vitamin C are combined, a solution will be formed that is easily absorbed by the body or can be called complex ascorbic acid(Mattila et al., 2021). The nutritional content of jackfruit seeds that have been processed into various forms of processed products is not much different from the content of fresh jackfruit seeds or just boiled ones. As explained by(Kamdem Bemmo et al., 2023)in his research, he found that there are various kinds of vitamins and minerals in boiled jackfruit seeds, such asprotein, phosphorus, calcium, and magnesium. The protein in jackfruit seeds is 21.66±0.31, phosphorus 101.51±4.02, calcium 132±9.42, and magnesium 43.73±9.12.

8. Eating dragon fruit. By consuming dragon fruit, the body can absorb iron more effectively, because the content of dragon fruit such as vitamin C, vitamin B1 to B3, and protein, as well as various other vitamins and minerals that are very beneficial for body health.(Rahmiati et al., 2023). Based on research(Aulya et al., 2021)250ml of dragon fruit consumed by pregnant women twice a day for two weeks has an impact on increasing Hb from 9.62g/dL to 11.64g/dL.
9. Fe tablets and red guava juice. According to(Alhakmani et al., 2013)Red guava contains good nutrition for pregnant women who suffer from anemia because red guava contains 87mg of iron and 100 grams of vitamin C. Vitamin C reduces Fe3+ to Fe2+, so the body will absorb it more easily. Other nutritional content in red guava such as copper and phosphorus also play a role in the formation of hemoglobin in the blood.
10. Consuming Fe with Ambon bananas. The content of micronutrients that form hemoglobin contained in Ambon bananas such as vitamin C, pyridoxine, folic acid, and iron(Aulia, 2023). Judging from its content, Ambon bananas can be an option for pregnant women who suffer from anemia to meet their iron needs. In order to stimulate hemoglobin and so

that red blood cells can be produced, pregnant women need to consume Ambon bananas every day as much as two medium-sized ones along with Fe tablets.(Luthbis & Ratnasari, 2020).

CONCLUSION AND SUGGESTIONS

Pregnant women who suffer from anemia can consume iron tablets or Fe tablets 1 tablet/day. To be more effective, do not only rely on consuming Fe tablets, but must consume foods that contain compounds that help hemoglobin synthesis, namely iron, for example consuming Ambon bananas, green bean juice, jackfruit seed milk, red guava juice, dragon fruit, dates, tempe, combination juice, tomato herbal tea, chayote, and so on. Iron obtained from plant sources will be slightly absorbed by the body, therefore vitamin C is needed to help increase absorption to the maximum because its absorption capacity is up to 4 times greater.

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