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Dragon fruit intervention for increasing hemoglobin level on pregnant woment in Sumber Agung Village

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ABSTRACT

Background: Iron Deficiency Anemia is a condition the hemoglobin level less of 11gr%. The global pravalence of anemia in pregnancy is estimated to be approximattely 41,8%. In Indonesia the pravalences anemia reach of 48,9%, and 84,6% beetween occurs in the 15-24 year age group, and in the sumber agung village the number of anemia in 2023 reach of 4 cases. Anemia Assosiated with risk of low birth weight, preterm labor, abortus, postpartum haemorrage and Fetal maternal neonatal death. The Purpose of study is to investigated of Dragon fruit juice within increased level of the hemoglobin in woman's pregnant in the working area at Sumber Agung Village. Method's: The study design use quantitative observasional research design, involved 14 participant woman anemia in pregnant, in the each of them comsumed ferosus sulfate and Dragon fruit. The data analyse by descriptive level of hemoglobin before and after intervention. The result showed the mean of level of hemoglobin in woman anemia increased up to 1,4 gr/dl, within seven days intervention. The Conclussion The combination of ferosus sulfate and dragon fruit, describe for increasing level of hemoglobin at woman anemia in pregnancies. Suggestion: Dragon fruid could be an alternative intervention to prevent of anemia in pregnancies.

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INTRODUCTION

Anemia is one of the most common complications associated with pregnancy. Even severe anemia has adverse effects on the mother and fetus. As many as 75% of the most common anemia during pregnancy is iron deficiency anemia. Iron Deficiency Anemia is a condition the haemoglobin level less of 11gr%. Anemia are major Indicator maternal and neonatal outcames, is an determinant of Low Birt Weight (LBW), post partum Haemorhage, and abortus. The global prevalence of anemia in pregnancy is estimated to be approximately 41.8%, and more often happened in low social economic which is 40-50% (Garzon et al., 2020). In Indonesia prevalence of anemia up to 48,9%, and 84,6% beetween occurs in the 15-24 year age group (Kemenkes RI., 2021). Iron deficiency are

most common to be causal of anemia in pregnancies. The Clnical presentation of anemia is often characterize by various symtomp include as fatique, poor, weakness, irritability, pale, nausea, low concentration and low performance in several condition (Garzon et al., 2020).

The diagnosis of Anemia was enforced when haemoglobin level less than 11 gr/dl and Hct precentage levels bellow 30%, in The first semester and 10,5 gr/dl and 32% in the second trimester, and return to normal level in Third semester (Garzon et al., 2020). Anemia in Pregnancies also caused by physiological changes in the cardiovascular system (hemodilution). This Condition can be an increase in the volume of blood plasma so that it is more than the volume of red blood cell s. Therefore, a state of hemodilution occurs with a marked decrease in the hemoglobin level. Lack of hemoglobin in the blood can cause more serious complications for the mother both in pregnancy, childbirth and the puerperium (Grandi et al., 2022). Lack of haemoglobin levels in the blood can be caused the uterus experiencing a lack of oxygen, which then affects uterine muscles not contractions adequately, so that uterine atony can arise which results in bleeding (Grandi et al., 2022).

Almost of 95% of anemia caused by factor deficiency of iron and folid acid deficiency, lack of intake maternal nutrition (such as folate, vitamin b12, and riboflavin) and also caused by another factor as maternal complication, parasites, acute or chronic infection, and chronic kidney disease. *World Health Organization* (WHO) (2020) called are estimates that case of iron deficiency in pregnancies account 50% biroulet (lopez A, Cacoub p, Macdougall IC, 2016). The physiological iron demand in pregnant women corresponds roughly to 1000–1200 mg for an average weight of 55 kg. This quantity includes almost 350 mg associated with fetal and placental growth, about 500 mg associated with expansion in red cell mass, and around 250 mg associated with blood loss at delivery.

Anemia can be treated by pharmacologically and non pharmacologically. From the goverment antenatal program, intervention of anemia in pregnant women by giving minimum of 90 tablets of Fe during pregnancy to overcome preventing complications during pregnancy. In another pharmacology can be given of supplementation such as ribovlavin and folic acid, vit c, or other iron mineral (Megasari & Pitriani, 2021). Fe can be optimal absorbtion when mucosal luminal damage as well as by the ingestion of certain foods, it is indicated that administration one hour before meals on an empty stomach with a glass of orange juice or another form of vitamin C to favor absorption (Khallafallah, A.A. Dennis, AE, 2012).

Anemia is also can be threatened by consumption of suplemen and food. Dragon fruit is one alternative to the increase of haemoglobin levels in anemia pregnant. Dragon fruit contain high levels of iron and vitamin C is dragon fruit which contains 0.16-0.20 mg of iron and vitamin B1, vitamin B2 and vitamin C (Faridah, 2015). Dragon fruit plays a role in the body's metabolism so that it can increase hemoglobin levels in the blood. Vitamin C plays a role in the absorption of iron by reducing ferrous to ferrous in the small intestine so that it is easily absorbed. Vitamin C also increases the absorption of iron from plant (non-heme) foods (Iswahyuni, Sayekti, Sunaryanti, 2018).

Ptiriani (2021) show that there is a significant difference between Hb levels before and after consuming dragon fruits. The consumtiom of dragon fruit in pregnancies has been increase level of mean hemoglobin amount of 0,57 gr/dl every womens. From the journal show that Consumption of dragon fruit eaten in the morning for 14 days can help increase hemoglobin levels because dragon fruit contains iron minerals and B complex vitamins that play an important role in the formation of hemoglobin and red blood cells. This study was conducted on 30 pregnant women with measurements of 2x Hb levels, namely before and after consuming dragon fruit. After doing the research on the effectiveness of dragon fruit consumption on increasing hemoglobin levels in pregnant women with mild anemia, it was carried out with a dependent T test where the p-value < (0.001), meaning that there was a significant difference between the Hb levels of pregnant women before and after given dragon fruit at the Pramuka Primary Clinic, Pekanbaru City. This is in accordance with reported by research from Ptiriani (2021) if consuming 500 grams of dragon fruit for 14 days on a regular basis will help increase hemoglobin levels in the blood, this is because 100 grams of dragon fruit contains 0.16 mg of iron, iron needs for mothers pregnant per day by 0.8 mg. This iron will be converted

into red blood cells, making it useful for pregnant women who are prone to anemia. As the literature also says that dragon fruit contains high amounts of iron and vitamin C which helps increase the amount of hemoglobin substantially during pregnancy

RESEARCH METHOD

This type of study is quantitative research employ's of observasional kohort prospective design (Budiarto, 2004).The population for this research are involved all pregnant women diagnosed with anemia at Sumber Agung Village account of 14 respondent. This research was conducted during 15 November until 2 Desember 2023, The sampling technique employed is accidental sampling (Budiarto, 2004). The research aims to observation of hemoglobin levels before and after consumtion of Fe tablet and dragon fruit juice. The intervention of dragon fruit juice made by 200gram dragon fruit mix 50 ml water. The dependent variable is the hemoglobin level, while the independent variable is dragon fruit. This research analysis by software exel 2021 was conducted to the characteristics of each research variable, including measures of age, mean, minimum and maximum values.

RESULTS AND DISCUSSIONS

Based on the result of the research conducted by the author, the researcher finding of the descriptive data of each age respondent's, can be seen in the following of the table:

Table 1. The descriptive data of age respondents

The Average Number Of Age	Precentage
>20	0
20-35	70%
>35	30%

Based on the table.1 above, the majority of respondent, are aged beetween 22 until 35 is (70%), the minimal age is 22 year and maximal 35 year. From the data was seen all of the respondent entered of aged reproduction. Aged 20-35 years entered in the healthy reproductive period. At reproductive age, women are possible to pregnant. Pregnancies is condition the are need it attention about anemia. In the pregnancy the womens may will be to experience hemodilusi from the blood level, so the are condition caused the volume of red blood level to be down.

Table 2. The data of observation pretest and postest hemoglobin levels

Hb Levels	Mean gr/dl	Δ Mean	Min	Max
Pretest	10,7	1,4	8	10,6
Postest	9,3		10,1	11,2

Based on the table.2 above show that the different mean of levels hemoglobin before and after treathment of dragon fruit juice is 1,4 gr/dl. The value of minimum pretest is 8 and maximum 10,6, and the minimum posttest is 10,1 and maximum level 11,2. Based on The data showed that level of hemoglobin after the treatment was administered increase at the woman anemia in pregnancy.

From the data was seen all of the respondent entered of aged reproduction. Aged 20-35 years entered in the healthy reproductive period. Anemia this in turn depends on age, nutrition and balance of iron absorption and losses. At reproductive age, women are possible to pregnant. During pregnancy, womens very at risk of developing anemia, so hemoglobin levels are very important to note. This is done to prevent the bad effects of anemia itself (Mulyani & Sari, 2020). During pregnancy, the cardiovascular system changes occur and increase the volume of blood

plasma so that it is more than the volume of red blood cells are called hemodilution. Therefore, a state of hemodilution occurs with a marked decrease in the hemoglobin level (Grandi et al., 2022, Aulya, Y., Silawati, V., & Margareta, E, 2021).

Hemoglobin levels in young women can decrease by several factors, namely the adequacy of iron in the body where iron is needed to produce hemoglobin. Age, the more you get older, the more you will experience a physiological decline. This is according to the function of organs including bone marrow which produces red blood cells. Gender in female sex is more susceptible and prone to decreased hemoglobin levels. The habit of drinking tea every day can inhibit the absorption of iron so that it will greatly affect hemoglobin levels (Thamrin et al., 2018).

Difference in hemoglobin levels before and after administration of iron tablet and dragon fruit the research findings show increase of the mean levels, among pregnant women anemia in the working area at Sumber Agung, Pringsewu Lampung. Deficiency of Iron in Pregnant woman increased risk complication as fatique, susceptibility to infections, cardiovascular insufficiency, eclampsia, higher risk of hemorrhagic shock, or need of peripartum blood transfusion in cases of heavy blood loss, and risk of maternal mortality (Breymann & Auerbach, 2017). Anemia in pregnancy showed various symptoms including pallor, breathlessness, palpitations, hair loss, headaches, vertigo, leg cramps, cold intolerance, dizziness, irritability, fatique, and poor concentration. In onothe impact anemia in womens pregnant can reduced working capacity, decreased maternal breast milk production (Annamraju, 2016, Napisah, 2023).

Maternal morbidity in anemia is linked to factors such as socio-economic status, availability of medical care, and nutritional state (Breymann & Auerbach, 2017). In another research explained if anemia this in turn depends on age, nutrition and balance of iron absorption and losses. Iron stores for adult women are generally low as a result of the composite effect of menstrual losses, poor dietary intake and iron losses associated with pregnancy and lactation (approximately 1000 mg each for pregnancy, delivery and breast feeding) Nutritions are essensial for pregnant womens to prevent anemia case in pregnancy, and also maintainance the body from decrease hemoglobin levels (Indah et al., 2021).

In pregnancy womens are needed of iron higher are three times beetween normal womans, so the womens recommended it daily allowance in pregnancy of nearly 30 mg iron per day. Awareness of dietary requirements and the iron content of various foods is essential in pregnant womens. The first line of management should be oral iron. The optimal dose has not been established but it has become standard to prescribe 100–200 mg of elemental iron daily. Absorption is maximized by administration 1 hour before meals on an empty stomach, with a glass of orange juice or other form of vitamin C (Annamraju, 2016). The ideal dosage for intermittent or weekly administration is unknown because the proportional absorption is inversely proportional to the administered dose. Dosages between 100 and 200 mg daily are a compromise in relation to the hemoglobin increase and tolerability of iron. The recommended dosage is 80-160 mg elemental iron/d (Breymann & Auerbach, 2017).

Anemia in pregnant women Consumption of dragon fruit during pregnancy is thought to prevent and treat anemia. That's because dragon fruit is rich in iron as the main constituent of red blood cells. In 100 grams of dragon fruit contains about 0.55 Fe tablet. Dragon fruit in every 100 grams contains 83.0 g of water calories as a food ingredient that contains complete nutrients needed by the body, where the protein content is 0.229 g, iron 0.65 mg,vitamin A, vitamin B2 0.045 mg, and vitamin C 9 mg contained in dragon fruit plays a role in the body's metabolism so that it can increase hemoglobin levels in the blood. The mechanism of association between vitamin A and anemia occurs through several possibilities, namely erythropoiesis regulation, mobilization of iron from reserves to the body's transferrin circulation from infection, and increasing iron absorption in the intestine. Meanwhile, vitamin B2 deficiency causes anemia due to impaired absorption and mobilization of iron. Vitamin C plays a role in the absorption of iron by reducing ferrous to ferrous

in the small intestine so that it is easily absorbed. Vitamin C also increases the absorption of iron from plant (non-heme) foods (Iswahyuni, Sayekti, 2018, Kęska et al., 2023).

Ascorbic acid or vitamin C, folic acid, and protein are the main factors that can encourage the absorption of nonheme iron. Vitamin C can increase the absorption of nonhaem iron up to four times. Citrate,malic,lactic,succinic, and tartaric acid can increase the absorption of nonheme iron under certain conditions Chavan, S., Rana, P., Tripathi, R., & Tekur, U, 2021). Vitamin C has a reducing factor that is useful in increasing the absorption (absorption) of iron by reducing ferric iron to ferrous so that iron absorption becomes more efficient and effective. Research conducted by (Hasibuan, 2019) found that administering dragon fruit led to an average increase in hemoglobin levels. From another research conducted by (Nulhakim & Kaltim, 2023), findings show a significant difference in Hb levels before and after the administration of iron tablet combined with dragon fruit among pregnant women in the working area of Rantau Pulung Community Health Center, as evidenced by the p-value of 0.000 < α 0.05. This demonstrates that the combination of iron tablet and dragon fruit effectively increases Hb levels in pregnant women.

The combination of dragon fruit and Fe Tablet greater impact or contribution to enhanced iron absorption. Dragon fruit accelerates the hemoglobin synthesis process. Almatsier (2019) and (Novelia, S., Dewi, A., Melinasari, S., Widowati, R., & Tiara, 2020) explains that hemoglobin synthesis begins with erythroblasts and continues until the normoblast and reticulocyte stages. Isotope investigations reveal that the hem part of hemoglobin is primarily synthesized from acetate and glycine and this process mostly takes place in the mitochondria (Almatsier, 2019). Increased hemoglobin levels are not only affected of red dragon fruit juice but can be influenced by other factors such as the consumption of foods containing substances needed in hemoglobin synthesis such as spinach/ or green vegetables and limiting drinks containing tannin compounds such as tea, or coffee (Thamrin et al., 2018). The initial step involves the formation of pyrrole compounds. Subsequently, four pyrrole compounds combine to form through blood smear protoporphyrin, which then binds to iron to create hem molecules. Ultimately, four hem molecules bind to one globin molecule, a globulin synthesized in the endoplasmic reticulum ribosome, to form hemoglobin (Guyton, Arthur dan Hall., J., 2019).

The Health Information Package Program (HIPP) with follow-up educational health messages and reminders using the WhatsApp platform was an effective intervention for anemic pregnant women in Saudi Arabia. It helped to improve the women's knowledge regarding anemia during pregnancy, increase the women's awareness of better food selection, enhance their compliance with iron supplementation, and increase their Hb levels. The Health Information Package Program should be endorsed by policymakers and used as a comprehensive national strategy to prevent anemia during pregnancy Owais A., Merritt C., Lee C., Bhutta Z.A, 2021, and Nahrisah P., Somrongthong R., Viriyautsahakul N., Viwattanakulvanid P., Plianbangchang S. 2020).

CONCLUSION

For the research, findings the difference value levels of hemoglobin before and after administration of iron tablet and dragon fruit the research findings show increase of the mean levels, among pregnant women anemia in the working area at Sumber Agung, Pringsewu Lampung. The conclussion of the research, if the combination consume of Tablet Fe and dragon fruit juice, effective to increase hemoglobin levels in anemia in the pregnant womens. The Researcher suggest from the provider of midwife to given at the womens pregnants to use dragon fruit within preventive from anemia, and use the dragon fruit as change of vitamin C to being consumption togetherness with tablet FE..

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