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The Effect Of Dragon Fruit (Hylocereus Polyrhizus) On Increasing Hemoglobin Levels In Pregnant Women At The Ernita S.Tr. Keb PMB Pekanbaru City In 2025

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Abstract

Anemia in pregnant women is still a health problem that can increase the risk of complications in both the mother and the fetus. In addition to Fe tablet supplementation, red dragon fruit contains iron and vitamin C which have the potential to help increase hemoglobin levels. To analyze the effect of dragon fruit administration on increasing hemoglobin levels in pregnant women at PMB Ernita S.Tr. Keb Pekanbaru City in 2025. Quantitative research with a quasi-experimental design one group with a control group. The population consisted of 14 pregnant women and all were sampled using a total sampling technique. The research instrument used the GCHb Easy Touch tool, observation sheets, and digital scales. Data analysis was carried out univariately and bivariately using the Paired Sample T Test with a significance level of 0.05. The treatment group experienced an increase in the proportion of pregnant women in the non-anemic category from 57.1% to 92.9%, while the Paired Sample T Test showed a p value = 0.022. In the control group, a p value = 0.165 was obtained which indicated no significant change. Giving dragon fruit as a companion to consuming Fe tablets has an effect on increasing hemoglobin levels in pregnant women so that it has the potential to be an alternative non-pharmacological therapy in preventing anemia during pregnancy.

Keywords: Anemia, Hemoglobin, Iron Supplementation, Pregnancy, Red Dragon Fruit

INTRODUCTION

Pregnancy is a crucial period that determines the health of the mother and fetus, so meeting nutritional needs during pregnancy is an essential aspect. Maternal nutritional status directly impacts fetal growth and development, as inadequate nutritional intake can increase the risk of a baby with poor health, while mothers with good nutritional status are more likely to give birth to a healthy baby with an appropriate birth weight. In addition to nutritional support, regular antenatal care, including hemoglobin (Hb) level checks, is crucial for early detection of risk factors and prevention of pregnancy complications (Elisa Safitri & Rahmika, 2022; Pibriyanti et al., 2023). Hemoglobin plays a key role in transporting oxygen throughout the body, so a decrease in hemoglobin levels can lead to anemia. In pregnant women, anemia is defined as Hb levels below 11.0 g/dL in the first and third trimesters and below 10.5 g/dL in the second trimester (Martini et al., 2023).

Anemia in pregnancy is a common health problem that can have serious consequences for both the mother and the fetus. This condition can increase the risk of maternal death, premature delivery, low birth weight, and infant death. Common symptoms include fatigue, dizziness, blurred vision, decreased appetite, impaired concentration, and shortness of breath in severe anemia (Dai, 2023). Globally, the World Health Organization reports that approximately 41% of pregnant women experience anemia, with prevalence reaching 49% in developed countries and 53% in developing countries. In Indonesia, the 2021 Basic Health Research (Riskesdas) showed that approximately 78% of pregnant women experience anemia (Ministry of Health, 2021). In Riau Province, the 2022 Health Profile recorded 18,808 cases of anemia in pregnant women, representing 13.06%. In Pekanbaru City, the incidence of anemia in pregnant women in 2022 reached 18.76%, an increase compared to 6.2% in 2021.

Efforts to prevent anemia in pregnant women are not only carried out by administering Fe tablets, but can also be supported by consuming foods rich in iron, folic acid, and vitamin C. One food ingredient that has the potential to be utilized is red dragon fruit because it contains iron, vitamin C, antioxidants, betacyanin, vitamin B3, and fiber which play a role in helping hemoglobin formation

and increasing iron absorption in the body (Muzzaki, 2021; Prakoso et al., 2017; Mahardika & Zuraida, 2019). Several studies have demonstrated these benefits. Ratumas et al. (2019) reported an increase in hemoglobin levels after administering 250 grams of dragon fruit for five days with a p value = 0.005. Sholeha et al. (2020) also found that administering 200 grams of dragon fruit juice for 14 days increased hemoglobin levels by 1.82 g% with a p value = 0.000. Similar results were reported by Suhartini and Susan Mutia (2021) who obtained an Asymp. Sig. value. of 0.001 and Herlina et al. (2024) which showed the effect of giving dragon fruit juice on changes in hemoglobin levels in pregnant women with a p value = 0.003.

Although various studies have demonstrated the effectiveness of dragon fruit in increasing hemoglobin levels, the incidence of anemia in pregnant women is still found at the health service level. The results of an initial survey conducted on August 20, 2025 at PMB Ernita S, Tr. Keb Pekanbaru City showed that of the 45 pregnant women who underwent examinations from June to August 2025, four pregnant women experienced anemia. In addition, the results of interviews with five pregnant women showed that three of them continued to experience anemia despite taking Fe tablets, while two pregnant women did not know that red dragon fruit could be used as an effort to help increase hemoglobin levels. This condition indicates that there are still problems both in terms of the incidence of anemia and pregnant women's knowledge regarding the use of non-pharmacological therapies to support anemia prevention.

Based on these conditions, this study aims to analyze the effect of dragon fruit administration on increasing hemoglobin levels in pregnant women at PMB Ernita S, Tr. Keb Pekanbaru City in 2025. This study is important because it is expected to provide evidence regarding the use of dragon fruit as an alternative companion to Fe supplementation in an effort to increase hemoglobin levels in pregnant women. The novelty of this study lies in the implementation of interventions and measuring the effect of dragon fruit administration on hemoglobin levels in pregnant women at PMB Ernita S, Tr. Keb Pekanbaru City in 2025 by comparing the treatment group and the control group, so that the results of the study are expected to be a source of information for health workers and pregnant women in supporting efforts to prevent anemia.

RESEARCH METHODS

This study used a quantitative method with a quasi-experimental design with one group and a control group. The study involved two groups: the treatment group, which received an intervention in the form of consuming 250 grams of dragon fruit per day for five days accompanied by consuming Fe tablets, and the control group, which only consumed Fe tablets without dragon fruit. Hemoglobin levels were measured before the intervention (pretest) and after the intervention (posttest) in both groups to determine changes in hemoglobin levels after the treatment was given. The study was conducted at PMB Ernita S, Tr. Keb, Pekanbaru City from June 2025 to January 2026.

The research instruments included a GCHb Easy Touch hemoglobin level meter, observation sheets, digital scales, and intervention materials in the form of red dragon fruit. Hemoglobin level examinations were conducted before the intervention and repeated on the sixth day after respondents in the treatment group consumed 250 grams of dragon fruit daily for five days. Data processing was carried out through the stages of editing, coding, entry, tabulating, and cleaning. Data analysis consisted of univariate analysis to describe the distribution of each research variable and bivariate analysis using the Paired Sample T Test to analyze differences in hemoglobin levels before and after the intervention. Decision making was carried out at a significance level of $\alpha = 0.05$, with the provision that if the p value <0.05 then the research hypothesis is accepted.

The population in this study was all pregnant women who underwent antenatal care examinations at PMB Ernita S, Tr. Keb Pekanbaru City from June to August 2025, totaling 14 people. The sampling technique used total sampling, that is, all members of the population were used as research samples because the population size was relatively small. The determination of this technique

refers to the opinion of Sugiyono (2017) and Sugiyono (2020) who stated that total sampling is used if all members of the population are used as research samples. The sample was divided into treatment groups and control groups according to the research design. Respondents were selected based on inclusion criteria including pregnant women in the first, second, and third trimesters, consuming Fe tablets, domiciled in Pekanbaru City, and willing to participate in the study by signing an informed consent. Meanwhile, respondents who were unwilling to participate in the study or experienced pregnancy complications such as preeclampsia, gestational diabetes, or heavy bleeding were included in the exclusion criteria.

The research procedure began with a preliminary study, initial survey, observation, and preparation of a research proposal. After obtaining research permits, the researcher selected respondents according to the established criteria, explained the research objectives, and obtained informed consent from respondents. Furthermore, initial hemoglobin levels were examined on all respondents. The treatment group was given 250 grams of red dragon fruit per day for five days, peeled, cut, and then consumed directly along with an iron tablet. While the control group only consumed an iron tablet without dragon fruit. On the sixth day, hemoglobin levels were re-examined in both groups to obtain post-test data. All research implementation adhered to the principles of research ethics, including informed consent, anonymity, and confidentiality, ensuring that the rights and confidentiality of respondents' identities were maintained throughout the research process.

RESULTS AND DISCUSSION

Univariate Analysis

Hemoglobin levels of pregnant women in the treatment group before being given dragon fruit

Table 1. Frequency distribution of hemoglobin levels of pregnant women in the treatment group before being given dragon fruit at PMB Ernita S.Tr.Keb, Pekanbaru City.

Hb levels	F	%
No anemia	8	57.1
Mild anemia	4	28.6
Moderate anemia	2	14.3
Total	14	100

Source: Processed Research Data, 2025

Based on table 1 above, it is known that the majority of pregnant women's Hb levels were in the non-anemic category, namely (57.1%), mild anemia (28.6%) and moderate anemia (14.3%) before being given dragon fruit.

Hemoglobin levels of pregnant women in the treatment group after being given dragon fruit

Table 2. Frequency distribution of hemoglobin levels of pregnant women in the treatment group after being given dragon fruit at PMB Ernita S.Tr.Keb, Pekanbaru City.

Hb levels	F	%
No anemia	13	92.9
Moderate anemia	1	7.1
Total	14	100

Source: Processed Research Data, 2025

Based on table 2 above, it is known that the majority of pregnant women's Hb levels are in the non-anemic category, namely (92.9%), and moderate anemia (7.1%) after being given dragon fruit.

Hemoglobin levels of pregnant women in the control group before monitoring without dragon fruit administration.

Table 3. Frequency distribution of hemoglobin levels of pregnant women in the control group before monitoring without giving dragon fruit at PMB Ernita S.Tr.Keb, Pekanbaru City

Hb levels	F	%
No anemia	7	50
Mild anemia	5	35.7
Moderate anemia	2	14.3
Total	14	100

Source: Processed Research Data, 2025

Based on table 3 above, it is known that the majority of Hb levels of pregnant women are in the non-anemic category, namely (50%), mild anemia (35.7%) and moderate anemia (14.3%) before monitoring without giving dragon fruit.

Hemoglobin levels of pregnant women in the control group before monitoring without dragon fruit administration.

Table 4. Frequency distribution of hemoglobin levels of pregnant women in the control group after monitoring without giving dragon fruit at PMB Ernita S.Tr.Keb, Pekanbaru City.

Hb levels	F	%
No anemia	8	57.1
Mild anemia	5	35.7
Moderate anemia	1	7.1
Total	14	100

Source: Research Processed Data, 2025

Based on table 4 above, it is known that the majority of Hb levels of pregnant women are in the non-anemic category, namely (57.1%), mild anemia (35.7%) and moderate anemia (7.1%) after monitoring without giving dragon fruit.

Bivariate Analysis

In analyzing bivariate data, data testing was carried out using statistical tests aimed at determining the difference between giving dragon fruit and not giving dragon fruit in increasing hemoglobin levels in pregnant women at PMB Ernita S.Tr.Keb, Pekanbaru City.

Differences in the increase in hemoglobin levels in pregnant women at PMB Ernita S.Tr.Keb, Pekanbaru City before and after giving dragon fruit

Table 5. Differences in hemoglobin levels of pregnant women before and after being given dragon fruit at PMB Ernita S.Tr.Keb, Pekanbaru City

Paired sample T-test	Mean	Std.deviation	95% confidence interval of the Difference		T	df	Sig.2 (tailed)
			lower	upper			
Hb levels before and after	0.429	0.646	0.055	0.802	2,482	13	0.022

Source: Processed Research Data, 2025

Based on table 5 above, it shows that the test*Paired sample T-test*In pregnant women who had undergone Hb examination before and after receiving dragon fruit, the p-value was 0.022 ($p < 0.05$). This indicates that there is an effect of giving dragon fruit to increase Hb levels in pregnant women at PMB Ernita S.Tr.Keb, Pekanbaru City.

Differences in the increase in hemoglobin levels in pregnant women at PMB Ernita S.Tr.Keb, Pekanbaru City before and after monitoring without giving dragon fruit

Table 6. Differences in hemoglobin levels of pregnant women before and after monitoring without giving dragon fruit at PMB Ernita S.Tr.Keb, Pekanbaru City.

Paired sample T-test	Mean	Std.deviation	95% confidence interval of the Difference		T	df	Sig.2 (tailed)
			lower	upper			
Hb levels before and after	0.143	0.363	-0.069	0.353	1,472	13	0.165

Source: Processed Research Data, 2025

Based on table 6 above, it shows that the test*Paired sample T-test*In pregnant women who had undergone Hb examination before and after monitoring without dragon fruit administration, the p-value was 0.162 (p>0.05). This indicates that there is no effect without dragon fruit administration on increasing Hb levels in pregnant women at PMB Ernita S.Tr.Keb, Pekanbaru City.

Discussion

Based on the univariate results of the treatment group, the majority of pregnant women's Hb levels were in the non-anemic category, namely (57.1%), mild anemia (28.6%) and moderate anemia (14.3%) before being given dragon fruit and after being given the intervention, the majority of pregnant women's Hb levels were in the non-anemic category (92.9%) and moderate anemia (7.1%). While the univariate results of the control group were mostly non-anemic (50%), mild anemia (35.7%) and moderate anemia (14.3%) before monitoring without being given dragon fruit and after monitoring, namely non-anemic (57.1%), mild anemia (35.1%) and moderate anemia (7.1%).

Based on the results of the bivariate test through the Paired sample T-test in the treatment group of pregnant women before and after the administration of dragon fruit, the p value was 0.022 (p <0.05). This shows that there is an effect of giving dragon fruit to increase Hb levels in pregnant women at PMB Ernita S.Tr.Keb, Pekanbaru City. While the results in the control group of monitoring without giving dragon fruit to pregnant women before and after the administration obtained a p value of 0.162 (p <0.05). This shows that there is no effect without giving dragon fruit to increase Hb levels in pregnant women.

This research is in line with the research conducted by Puspita, Ratu Mas (2019) with the title The Effect of Giving Dragon Fruit on Increasing Hb Levels in Pregnant Women at the Sindang Jaya Community Health Center, Tangerang Regency, obtained from 10 respondents, the results showed that pregnant women who had low anemia were 30% and pregnant women who had normal Hemoglobin were 70% of pregnant women, the p-value was 0.005 (p <0.005). This study proves that there was a significant increase in hemoglobin levels between before and after being given dragon fruit.

This research is in line with research (Suhartini, 2021) with the title of the effect of giving red dragon fruit on increasing hemoglobin levels in pregnant women with the results of the paired t-test can be seen Analysis of the effect of Hb levels after intervention Exp(B) 1.100 with 95%. It was concluded that dragon fruit can increase Hb levels 1.1 times (95%CI 0.362-3.341) compared to before dragon fruit.

This statement is in accordance with the theory that good nutrition is the best way to prevent anemia during pregnancy. Eating foods high in iron (such as green leafy vegetables, fruits, meat, cereals, eggs, and nuts) can help ensure that the body maintains the iron supply necessary for proper functioning. If anemia occurs during pregnancy, it can usually be treated with iron supplements. Ensure that pregnant women are checked at their first prenatal visit for a hemoglobin level check. (Suhartini & Susan Mutia, 2021).

Pregnant women who consume dragon fruit experience a significant increase in Hb levels. Dragon fruit can be used as an alternative to increase hemoglobin levels in pregnant women without side effects. The fluctuation of hemoglobin levels after consuming dragon fruit is also influenced by

various other factors, such as adequacy of daily nutritional intake, adherence to consumption of other iron-rich foods, the nutritional status of the pregnant woman, and the increased need for iron during pregnancy. If iron needs are not fully met, hemoglobin levels can remain low or even decrease even after consuming dragon fruit (WHO, 2020).

In addition to nutritional factors, physical activity and rest patterns also affect hemoglobin levels. Excessive physical activity without adequate nutritional intake can increase oxygen consumption and accelerate red blood cell breakdown, resulting in decreased hemoglobin levels. Conversely, adequate rest supports optimal metabolism and red blood cell formation (Ministry of Health of the Republic of Indonesia, 2019). In pregnant women, hemodilution also plays a role in fluctuating hemoglobin levels. A faster increase in blood plasma volume than red blood cell mass can cause a relative decrease in hemoglobin levels, even if iron supplementation from dragon fruit has been provided. This condition is a normal physiological change during pregnancy (Cunningham et al., 2018).

100 grams of dragon fruit contains 0.65 g of iron, the daily iron requirement for pregnant women of 0.8 g. This iron is converted into red blood cells, making it beneficial for pregnant women prone to anemia. The literature also indicates that dragon fruit contains high amounts of iron and vitamin C, which help substantially increase hemoglobin levels during pregnancy (Suhartini & Susan Mutia, 2021).

This statement aligns with the theory (Soebroto 2019), which states that pregnant women normally experience a twofold increase in iron requirements for blood formation during the second trimester and beyond compared to when not pregnant. This indicates an increased blood volume, which later serves as a carrier of oxygen and nutrients for the fetus.

According to the assumption of researchers giving dragon fruit can increase Hb levels in pregnant women. By giving 250 grams of dragon fruit per day for 1-5 days and accompanied by consuming iron tablets regularly as an alternative to increase Hb levels in pregnant women compared to pregnant women who only consume iron tablets. In addition, the effect of dragon fruit on Hb levels in pregnant women is because dragon fruit contains vitamin C which can help iron absorption, however, of the 14 respondents there was 1 respondent who still experienced moderate anemia, this was caused by several factors such as adequacy of daily nutritional intake, nutritional status of pregnant women, compliance with iron source consumption, physical activity and rest patterns as well as physiological changes in pregnancy in the form of hemodilution, therefore giving dragon fruit has not produced the same increase in Hb levels because in every pregnant mother.

CONCLUSION

The results of the study showed that giving 250 grams of dragon fruit per day for five days combined with consuming Fe tablets was able to increase hemoglobin levels in pregnant women at PMB Ernita S.Tr. Keb Pekanbaru City in 2025. In the treatment group, the proportion of pregnant women with the non-anemic category increased from 57.1% to 92.9%, while the results of the Paired Sample T Test showed a p value = 0.022 ($p < 0.05$), which indicated a significant effect of giving dragon fruit on increasing hemoglobin levels. In contrast, the control group that only consumed Fe tablets did not show significant changes with a p value = 0.165 ($p > 0.05$). These findings indicate that dragon fruit has the potential to be a non-pharmacological complementary therapy to help increase hemoglobin levels in pregnant women.

This study still has limitations, namely the relatively small sample size, the study was conducted only at a single health care facility, and the intervention duration was only five days, so the results cannot be widely generalized. Furthermore, the study did not control for other factors that can affect hemoglobin levels, such as nutritional adequacy, adherence to iron tablet consumption, physical activity, rest patterns, and physiological conditions during pregnancy. Therefore, further research is recommended involving a larger number of respondents, more diverse research locations, and a longer intervention period, taking these confounding factors into account. Practically, the results of this study

can be used as a reference for health workers in providing education regarding the use of dragon fruit as a companion to iron tablet supplementation in efforts to prevent and treat anemia in pregnant women.

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