

# Dates And Hemoglobin Levels: Literature Review

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**Abstract: Objective:** The aim of this systematic review is to review studies on the effect of dates on increasing hemoglobin levels in anemia

**Methods:** the method used is an electronic database that has been published through the online libraries PubMed and Sciendirect. The keywords used for article searches are based on research questions. **Result:** a review of six health articles stated that dates are effective for increasing hemoglobin levels. **Dosage, timing of administration, type of dates, food intake, a person's health condition should be of particular concern in giving date palm interventions. Not only increase hemoglobin levels, dates can also play a role in increasing ferritin, hematocrit, transferring saturation and serum iron levels in the majority of people. Conclusion:** dates can be used as an additional alternative to increase hemoglobin levels. However, disease or systemic syndrome in each person should be a concern because it can affect the effectiveness of dates in increasing hemoglobin levels.

**Keywords :** Dates, Hemoglobin, Anemia, Iron, Foodq

## 1. INTRODUCTION:

Anemia is a condition characterized by low concentrations of hemoglobin in red blood cells. Low hemoglobin concentrations affect the ability to deliver oxygen to all body tissues, thereby reducing work productivity<sup>1</sup>. Despite adequate knowledge of the causes and availability of treatment, anemia remains recognized as the most common health problem worldwide, especially in children and women. Iron Deficiency Anemia (IDA) is the most common cause of anemia in the world<sup>2,3</sup>. Anemia can lead to increased morbidity and mortality and decreased quality of life either directly or as another cause of risk factors.

Prevention of anemia should start before pregnancy, especially in young women<sup>4</sup>. Consumption of iron-rich foods through dietary changes, nutrition education, treatment and prevention of parasitic infections, and weekly iron supplementation to prevent iron deficiency anemia are some of the ways that can be done to prevent anemia. Iron is an important component of hemoglobin that can be obtained through iron intake from fruits and vegetables. Dates are a type of fruit that is rich in benefits, with the highest iron content (1,648 mg / 100g). The benefits of consuming dates are that they are able to neutralize toxins, kill cancer cells, strengthen auditory nerves, strengthen nerves, soften blood vessels, keep the intestines from irritation and other disorders, strengthen teeth and bones, maintain vitality, facilitate the birth process, overcome anemia. , pain relievers, reduce fever<sup>1-3,5</sup>.

The iron content in dates can increase the number of erythrocytes thereby increasing hemoglobin levels<sup>1</sup>. Apart from iron, the protein, carbohydrate and fat content in dates can help the process of hemoglobin synthesis. Carbohydrates are broken down into

monosakaradika and then into glucose. Glucose as the main fuel for metabolism will undergo glycolysis (breakdown) into 2 pyruvate and produce energy in the form of ATP and each of the pyruvate is oxidized to succinyl CoA. Long-chain fat is converted into acylcarnitine and penetrates the mitochondria which is further oxidized to succinyl CoA.<sup>6,7</sup>

Several studies related to giving dates to increase hemoglobin levels or as a supplement rich in iron have been conducted. However, information regarding how long to administer, the dosage and the types of dates that are most effective at increasing hemoglobin levels is still minimal. Therefore, this literature review aims to identify this. So that in the future, it is hoped that dates can be an alternative morphology in treating anemia.

## 2. METHODS

Keywords for article searches were identified based on the research question. Key words consist of dates; hemoglobin; anemia or keyword combination using Boolean. The online libraries PubMed and Scindirect were used to search for studies relevant to the effect of dates on hemoglobin levels in anemia.

## 3. RESULT

Based on the objectives of this systematic review there are six articles that were relevant in the last 5 years. One study is a True Experiment study, two Quasy Experiment studies, one Semi Experiment study, one Pre-Experiment study and one controlled trial study. Dosage or dosage, duration of administration and types of dates vary in the six articles. The longest time for giving dates from the six articles was 8 weeks. Measurement of hemoglobin levels was carried out before and after the intervention of dates with due observance of the research criteria. After giving dates and other additional interventions, not only hemoglobin levels were the parameters but also ferritin, hematocrit, serum iron and transferrin saturation levels. The characteristics of the study are presented in table 1.

**Table 1** Characteristics, Instruments, and Results of Selected Studies

Author	Purpose	Population	Intervensi	Study Design	Result
Sari et al. (2018) <sup>1</sup>	The purpose of this study was to determine the effect of adding dates on iron supplementation on hemoglobin levels in adolescent girls	Teenage girls with anemia were divided into two groups, namely the intervention group and the control group	The intervention group of 36 young women was given iron supplementation plus 7 dates for 30 days. While the control group of 36 young women was only given iron supplementation	Quasi Experiment research with pretest-posttest control group design	There was a significant difference in hemoglobin levels in the groups given iron supplementation plus dates (11.2 g / dL) and only given iron supplementation (9.94 g / dL). However, statistically this difference

					was not significant (p = 0.855)
<b>Wulandari et al. (2019)<sup>8</sup></b>	This study aims to prove the increase in hemoglobin and ferritin levels by using dates within 14 days in young girls	Young women were divided into two groups, namely the intervention group and the control group	The intervention group as many as 15 young women were given iron and dates supplementation (100gr / day). While the control group of 15 young women was only given Fe tablets. Performed for 14 days	True Experiment research with pretest-posttest control group design	Dates can significantly increase hemoglobin levels (Mean $\pm$ SD 11.76 $\pm$ 0.69, p value 0.041). Meanwhile, ferritin levels did not change significantly (Mean $\pm$ SD 38.61 $\pm$ 18.99, p value 0.057). Dates can be used as an alternative treatment for anemia
<b>Indrayani et al. (2018)<sup>10</sup></b>	This study aims to examine hemoglobin levels and differences in bowel movements resulting from the government's iron supplementation program and consumption of fruit and dates as well as two general products freely available to Indonesian consumers.	Respondents in this study were 40 adolescent girls with anemia who were selected using a random permutation block.	The first treatment group was given sangobion tablets (250mg ferrous gluconate). The second group consumed Sayer Dates (70-75gr / 2x35-37.5 grams per day). The third group consumed packaged date drinks (3 bottles / day). Meanwhile, the control group was given iron tablets subsidized by	This research is a randomized controlled trial with four groups, namely three treatment groups and one control group	There were significant differences in hemoglobin levels before and after the intervention in the four groups. The difference is seen at week 1,2,3 and tends to decrease. Based on this research, dates can be used as a substitute for iron tablets and packaged date drinks that have been certified can be used as a companion to iron tablets.

			the government (200 mg Ferro Sulfate). The intervention was carried out for 30 days, with a weekly assessment		
<b>Karajibani et al. (2019)<sup>11</sup></b>	This study aims to examine hemoglobin levels and differences in bowel movements resulting from the government's iron supplementation program and consumption of fruit and dates as well as two general products freely available to Indonesian consumers.	The study population consisted of 31 primary school girls in Iran	Respondents were given dates for two months. Before and after being given dates, the hemoglobin, hematocrit, and ferritin levels were measured	<i>semi-experimental</i>	The consumption of dates increases hemoglobin, hematocrit and ferritin levels in students with IDA. Hemoglobin levels at the beginning and end of this study were $11.19 \pm 0.38$ g / dL and $12.05 \pm 0.81$ g / dL ( $p = 0.001$ ), the hematocrit was $34.24 \pm 0.41\%$ and $37, 17 \pm 2.36\%$ ( $p = 0.001$ ), and the ferritin content was $47.07 \pm 21.89$ $\mu$ g / dL and $53.98 \pm 19.77$ $\mu$ g / dL ( $p = 0.001$ ).
<b>Youssef et al. (2015)<sup>13</sup></b>	This study aimed to evaluate the effects of black dates in children suffering from iron deficiency anemia	Eighty boys aged 9-11 years were randomly selected from two orphanages	Forty children were divided into four equal groups. The first group was the non-anemia group (negative control group),	Quasi Experiment research with pretest-posttest control group design	The non-anemic and anemic groups had lower intakes of thiamin, vitamin A, vitamin E, calcium and

	orphanage		the second, third and fourth groups were anemic groups. The second group was a positive control group (untreated), the third and fourth anemia groups were given black dates with or without skin (each 100g black dates daily for 8 weeks). After 4 and 8 weeks, blood samples were collected to evaluate hematologic parameters.		phosphorus than the Reference Dietary Intake values. Iron and zinc were higher in the non-anemic group compared to the Reference Dietary Intake values whereas the anemia group had the opposite trend. Meanwhile, hemoglobin, hematocrit, serum iron, ferritin and transferrin saturation in the group given black dates increased. Dates without skin are more effective at increasing hemoglobin, hematocrit, serum iron, ferritin and transferrin saturation
<b>Akilaroora n et al. (2019)<sup>14</sup></b>	This study aims to estimate hemoglobin levels by consuming amla accompanied by honey and dates alone	The study consisted of 50 people from different age groups and did not have any systemic diseases or syndromes	50 respondents were divided into two groups. 25 respondents were given amla and honey, then 25 were given dates for 25 days	True Experiment research with pretest-posttest control group design	Consumption of amla accompanied by honey and consumption of dates, have nutritional components that play a role in increasing hemoglobin levels

#### 4. DISCUSSION

Dates are one type of fruit that grows widely in arid and semi-arid parts of the world. Dates and their by-products such as seeds, have nutritional and medicinal value. However, the fruit and seeds of dates are not yet fully considered potential foods with promising health benefits. Dates contain 70% carbohydrates, several minerals including potassium, iron, calcium, dietary fiber and low levels of lipids and protein<sup>15,16</sup>. The high iron content in dates plays a role in the formation of complexes with molecular oxygen in hemoglobin and myoglobin. Iron can synthesize heme which can increase hemoglobin levels<sup>3</sup>.

Based on a review of six articles, the majority of date palm interventions were carried out on young women and children. Women and children are the groups most vulnerable to anemia<sup>17</sup>. Dates are not only able to increase hemoglobin levels, but also increase other hematological parameters, such as: ferritin levels, hematocrit, serum iron and transferrin saturation.<sup>11,13</sup>. However, other studies have stated that there is no increase in ferritin levels after consuming dates<sup>8</sup>.

The six research articles provide date interventions with different dosages or dosages and duration of administration. Research by Sari et., Al (2018) did not specify the weight of the dates given, only 7 dates were given. Meanwhile, other studies have determined the weight of dates given, namely 70-75gr / day and 100gr / day<sup>8,10,11</sup>. Dates varieties should also be a concern, because they will affect their nutritional value and quality<sup>16</sup>.

#### 5. CONCLUSION

Dates can be used as an additional alternative to increase hemoglobin levels. However, disease or systemic syndrome in each person should be a concern because it can affect the effectiveness of dates in increasing hemoglobin levels.

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