



## Potential of date palm fruit (*Phoenix Dactylifera*) for improving haemoglobin and ferritin level in anemic female adolescent

(Study at MAN 3 Jombang East Java)

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### ABSTRACT

#### Background

Anemia is one of the health problems throughout the world, especially in developing countries, which is estimated to be 30% of the world's population suffering anemia. Management of anemia is by consuming Fe tablets, but Fe tablets have side effects, namely defecation and nausea. One alternative to prevent anemia is using dates palm fruit that are rich in iron and also contain protein, fiber, glucose, vitamins, biotin, niacin, and folic acid. Date palm fruit contains complete nutrients with no side effects when given in patients with anemia.

#### Objective

To prove the program of improving hemoglobin and Ferritin levels by using Dates Palm fruit (*Phoenix Dactylifera*) in 14 days of female adolescent conducted in the intervention group and the control group.

#### Method

True experiment: with pretestposttest control group design. The dependent variable is the hemoglobin and ferritin level, the independent variable is dates palm fruit. The female adolescent research subjects as many as 30 respondents were divided into 15 intervention groups given Fe and Dates palm fruit and 15 control groups were only given Fe tablets. Treatment was done for 14 days. Blood measurement uses laboratory analysis.

#### Results

Dates palm fruit can increase hemoglobin levels significantly (Mean  $\pm$  SD 11.76  $\pm$  0.69 p value 0.041), while Ferritin levels did not change significantly (Mean  $\pm$  SD 38.61  $\pm$  with a p value of 0.057).

#### Conclusions and Suggestions

Date Palm fruit has a lot of nutritional content used to increase hemoglobin and ferritin levels. Date palm fruit has the potential as an alternative treatment for anemia.

**Keywords:** Dates Palm Fruit, Hemoglobin Levels, Ferritin Levels.

## INTRODUCTION

Anemia is one of the health problems throughout the world, especially developing countries, which is estimated at 30% of the world's population suffering anemia. Anemia often occurs in the community, especially in adolescents and pregnant women. Anemia in young women is still quite high [1]. According to the data from Riskesdas (2013), the prevalence of anemia in Indonesia is 21.7%, with anemia sufferers aged 5-14 years 26.4% and 18.4% with patients aged 15-24 years [2]. The 2012 Household Health Survey (SKRT) data stated that the prevalence of anemia among female adolescents aged 10-18 years was 57.1% and age 19-45 was 39.5% [3]. According to the data above, it shows that the highest incidence of anemia happen in adolescence, because adolescence are productive age and has high in activity that can affect the decreasing of hemoglobin level. The high incidence of anemia that still occur especially in young women shows that there are still many teenagers who had lack of balance food consumption, especially consumption of iron [4]. Anemia is mostly caused by iron deficiency factors which are characterized by low hemoglobin levels and a decrease in ferritin levels.

As one alternative that can be used to increase hemoglobin levels and ferritin levels by giving date palm fruit. In the community dates palm fruit are known as the fruit of the Prophet which has many benefits and is easily obtained. Dates palm fruit are rich in iron which is useful for increasing hemoglobin levels. Inside the dates also contain a lot of nutrients which play a role in the formation of hemoglobin including iron, protein, pyridoxine (vitamin B6) which acts as a catalyst in the synthesis of hem in the hemoglobin molecule, vitamin C (affects the absorption and release of iron from transferin to in body tissues), and vitamin E which affects the stability of cell membranes and blood. A series of studies of 50 winstar mice for 112 days showed that raw methanol and palm fruit extract (Phoenix Dactylifera) had the properties of supporting an increase in synthesis of

erythropoietin by the liver to stimulate the bone marrow to produce more red blood cells / haemopoiesis [5]. Flavonoid content in dates has antioxidant activity that works as a free radical catcher that can be used to repair or restore blood vessel endothelial function. Blood vessel endothelial cells are layers of flat cells that line the surface of blood vessels, and are directly related to blood and other blood products which flows inside.

## Study Objectives

Proving the program to improve hemoglobin and Ferritin levels by using Dates palm fruit (Phoenix Dactylifera) in female adolescence.

## Methods

This research is a type of analytic research using True Experiment design with a pretestposttest control group design. Dependent variable is hemoglobin and ferritin level, independent variable is date palm fruit. The female adolescent research subjects as many as 30 respondents were divided into 15 intervention groups given Fe and Dates palm fruit and 15 control groups were only given Fe tablets. Treatment was done for 14 days. Blood measurement uses laboratory analysis.

## Data Analysis

Univariate analysis is done by calculating the mean, maximum, minimum and standard deviation of the indicator of inferential analysis instrument used to determine the significant differences between the two groups namely the intervention group and the control group. Data analysis using Paired t-test and Wilcoxon. ( $p < 0.05$ ).

## RESULTS

### Data Presentation and Research Analysis

Giving Fe and Fruit Dates tablets is more influential than the administration of Fe tablets alone in increasing Haemoglobindan levels and Ferritin levels in adolescent girls with anemia.

**Table 4.4 Differences in Hemoglobin Levels in the Intervention and Control Groups (Pre and Post Test)**

Group of Experiment	Haemoglobin Level (gr/dl)		P
	(Mean+ SD)		
	Pre	Post	

Intervention	10,08 ± 0,96	11,76 ± 0,69	0,001*
Control	9,95 ± 1,06	10,73 ± 1,41	0,005*

\* Wilcoxon test

Table 4.4 shows that there are haemoglobin changes in female adolescent before and after treatment. In the control group and intervention group showed hemoglobin levels increasing in

before and after treatment. In those two study groups, the higher of increasing hemoglobin levels occurred in the intervention group.

**Table 4.5 Ferritin Level Differences in the Intervention and Control Groups (Pre and Post Test)**

Group of Experiment	Ferritin Level (µg/ml) (Mean± SD)		P
	Pre	Post	
Intervention	21,08 ± 19,37	38,61 ± 18,99	0,001*
Control	16,15 ± 13,56	26,34 ± 14,59	0,001**

\* Wilcoxon test

\*\* Test paired t-test

Table 4.5 shows that the test results for differences in female ferritin levels before and after treatment in the study. Based on the results of the paired t-test it was found that there were significant differences in ferritin levels before and after treatment in the control group with p value = 0.001. In the intervention group, the Wilcoxon test results also showed significant differences in ferritin levels before and after treatment with p value = 0.001. Changes in female ferritin levels before and after treatment. As changes in hemoglobin levels, showed an increase in young female ferritin levels before and after treatment, where a higher increase in ferritin levels occurred in the intervention group.

## DISCUSSION

In this study it can be seen that in the control group with the consumption of Fe tablets there was a significant increase in hemoglobin levels because iron supplementation is very beneficial that can improve hemoglobin status in a relatively short time within 7-14 days.

The formation of hemoglobin in the blood is influenced by the availability of other nutrients such as protein and iron. Dates palm fruit are rich in nutrients that play a role in the formation of hemoglobin including iron, protein, pyridoxine (Vitamin B6) which acts as a catalyst in the hemoglobin system. Consumption of nutrients from dates palm fruit is expected to optimize metabolic processes in the body. Teenagers who have good nutritional status, regular

menstrual cycles and do not have a disease that can reduce hemoglobin levels in the body.

Dates palm fruit contain flavonoids. Flavonoid compounds are polyphenol that act as antioxidants, which in blood cells can act as a reservoir of hydroxyl and superoxide radicals to protect membrane lipids and prevent cell damage. Flavonoids can increase the process of erythropoiesis (erythrocyte formation) in the bone marrow and have immunostimulant effects [6]. The intake of antioxidant compounds from Dates palm fruit, the attack of free radicals on blood cells can be minimized and the process of forming blood cells can increase, so that hemoglobin levels can be maintained and even increase hemoglobin levels.

This study proves that by consuming dates palm fruit with a dose of 100 gr together with Fe tablets per day on a regular basis can increase ferritin levels and hemoglobin levels in female adolescent. This is because dates palm fruit contain flavonoids and many nutrients that can help absorb iron in food.

## CONCLUSION

Giving dates palm fruit (*Phoenix Dactylifera*) and Fe tablets given to female adolescent who are anemic for 14 days have an effect on the increase in hemoglobin levels.

Giving dates palm fruit (*Phoenix Dactylifera*) and Fe tablets given to adolescent girls who are anemic for 14 days does not have an effect on increasing levels of ferritin in young women.

## RECOMMENDATION

For the next researcher can continue this research by making more observations in the

factors that influence the occurrence of anemia so that the intervention will be carried out and more optimal to increase hemoglobin and ferritin levels.

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