



Giving Mung Bean Extract on Changes in Preconception Mothers' Hemoglobin Levels at the Blue Telaga Community Health Center

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Abstract

This study aims to determine the effect of giving green bean juice on changes in hemoglobin levels in preconception mothers at the Danau Biru Health Center. This study used a pre-experimental design with one group pre-post test design. The sample used was a purposive sampling method with a sample size of 26 respondents. Data collection using observation sheets and data analysis using the Independent Sample T Test analysis with a significance level of 95% ($\alpha = 0.05$), obtained a p value = 0.013 and a static tick test through a significance level of 95% IK value of 10.9 which means that giving green bean juice is 10.20 times more likely to increase hemoglobin levels, so it can be concluded that there is an effect of giving green bean juice on changes in hemoglobin levels in preconception mothers. This study was conducted to help preconception mothers in dealing with pregnancy and to increase knowledge about Hb.

Introduction

Anemia is one of the common health problems experienced by women, especially during the preconception period. This condition is characterized by low levels of hemoglobin in the blood, which can cause fatigue, weakness, and other health complications. Anemia in preconception women can have a negative impact on maternal health and fetal development during pregnancy (Means, 2020; Allen, 2000). One way to prevent and overcome anemia is to increase the intake of iron and other nutrients that play a role in the formation of red blood cells. Green beans are known as a good source of nutrition, and have vitamin and mineral content. Minerals such as calcium, phosphorus, iron, sodium and potassium are abundant in green beans (Astawan, 2009; Sathe et al., 1984; Akram et al., 2020; Natesh et al., 2017).

Giving green bean juice is considered to be an alternative experience and easy to obtain to increase hemoglobin levels. In Gorontalo Province in 2022 the incidence of anemia in mothers was around 39.6%, where Boalemo Regency was the regency with the highest incidence of anemia in mothers, namely 16.9% which was the second highest, namely North Gorontalo Regency, the highest at 12.1%, third Gorontalo Regency as much as 4.1%, fourth Gorontalo City as much as 3.4 and Huwato Regency as much as 1.2%. The relevant research results from (Tyas, 2022) regarding the provision of green bean juice on blood hemoglobin levels during menstruation in adolescent girls at SMA N 1 Godean in 2022 from the results of the study which was given green bean juice for 7 days in the morning and evening. Pre-test hemoglobin levels before being given green bean juice, the mean score was 12.94 then the results of hemoglobin levels after being given green bean juice, the mean score was 14.35

Study This give intervention that is giving non - pharmacologically in the form of peanut extract green containing substance iron as well as required For formation cell blood red so that can overcome effect decreased hemoglobin. Content substance iron in peanut green as much as 6.7 mg in 100 grams of nuts green. Consume 2 cups peanut green every the day means consume 50% of the needs iron every day namely 18 mg and can increase hemoglobin levels for 2 weeks (Maulidya Chikmah et al., 2020). Peanuts green also contains phytate by 2.19% which is an obstacle absorption substance iron so that recommended soak peanut green moreover formerly before process it (Choirunissa & Manurung, 2020; Maharani et al., 2022). Research This aiming For evaluate influence giving peanut juice green to change hemoglobin levels in Mother preconception. With know effectiveness of peanut juice green, expected can give solution practical nutrition And effective For treating anemia, especially on woman preconception , and support health optimal reproduction.

Methods

This research design uses a non-equivalent control group design. In this design, the grouping of sample members into the experimental group and the control group is not done randomly because the random sampling process requires more time, cost, and effort compared to the non-random method and researchers also consider characteristics related to special populations, availability of respondents, research objectives, difficulties in population identification, ethical principles and compliance, practical considerations and small sample sizes (Notoatmodjo, 2019). The sample in this study consisted of 26 preconception mothers, who were divided into an experimental group of 13 people and a control group of 13 people. The determination of the sample size uses the Slovin formula. The statistical test used in this study is the Independent T-test. Green bean juice was given as much as 2 glasses a day, namely in the morning and evening for 7 days.

Result and Discussion

Characteristics Respondents

Respondents based on age And mother's job preconception most most namely 20-35 year on group control group as many as 92.3% or 12 people and intervention group 84.6% or 11 people people. Based on the frequency of respondents based on the mother's preconception age, the most were 20-35 years in the control group as many as 92.3% or 12 people and the intervention group 84.6% or 11 people. The occupation of respondents in the control group was housewife 11 (84.6%), private / shop employees 2 (15.4%). In the intervention group 10 (76.9%) and private / shop employees 3 (23.1%). The control group's place of residence was highland 7 (53.8%), lowlands 6 (46.2%). In the highlands intervention group 8 (61.5%) and lowlands 5 (38.5%).

Table 1. Frequency of respondents based on characteristics of preconception mothers in Telaga Health Center Blue

Variables	Control		Intervention	
	n	(%)	N	(%)
Age				
<20 year	1	7.7	2	15.4
20-35 year	12	92.3	11	84.6
Total	13	100	13	100
Work				
housewife	11	84.6	10	76.9
Private / Store Employee	2	15.4	3	23.1
Total	13	100	13	100
Place Stay				

Plains Height (mountains)	7	53.8	4	30.7
Lowland	6	46.2	9	69.3
Total	13	100	13	100

Source: Data Primer (2024)

Results Analysis Univariate

Based on table 2 Levels hemoglobin *pretest* shows that almost all big Respondent on group control own level Hb 9.7 – 11.4 gr/dL with an average value of 10,362. In the intervention group, the average hemoglobin level was 9.1-11.8 gr/dL with an average value of 10,415. The category of hemoglobin levels in the control group at the time of the pretest was an average of >11 gr/dL for 2 people (15.4%), an average hemoglobin level of 10 gr/dL for 9 people (69.2%), and a hemoglobin level of ≤ 10 gr/dL for 2 people (15.4%). In the intervention group, the average hemoglobin level was >11 gr/dL for 3 people (23.1%), an average hemoglobin level of 10 gr/dL for 7 people (53.8%), and a hemoglobin level of <10 gr/dL for 3 people (23.1%).

Table 2. Distribution of *Pretest Hemoglobin Levels* in the Control Group And Intervention in Telaga Health Center Blue

Group	Mean + SD	n	(%)
	Min- Max		
Control	10,362 ±0.49 9.7- 11.4	13	50
Intervention	10.415 ±0.769 9.1- 11.8	13	50
Total		26	100

Source: Data Primer (2024)

Based on table 3 Hemoglobin levels *posttest* shows that almost most of the Respondent on group control own level hemoglobin 9.0 – 11.3 gr/dL with an average value of 10,277. In the intervention group, some had hemoglobin levels of 10.0-12.4 gr/dL with an average value of 10,985.

Table 3. Distribution of *Posttest Hemoglobin Levels* in the Control Group And Intervention in Telaga Health Center Blue

Group	Mean + SD	n	(%)
	Min- Max		
Control	10,277 ±0.62 9.0- 11.3	13	50
Intervention	10.985 ±0.727 10.0- 12.4	13	50
Total		26	100

Source : Data Primer (2024)

Results Analysis Bivariate

The hemoglobin level in the intervention group had a minimum pretest value of 9.1, a maximum value of 11.8, with an average of 10.41 and the *posttest results* obtained a minimum value of 10.0, a maximum value of 12.4, and an average value of 10.98, so that the *pretest* and *posttest values* had a difference of 0.57. In the control group, hemoglobin levels were found mark pretest minimum 9.7, mark maximum 11.4, with average 10.36 and the *posttest result value obtained* a minimum value of 9.0, maximum value of 11.3, average value 10.27, so that on mark *pretest* And *posttest* have value difference 0.09. In study This group intervention own

mark difference more big 0.59 from group control. Results test independent sample test mark $p = 0.013$ and test statistics through mark IK 95% is 10.9 which means that the provision of essence Green beans have a 10.20 times greater chance of increasing hemoglobin levels.

Table 4. Provision Sari Peanut Green To Hemoglobin Levels in Preconception Mothers at Telaga Biru Health Center

Hemoglobin levels	Pretest			Posttest			Mark Difference mean	P Value	IK95%
	Min	Max	Mean+SD	Min	Max	Mean+SD			
Intervention	9.1	11.8	10.41 + 0.769	10.0	12.4	10.98 + 0.72	0.57	0.013	10.98 (0.16-1.25)
Control	9.7	11.4	10.36+0.49	9.0	11.3	10.27+0.62	0.09		

Source: Data SPSS (2024)

Very young preconception mothers, especially teenagers, often face a higher risk of anemia. This is due to the increased nutritional needs for their own body growth along with the needs of pregnancy. Biologically, teenagers are still developing both physically and emotionally. Some changes and discomforts that occur during pregnancy such as nausea in early pregnancy can have a negative impact physically and psychologically, so teenagers tend to be less notice his health (Ramadirga Thio Saba, 2020) . Research This show that There were 2 respondents aged <20 years in the intervention group and 1 respondent in the control group. This has a more susceptible impact on iron deficiency and anemia compared to adult women. Therefore, this study with the provision of green bean juice in the morning and evening for 7 days found in the intervention group aged <20 years the hemoglobin levels before the intervention were around 10.5 gr / dL and 10.8 gr / dL. After being given the intervention, the hemoglobin levels changed to 11.0 gr / dL and 11. 2 gr / dL. The increase in hemoglobin levels in the intervention group given green bean juice for 7 days was 0.5 gr / dL and 0.4 gr / dL. Green beans contain iron which is needed for the formation of red blood cells so that they can overcome the effects of decreased hemoglobin levels with the content iron in green beans is 6.7 mg in 100 grams of green beans. Consuming 2 cups of green beans every day means consuming 50% of the daily iron requirement, which is 18 mg and can increase hemoglobin levels for 1 week (Maulidya Chikmah et al., 2020). In line with research (Zaimy et al., 2021) on the effect of giving green bean juice on hemoglobin levels in adolescent girls. The average hemoglobin level of adolescent girls before being given green bean juice was 10.87 g/dL and after being given the intervention it became 12.15 g/dL. The results of this study prove that the intervention group given green bean juice experienced an average increase in hemoglobin levels of 1.28 g/dL.

The average age of the respondents is mostly between 20-35. This age tends to have more stable hemoglobin levels compared to teenagers. However, factors such as nutritional status, diet, and general health conditions also play an important role (Jelliffe & World Health Organization, 1996; Moreno et al., 2008). Meanwhile, older mothers (over 35 years) will experience changes in hemoglobin levels due to pre-existing health conditions or decreased efficiency of iron absorption with age. However, in this study there were no preconception mothers aged >35 years.

The average respondent in the study, both the intervention group and the control group, worked as a housewife/housewife. The results of the study of providing green bean juice intervention for 7 days in the group of working mothers and housewives/housewives showed that before the intervention, the average hemoglobin level of working mothers was 9.1 gr/dL - 10.8 gr/dL and after the intervention it became 10 - 12.4 gr/dL. There was an increase in hemoglobin levels before and after the intervention of 0.6 gr/dL - 0.9 gr/dL. While the hemoglobin levels in housewives before the intervention were 9.5 gr/dL - 11.0 gr/dL and after the intervention the average increase in hemoglobin levels was 10 gr/dL - 12.1 gr/dL. The difference in the increase in hemoglobin levels in housewives was 0.4 gr/dL - 0.6 gr/dL.

The results of this study indicate that there was an increase in hemoglobin levels in the intervention group given green bean juice for 7 days in working mothers and housewives. However, in housewives, the difference in the increase in hemoglobin levels was only around 0.4 gr / dL - 0.6 gr / dL. This shows that there is a relationship between the work of housewives and hemoglobin levels in preconception mothers, because excessive physical activity can cause hemolysis and reduce the amount of hemoglobin (Fadlilah, 2018; Hu & Lin, 2012; Robinson et al., 2006).

This increase is due to the intake of iron through green bean juice. The intake of green bean juice given twice a day for one week is the same as consuming 50% of the iron requirement. Iron absorption can form red blood cells or hemoglobin, so that hemoglobin in the blood is normal. In addition, the provision of green bean juice can support the government in reducing number incident anemia especially in preconception mothers who will prepare for a healthy pregnancy. In theory (Akram et al., 2020) that the content of green beans, namely protein, folic acid functions to form red blood cells, iron has a function as a hemoglobin former, zinc, potassium, magnesium, copper functions as the absorption of iron, manganese, and thiamine. This shows that inadequate energy intake will have an impact on the availability of other macronutrients in the body (Millward, 2004; Casazza et al., 2018; Stubbs et al., 2000). The body forms energy for physiological processes and helps the body's work in the metabolism of nutrients that play a role in the formation of hemoglobin (Bender & Cunningham, 2021). Therefore, preconception women who lack energy tend to experience iron deficiency, which can be seen from low hemoglobin levels. The results of this study are in line with research from (Dieny et al., 2019) entitled nutrient intake and hemoglobin levels of preconception women, that one of the factors that affects hemoglobin levels is energy intake, protein, iron and nutritional status. However, the most influential factors are energy intake and nutritional status.

Conclusion

Study This show that giving peanut juice green can increase level hemoglobin on Mother preconception . Peanuts green is source rich in nutrients substance iron, protein, and vitamins, which play a role important in formation hemoglobin And cell blood red. Peanut green as source food experience offer affordable alternative And easy accessed compared to with supplement substance iron that may No available For all circles society, especially in the regions rural. Increase level hemoglobin before pregnancy can reduce risk anemia during pregnancy , so that support health Mother And development optimal fetus.

Suggestion

Health program public can consider giving peanut juice green as part from intervention nutrition For woman preconceptions, especially in the area with prevalence high anemia. Education about benefit peanut green And method proper processing must improved For increase reception And consumption among public wide. Required study more carry on For understand optimal dose and frequency giving peanut juice green, and interaction potential with food or other supplements consumed by Mother preconception. Monitoring effect term long from consumption of peanut juice green on health Mother And child can give information more carry on about effectiveness And security intervention This.

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