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Effectiveness of instant drinking of peanut (Arachis Hypogaea) on improvement of albumin levels pregnant women chronic energy deficiency with anemia (Studies in Health Centre Pati II Districts Pati)

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ABSTRACT

Background

Poor nutrition during pregnancy causes anemia and Chronic Energy Deficiency (CED). The government has given classic PMT and iron tablet, but pregnant women still need additional energy. Peanuts contain macro and micro nutrients as an alternative companion for handling CED pregnant women with anemia.

Objective

To analyze the effectiveness of peanut instant drinks on increasing albumin levels of CED pregnant women with anemia.

Method

This type of research is a quasi experiment with pretest posttest with control group. Sample: CED pregnant women with anemia of 26 respondents (purposive sampling technique), divided into 2 groups: 13 intervention groups given classic PMT, Fe, 31 g instant peanut drink and control group given classic PMT and iron tablet for 30 days. Analysis: paired t test, independent t test.

Results

Instant drink 31 g of peanuts in CED pregnant women with anemia affects the increase in albumin levels (p = 0,000).

Conclusion

Instant drink 31 g of peanuts given to CED pregnant women with anemia along with Classical PMT and iron tablet for 30 days increases levels of albumin.

Keywords: Peanuts, Albumin, hematology, CED, Anemia

INTRODUCTION

In the first 1000 days of life is a golden period for children to develop optimally. Nutritional status is an important aspect for pregnant women. The most common nutritional problems experienced by pregnant women are anemia and Chronic Energy Deficiency (CED). The results of the study Aminin, et al mentioned that there was an effect of KEK with the incidence of anemia [1]. Upper Arm Circumference (MUAC) <23.5 cm is one of the

identification of CED. During pregnancy each mother gets at least 90 tablets to add blood tablets to prevent anemia [2]. Poor nutritional status can cause impaired fetal growth, increase degenerative diseases in adulthood, and risk of obesity [3,4]. CED increases the risk 4 times as much to give birth to LBW babies, and increases the incidence of anemia [1,5]. Other risk factors that affect LBW are the environment, education level, and socioeconomic[6].

One of the malnutrition biomarkers is albumin [7]. Someone with Hemoglobin <11gr / dl, also experiences low albumin levels [8]. The albumin levels of CED Pregnant women were 3.12 g / dL and those without CED were 3.45 g / dL, so that there was a difference of 0.33 g / dL and p = 0,000 between albumin levels of CED pregnant women and non CED [9]. The additional energy needs of CED pregnant women amount to 350-500 kcal / day from adult women which is 2500 kcal / day. Meanwhile, additional food from the government (PMT Classic) for CED pregnant women trimester II and III, namely 60 gram layer biscuits / day (3 pieces of biscuits) contains only 270 calories, 6 grams of protein, 12 grams of fat, 11 kinds of vitamins and 7 kinds of minerals and additional food was made from local specialties, regional specialties, adjusted to local conditions [10–12].

Indonesia is an agricultural country that has a variety of plants that can be utilized. One of the local wisdom plants and easily found is peanuts. 100 grams of peanuts in serving size contains 49.2 grams of fat, 25.8 grams of protein, and 21.51 grams of carbohydrates, 585 kcal of energy, micronutrients and phytonutrients [13]. Consuming 25 grams of peanuts can meet the body's daily protein of 12 AKG 25% [14]. The results of research by giving formula peanut drinks higher improve the nutritional status of the formula red beans, soybeans, and formula milk for pregnant women [15]. Ready To Use Therapeutic Food (RUTF) is a peanut-based food mixed with millet porridge providing an energy intake of 245 kcal / per consisting of 35.5 grams of protein, zinc 8 mg, and 78 µg selenium so that it can reduce anemia, increase fat mass and cell mass in HIV adults with chronic malnutrition[16].

METHODS

This research is a quasi experiment design study with a pretest posttest with control group design that is used to determine the effectiveness of instant peanut drinks on albumin levels of CED pregnant women with anemia given by classic PMT and iron tablet. Research using the experimental group and the control group obtained 13 respondents for each group with the inclusion criteria KEK pregnant women with anemia, single pregnancy, gestational age second and third trimesters, willing to be a respondent and sign an informed consent. The study began with pretest blood sampling in both groups, the intervention group was given an instant drink 31 grams of peanuts, classic PMT, and iron tablets for 30 days. The control group was given classical PMT and iron tablets for 30 days. Day 31 performed posttest on both groups. The data obtained were analyzed using SPSS 24.

RESULTS

Analysis characteristics of respondents

The results of the analysis characteristics respondents in the studied group can be seen in Table 1.

Table 1. Characteristics of Respondents

Category	Intervention Group (n=13)		Control Group (n=13)		*p*
	n	%	n	%	
Energy sufficiency level					
Deficit	8	61,5	9	69,2	
Normal	3	38,5	4	30,8	0,807
Total	**13**	**100**	**13**	**100**	
Age					
<20					
20-35	13	100	13	100	0,951
>35					
Total	**13**	**100**	**13**	**100**	
Education					
Senior High School	8	61,5	9	69,2	
Collage	5	38,5	4	30,8	0,443
Total	**13**	**100**	**13**	**100**	

Profession					
Work	2	15,4	3	23,1	
Housewife	11	84,6	10	76,9	0,341
Total	**13**	**100**	**13**	**100**	
Parity					
Primigravida	9	69,2	7	53,8	0,188
Multigravida	4	30,8	6	46,2	
Total	**13**	**100**	**13**	**100**	

*Levene's test

Based on table 1 shows the energy sufficiency level experienced a deficit of 61.5% in the intervention group, and the control group (69.2%). Characteristics of maternal age respondents in the intervention and control group aged 20-35 years. The majority of high school education is in the intervention group (61.5%) and the control group (69.2%).

Characteristics of respondents based on the work of CED pregnant women with anemia majority of housewives in the intervention group (84.6%), the control group (76.9%), and based on parity of CED pregnant women with anemia of the majority of primigravida in the intervention group (69.2%), and the control group (53.8%), so there is no significant difference in the characteristics of respondents between the intervention and control groups with a p value> 0.05.

Analysis of Albumin Levels

The results of albumin levels in the studied group can be seen in Table 2.

Table 2. Albumin Levels

Variabel	Kelompok Intervensi	Kelompok Kontrol	*p-value*
	Mean±SD	Mean±SD	
Kadar Albumin (gr/dl)			
Pre Test	4,208±0,233	4,400±0,224	0,042**
Post Test	4,738±0,247	4,508±0,214	0,018**
Δ	0,531±0,125	0,108±0,086	0,000**
p-value	0,000*	0,001*	

* Uji Paired T-Test
** Uji Independent T-Test

The difference in albumin levels before and after the intervention can be seen in table 2 obtained pvalue <0.05 which means that there are differences in albumin levels in the control group and intervention before and after the intervention is given.

The difference in albumin levels between the intervention group and the control group before the intervention in the p-value = 0.042 was obtained which means that there were differences in albumin levels in the control and intervention groups before the intervention was given. The results of the average albumin levels after the intervention obtained p-value = 0.018 which means that there are differences in albumin levels in the control group and the intervention after the intervention was given.

Difference in mean difference in albumin levels after being given an intervention in the two groups obtained p-value = 0,000, which means that there are differences in albumin levels in the control group and the intervention after the intervention was given.

DISCUSSION

Peanuts formula drink in 300 ml contains 300 kcal of energy, protein 17 g, Fe 13 mg, Ca 150 mg, folic acid 200 mg, Mg 30 mg, Vitamin B12 0.2 mg, Vitamin A 300 RE,

vitamin C 10 mg [17]. Peanut contain macro, micro, and phytonutrient nutrients, more vegetable protein than other nuts. Macro nutrients in peanuts per 100 grams are 25.8 grams of protein, 49.2 grams of fat, 21.51 grams of carbohydrates and 2220 kilojoules of energy[13]. About 30% composition of peanut protein consisting of essential amino acids is the right intake and is needed in the growth, maintenance of body tissues and the formation of albumin in the liver [18,19].

Albumin is the main protein found in human plasma and consists of 60% of total plasma protein released by the liver into the blood. In plasma there are 40% albumin and another 60% found in the extracellular space. Albumin levels can be measured by the spectrophotometric method. Albumin levels depend on protein intake which is a complex form of amino acids. Nutrition problems can be attributed to the low amount of albumin, because albumin is a transporter carrying substances in the blood, nutrition in cells, and regulating water to be balanced [20].

The results of the study explained that the edamame nugget formula with the addition of 30 grams of peanut flour can increase protein levels with a p-value of 0.003 <0.005. The increase in protein occurs because peanuts contain 22% which is a type of water-soluble protein [21]. Methionine is one of the essential amino acids in peanuts that is useful for protein synthesis, and acts as an initial amino acid in the process of protein synthesis. All amino acids are very important to prevent malnutrition disorders[22]. Albumin as the body's protein transport that indicates protein status is a response from food consumption, especially food sources of protein. If protein intake increases, albumin synthesis will also increase[8].

Providing peanut formula drinks can be used as an alternative intervention model to increase energy intake and improve nutritional status in pregnant women [15]. The use of cheaper nutritious ingredients by replacing milk powder with locally available food plants has the potential to reduce costs significantly [23].

CONCLUSION

Giving instant drink 31 grams of peanuts for 30 days in CED pregnant women with anemia who get classic PMT biscuits and iron tablets effectively increases of albumin levels.

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