



THE EFFECTIVENESS OF GIVING SUTARMA NUTRITIOUS DRINK "DATE TARAP MILK" ON INCREASING UPPER ARM CIRCUMFERENCE OF PREGNANT WOMEN

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ABSTRACT

Chronic Energy Deficiency (CED/ kekurangan energi kronik / KEK) must be overcome by increasing adequate nutrient intake. The additional nutritional intake that can be provided is by utilizing local wisdom from Kalimantan, namely tarap fruit seeds which have nutritional content such as protein, carbohydrates, fats, and vitamins combined with dates in an innovation "SUTARMA". The purpose of this study is to find out the benefits of giving Sutarma nutritious drink "Date Tarap Milk" can increase the upper arm circumference (lingkar lengan atas/LILA) in pregnant women at the Karang Rejo Health Center. This research method is a quasi-experimental quantitative research with a one-group pretest posttest design. The research sample used was 15 pregnant women. This research was conducted in the work area of the Karang Rejo Health Center. This study provides Sutarma intervention for 15 days with a frequency of 1 time a day. And based on descriptive analysis, the average value of the LILA pre-test before the administration of Sutarma to pregnant women was 21.7 cm and the post-test of LILA after the administration of Sutarma for 15 days was 23.1 cm, and the average increase in LILA in mothers was 1.3 cm. Based on the statistical test using paired samples t-test in the output table of t-test results, a significant value of p-value is obtained. 0.000, which means that the p-value < 0.05. Thus, Ho was rejected and H1 was accepted. Thus, it can be concluded that the administration of Sutarma's nutrient-dense drink "Susu Tarap Kurma" is effective and significant in increasing LILA in pregnant women at the Karang Rejo Health Center.

Keywords: chronic energy deficiency; date; tarap

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INTRODUCTION

Chronic Energy Deficiency (CED) is one of the common nutritional problems happen during pregnancy. Chronic energy deficiency in pregnant women is a disease in pregnant women caused by an imbalance in nutrient intake, energy and protein, so the body does not need a sufficient amount of substances (Misnaniarti et al., 2023). According to World Health Organizations (WHO), CED Intended for women who are thin and underfat due to chronic lack of energy. According to the Indonesian Ministry of Health, pregnant women at risk of CED are pregnant women who have an Upper Arm Circumference (LILA) of less than 23.5 cm (Ministry of Health of the Republic of Indonesia, 2022). CED disease is a nutritional problem in pregnant women and is still a nutritional problem throughout the world. Based on research, pregnant women who experience CED, especially in the third trimester (7-9 months). CED are not only risky and bring complications for pregnant women but also risks

to babies. The impact of CED pregnant women is at risk of decreasing muscle strength that helps the delivery process so that it can result in long partus and postpartum bleeding, abortion, and even maternal death (Amalia, et al, 2023) . Meanwhile, in babies, it can cause premature infant disease, stunted babies (smaller than normal babies), and Low Birth Weight (BBLR) (Syami yulianti, 2018).

According to the World Health Organization (WHO) estimates the prevalence of anemia and CED during pregnancy to be 32-73% globally, with the highest incidence in the third trimester in pregnancies in the first and second trimesters. (Triwahyuningsih & Prayugi, 2018). In 2020, the prevalence of pregnant women at risk of CED in Indonesia was 9.7% (Ministry of Health of the Republic of Indonesia, 2021 &) (Misnaniarti et al., 2023). According to the 2021 North Kalimantan Provincial Health Office performance report, the proportion of pregnant women with CED at the Summit is 29% (Health & Kalimantan, 2021). It is known from the Tarakan City Health Office regarding the report on the achievement of LILA recapitulation of pregnant women which was measured cumulatively from January to December 2023 in the Karang Rejo Health Center area of 1,646 pregnant women, in the Mamburungan Health Center area reached 637 pregnant women, in the Gunung Lingkas Health Center area reached 1,068 pregnant women, the Sebengkok area reached 910 pregnant women, the Amal Beach area reached 363 pregnant women, and the Juata Health Center area reached 861 pregnant women. So the total coverage of LILA for pregnant women < 23.5 cm in the Tarakan City area from the data of the Tarakan City Health Office is 5,485 pregnant women.

The data obtained from the Karang Rejo Health Center shows that the number of pregnant women who experience CED in 2023 is 102 or 6.20% of the 1,646 pregnant women measured cumulatively. Then the LILA coverage data < 23.5 cm for pregnant women in the Karang Rejo Health Center area from January to February 2024 is as many as 12 pregnant women. Management that can be done to overcome CED in pregnant women includes pharmacological and non-pharmacological therapy. The pharmacological management given to pregnant women who have the potential to experience anemia due to lack of absorption of nutrient intake to be absorbed is Fe tablets (Farahdiba, 2021). Other treatments that can be done are non-pharmacological or complementary treatments that utilize local wisdom in the Kalimantan region which has the advantage of being easy to get, cheaper, and has no side effects and one type of local wisdom plant that can help increase LILA in pregnant women who experience CED is the seeds of the tarap fruit (Yulianti, Ika, 2023). However, not only utilizing seeds from therapeutic fruits but also combining with dates and UHT milk which have protein, carbohydrates, fats, minerals, glucose, and one of them iron which can increase Hb in CED pregnant women (Suventina et al, 2023).

Based on the report on the results of the laboratory test of tarap seed flour at the Faculty of Fisheries and Marine Sciences, University of Borneo Tarakan, it was obtained that 2 grams of tarap seeds contain a protein content of 9.28%, a fat content of 14.06%, a carbohydrate content of 52.65% and a vitamin C level of 19.37 mg / 100 g of a tarap seed. According to research, *Artocarpus odoratissimus* or tarap fruit is non-toxic (C.L. et al, 2010) and rich in protein, fat, carbohydrates, calcium, phosphorus, iron, retinol, beta-carotene, niacin, thiamin, riboflavin, vitamins A and C (Alvarado, 2023). In this study, tarap seeds will be combined with sukari dates. However, it is not surprising that dates are not only a natural sweetener, but also have ingredients that overcome CED in pregnant women. Based on research, 100 g of sukari dates contain potassium 52 mg, protein 2.35 mg, fat, 0.43 mg, carbohydrates 75 g, fiber/fiber 2.4 mg, vitamin A 90 IU, nicotinic acid, 2.2 mg, potassium 667 mg, magnesium 50

mg, iron 1.2 mg, glucose 38.5 mg, ascorbic acid 6.1 mg, sodium 13 mg, niacin 2 mg, sulfur 14.7 mg, Energy 323 mg (Suventina et al, 2023). In this study, the researcher used UHT milk as one of the ingredients for making Sutarma "Date Tarap Milk".

Based on the above problems, the data on pregnant women with CED is increasing every year, where we know that CED can cause bleeding in pregnant women during pregnancy and childbirth (Silawati & Nurpadilah, 2019). Therefore, the researcher conducted research by looking at and utilizing local wisdom from Kalimantan, namely tarap fruit seeds which have so much content for health and combined with dates which will create an innovation of tarap seed milk and dates which is expected to be effective in increasing LILA in pregnant women in the second and third trimesters at the Karang Rejo Health Center. This study aimed to analyze the effectiveness of giving sutarma nutritious drink "date tarap milk " on increasing upper arm circumference of pregnant women

METHOD

This study is a quasi-experimental quantitative research with one group pretest posttest design. This study provided an intervention and compared with the results of LILA anthropometric measurements using LILA pre-test and post-test LILA bands for pregnant women. The independent variable in this study is the administration of Sutarma's nutritious drink "Susu Tarap Kurma", while the dependent variable in this study is the increase in LILA in pregnant women with SEZs. This research was conducted at the Karang Rejo Health Center, Tarakan City, in April 2024. With a sample of 15 pregnant women in the second and third trimesters with nonprobability sampling techniques, namely by purposive sampling. We compiled and selected respondents based on inclusion criteria with health center officers and then checked LILA before intervention. The researcher prepared SUTARMA and gave it to each respondent every day until 14 day. On the fifteenth day, the researcher conducted a LILA examination as an outcome.

The provision of Sutarma's nutrient-dense drink "Date Tarap Milk" which has been made is 100 ml per day. Given to pregnant women TM II and TM III every day for a period of 14 days (Krisnaningrum et al., 2023). Milk is given to pregnant women at least 2 hours before/after consuming Fe tablets (Goyal, et al, 2019). SUTARMA is made from 8 grams of tarap seeds, 50 grams of dates and 200 ml of milk in each serving. The frequency of administration is 300 ml / day, during a period of 14 days. The instruments used in this study consisted of: observation sheets, Standard Research Procedures, LILA Ribbons, organoleptic tests, phytochemical tests, proximate tests, and toxicity tests. The normality test used Shapiro Wilk. The data analysis carried out was univariate analysis and bivariate analysis with paired samples t-test.

RESULTS

This study was conducted at the Karang Rejo Health Center with a sample of pregnant women in the second and third trimesters. This research began with a *pre-test* then an *intervention* was carried out to give Sutarma gisi solid drink "Susu Tarap Kurma" and then *post-test*.

Table 1.

Distribution of LILA Frequency of Pregnant Women Before the Intervention of Giving Nutrient-Dense Drink Sutarma "Date Tarap Milk" at Karang Rejo Health Center (n=15)

LILA Classification	f	%
< 23.5 cm (LILA Kuraang)	15	100.0

Table 1, all pregnant women respondents before being given the intervention to give Sutarma experienced a lack of LILA (<23.5 cm).

Table 2.

Distribution of LILA Frequency of Pregnant Women After the Intervention of Giving Sutarma Nutrient-Dense Drink "Date Tarap Milk" at Karang Rejo Health Center (n=15)

LILA Classification (%)	f	%
< 23.5 cm (LILA Less)	12	80.0
23.5-28.5 cm (Normal LILA)	3	20.0

Table 2. Respondents of pregnant women after being given the intervention of Sutarma increased and pregnant women who experienced Normal LILA (>23.5 cm) as many as 3 respondents.

Table 3.

LILA Analysis Before and After Sutarma Treatment "Date Tarap Milk"

Variabe	Treatment	f	Mean	Min-Max
LILA	Pretest Intervention	15	21.767	19.0-23.3
	After treatment	15	23.180	21.0-24.5

Table 3. Above it is known that the lowest LILA value before the treatment of Sutarma "Susu Tarap Kurma" is 19.0 cm and the highest value of LILA before the treatment of Sutarma "Susu Tarap Kurma" is 23.3 cm. Then, the lowest LILA value after the treatment of Sutarma nutrient-dense drink "Date Milk Tarap" was 21.0 cm and the highest LILA value after treatment was 24.5 cm. Then, the mean LILA before treatment was 21.7 cm and the mean LILA after treatment was 23.1 cm. And it can be concluded that the value of increasing the LILA of pregnant women during the 15 days of Sutarma administration is 1.3 cm.

Table 4.

Paired samples t-test of the effectiveness of Sutarma "Date Tarap Milk" on the increase in LILA of pregnant women at the Karang Rejo Health Center (n=15)

	T	P value
Upper Arm Circumference - pre and post intervention	107.162	0,000

Table 4. the results of the research analysis to determine the effect of the administration of Sutarma nutritious solid drink "Date Milk Tarap Milk" on the increase of LILA in pregnant women at the Karang Rejo Health Center based on a statistical test using *paired samples t-test* in the output table of t-test results, a value of sig. 0, 000 which means *p-value* was obtained < 0.05. Thus, there is an effectiveness of the provision of Sutarma nutrient-dense drink "Date Tarap Milk" on the increase in LILA of pregnant women at the Karang Rejo Health Center.

DISCUSSION

Deficiency Chronic Energy (KEK) is one of the malnourished states (Fatmawati et al., 2023). Pregnant women with KEK are pregnant women at risk of experiencing CED which is characterized by an Upper Arm Circumference (LILA) of less than 23.5 cm (Rusmiati et al., 2023). LILA measurement can also be used to detect pregnant women at risk of CED. The CED category is LILA less than 23.5 cm or in the red part of the LILA ribbon (Nugraheni et al., 2020). LILA itself describes the deposition of muscle tissue and fat under the skin (subcutaneous fat) on a woman's upper arm. Based on table 1. all research respondents or as many as 15 pregnant women before being given the intervention of Sutarma "Date Tarap Milk" experienced a lack of LILA (<23.5 cm). The impact of pregnant women who experience CED will be at risk of a decrease in muscle strength that helps the delivery process so that it can result in long partus and postpartum bleeding, abortion, and even maternal death (Amalia, et al, 2023) . Meanwhile, in babies, the impact of KEK can cause premature infant

diseases, stunted babies (smaller than normal babies), and Low Birth Weight (BBLR) (Syami yulianti, 2018).

Based on table 2, the LILA of pregnant women respondents after being given the intervention of Sutarma's nutrient-dense drink "Susu Tarap Kurma" increased and entered the LILA Normal category (>23.5 cm) as many as 3 respondents. However, 12 pregnant women respondents also experienced an increase in LILA, only it was still in the category of less LILA because it was below or < 23.5 cm. And it can be concluded that the value of increase in LILA in all pregnant women respondents during 15 days of giving Sutarma nutrient-dense drink with a frequency of 300 ml/day is 1.3 cm which is obtained from the average LILA value of pregnant women after giving Sutarma's nutrient-dense drink "Susu Tarap Kurma". Sutarma is an abbreviation for "Date milk tarap". Sutarma is a nutrient-dense drink that combines tarap seeds and dates which are rich in nutrients needed by pregnant women. Sutarma is very good for consumption to meet the needs of macronutrients and micronutrients needed by pregnant women for the development of their fetus. Sutarma is made with the aim of increasing LILA in pregnant women which can be obtained from various ingredients that are mixed so that it becomes milk. For pregnant women who rarely consume staple foods, silk can be a solution to increase taste interest for pregnant women and become a nutrient-dense drink for pregnant women. Sutarma is also a practical solution and helps to get the nutrients that the body needs.

Based on the results of the proximate test of tarap seeds in the nutrition laboratory, Faculty of Fisheries and Marine Sciences, University of Borneo Tarakan obtained the results that in 2 grams of tarap seeds contain protein content of 9.28 g, fat content of 14.06 g, carbohydrate content of 52.65 g and vitamin C content of 19.37 mg / 100 g of tarap seeds. In this study, UHT full cream milk size 200 ml was used which has nutritional values including: energy 120 kcal, total fat 6 g, carbohydrates 10 g, protein 6 g, and sodium 100 mg. And based on research conducted by Suventina et al. (2023) in 100 g of the content of sukari dates includes: protein 2.35 mg, fat 0.43 mg, carbohydrates 75 g, energy 323 mg. The ingredients contained in Sutarma's nutrient-dense drink "Tarap Date Milk", consist of 8 g of tarap seeds, 50 g of sukari dates, and 200 ml of UHT milk. Based on calculations, in 300 ml of sutarma nutrient-dense drink "Tarap Date Milk" contains 42 g of protein, 286 g of carbohydrates, 62.2 g of fat, and 40.8 mg of vitamin C. The calculation of the nutritional content of Sutarma "Susu Tarap Dates" is based on the number of nutritional needs of pregnant women in the second and third trimesters and is based on the needs of pregnant women based on the age of 19-29 years and 30-49 years according to the Ministry of Health of the Republic of Indonesia No. 28 of 2019 concerning the Nutritional Adequacy Rate (angka kecukupan gizi/AKG) and adjusts to the needs of pregnant women according to the contents of my plate.

Chronic Energy Deficiency (CED) is a health problem worldwide, especially in developing countries. Chronic energy deficiency occurs when the intake of energy, protein, or both is insufficient for the body's needs. Management that can be done to overcome CED in pregnant women can be non-pharmacological by utilizing local wisdom, namely seeds from tarap fruits. Where the tarap seeds will be combined with sukari dates and added with UHT milk which will produce Sutarma's nutrient-dense drink "Tarap Date Milk". Figs are rich in protein, fat, carbohydrates, potassium, forfor, iron, retinol, beta carotene, niacin, thiamin, riboflavin, vitamin A and Vitamin C (Yulianti et al., 2022). The intake of nutrients for the baby in the womb comes from the supply of nutrients in the mother's body. Pregnant women who suffer from chronic energy deficiency will increase the risk of giving birth to babies with low birth weight and the potential for stunting(Yulianti et al., 2023) . Based on the results of research

conducted by Ika Yulianti, et al on ice cream innovation can increase the BB of CED pregnant women (Yulianti, Ika, 2023).

Dates also have protein content that can increase breast milk production by increasing glucose metabolism for lactose synthesis (Alsarayrah et al, 2023; Sayas-Barberá et al,2023). Dates have phytochemical compounds such as citric acid, ferric acid, flavonoids, phenolics, sterols, procyanidins, anthocyanins, carotenoids, vitamins and minerals that function as antioxidants (Duan et al 2008), and anti-inflammatory (Dabbaghi, et al,2019; Belhaoues et al, 2020). As for UHT milk, calories, protein, carbohydrates, and protein can be nutrient intake for pregnant women in sufficient nutritional intake (Irmawati et al., 2023). In this study, the intervention given to 15 pregnant women was Sutarma's nutritious drink "Date Tarap Milk" and those who experienced an increase and entered the Normal LILA category (>23.5 cm) were as many as 3 respondents. Apart from that, it was also seen from the pre-test and post-test of LILA pregnant women in the administration of Sutarma's nutrient-dense drink "Susu Tarap Kurma" that the average value of LILA increased in 15 respondents of pregnant women for 15 days of administration with a frequency of 300 ml/day of 1.3 cm. Based on the results of the analysis based on the paired samples t-test test in this study is to determine the effect of the administration of Sutarma nutrient-dense drink "Date Milk Tarap" on the increase of LILA in pregnant women at the Karang Rejo Health Center based on a statistical test using paired samples t-test in the output table of the t-test results, a significance value of p-value was obtained 0.000 means < 0.05 . Thus, there is an effectiveness of the provision of Sutarma's nutrient-dense drink "Susu Tarap Kurma" on the increase in LILA of pregnant women at the Karang Rejo Health Center.

This research is in line with research conducted by Yulianti (2023) where there were 15 participants who experienced significant weight gain after finishing consuming ice cream from tarap fruit. In addition, this research is in line with the research conducted by Krisnaningrum, et al. (2022) in 15 respondents of pregnant women where the results of the analysis found that the average LILA of the respondents before being given UHT milk was 22.73 cm with a standard deviation of 0.45 and the average LILA of the respondents after being given UHT milk was 23.13 cm with a standard deviation of 0.51 (Krisnaningrum et al., 2023). And this research is also in line with research conducted by Nabiyla Fathimah Alhasani, et al. (2022) where the results of the experiment of mung bean formula given to pregnant women with CED for 21 days and measurements were carried out every 7th day. From the study given to pregnant women for 21 days, it had the effect of increasing LILA by 0.7 cm and weight by 0.6 kg. (Alhasani et al., 2022). Based on the results of the interview, the satisfaction of the respondents with the intervention of giving Sutarma's nutrient-dense drink "Date Milk Tarap" was obtained that pregnant women who consumed Sutarma experienced smooth bowel movements and increased appetite in pregnant women. So it can be concluded that Sutarma is not only effective in increasing LILA, but also has the ability to facilitate bowel movements and increase appetite. Therefore, researchers can assume that the administration of ggizi silk solid drink "Susu Tarap Dates" which is made from tarap seeds, dates and UHT milk in accordance with the theory contains protein, carbohydrates, fats, and energy. Therefore, it can be concluded that Sutarma can increase LILA and BMI in pregnant women which can be consumed within 15 days.

CONCLUSION

From the results of the study that analyzed the effectiveness of the administration of Sutarama nutrient-dense drink "Date Milk Tarap Milk" on the increase of LILA in pregnant women at the Karang Rejo Health Center, it can be concluded that the results of the study showed that

all pregnant women respondents before being given the intervention to give Sutarma experienced a lack of LILA (<23.5 cm). Based on the results of the study, pregnant women after being given Sutarma intervention increased and pregnant women who experienced Normal LILA (>23.5 cm) as many as 3 respondents. And the value of the increase in LILA for pregnant women that occurred during the 15 days of Sutarma administration was 1.3 cm. Then, the administration of Sutarma's nutrient-dense drink "Susu Tarap Kurma" for 15 days, with a frequency of 300 ml/day has been proven to be effective in increasing LILA in pregnant women at the Karang Rejo Health Center.

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