



WALUYA THE INTERNATIONAL SCIENCE OF HEALTH JOURNAL

Analysis of the Effect of Providing Local Food Supplements on Weight Gain in Pregnant Women with Chronic Energy Deficiency at the Lamparinga and Tetewatu Community Health Centers in North Konawe Regency

Heny Makmur, Tasnim, Sartini Risky

Mandala Waluya University, Indonesia

Correspondence: hennymakmur08@gmail.com

ARTICLE INFO

Article history

Received : August 31st, 2025

Revised : September 18th, 2025

Accepted : September 30th, 2025

Keywords

Providing Supplementary Food,
Pregnant Mother,
Chronic Energy Deficiency.

ABSTRACT

Introduction: Chronic Energy Deficiency is a health problem for pregnant women that can lead to premature birth, birth defects, low birth weight, and even death. The prevalence of chronic energy deficiency in 2022 at the Lamparinga Community Health Center was 11.8% and at the Tetewatu Community Health Center 8.3%. The purpose of this study was to analyze the effect of providing local food supplements on weight gain for pregnant women with chronic energy deficiency at the Lamparinga and Tetewatu Community Health Centers in North Konawe Regency.

Method: The type of research is quantitative (Quasi-experiment), with a pre-test, post-test, control group design. The population was 64 pregnant women with chronic energy deficiency in the working area of the Lamparinga and Tetewatu Health Centers in January 2024, and a sample of 18 people using cluster random sampling. Data were analyzed using the independent t-test, Mann-Whitney U test, and Kruskal-Wallis test.

Result: The results of the study obtained an average control weight of 48.67 kg pre-test and 48.66 kg post-test, intervention weight, 50.2 kg pre-test and 51.9 kg post-test. The results of the independent t-test p-value 0.001 and the results of the Kruskal-Wallis analysis obtained a p-value of 0.001 on the body weight variable.

Conclusion: Providing local food supplements on increasing the weight of pregnant women with chronic energy deficiency and the effectiveness of providing local food supplements on increasing the weight of pregnant women with chronic energy deficiency at the Lamparinga and Tetewatu Health Centers.

Introduction

Nutritional problems in pregnant women are problems that need to be addressed seriously.^[1] One of the nutritional problems of pregnant women is Chronic Energy Deficiency, which is a condition of imbalance in nutritional intake between energy and protein, so that the nutrients the body needs are not met.^[2] The impact of chronic energy deficiency on pregnant women can interfere with the growth and development of the fetus, namely physical growth, brain and metabolism which causes non-communicable diseases in adulthood.^[3] Chronic Energy Deficiency also results in prolonged labor and postpartum hemorrhage, even maternal death, while risks to the baby can result in fetal death, premature birth, birth defects, low birth weight, and even infant death.^[4]

The World Health Organization (WHO) reported in 2021 that the prevalence of Chronic Energy Deficiency in pregnant women globally was 35-37%. The prevalence of Chronic Energy Deficiency in 2021 occurred in several countries such as Uganda (22.3%), India (19.5%), Botswana (19.5%), India (26.2%), Malaysia (8.5%), and Colombia (2.8%).^[5] The results of the 2018 National Basic Health Research noted that the prevalence of Chronic Energy Deficiency in pregnant women in Indonesia was 17.3% and based on the Indonesian Health Profile, the incidence of Chronic Energy Deficiency in pregnant women in 2019 was 17.9%.^[6] Then in 2020, data collected from 34 provinces showed that the percentage of pregnant women at risk of Chronic Energy Deficiency in 2020 was 9.7%, then in 2021 it was 10.2%, increasing in 2022 to 11.5%.^[7]

The prevalence of Chronic Energy Deficiency in pregnant women in Southeast Sulawesi Province based on 2013 Basic Health Research data was 24.2% and increased in 2018 Basic Health Research by 28.0% and based on data obtained from the Southeast Sulawesi Provincial Health Office, it shows that the incidence of Chronic Energy Deficiency in pregnant women in 2019 was 15.7%. Meanwhile, data from the Southeast Sulawesi BPS shows that the prevalence of Chronic Energy Deficiency in 2019 was 15.5%, then in 2020 it reached 11.3% and in 2021 it was 12.4% and in 2022 it was 12.8%.^[8] The percentage of pregnant women with

Chronic Energy Deficiency is expected to decrease by 1.5% annually.^[9]

The North Konawe District Health Office is one of the working areas of Southeast Sulawesi Province where the prevalence of Chronic Energy Deficiency in pregnant women has increased.^[10] The North Konawe Regency Health Office's work area includes 22 community health centers, with a prevalence of chronic energy deficiency among pregnant women of 11.2% in 2021, increasing to 11.9% in 2022. Meanwhile, cases of Chronic Energy Deficiency in other regencies experienced a decline, such as in South Konawe Regency at 10.6% in 2021 and 9.6% in 2022. Furthermore, in Bombana Regency, the prevalence of Chronic Energy Deficiency in 2021 was 9.8% and decreased to 9.6% in 2022.^[11]

The highest number of Chronic Energy Deficiency cases was in Lamparinga Health Center and Tetewatu Health Center, namely in 2022 at Lamparinga Health Center at 11.8% and Lamparinga Health Center at 8.3%, while the third highest was at Matandahi Health Center at 7.8% and the fourth was Sawa Health Center at 6.4%.^[12]

The direct causes of chronic energy deficiency in pregnant women are inadequate nutritional intake and disease. Addressing the risk of chronic energy deficiency in pregnant women is implemented through specific nutritional interventions across programs, particularly in integrated antenatal care. One such intervention is providing supplementary food to pregnant women identified as being at risk of chronic energy deficiency.^[13]

Nutritional fulfillment during pregnancy is crucial, both to meet the nutritional needs of the mother and the baby and to prevent chronic diseases. Therefore, public health policies are needed to ensure the availability of nutritious food for pregnant women, such as providing nutritious food to pregnant women and increasing their knowledge so they can provide food that meets their nutritional needs.^[14]

According to the Ministry of Health in 2023, the standard for providing additional food to pregnant women is given for 30-90 days with a frequency of 1 time per day.^[15] Other research conducted found that after being given Local Supplemental Food for 1 month, there was an increase in the weight of pregnant women by 4.91 kg.^[16] Efforts to provide additional food for

pregnant women with Chronic Energy Deficiency are a realization of health efforts in the form of curative and preventive measures to improve the nutritional status of pregnant women.^[17]

Based on the 2018 Basic Health Research, pregnant women in Indonesia received Supplementary Food Provision as much as 25.2% and 89.7% of them received Supplementary Food Provision in the form of Supplementary Food Provision program biscuits, other biscuits, powdered milk, liquid milk, raw food ingredients, and cooked food ingredients. Of the several additional foods, the most commonly given are program biscuits. The results of the 2018 basic health research show data on Supplementary Food Provision recipients who did not finish their additional food, due to several reasons, namely the taste of the Supplementary Food Provision was not tasty (23.7%), the taste was not varied enough (7.5%), too sweet (14.1%), did not like the aroma (10.2%), there were side effects (6.8%), forgot (2.7%), eaten by other family members (18.4%) and other reasons (16.6%).^[18] Based on the data on supplementary feeding, it is clear that the government-provided supplementary feeding is not yet optimal for pregnant women. Therefore, innovation is needed in the form of providing local supplementary feeding utilizing locally available food ingredients in North Konawe Regency.

Local food for pregnant women, consisting of complete meals made from local ingredients with appropriate nutritional content, is recommended for pregnant women. In addition to biscuits, supplementary food for pregnant women with chronic energy deficiency can also include local foods such as sago flour and red bean flour.^[19] The calorie content of sago starch per 100 grams is comparable to that of other foods. Sago flour contains 353 calories. Red bean flour is quite high in protein. Red beans offer many benefits, including a long shelf life and the ability to be used in food.^[16] In addition to these two food ingredients, it can be mixed with other local food ingredients such as moringa, spinach, chayote, papaya which are available and easy to obtain in the Lamparinga and Tetewatu Health Center areas.

Method

This research is a quantitative with a cross-sectional study. This study was conducted from April to May 2022 in Bungin Permai Village, South Konawe Regency. The population in this study was 310 and the sample in this study amounted to 175 respondents using proportional simple random sampling. The dependent variable in this study was contact dermatitis and the independent variables were length of work and use of personal protective equipment. The instrument in this study was a questionnaire. This study used the Chi-Square Test analysis.

Result

Table 1 showed that the weight of the control group in the initial measurement (pre-test) was obtained an average of 48.67 kg with the lowest BB value being 45.2 kg and the highest 50.3 kg and in the final measurement (post-test) it became 48.66 kg, and the lowest BB was 45.4 kg and the highest was 50.5 kg. Then the weight of the intervention group, before being given Local Supplementary Food (pre-test) obtained an average of 50.2 kg with the lowest BB value being 47 kg and the highest 53 kg and after being given Local Supplementary Food (post-test) it became 51.9 kg, and the lowest BB was 49 kg and the highest was 54 kg.

Table 2 showed that after conducting a normality test using Shapiro Wilk in the control group, a p value $< \alpha$ (0.05) was obtained so that the data was not normally distributed, while in the intervention group a p value $> \alpha$ (0.05) was obtained, so that the data was normally distributed, based on this data inequality, the difference in H BB before and after was calculated in the case and control groups and a p value of 0.063 $> \alpha$ (0.05) was obtained, so it was concluded that the data was normally distributed and an Independent T-Test was carried out on the body weight variable.

Table 3 showed that the results of the Independent T-Test obtained a p value of 0.001 $< \alpha$ (0.05), so H_a is accepted and H_0 is rejected, so it is concluded that there is an effect of providing additional local food on increasing the weight of pregnant women with chronic energy deficiency at the Lamparinga and Tetewatu Health Centers.

Table 4 showed that the results of the Kruskal Wallis test obtained a p value of $0.000 < \alpha (0.05)$, so H_a is accepted and H_0 is rejected, so it is concluded that providing additional local food is

effective in increasing the weight of pregnant women with chronic energy deficiency at the Lamparinga and Tetewatu Health Centers.

Table 1.
Body Weight Distribution before and after being given Local Supplemental Food

Weight	n	Mean	Min	Max	St-Dev
Control Group					
Before (Pre Test)	9	48.67	45.2	50.3	1.93
After (Post Test)	9	48.66	45.4	50.5	1.98
Intervention Group					
Before Local PMT (Pre Test)	9	50.2	47	53	1.75
After Local PMT (Post Test)	9	51.9	49	54	1.75

Table 2.
Normality Test Results for Pregnant Women's Weight

Weight	P-value	Information
Control Group		
Body Weight (Pre)	0.034	Abnormal
Body Weight (Post)	0.028	Abnormal
Intervention Group		
Weight Before Local Supplemental Feeding (Pre)	0.953	Normal
Weight After Local Supplemental Feeding (Post)	0.332	Normal
Difference (BB Before and After)	0.063	Normal

Table 3.
The Effect of Providing Local Supplemental Food on Body Weight

Body Weight (Kg)	n	p-value
Before Giving Local Additional Food (Pre Test)	18	0.001
After Local Supplemental Food Administration (Post Test)	18	

Table 4.
Effectiveness of Providing Local Supplemental Food on Pregnant Women's Weight Gain

Weight	n	Mean Rank	p-value
Control Group	9	5	0,000
Intervention Group	9	14	

Discussion

This study shows that the control group's weight decreased by 0.01 kg, namely at the initial measurement an average of 48.67 kg and at the end it became 48.66 kg. This condition is because the control group was not given intervention in the form of local supplementary food. Meanwhile, in

the intervention group, there was an increase of 1.7 kg, namely before being given Local Supplemental Food (pre-test) an average of 50.2 kg was obtained and after being given Local Supplemental Food (post-test) it became 51.9 kg. Descriptively, this explains that the intervention group experienced an

increase in weight while the control group experienced a decrease.

The results of statistical analysis using the Independent T-Test show that there is an effect of providing local food supplements on increasing the weight of pregnant women with Chronic Energy Deficiency at the Lamparinga and Tetewatu Health Centers, in this case it has a positive effect, where providing local food supplements can increase the weight of pregnant women with Chronic Energy Deficiency.

This research is in line with research conducted by Malik in 2023 which found that there was an effect of providing additional food with biscuits on the nutritional status of pregnant women with Chronic Energy Deficiency in the working area of the Nambo Health Center in Kendari City.^[20] Likewise, after being given local supplementary food for 1 month, there was an increase in the weight of pregnant women by 4.91 kg.^[16]

This research is also in line with the recommendations, that the standard for providing supplementary food to pregnant women is 30-90 days with a frequency of once daily. Efforts to provide supplementary food to pregnant women with Chronic Energy Deficiency are the realization of health efforts in both curative and preventive forms to improve the nutritional status of pregnant women.^[15]

Conclusion

There is an effect of providing local food supplements on weight gain in pregnant women with Chronic Energy Deficiency at the Lamparinga and Tetewatu Health Centers with a p-value of 0.000. It is hoped that the provision of local food supplements will be carried out routinely and continuously, accompanied by motivation, education, monitoring and evaluation of the food provided.

Reference

1. Ekayanthi NWD, Suryani P. Nutrition education for pregnant women prevents stunting in pregnancy classes. *J Health*. 2019;10:312–319.

2. Anggoro SA. The relationship between dietary patterns (carbohydrates and protein) and the incidence of chronic energy deficiency in pregnant women at the Pajangan Bantul Yogyakarta Health Center. *Nutr J Food Nutr Health*. 2020;1:42–48.
3. Ernawati A. The relationship between mother's age and employment status with the incidence of chronic energy deficiency in pregnant women. *J Res Dev Media Inf Res Dev Sci Technol*. 2018;14:27–37.
4. Ariani S, Zalukhu M, Winarni LM. The relationship between chronic energy deficiency and the incidence of anemia in pregnant women. *JMM (J Madani Midwifery)*. 2024;1:11–8.
5. World Health Organization, UNICEF, World Bank Group. Levels and trends in child malnutrition: Key findings of the 2020 edition. UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates. *World Health Organization*; 2020.
6. Ministry of Health of the Republic of Indonesia. *Indonesia Health Profile 2020*. Ministry of Health of the Republic of Indonesia; 2021.
7. Yulizarna IR. *The relationship between chronic energy deficiency (CED) and the incidence of anemia in pregnant women at the Rizka Yulizarna PMB Damai Parindu Center, West Kalimantan in 2023*. 2024.
8. Southeast DS. *Profile of the Southeast Sulawesi Health Service*. 2021.
9. Annisaa S, Rofika A. The relationship between pregnant women's knowledge about nutrition during pregnancy and the incidence of chronic energy deficiency (CED) in the third trimester of pregnancy at Puriala Health Center. *J Res Educ Midwife (Midwife Educ Res J)*. 2024;2:99–104.
10. Farming F. Education about the importance of preventing early pregnancy and chronic energy deficiency in women of childbearing age. *J Coastal Stunting Appl*. 2024;3:9–17.
11. Southeast Sulawesi Provincial Health Office. *Profile of the Southeast Sulawesi Provincial*

- Health Office in 2020*. DinkesProv Sultra; 2023.
12. Konawe et.al. *Profile of the Konawe Regency Health Office in 2023*. 2023.
 13. Ministry of Health of the Republic of Indonesia. Ministry of Health 2020. *Ministry of Health, Republic of Indonesia; 2021*.
 14. Marshall NE, et al. The importance of nutrition in pregnancy and lactation: lifelong consequences. *Am J Obstet Gynecol*. 2022;226:607–632.
 15. Ministry of Health of the Republic of Indonesia. Technical Instructions for Provision of Supplementary Food Made from Local Food Ingredients for Toddlers and Pregnant Women. *Ministry of Health, Republic of Indonesia; 2023*.
 16. Khairiah R. Effectiveness of local food ingredients (sago flour, red bean flour, and red fruit juice) as a base for supplementary feeding of chronically energy-deficient pregnant women on weight gain of chronically energy-deficient pregnant women. *Sci J Nurs*. 2023;9:117–123.
 17. Hidayah N, Marwan M. Community empowerment efforts to create a nutrition-conscious millennial generation that is free from stunting through 1000 HPK activities. *J Community Engagem Health*. 2020;3:86–93.
 18. Sari DN, Zisca R, Widyawati W, Astuti Y, Melysa M. Community empowerment in stunting prevention. *JPKMI (J Serv Indones Community)*. 2023;4:85–94.
 19. Nabilla D, et al. Development of high-protein, iron-rich "prozi" biscuits for pregnant women as an effort to prevent stunting. *Amerta Nutr*. 2022;6:79–84.
 20. Malik MF. Effectiveness of the supplemental food provision program in the form of biscuits on the nutritional status of pregnant women in the Nambo community health center work area in 2022. *J Res Sci Health Avicenna*. 2023;2:1–7.