
The Effect Of Supplementary Food Supply (PMT) Supervision Local For Pregnant Women With Chronic Energy Deficiency (CED) On The Nutritional Status Of The Mother

Ulfia Fitrianingsih^{1)*}, Yesi Putri²⁾, Indah Eriska³⁾, Zella Choirun Ni`mah⁴⁾

^{1,2,3,4)} Undergraduate Midwifery Study Program, Faculty of Health, Dehasen University, Bengkulu

*Corresponding Author

Email : ulfiafitrianingsih93@gmail.com

Abstract

Chronic energy deficiency (CED) in pregnant women is a major public health challenge. Globally, the WHO reports that approximately 38 million pregnant women experience malnutrition each year, including CED, which contributes to an increased risk of maternal and neonatal mortality. In Indonesia, based on 2018 Riskesdas data, the prevalence of CED in pregnant women reached 17.3% (Ministry of Health of the Republic of Indonesia, 2023b). CED in pregnant women, identified by an upper arm circumference (LILA) of less than 23.5 cm, has serious impacts on maternal and fetal health, such as increasing the risk of low birth weight (LBW), premature birth, hypothyroidism, and stunting (Supadmi et al., 2020). This problem poses a major challenge in efforts to reduce maternal and infant mortality and improve the quality of public health. This study aims to determine the effect of local supplementary feeding (PMT) assistance for pregnant women with chronic energy deficiency (CED) on maternal nutritional status. This research was conducted in May 2026. This type of research is quantitative research using a Pre-Experimental design with a one group pretest posttest design approach . The sampling technique was carried out using a purposive sampling method . The sample used in this study was 18 respondents. The instruments used were questionnaires and PMT assistance sheets. The average nutritional intake before assistance was 42.3 calories and after assistance was 73.4 calories, while the LiLA measurement before assistance was 22.3cm and after assistance was 23.3cm. There is an effect of local supplementary feeding assistance (PMT) for pregnant women with chronic energy deficiency (KEK) in the work area of the Sindang Danau Health Center UPT on maternal nutritional status, with an increase in nutritional intake between 20.9 calories to 38.6 calories and an increase in LiLA size between 0.5 cm to 1.6 cm.

Keywords: PMT; Nutrition; KEK; Pregnant women; Nutritional status.

INTRODUCTION

Chronic energy deficiency (CED) in pregnant women is a major public health challenge. Globally, the WHO reports that approximately 38 million pregnant women experience malnutrition each year, including CED, which contributes to an increased risk of maternal and neonatal mortality. In Indonesia, based on 2018 Basic Health Research (Riskesdas) data, the prevalence of CED in pregnant women reached 17.3% (Ministry of Health of the Republic of Indonesia, 2023b). CED in pregnant women, identified by a mid-upper arm circumference (MUAC) of less than 23.5 cm, has serious impacts on maternal and fetal health, such as increasing the risk of low birth weight (LBW), premature birth, hypothyroidism, and stunting (Supadmi et al., 2020). This problem poses a major challenge in efforts to reduce maternal and infant mortality and improve public health.

The problem of chronic energy deficiency (CED) in pregnant women is not only caused by inadequate energy and protein intake, but is also influenced by various other factors, such as limited knowledge about nutrition, limited access to nutritious food, and an unbalanced diet. Although supplementary feeding programs (PMT) exist, their implementation often faces challenges, including boredom with conventional PMT products such as manufactured biscuits. Furthermore, many pregnant women in Indonesia do not receive supplementary food intake that meets their nutritional needs (Amalia et al., 2023; Jayadi et al., 2024; Rohmah, 2020). The gap between ideal nutritional needs and limited access to nutritious food is a problem that needs to be addressed immediately.

Various steps have been taken to address the problem of chronic energy deficiency (CED) in pregnant women, one of which is through the supplementary feeding (PMT) program. Globally, PMT has proven effective in improving the nutritional status of pregnant women, particularly by providing products rich in energy and protein, such as foods made from small fish and nuts. In Indonesia, the

government has launched a PMT program as part of nutritional interventions for pregnant women with CED, including the provision of high-energy biscuits. However, research shows that PMT biscuits are often unappealing, resulting in low acceptance (Bakri, 2021; Handayani et al., 2019; Rohmah, 2020). Therefore, more innovative and locally based approaches are needed to improve the effectiveness of PMT programs.

One solution offered is the use of local food supplements based on traditional ingredients, such as Iwel Latan, which uses soybean flour and pumpkin. This product has been shown to have a higher nutritional content than conventional PMT biscuits, with a protein content of 9.39% and carbohydrate content of 44.40%. Furthermore, local PMT is more acceptable to pregnant women because its taste, aroma, and texture suit the community's preferences (Handayani et al., 2019). Local food supplements also have additional benefits such as abundant raw material availability, sustainability, and economic empowerment of local communities (Banudi & Toruntju, 2024; Ministry of Health of the Republic of Indonesia, 2023a; Torizellia et al., 2023). Thus, the development and use of locally based food supplements can be a strategic step in addressing Special Economic Zones (KE) and improving the welfare of pregnant women in Indonesia.

In a survey conducted in the Sindang Danau Community Health Center (UPT) work area, data from the first quarter of the KIA program showed that 18 of 85 pregnant women experienced Chronic Energy Deficiency (CED). In accordance with the government program, pregnant women with chronic energy deficiency (CED) are given PMT. The use of local food ingredients as basic ingredients for PMT has great potential to improve the nutrition of pregnant women while supporting local economic sustainability. For example, research conducted in Indonesia shows that jack bean flour can be used to increase the protein content in PMT biscuits without reducing product acceptability. Other local food ingredients, such as anchovies and snails, have the potential to be sources of protein and important micronutrients, such as calcium and iron, which are essential during pregnancy. (Banudi & Toruntju, 2024; Handayani et al., 2019; Indriani et al., 2020).

In several countries, such as Ghana and India, the use of locally sourced foods has been shown to be effective in improving the nutritional status of pregnant women. A study in Ghana found that fortifying food with small fish can increase levels of micronutrients such as vitamin A, iron, and omega-3 without affecting taste (Atter et al., 2024). Meanwhile, research in India showed that consumption of locally sourced foods significantly increased dietary diversity and micronutrient intake in pregnant women from indigenous communities (Ghosh-Jerath et al., 2022).

Research in Malawi and Kenya has also demonstrated the effectiveness of locally sourced food-based supplementary feeding (PMT) in improving maternal and infant health. In Malawi, micronutrient-fortified maize flour successfully reduced the prevalence of anemia, increased maternal weight gain, and reduced the risk of preterm birth, suggesting that locally sourced food can be an effective solution for pregnant women in areas with limited access to nutritional supplements. Meanwhile, in Kenya, moringa (*Moringa oleifera*) leaves, rich in protein, iron, vitamin A, and calcium, have been shown to increase hemoglobin levels in anemic pregnant women and reduce the incidence of low birth weight (LBW) babies, while also improving breast milk quality after delivery (Chilima et al., 2019; Mupenzi et al., 2021). While numerous studies demonstrate the significant potential of locally sourced food-based supplementary feeding (PMT) in improving the nutritional status of pregnant women, there are research gaps that need to be addressed, particularly regarding the scalability and sustainability of interventions in the field. Many studies have not comprehensively examined contextual factors such as local food availability, community preferences, and accessibility in remote areas.

Based on the above analysis, this study aims to assess the impact of providing locally-based supplementary feeding (PMT). This study aims to gain deeper insight into the implementation of local PMT in public health programs. Furthermore, this article seeks to make a positive contribution to addressing nutritional issues in pregnant women, thereby supporting optimal maternal health improvement.

RESEARCH METHODS

This research was conducted between May 2026. The researchers in this quantitative study used *a one-group pretest posttest design based on Pre-Experimental* research . The sampling used was purposive sampling. Eighteen pregnant women with Special Economic Zones (KEK) who received PMT participated in the survey for this study. Monitoring of the provision of local food-based PMT for pregnant women was given for 1 month. Pregnant women with Special Economic Zones (KEK) were measured for their upper arm circumference (LILA) before being given PMT and after being given PMT for 1 month, LiLA was measured again. Assistance in Providing Local Supplementary Food (PMT) for Pregnant Women with Chronic Energy Deficiency (KEK) Serves as an Independent Variable. Maternal Nutritional Status Serves as a Dependent Variable.

Questionnaires and sheets for the provision of local supplementary food (PMT) for pregnant women with chronic energy deficiency (KEK) regarding maternal nutritional status consumption were used as research tools for data collection.

RESULTS AND DISCUSSION

Eighteen pregnant women received support, those with KEK status based on their upper arm circumference. These pregnant women were identified as having KEK nutritional status.

Food Intake

Food intake from PMT provided to pregnant women with special needs who received assistance. Table 1 shows the average food intake received from consuming PMT.

Table 1. Food intake from PMT given to pregnant women

Pregnant mother	% Food Intake From PMT	
	Before	After
I	45.6	74.2
II	37.8	68.3
III	40.0	72.7
IV	45.8	82.3
V	47.5	72.0
VI	38.5	70.7
VII	42.6	72.5
VIII	46.3	69.0
IX	42.2	78.6
X	38.4	79.6
XI	37.6	74.5
XII	40.8	71.8
XIII	43.6	68.2
XIV	48.9	69.8
XV	47.0	71.6
XVI	43.4	74.0
XVII	38.6	75.8
XVIII	37.8	76.4
Average	42.3	73.4

Pregnant women's acceptance varies. If they like what they eat, they'll finish some of the food quickly, or some will finish it a little later. However, if they don't like it, they'll be less enthusiastic

about it. This is related to appetite disturbances due to frequent nausea and vomiting, which can lead to less optimal consumption by pregnant women with special needs (KE) of the provided food.

Based on the results of the mentoring, it can be seen that the acceptance of pregnant women with special needs (KE) in consuming this PMT is still lacking, it can be seen that all pregnant women with special needs still leave half of the additional food portion provided. This is in line with the opinion of Fatmala et al., food acceptance is the acceptance of the food served can be accepted by consumers. The benchmark for the success of food provision is the food served is acceptable and the food is consumed without leaving any leftovers. Acceptance is a benchmark for customer satisfaction. In addition to providing PMT, pregnant women are also provided with information and education (IEC) on healthy foods to consume during pregnancy, sourced from locally available ingredients at lower prices (eggs, nuts, cereals, spinach, kale, fish, tempeh, tofu, etc.). Providing PMT and special meals for pregnant women with special needs (KE) with high nutritional value and a varied menu aims to stimulate appetite and ensure adequate nutritional intake.

Nutritional Status Monitoring

Table 2 LiLA Measurements During Mentoring

Pregnant mother	LiLA (cm)	
	Before	After
I	21.8	23.2
II	22.3	23.3
III	23.0	23.7
IV	22.8	23.3
V	22.5	23.0
VI	21.5	22.7
VII	22.6	23.5
VIII	22.3	23.0
IX	23.2	23.6
X	21.4	22.6
XI	21.6	22.5
XII	21.8	22.8
XIII	22.6	23.2
XIV	22.9	23.8
XV	23.0	23.6
XVI	23.4	24.0
XVII	22.6	23.8
XVIII	21.8	22.4
Average	22.3	23.3

Maternal nutritional status was measured based on the LiLA measurement. The LiLA measurement of pregnant women was measured at the beginning and at the end of the mentoring period. It showed that there was a change in the upper arm circumference of pregnant women with KEK who received mentoring regarding the PMT food provided. Of the 18 pregnant women suffering from KEK, there was an increase in upper arm circumference between 0.5 cm and 1.6 cm. The average upper arm circumference before mentoring was 22.3 cm, and after mentoring it increased to 23.3 cm. From this mentoring effort, it can be concluded that there was a difference in LILA in pregnant women

with KEK between before and after mentoring. The increase in LILA of pregnant women with KEK during mentoring averaged 1.0 cm. Providing additional food to pregnant women is an intervention program for pregnant women suffering from Chronic Energy Deficiency (KEK) which aims to meet nutritional needs so that their nutritional status improves until it becomes good. For families at risk of malnutrition, nutritional intervention through the provision of supplementary food is paramount, given that families may not be able to provide sufficient food. Furthermore, this supplementary food provision will serve as a means of education to develop families' ability to provide adequate food to meet the nutritional needs of pregnant women. After the supplementary food program ends, it is hoped that families and communities will gain knowledge about the uses of various foods, be able to process and prepare them, and become accustomed to consuming them.

Information and Communication (IEC) regarding certain types of chronic energy deficiencies (KE), their influencing factors, and how to manage them. It is hoped that PMT (prenatal nutrition counseling) for pregnant women will be provided to all pregnant women. KEK conditions in pregnant women must be addressed immediately before the gestational age reaches 16 weeks. Providing high-calorie, high-protein supplementary foods (TKTP), combined with the implementation of small, frequent feedings, has been shown to successfully reduce the incidence of low birth weight (LBW) in Indonesia. An additional 200–450 calories and 12–20 grams of protein from the mother's daily needs is sufficient to meet the nutritional needs of the fetus.

However, in the assistance efforts provided to pregnant women with KEK in the Sindang Danau Community Health Center work area, not all of them have met the additional figure for PMT for pregnant women with KEK for recommended nutritional adequacy (285 calories), but from 18 pregnant women who suffered from KEK, there was an increase in food intake between 20.9 to 38.6 or an increase in the average intake starting from assistance, namely from 43.2 to 73.4 of the total PMT provided.



Figure 1. Examples of Snacks for PMT Activities



Figure 2. Implementation of the PMT Program in the Village

The Effect of Nutrition Assistance on LLA Table 3. The Effect of Nutrition Assistance on Pregnant Women's Weight in Coastal Areas of Kendari City Body Weight (Kg) n Mean Rank p-value Intervention 35 22.60 0.000* Control 35 48.40 * Mann Whitney test results Table 3 shows that the mean rank of BB in the intervention group was 22.60 while in the control group was 48.4. The Mann Whitney test results obtained a p-value of 0.000 so that there is an effect of nutritional assistance on pregnant women's weight, which means that nutritional assistance can increase the size of pregnant women's weight in the coastal areas of Kendari City.

CONCLUSIONS

Assistance in Providing Local Food-Based Supplementary Feeding can improve the nutritional status of pregnant women with Special Economic Zones (KE) in the working area of the Sindang Danau Community Health Center (UPT).

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