

The Effectiveness of Providing Supplementary Food (PMT) Made from Local Ingredients on Increasing the Weight of Pregnant Women with Chronic Energy Deficiency at Sungai Cuka Health Center in 2024

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ABSTRACT

Chronic Energy Deficiency (CED) among pregnant women in South Kalimantan exceeded the national average in 2023, contributing to maternal mortality due to hemorrhage (22.8%) and infant mortality due to low birth weight (37.8%). Tanah Laut Regency recorded the second-highest prevalence of CED, including the Sungai Cuka Health Center. The government implemented a locally sourced Supplementary Feeding (PMT) program funded by the Health Operational Assistance (BOK) since 2023, which requires evaluation to assess its effectiveness in improving the health of pregnant women with CED. To determine the effectiveness of supplementary feeding (PMT) using local food ingredients in increasing the weight of pregnant women with chronic energy deficiency (CED) at Sungai Cuka Health Center in 2024. This study employed an analytical research design with a quasi-experimental one-group pretest-posttest approach, comparing the weight of pregnant women with CED before and after receiving supplementary feeding (PMT) for 28 days. The total sample consisted of 23 respondents. The average pretest weight of pregnant women with CED was 50.44 kg, while in the posttest it was 54.17 kg, indicating an average weight gain of 3.73 kg. A paired sample t-test revealed a p-value of 0.000 ($p < 0.05$) and an r-value of 0.988, leading to the rejection of H_0 and acceptance of H_1 . Cohen's $d = -3.851$ indicated a very large effect size for the effectiveness of supplementary feeding on weight gain. Supplementary feeding (PMT) using local food ingredients is highly effective in increasing the weight of pregnant women with chronic energy deficiency at the Sungai Cuka Health Center.

Keywords: Local Supplement, Pregnant, Chronic Energy Deficiency (CED).

INTRODUCTION

Malnutrition in pregnant women remains a significant public health issue in many developing countries, including Indonesia. The prevalence of malnutrition is an indirect cause of high maternal mortality rates (MMR) associated with hemorrhage and high infant mortality rates (IMR) linked to low birth weight (LBW). By the end of 2023, the MMR in Indonesia was recorded at 189 deaths per 100,000 live births, achieving the target of the Medium-Term Development Plan (RPJMN) of 194 deaths per 100,000 live births. However, Indonesia still ranks as the second-highest MMR in ASEAN (Ministry of Health, 2023). Meanwhile, the MMR and IMR in South Kalimantan have shown an upward trend over the past six years. By the end of 2023, the MMR was recorded at 145 per 100,000 live births, with the lowest rate of 92 per 100,000 live births occurring in 2019. The three main causes of maternal deaths were hypertension (26.1%), hemorrhage (22.8%), and other factors (22.8%) (South Kalimantan Health Office, 2024). Hemorrhages are generally caused by anemia or Chronic Energy Deficiency (CED) in pregnant women (Mukaddas et al., 2021). The IMR in Indonesia at the end of 2023 was 17.22 per 1,000 live births, meeting the target of 17.6 deaths per 1,000 live births. In South Kalimantan, the IMR was recorded at 10 per 100,000 live births, with the lowest rate of 7 per 100,000 live births in 2019, 2020, and 2021. Among the causes of infant deaths, 37.8% were attributed to LBW, 27.6% to other causes, and 25.7% to asphyxia. LBW itself is partly caused by Chronic Energy Deficiency in pregnant women (Ministry of Health, 2023; South Kalimantan Health Office, 2024).

Chronic Energy Deficiency (CED) in pregnant women is a condition where nutritional status is poor due to insufficient intake of energy-rich foods containing macronutrients and micronutrients, resulting in the body

experiencing an energy deficit (WHO, 2021). CED generally arises from several factors, including inadequate nutrition intake, health conditions, socioeconomic factors, and a lack of education and awareness about nutritional needs during pregnancy (Ministry of Health, 2022). CED can have numerous adverse effects on both the mother and the fetus. Pregnant women with CED may experience physical weakness, higher infection risks, and potential complications during childbirth, such as hemorrhage and preterm labor. For the fetus, it can lead to restricted growth, low birth weight, miscarriage, congenital defects, intrapartum asphyxia, developmental disorders, and stunting (UNICEF, 2020; WHO, 2020).

South Kalimantan Province is one of 17 provinces with a prevalence of Chronic Energy Deficiency (CED) risk above the national level, recorded at 11.7%, exceeding the national target of 11.5%. This places South Kalimantan as the 16th highest province in Indonesia for the percentage of pregnant women with CED (Ministry of Health, 2023). The high incidence of CED in pregnant women in South Kalimantan is significantly influenced by the prevalence in Tanah Laut Regency, which ranks second in the province. As of June 2024, the rate in Tanah Laut has reached 5.43%, nearing the national annual target of 10%. Meanwhile, at Sungai Cuka Health Center, the prevalence has reached 7.29%, making Sungai Cuka the third-highest area for CED prevalence in Tanah Laut Regency (Tala Health Office, 2023). The high prevalence of CED among pregnant women poses a significant obstacle to the success of two priority national programs in the health sector set by the Indonesian government: the reduction of maternal mortality rates (MMR) and infant mortality rates (IMR), as well as the prevention and reduction of stunting.

To address this issue, various government and non-government organizations have implemented supplementary feeding programs targeting pregnant women with CED. The Supplementary Food Provision Program (PMT) using local food ingredients is one such initiative launched by the South Kalimantan Provincial Government in 2023. This program aims to improve the nutritional status of pregnant women with CED by providing nutritious supplementary food sourced from local ingredients (Wulandari et al., 2022). The program involves daily provision of balanced meals, including snacks rich in animal protein, for 90 days across Indonesia (Ministry of Health, 2023).

The high incidence of CED among pregnant women in the Sungai Cuka area in 2024 raises questions about the effectiveness of the PMT program using local food ingredients, which began in 2023. Evaluating the program's effectiveness is crucial to understanding its impact on maternal weight gain, thus contributing to optimal maternal and child health outcomes.

Given the urgency of assessing the Supplementary Food Provision Program (PMT) using local food ingredients to reduce the prevalence of CED among pregnant women in the Sungai Cuka Health Center area, further research is needed. This study aims to evaluate the effectiveness of the PMT program in increasing the weight of pregnant women with CED at Sungai Cuka Health Center. The findings are expected to serve as a reference for government and non-government organizations in assessing the PMT program and identifying the best solutions to address the issue of CED among pregnant women.

METHOD

This research employs an analytical method with a quasi-experimental one-group pretest-posttest design, as the researcher does not randomly assign research subjects. The study aims to compare the condition of the same group before and after the research intervention to directly test the effect of an independent variable on a dependent variable (Sugiyono, 2019).

The population in this study consists of all pregnant women with Chronic Energy Deficiency (CED) in the Sungai Cuka Health Center area during September 2024, totaling 23 individuals. No sampling was conducted in this study; the entire population was included as respondents or research subjects. Thus, the sample in this study comprises all pregnant women with CED in the Sungai Cuka Health Center area during September 2024, amounting to 23 individuals. The sampling technique employed is total sampling.

Data Collection Method consists of primary data, namely researchers obtain information and conduct research directly by weighing before and after the PMT intervention, measuring height, and analyzing the Body Mass Index (BMI) before Local Supplementary Food Provision (PMT), providing Supplementary Food (MT) and monitoring the Supplementary Food (MT) consumption control card form. And secondary data uses documentation studies as secondary data, namely data collection by looking at the pregnant women's registration book in all villages in the Sungai Cuka Health Center area in 2024 and the respondent's KIA book to obtain respondent information, namely pregnant women with Chronic Energy Deficiency (KEK) and to obtain information on the average weight gain of pregnant women before the local Supplementary Food Provision (PMT) intervention.

RESULT AND DISCUSSION

Research Location Overview

The research location is the working area of Sungai Cuka Health Center, located on A. Yani Street, Sungai Cuka Village, approximately 90 km from the district capital. The distance from the community to the health center

ranges from the farthest at approximately 10 km to the nearest at approximately 1 km. Sungai Cuka Health Center is situated in Kintap Subdistrict, Tanah Laut District, South Kalimantan Province, Indonesia, with the following territorial boundaries, North: Borders with Kintap Kecil Village. South: Borders with Tanah Bumbu District. West: Borders with Banjar District. East: Borders with the Java Sea.

The working area of Sungai Cuka Health Center includes six villages: Sungai Cuka Village, Sumber Jaya Village, Bukit Mulia Village, Kebun Raya Village, Mekar Sari Village, Sebamban Baru Village.

The total coverage area is 147.00 km², with a population of 17,328 people, comprising 9,092 males and 8,236 females. The largest population is in Sungai Cuka Village, with 5,019 people. The smallest population is in Mekar Sari Village, with 1,675 people.

The geographical conditions of the working area are predominantly lowlands, with a significant portion being coastal areas and coal mining regions. The climate consists of rainy and dry seasons. The socioeconomic condition of the population in the working area of Sungai Cuka Health Center can generally be categorized as middle to lower class, as reflected in the predominant livelihoods, which include farming, gardening, industrial labor, construction work, crafting, and trading.

Sungai Cuka Health Center serves a total of 288 pregnant women, distributed across six villages with varying populations. The village with the highest number of pregnant women is Sungai Cuka Village, with 77 individuals, followed by Kebun Raya Village with 53, Sumber Jaya Village with 47, Bukit Mulia Village with 43, Sebamban Baru Village with 36, and Mekar Sari Village with 32. Efforts to support these women, particularly those suffering from Chronic Energy Deficiency (CED), include the provision of locally-sourced supplementary food funded by the Regional Health Operational Assistance (BOK). Additionally, a stunting prevention program provides nutritional support in the form of 432 boxes of maternal milk (200g each) distributed from the South Kalimantan Province on September 5, 2024, which will be allocated to CED pregnant women in 2025. Furthermore, 678 boxes of pregnancy biscuits were distributed on November 28, 2024, targeting newly identified CED pregnant women alongside recipients of local supplementary food.

Stunting prevention programs are also implemented in villages using the Village Fund Allocation (ADD), with varying initiatives for CED pregnant women starting in June 2024 for a duration of three months. In Bukit Mulia and Sumber Jaya Villages, all pregnant women received two boxes of maternal milk (200g each). Sebamban Baru Village provided eggs, one box of maternal milk (200g), and cooked meals for CED pregnant women. In Kebun Raya Village, CED pregnant women received eggs and one box of maternal milk (200g), while Mekar Sari Village distributed one box of maternal milk (200g) during maternal health classes.

Sungai Cuka Health Center also collaborates with PT Arutmin Site Kintap to provide free Ultrasonography (USG) services. Each month, 55 pregnant women benefit from this program, receiving 30 vitamin tablets, two boxes of maternal milk (200g each), and a "My Plate" nutritional package containing ready-to-eat meals. These meals are designed to serve as a practical example of balanced meal portions in accordance with the Ministry of Health's recommendations.

Respondent Characteristics

The respondents in this study consist of all CED pregnant women within the coverage area of the Sungai Cuka Health Center. These individuals were identified using a total sampling technique, which included all pregnant women with a pre-pregnancy or first-trimester body mass index (BMI) of <18.5 kg/m². A total of 23 pregnant women were identified as CED cases on September 3, 2024. Further details about the respondents' characteristics, including their domicile, age, education, occupation, parity, gestational age, and height, are provided to enrich the understanding of this study population.

Table 1. Respondent Characteristics

Respondent Characteristics	Frequency	Percentage (%)
Domicile		
Sungai Cuka	8	34,8
Kebun Raya	4	17,4
Sumber Jaya	3	13
Bukit Mulia	3	13
Sebamban Baru	1	4,3
Mekar Sari	4	17,4
Age		
<20 th	2	8,7
20-35 th	20	87
>35 th	1	4,3
Highest Level of Education		
SD/Sederajat	1	4,3

SMP/Sederajat	0	0
SMA/Sederajat	16	69,6
D3/S1	6	26,1
Job		
Ibu Rumah Tangga	18	78,3
Guru Honorer	3	13
Pedagang	2	8,7
Paritas		
Primigravida	12	52,2
Multigravida	11	47,8
Pregnant Age		
0-12 Minggu	1	4,3
13-27 Minggu	12	52,2
28-40 Minggu	10	43,5
Height		
<145 cm	0	0
145cm - 155cm	11	47,8
>155cm	12	52,2

Source: Primary Data, (2024)

Based on Table 1, it shows that the majority of the respondents reside in Sungai Cuka village, with 8 people (34.8%), and the fewest respondents reside in Sebanban Baru village, with 1 person (4.3%). The majority of pregnant women experiencing chronic energy deficiency are within a healthy reproductive age, specifically between 20 and 35 years old, totaling 20 respondents (87%), while those at high risk, under 20 years old, amount to 2 people (8.7%) and those over 35 years old total 1 person (4.3%). In terms of the last education level, the majority are high school graduates or equivalent, with 16 pregnant women (69.9%). The respondents' characteristics based on occupation could only be categorized into three jobs: housewives, honorary teachers, and traders, with housewives being the most common occupation, totaling 18 respondents (78.3%). Based on parity (the number of children born), there is only 1 respondent more among primigravida (first-time pregnancies), with 12 pregnant women (52.2%) compared to multigravida respondents. The smallest group of respondents is those in the first trimester (0–12 weeks), with only 1 pregnant woman (4.3%), while the majority of respondents are in the second trimester (13–27 weeks), with 12 respondents (52.2%). There were no respondents with a height less than 145 cm, and most respondents had a height of over 155 cm, with 12 pregnant women (52.2%).

Research Data

The specific data in this study aims to describe the effectiveness of providing local food-based supplementary feeding (PMT) for 28 days, starting from the ethics approval date of November 3, 2024, on increasing the weight of pregnant women with Chronic Energy Deficiency (KEK) at Puskesmas Sungai Cuka. The data were processed using Paired Sample T-Test statistical testing to observe the difference in weight before (pretest) and after (posttest) the PMT intervention, as shown in the following table:

Table 2. Average Body Weight Pretest and Posttest

Variable	Mean	N	Standar Deviation	Standar Error Mean
Pretest	50,4391	23	5,66310	1,18084
Posttest	54,1696	23	5,99442	1,24992

Source: Primary Data, (2024)

Based on Table 2, it shows that the average body weight of 23 respondents before PMT administration (pretest) was 50.44 kg, and the average body weight after PMT administration (posttest) increased to 54.17 kg.

Table 3. Correlation test between Pretest and Posttest values

Variable	N	Corelation	Significance (p)
Pretest and Posttest	23	0,988	0,000

Source: Primary Data, (2024)

Based on Table 3, it is known that the results of the correlation test show that there is a very strong effectiveness between pretest and posttest body weight with a correlation coefficient of 0.988 and a significance value of $p = 0.000$ ($p < 0.05$).

Table 4. Differences in Pretest and Posttest Averages

Variable	Mean Difference	Standar Deviation	Std. Error Mean	t	df	Sig. (p)	95% Confidence Interval of Difference
Pretest and Posttest	-3,73043	0,96880	0,20201	-18,467	22	0,000	-4,14938 to -3,31149

Source: Primary Data, (2024)

Based on Table 4, it is known that the average difference in weight between the pretest and posttest is -3.73, meaning there was an average weight increase of 3.73 kg. The t-value = -18.467 with degrees of freedom (df) = 22 and significance (p) = 0.000 < 0.05 indicates that the difference in weight before and after the local PMT intervention is statistically significant. With a 95% confidence interval for the average weight difference of (-4.15, -3.31), it means this difference is consistently significant.

Table 5. Effect Size Results

Effect Size	Standard Deviation	Point Estimate	95% Confidence Interval
Cohen's d	0,96880	-3,851	-5,046 to -2,644
Hedges' Correction	1,00347	-3,718	-4,872 to -2,552

Source: Primary Data, (2024)

Based on Table 5, it can be seen that the Cohen's d value is -3.851, which indicates that the provision of PMT has a very large effect on increasing the weight of pregnant women with KEK, because this value is far above 0.8, which is the limit for a large effect size.

Table 6. Average Weight Gain of Respondents Based on Domicile

Domicile	Frequency	Average Weight Gain
Sungai Cuka	8	3,18 kg
Kebun Raya	4	4,75 kg
Sumber Jaya	3	4,23 kg
Bukit Mulia	3	4,53 kg
Sebamban Baru	1	3,2 kg
Mekar Sari	4	2,95 kg
Mean	23	3,73 kg

Source: Primary Data, (2024)

From Table 6, it can be seen that there are three villages with an average weight gain of the respondents during the intervention below the mean value of all respondents (3.73 kg), namely Mekar Sari Village (2.95 kg), Sungai Cuka Village (3.18 kg), and Sebamban Baru Village (3.2 kg).

DISCUSSION

The results of this study indicate that the provision of local food-based supplementary food (PMT) has a very large and significant effect in increasing the weight of pregnant women experiencing Chronic Energy Deficiency (KEK) at the Puskesmas Sungai Cuka in 2024. This is evidenced by an average weight gain of 3.73 kg after the intervention. The Paired Sample T-Test results show a significant difference with a p-value of 0.000 ($p < 0.05$), thus rejecting H_0 and accepting H_1 . The effect size (Cohen's $d = -3.851$) indicates that the effectiveness of PMT in increasing weight is very large. These results are consistent with several previous studies that state that PMT can increase weight and improve the nutritional status of pregnant women with KEK (Iskandar, et al.; Novianti, et al.). This emphasizes that the 28-day intervention of local food-based PMT has a real impact on the nutritional status of pregnant women with KEK.

Weight of Pregnant Women with Chronic Energy Deficiency at Puskesmas Sungai Cuka Before Receiving Local Food-Based PMT in 2024

Before the intervention with local food-based PMT in 2024, pregnant women with Chronic Energy Deficiency (KEK) at Puskesmas Sungai Cuka had a weight that did not align with the ideal weight standards for pregnancy. The research results show that the average pretest weight of the pregnant women was 50.4 kg. A total of 23 pregnant women were determined to be KEK based on their status, as they were the targets of the local PMT program by the local government.

According to the theory, KEK pregnant women are those with a pre-pregnancy Body Mass Index (BMI) or during the first trimester (<12 weeks) of $<18.5 \text{ kg/m}^2$ (Ministry of Health, 2023). Based on the researcher's analysis, the average pretest weight was 50.4 kg, with the majority having a height of $>155 \text{ cm}$ (52.2%), which did not indicate that the respondents experienced chronic energy deficiency, as they had a BMI greater than 18.5 kg/m^2 . However, considering that the respondents were all targets of the local PMT program, which started on September 3, 2024 (secondary data), their BMI at the start of pregnancy was less than 18.5 kg/m^2 . Furthermore, the respondents had received local PMT for two months by the time the primary data collection began after ethical approval on November 3, 2024.

Weight of Pregnant Women with Chronic Energy Deficiency at Puskesmas Sungai Cuka After Receiving Local Food-Based PMT in 2024

The research conducted on December 2, 2024, showed that the average weight of pregnant women with Chronic Energy Deficiency (KEK) after receiving the local food-based supplementary food (PMT) intervention in 2024 (posttest) was 54.17 kg, with the majority of respondents having a height of $>155 \text{ cm}$ and a Body Mass Index (BMI) of approximately 22.5 kg/m^2 . According to the theory, pregnant women with a BMI of $18.5\text{--}24.9 \text{ kg/m}^2$ are categorized as having normal nutritional status (Ministry of Health, 2024). This is also consistent with the thesis by Wulan et al. (2024), which states that local PMT can change the nutritional status from underweight to normal.

Based on these findings, the study shows that there has been an improvement in nutritional status after the intervention with local food-based PMT, from being categorized as experiencing chronic energy deficiency to achieving a normal nutritional status. This change is likely due to the fact that the posttest data was collected on December 2, 2024, which was exactly 90 days after the local food-based PMT intervention began.

Weight Gain in Pregnant Women with Chronic Energy Deficiency at Puskesmas Sungai Cuka Before and After Receiving Local Food-Based PMT in 2024

After the 28-day intervention with local food-based PMT, on December 2, 2024, the research showed an average weight gain in the respondents from 50.44 kg to 54.17 kg, which is an increase of 3.73 kg. The analysis using the Paired Sample T-Test produced a p-value of 0.000 ($p < 0.05$) and $r = 0.988$, with a Cohen's d value of -3.851.

According to the Ministry of Health (2024) guidelines, the impact of weight monitoring interventions can be tracked at least weekly, with a target weight gain of $>0.5 \text{ kg}$ per week. This study's results are consistent with previous research, which shows that the provision of PMT effectively increases the weight of pregnant women with KEK by an average of 2-5 kg/month (Iskandar et al., 2022; Nursihhah, 2022). The Ministry of Health (2024) even recommends that the intervention should result in a minimum weight gain of 2 kg/month, and if the weight gain is less than 2 kg/month, referral should be considered.

This is further supported by the World Health Organization (WHO, 2020) and the Ministry of Health (2024), which state that pregnant women with KEK require an additional 300-500 kcal/day to increase their weight and prevent pregnancy complications. Nutritional intake theory also supports that providing additional food that meets the criteria of a balanced diet will increase a woman's weight due to the additional energy stored as body fat and protein. The local food ingredients used are also rich in active substances such as fiber and antioxidants, which aid in the optimization of metabolism and nutrient absorption (Ministry of Health, 2023). According to Sugiono (2019), the Paired Sample T-Test analysis produced a p-value of 0.000 ($p < 0.05$) and $r = 0.988$, meaning that H_0 is rejected and H_1 is accepted, with a Cohen's d value of -3.851, which is much higher than the large effect size threshold of 0.8.

Based on previous research and the theories above, the researcher believes that the local food-based PMT in this study, which contains 500-700 kcal/day as a source of protein, complex carbohydrates, healthy fats, as well as vitamins and minerals tailored to meet the nutritional needs of pregnant women, is more than sufficient (300-500 kcal/day) to meet the daily calorie intake needed to increase the weight of pregnant women if consumed regularly. The weight gain of 3.73 kg over 4 weeks, with Paired Sample T-Test analysis producing a p-value of 0.000 ($p < 0.05$) and $r = 0.988$, indicates a very strong and significant relationship between the provision of local food-based PMT and the weight gain of pregnant women with KEK. According to the theory of nutrition intervention evaluation, the significant p-value indicates that the weight difference before and after the intervention is not a coincidence, but a real effect of PMT. This weight gain reflects the improvement in maternal nutritional status, which positively impacts fetal health. With the additional energy and nutrients from PMT, pregnant women are able to meet their daily nutritional needs, which were previously deficient due to Chronic Energy Deficiency (KEK). This finding also indicates a significant effectiveness of the local food-based PMT intervention in improving the weight of pregnant women with KEK. This shows that the PMT program not only has a positive impact but also provides statistically measurable results within a relatively short time (28 days).

The improvement in nutritional status of pregnant women can also be interpreted as the fulfillment of the fetus's nutritional needs more optimally, preventing negative impacts such as impaired fetal growth (IUGR) and chronic malnutrition in infants, as seen in previous studies by Munir et al. (2022) and Simbolon et al. (2022), which state that fulfilling the nutritional needs of pregnant women with KEK indirectly contributes to improving fetal health, preventing Low Birth Weight (LBW) babies, and avoiding other pregnancy complications.

In the research data, there were 23 respondents who all participated in the pretest and posttest assessments, distributed across all villages in the working area of Puskesmas Sungai Cuka, with the majority of respondents residing in Desa Sungai Cuka (34.8%). The majority of respondents were in the 20-35 years age group (87%), with a status of housewives (78.3%), and the majority of respondents had completed high school or equivalent education (69.6%). There were even respondents with an associate degree or bachelor's degree (26.1%), and only 4.3% of the respondents were in their first trimester.

Based on previous studies, several factors from respondent characteristics such as age, employment status, education, and gestational age support the success of this program. For instance, research by Handayani et al. (2021) states that pregnant women of advanced maternal age (over 35 years) are 5.029 times more likely to experience KEK due to an increased susceptibility to diseases and impaired nutrient absorption, while younger women under 20 may not have completed their linear growth. Employment status is another socioeconomic factor linked to KEK occurrence (Andini et al., 2020). Mulyani et al. (2021) found that the higher an individual's education level, the more likely they are to accept and apply information. Furthermore, Nurihahh (2022) stated that a pregnant woman's weight begins to increase during the second trimester.

Based on the results of the previous studies, several factors significantly contribute to the success of this research. First, the age range of 20-35 years is considered the ideal reproductive age, where a woman's body is generally in optimal condition to support pregnancy, including better metabolism and the body's ability to adapt to additional nutritional needs. Furthermore, the educational background of the respondents, with 95.7% having at least a senior high school education or equivalent, indicates a good understanding of the importance of meeting nutritional needs during pregnancy and consuming supplementary food. This also reflects the community's awareness of high-risk pregnancies, such as those that are too young, too old, too many, or too close, which can lead to complications during pregnancy and childbirth. Consequently, most respondents decided to conceive during their reproductive years.

The study also highlighted that employment status does not seem to significantly influence the ability of respondents to meet their nutritional needs. While previous studies suggest that occupation relates to economic status and income, this research found that most of the respondents were not employed (78.3%), with only five having additional jobs. The researcher assumes that the non-working status of respondents may actually benefit the effectiveness of the program, as they were able to focus more on monitoring their nutritional intake and had more time to participate in the PMT program as recommended by the PMT cadres. Another factor that benefited the program's success was that only one respondent (4.3%) was in the first trimester, where nausea and vomiting could interfere with nutrition intake. The rest of the respondents were in their second or third trimester, a stage past the critical early period, which further enhanced the effectiveness of the local PMT intervention.

Additionally, the majority of respondents were from Desa Sungai Cuka, which had the largest target group—77 respondents, or 26.7% of the total 288 targets in the Puskesmas area. As for the consistency of the research, the number of respondents in both the pretest and posttest remained the same, with 23 respondents participating in both. The local PMT program was successfully implemented according to the technical guidelines of the Ministry of Health in 2024, with the preparation of meals, menu schedules, and illustrations carried out as planned over a 28-day period.

The local PMT program, as described in the literature review, is a government initiative that provides ready-to-eat meals, not as a replacement for main meals, and is provided according to nutritional adequacy standards (Ministerial Regulation No. 28/2019). The program is supervised by nutrition program managers, monitored across sectors and programs, and implemented by PMT cadres based on official guidelines (Ministry of Health, 2024). The use of local ingredients like legumes, tubers, and vegetables provides good nutritional value, is easily absorbed by the body, and is economically accessible (Ministry of Health, 2023). Moreover, the program aligns with government recommendations to include nutritional education and health awareness for pregnant women with nutritional issues, as well as proper record-keeping and reporting throughout the intervention period (Ministry of Health, 2024).

Another factor contributing to the success of the PMT program in increasing weight among pregnant women with KEK is the quality and nutritional content of the PMT itself. The local ingredients used in accordance with technical guidelines are rich in macronutrients (carbohydrates, proteins, fats) and micronutrients (iron, vitamin A, and folic acid), which help improve the nutritional status of pregnant women with KEK. Compliance with the consumption of PMT as directed by health workers, along with regular nutritional education and monitoring, played a significant role in the observed weight gain. It was noted that all 23 respondents completed the intervention, meaning none gave birth or moved outside the Kintap district, or stopped receiving the PMT during the study. Respondents' compliance was evaluated daily, with PMT being delivered every day without

interruption, as evidenced by photos and receipts. Weighing was done weekly, and health workers provided education on proper meal planning as part of the monitoring and education efforts. Furthermore, the 28-day duration of PMT delivery was considered sufficient to show significant changes, with evaluations taking place at least weekly.

The research also showed that three villages had an average weight gain below the overall mean of 3.73 kg during the intervention. These villages were Desa Mekar Sari (2.95 kg), Desa Sungai Cuka (3.18 kg), and Desa Sebamban Baru (3.2 kg). All three villages are located on the eastern side, bordering the Java Sea, and lack access to a clean water source. A similar PMT program was conducted in two villages for three months starting in September 2024. In Desa Sebamban Baru, pregnant women with KEK received eggs, 200g boxes of pregnant women's milk, and cooked food, while in Desa Mekar Sari, milk was provided during pregnancy classes.

According to UNICEF (2020) theory, factors such as sanitation, access to clean water, and food quality are indirect causes of malnutrition. This aligns with the findings of Maryani, F. et al. (2023), which mention that poor water quality affects child development, such as stunting in infants. Meanwhile, the variation in types and quality of nutritional intake can influence weight gain outcomes. More comprehensive interventions tend to yield better results (Ministry of Health, 2023).

Based on previous theories and research, the author analyzes the factors contributing to the weight gain of respondents below the average of 3.73 kg in these three villages, despite receiving the same type of nutrition and intervention. A significant factor is the environmental conditions, as all three villages are located near the Java Sea and lack clean water sources, which may contribute to the lower weight gain. The availability of clean water is closely linked to food hygiene and the risk of infection, which could hinder weight gain even with nutritional interventions. Among these villages, Desa Mekar Sari, which is nearly entirely bordered by the sea, lacks natural water sources, and residents rely on rainwater harvesting and a village water reservoir. This could explain why respondents from Desa Mekar Sari had the least weight gain during the intervention (2.95 kg). Of the three villages, Desa Sungai Cuka, which is less bordered by the sea, has some clean water sources, but its weight gain (3.18 kg) was still lower than Desa Sebamban Baru (3.2 kg). This difference was likely due to additional interventions in Desa Sebamban Baru, where pregnant women received eggs, milk, and cooked meals once a month, which was not the case in Desa Sungai Cuka.

The researcher also found that other nutrition interventions were less impactful in the local PMT intervention because of the aid distribution, such as the 432 boxes of 200g pregnant women's milk from South Kalimantan Province distributed to the Puskesmas Sungai Cuka on September 5, 2024, and 678 boxes of pregnant women's biscuits distributed to the same Puskesmas on November 28, 2024. These aids were intended for new pregnant women with KEK, not the respondents in the local PMT intervention, as their expiration dates were still far off in 2027. Meanwhile, a third-party intervention by PT Arutmin Kintap Site, providing vitamin supplements (30 tablets), pregnant women's milk (2 boxes of 200g), and meal packages during free ultrasound activities, had little effect. This is because all pregnant women, whether with KEK or not, had the same opportunity to participate in the event at least once every three months.

Research Limitations

This study has several limitations, including the small sample size of 23 respondents and the relatively short research duration. Further research with a longer intervention period and a larger sample size could provide more representative and applicable data. The study used a quasi-experimental design with a pretest-posttest group, so there was no control group. Although the results show significant effectiveness, using a control group in future research could provide a more comprehensive picture of the effectiveness of the local food-based PMT intervention.

Another limitation was the lack of monitoring of external factors, such as daily food intake aside from the PMT, physical activity of pregnant women, their health status, and the presence of similar intervention programs outside the jurisdiction of Puskesmas Sungai Cuka.

CONCLUSION

Based on the results of the study, the following conclusions can be drawn:

1. The average body weight of pregnant women with Chronic Energy Deficiency (KEK) was 50.4 kg before the local food-based PMT intervention on November 3, 2024.
2. The average body weight of pregnant women with KEK was 54.17 kg after the local food-based PMT intervention on December 2, 2024.
3. The intervention of providing local food-based supplementary feeding (PMT) for 28 days demonstrated a significant effectiveness in increasing the body weight of pregnant women with KEK, with an average weight gain of 3.73 kg in the working area of Puskesmas Sungai Cuka. The weight gain was influenced by factors such as the ideal age characteristics of the respondents, education level (majority \geq high school), employment status, compliance in consuming PMT, nutrition education, regular monitoring by health workers, and the organized implementation of the intervention according to Ministry of Health guidelines.

The analysis indicated that environmental factors, such as limited access to clean water and the geographical location bordering the Java Sea, contributed to the lower results.

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