

Multi-micronutrient supplementation for weight gain of pregnant women with CED in West Lombok Regency

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Abstract

Purpose: This study aims to determine the effectiveness of multi-micronutrient supplementation with increasing body weight in pregnant women with CED in West Lombok Regency

Method: This study aims to determine the effectiveness of multi-micronutrient supplementation with increasing body weight in pregnant women with CED in West Lombok Regency. This study used a quasi-experimental design with 1 group design and a sample of 30 KEK pregnant women, with the *consecutive sampling* technique. Statistical test analysis used the *Peiret T*-test. For clinical significance, the Δ mean with a 95% *confidence interval* with a P value <0.05 was used.

Results: The results showed that most of the respondents were aged ≥ 21 years, namely 73.3%, with the highest level of education in higher education, namely 17 people (56.7%). The most income respondents are low income, namely 19 people (63.3%). The highest gestational age in this study was the second trimester of 17 women (56.7%). Bivariate analysis found a significant difference with a p value > 0.05, which means that there was a significant difference between the weight of pregnant women before and after the intervention with the average increase in body weight of pregnant women in this study 5.83.

Keywords: Micronutrien, Pregnant women CED

Introduction

Chronic lack of energy (CED) that lasts a long time in pregnant women will affect the fulfillment of nutrients needed by the body and have an impact on the fulfillment of fetal nutrition in the womb. This can increase maternal and fetal morbidity and mortality rates are increasing. based on Riskesdas in 2018 shows the high prevalence of malnutrition in pregnant women in Indonesia, which is as many as 17.3% of pregnant women in conditions of Chronic Energy Deficiency (CED) [1] NTB is included in the 10 provinces that have the highest CED prevalence of 21.5%, the prevalence is still high from the national average prevalence of CED incidence, so intervention is still needed in efforts to overcome CEDs in NTB [2] (Riskesdas NTB 2018).

Chronic low energy pregnant women are pregnant women who have a pre-pregnancy body mass index or in the 1st trimester (< 12 weeks) of < 18.5 kg/m² [3]. Indicators and targets of public health programs in the National Medium-Term Development Plan (RPJMN) and Strategic Plan (Renstra) for 2020-2024 place CEDs as one of the medium-term programs, the percentage of pregnant women with Chronic Energy Deficiency (CED) is 14.5% [4], and The pre-pregnancy and pregnancy period must be well prepared by accelerating the improvement of community nutrition with the main focus on the first 1000 days of life (1000 HPK).

CEDs on Lombok Island are still high from the average prevalence of CEDs in Indonesia, 3 districts with the highest prevalence were West Lombok as much as 25.92%, North Lombok as much as 29.19%, East Lombok as much as 20.17%. West Lombok is the district with the highest number of CEDs with the highest prevalence. This data is still above the average prevalence of CEDs in NTB, which is 21.50% [2]. Chronic lack of energy has an impact on the pregnancy process will cause late baby growth (IUGR), labor will affect contractions (his) so that it will inhibit the progress of labor, Low Birth Weight (BBLR), and Asphyxia [5], these impacts are very detrimental to maternal and fetal health during the pregnancy period.

CEDs are caused by many influencing factors, based on the characteristics of pregnant women who experience CEDs in Indonesia in the most age groups experiencing CEDs during pregnancy, namely at the age of 15-19 years by 33.5%, Education for pregnant women who experience the most CEDs at the Senior High School Education (SLTA) level by 19.4%, Pregnant women's work is in the category of being in school by 25.9% and seen from the location of pregnant women who experience CEDs in Indonesia the most 19, 3 % [1].

Research conducted by [6] (Supadmi, Kusri, and Kusumawardani 2020) found CED and anemia were found in pregnant women and pregnant women with hypothyroidism and without hypothyroidism in Ponorogo Regency. Normal and healthy pregnancy outcomes can be achieved by evaluation of thyroid function and adequacy of iron and other nutrients during pregnancy. Therefore, efforts to improve nutrition in an integrated and continuous manner since preconception and during pregnancy should be carried out and advised to screen pregnant women to prevent thyroid dysfunction and to carry out continuous supplementation in relation to urgent needs during pregnancy due to physiological and hormonal changes.

The government's effort to overcome CEDs is by providing Micronutrients (MN) as much as 30 tablets for 1 month to 90 tablets [7]. Pregnant women consume 1 tablet daily. Pregnant women are advised to take supplements of folic acid, iodine and vitamin D. Multivitamins are a combination of various minerals and vitamins usually in tablet form. Some multivitamins are made specifically for pregnant women (prenatal multivitamins). If you are pregnant, it is recommended to avoid taking multivitamins that are not for pregnant women. Taking high doses of vitamin A, C and E supplements can harm pregnancy. We recommend avoiding consumption of this vitamin while pregnant including avoiding foods that are high in A, such as liver and its products.

Research conducted by [8] (Mires et al. 2022) based on a systematic review study conducted on 726 articles with maternal respondents who consumed 8 nutrients in micronutrients obtained 1,199 pregnant women from 2,427 or 49% gave birth to babies with congenital heart defects. Further studies are needed to see the effectiveness of micronutrients on pregnancy.

The prevalence of CEDs in West Lombok was obtained by 3 highest Puskesmas, namely Dasan Tapen Health Center with 186 cases (20.62%), Meninting Health Center with 156 cases (14.38%) and Sekotong Health Center with 147 cases (18.97%) (Dinkes Lobar 2022). The problem of CED in pregnant women worsens the condition of their pregnancy, Based on the explanation above, the author is interested in raising research on "Multi-Micronutrient Supplementation Against Weight Increase of Pregnant Women with CED in West Lombok Regency in 2023".

Methods

This research will use a quasi-experimental research design with a pretest posttest one group design research design. The study began by identifying pregnant women in West Lombok Regency, then given intervention by providing Multi Micronutrients. The study was conducted on CED pregnant women in West Lombok Regency. The research will be conducted from February to April 2023.

In this study using dependent and independent variables. The dependent variable in this study was multi-micronutrient supplementation. While the independent variable in this study is weight increase in CED pregnant women. The inclusion criteria in this research were being willing to take part in the research until the end. Exclusion criteria are respondents who cannot and have contraindications to multi micronutrients. The sampling technique used in this study using Consecutive sampling is the choice of researchers who do not get a sample frame. The trick is to take samples that meet certain criteria until a number of samples are obtained. In this study using a minimum sample of 30 samples.

This research is ethically feasible based on a Certificate of Ethical Eligibility from NTB Provincial Hospital with No: 075.1/18/KEP/2022. The data collected in this study are secondary and primary data. Secondary data consists of an overview of the location of the study, data on the number of CED pregnant women in West Lombok. Primary data consists of maternal age, maternal education, family income, maternal occupation, chronic energy deficiency and the results of measuring the weight of pregnant women. The study was conducted by identifying CED patients then given a micronutrient intervention (Lexavit) with a maximum of 90 tablets. The composition of lexavit is Vit A 6,000 IU, vit D 400 IU, vit C 100 mg, vit B₁ 10 mg, vit B₂ 2.5 mg, vit B₆ 15 mg, vit B₁₂ 4 mcg, nicotinamide 20 mg, Ca pantothenate 7.5 mg, folic acid 0.25 mg, Fe fumarate 90 mg, Ca lactate 250 mg, copper 0.1 mg, iodine 0.1 mg, simeticone 20 mg, fluoride 1 mg. Respondents were given 30 micronutrient tablets 3 times and consumed micronutrient tablets once a day [10].

Results

Table 1. Frequency Distribution of CED Pregnant Women Characteristics

No	Karakteristik	n	%
1	Mother's age		
	Young age	8	26.7
	Age of majority	22	73.3
2	Education Level		
	Low	13	43.3
	Hight	17	56.7
3	Income		
	Low	19	63.3
	Hight	11	36.7
3	CED		
	Risk	30	100
	No Risk	-	-
4	Gestational Age		
	Trimester I	5	16.7

Trimester II	17	56.7
Trimester III	8	26.7

Source: primary data, Mei 2023

Based on this, it shows that most respondents are aged ≥ 21 years, which is 73.3% with the highest level of education in higher education, which is 17 people (56.7%). The highest income of respondents with low income is 19 people (63.3%). All restaurants have a LILA of less than 23 cm which is risk. The most gestational age in this study was the second trimester as many as 17 people (56.7%).

Table 2. Effectiveness of Multi Micronutrient Supplementation on Weight Increase of Pregnant Women with CED.

Variabel Intervensi	N	Mean	SD	P-Value
Weight Loss Before	30	40.30	4.677	0.002
Weight Loss After		46.12	4.974	

Source: primary data, Mei 2023

In Table 1. shows that most respondents are aged ≥ 21 years, which is 73.3% with the highest level of education in higher education at 17 people (56.7%). The highest income of respondents with low income is 19 people (63.3%). All restaurants have a LILA of less than 23 cm which is risk. The most gestational age in this study was the second trimester as many as 17 people (56.7%).

The normality test using analysis to determine between the independent variable of multi-micronutrient supplementation against the dependent variable of increasing the body weight of pregnant women with CED was carried out using an independent t-test. Before the independent t test, a data normality test was carried out. data normality test results with Shapiro-wilk test. The results of the normality test obtained a p-value of > 0.05 , namely the p-value of pregnant women's weight before the intervention of 0.07 and the weight of pregnant women after micronutrient administration of 0.92.

Based on table 2. The results of this study found a significant relationship with a p-value of < 0.05 which means there is a significant influence between the provision of micronutrients on the increase in body weight of CED pregnant women. The results showed that micronutrient intervention in CED pregnant women obtained an average of 40.30 in body weight before the intervention and after micronutrient administration obtained an increase in body weight with an average of 46.12. So the difference in the average increase in body weight of pregnant women before the intervention and after the intervention in this study was 5.83.

Discussion

In this study, the highest age of respondents was obtained at the age of ≥ 21 years with an average age of 24 years. The highest income level in the low category is below MSEs, and the highest level of education of respondents is 17 respondents (56.7%). based on research conducted by [11] shows that the probability of the incidence of CED pregnant women to low economic status is 115 times higher than pregnant women not CED. And showed that the probability of incidence of CED pregnant women to low education levels was 2.3 times higher than that of non-CED pregnant women. Therefore, it can be concluded that low education levels increase the risk of CED in pregnant women 2.3 times stronger than pregnant women with higher education levels.

A significant relationship was obtained with a p-value of < 0.05 which means that there is a significant influence between the provision of micronutrients on the increase in body weight of CED pregnant women. supported by research conducted by [12], it was found that there was a relationship between the weight of pregnant women with KEK and the birth weight of the baby, then the relationship between Hemoglobin and the birth weight of the baby was significant. Providing nutrients such as DHA supplements, iron, calcium, lactobacillus casei and sufficient calories affects the baby's birth weight, even though the intervention is only carried out in the 3rd trimester.

The results showed that micronutrient intervention in CED pregnant women obtained an average of 40.3 in body weight before the intervention and after micronutrient administration obtained an increase in body weight with an average of 46.12. So the difference in the average increase in body weight of pregnant women before the intervention and after the intervention in this study was 5.83.

Supported by research conducted by [13] it was found that the effect of multi-micronutrient supplementation (MMS) was greater in pregnant women with less weight than women who were not underweight in reducing the risk of preterm birth (16% for women with underweight versus 6% for women who were not thin with a P Value for heterogeneity of 0.01), and the effect of MMS was greater in women who started supplementation after 20 weeks gestation than those who started it before 20 weeks in reducing the risk of stillbirth (19% reduction after 20 weeks versus a 3% reduction before 20 weeks with a P value for heterogeneity of 0.05).

Multi-micronutrient supplementation interventions benefit pregnant women and newborns, research conducted by [14] of 17 trials (involving 137,791 women) obtained good results from the effects of multi-micronutrient supplementation (MMN) during pregnancy on the outcomes of fetus, baby, and mother. MMN supplementation with iron and folic acid versus supplementation with iron (with or without folic acid) showed an 8% reduced risk of small birth for gestational age (SGA) and a 12% reduced risk of low birth weight (BBLR).

In this study, an increase in pregnant women's weight was obtained from all semesters before and after micronutrient administration with an average amount of 5.83. The benefits of providing micronutrients do not have a long impact on the health of the fetus born, based on research [15] there were improvements in the characteristics of upper arm circumference (CED), fundus uteri height growth, Biparietal biometric size diameter and Hb levels among CED pregnant women given micronutrient supplementation in the 3rd trimester and showed that micronutrient supplementation and adequate caloric intake can improve infant outcomes in mothers pregnant with CED with the results of the analysis of the relationship between increased LILA and normal birth weight outcomes, a positive correlation was obtained with a value of $p: 0.0106$; 95%CI with $R: 0.4595$. So that a relationship was obtained between the increase in LILA and good baby outcomes.

Conclusion

There is a significant difference between the body weight of pregnant women before and after taking multi-micronutrient supplementation. Monitoring of pregnant women during micronutrient consumption still needs attention. A balanced menu is very important in supporting micronutrient interventions, so it is necessary to follow up the influence of nutrition with the success of micronutrients to increase the body weight of CED pregnant women.

Acknowledgment

The researcher would like to thank LPPM University of Muhammadiyah Mataram and all who have contributed to this research

Author Contributions

Table 3. Author Contributions

Author	Contributions
Catur Esty Pamungkas	- Conceptualization
	- Methodologi
	- Writing original draf
	- Supervision
	- Resources
	- Funding acquisition
	- Writing review and editing
Siti Mardiyah WD	- Project administration
	- Conceptualization
	- Methodologi
	- Writing original draf
	- Resources
Cahaya Indah Lestari	- Writing review and editing
	- Writing original draf
	- Project administration
	- Dokumentation
Dwi Kartika Cahyaningtyas	- Investigation
	- Writing review and editing
	- Writing original draf
	- Dokumentation
	- Funding acquisition
	- Writing review and editing

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