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Health Status Assessment of Pregnant Women with Chronic Energy Deficiency

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Abstract

The first thousand days of life is a critical period to improve children's physical and cognitive development. Unfulfilled food intake during pregnancy will affect nutritional status as illustrated by weight gain and chronic energy deficiency (CED). the purpose of this study is to determine the effect of nutritional interventions on the nutritional status of pregnant women with CED. This study was a qualitative analytic study with a case-control approach targeting 60 pregnant women with SEZ who were registered at all health centers in Kupang City. The independent variables are nutrition education and the provision of nutritious healthy food, the dependent variables are weight gain and LiLA. analysis using Mann Mann-Mann-Whitney t-test. The Mann-Whitney t-test showed that the p-value of body weight before intervention was 0.524 and body weight after intervention was 0.306, the p-value of LiLA before intervention was 0.865 and after intervention was 0.514 (>0.05) which means there was no significant difference between the two groups. Therefore, it can be concluded that there is no significant difference between the case group and the control group before and after the nutrition intervention. there is no difference because most pregnant women in both case and control groups have often received education from health workers.

Key words: Pregnancy, CED, Supplementary feeding, Nutrition Education;

Introduction

Stunting is the impact of chronic malnutrition and repeated infections in the first 1000 days of life[1] where there is impaired growth in children with lower height than their age standards. Indonesia ranks fifth with the highest number of stunted toddlers in the world and the third highest in Southeast Asia at 36.4%[2]. The first thousand days of life, which begins at conception until the child is 24 months old, is a critical period for improving the physical and cognitive development of children[3]. There is a significant relationship between the nutritional status of pregnant women and the incidence of stunting in children aged 6-59 months. The nutritional status of pregnant women is based on the size of the upper arm circumference (LiLA) less than 23.5 cm or what is commonly called pregnant women with SEZ[4]

Pregnancy is one of the most important life cycles. During pregnancy, food intake must be adequate and nutritionally balanced. Unmet food intake will affect nutritional status as reflected by weight gain during pregnancy and chronic energy deficiency (SEZ). In addition to food intake, many factors affect the nutritional status of women with SEZ, including knowledge about nutrition and food availability at the household level. The short-term effects of malnutrition during pregnancy are low birth weight (LBW), disability, premature fetuses, and prolonged labor, which risks infant and maternal morbidity. The long-term effects are stunting and poor brain development and metabolism, which can potentially lead to degenerative diseases in adulthood[5,6,7]. Apart from having an impact on physiological conditions, it can also have an impact on the psychological conditions of pregnant women, such as the emergence of stress due to stress, a natural human response that prompts us to address challenges and threats in our lives. Everyone experiences stress to some degree[8,9,10,11,12,13], The family of a pregnant woman can experience psychological problems when physiological or physical problems occur in family members such as low self-esteem[14,15,16,17,18,19,20]. Stunting also has problems not only with the physical condition of the child but can also cause problems with reduced coping mechanisms in mothers of children who experience stunting[21,22,23,24,25,26] Efforts to improve the incidence of stunting include specific and sensitive nutrition interventions. The focus of specific nutrition intervention efforts is pregnant women, breastfeeding mothers, and children 0-23 months because the most effective stunting prevention is carried out in the golden period or critical period[27]. One of the curative efforts in the group of pregnant women with SEZ is Supplementary Feeding (PMT) which aims to fulfill calories and protein, as well as menu variations in the form of food[28].

Based on the annual report of the Kupang City Health Office in 2021, there were 1282 pregnant women with SEZ out of a total of 10686 pregnant women and 948 anemic pregnant women out of 10686 people. The prevalence of pregnant women with CED in 2018 in Indonesia was 17.3%, East Nusa Tenggara (NTT) was 36.80%, and Kupang City was 40.24%. The number of pregnant women who received supplementary food in NTT was 40.44% and in Kupang City was 40.24%. Blood tablet supplementation for pregnant women was 75.27% and in Kupang City was 79.87%. RISKESDAS data (2018) shows that the incidence of LBW (<2500 grams) in Indonesia is 6.2%, NTT is 8.31%, short birth babies (<48 cm) are 22.7% and NTT is 25%. The nutritional status of toddlers in the BB/U index category of undernutrition and malnutrition was 17.7% in Indonesia and 37.2% in NTT. Short toddlers were 30.8% and 42.6% in NTT (8). Meanwhile, the percentage of exclusive breastfeeding for 0-6 months in 2013 was 54.3%. This figure is still far from the target of the 2012-2014 Exclusive Breastfeeding Acceleration Action Plan program launched by the government[29]. Based on the results of the Indonesian Nutrition Status Study (SSGI), in 2021, stunted toddlers were 24.4%, wasting was 7.1%, Underweight was 17.0%, while the highest prevalence of stunting in NTT was 37.8%[30].

Materials and Methods

The research design and method should be clearly defined.

This is a qualitative analytic study with a case-control design. The study was conducted from January to December 2022. The targets were pregnant women with SEZ in the first, second, and third trimesters recorded at all Primary health services in Kupang City with inclusion criteria, namely pregnant women registered in the Primary health services register, domiciled in Kupang City, willing to be respondents until the end of the study by signing the respondent's consent form. Exclusion criteria are resigning for personal reasons, and having a miscarriage during pregnancy. Sampling will be carried out by purposive sampling. Research ethics approval number no.L.B.02.03/1/0063/2022. Data collected included the identity of pregnant women, measurement of BW, and upper arm circumference (LILA). The case group will be given specific nutrition interventions including nutrition education, local food-based PMT, routine pregnancy check-ups (up to K6), and monitoring of nutritional status through measurement of LILA and weight gain during pregnancy while the control group will only be given nutrition education including local food-based PMT, routine pregnancy check-ups (up to K6) and monitoring of nutritional status through measurement of LILA and weight gain during pregnancy without being given nutrition education. The PMT menu is based on local food, in the form of lunch for 10 consecutive days. Pregnancy check-ups were conducted by interview using a questionnaire to determine the frequency of pregnancy checks, monitoring nutritional status by weighing BW

measuring TB, and measuring LILA. Data analysis using the SPSS 17 program and Whitney difference test.

Results and Discussion

Respondents in this study consisted of 60 respondents for the case group (who were given nutrition education and nutritious healthy supplementary food) and 60 respondents for the control group (only given nutritious healthy supplementary food).

Table 1. Characteristics of pregnant women with SEZ

Description	Control group		Case group	
	N	%	N	%
Education				
Elementary	6	10.0	8	13.3
Junior High	11	18.3	10	16.7
High School	33	55.0	37	61.7
University	10	16.7	5	8.3
Occupation				
Housewife	49	81.7	49	81.7
Civil Servant	1	1.7	1	1.7
Self-employed	1	1.7	1	1.7
Private Employee	7	11.7	7	11.7
Student	2	3.3	2	3.3
Age				
<20 Years	5	8.3	5	8.3
20-30 Years	45	75.0	47	78.3
> 30 Years	10	16.7	8	13.3
Total	60	100.0	60	100.0
Number of family members				
<=4 people	49	81.7	48	80.0
> 4 people	11	18.3	12	20.0
Total	60	100.0	60	100.0
Number of parties				
1st child	31	51.7	34	56.7
2nd child	14	23.3	14	23.3
≥ 3rd child	15	25.0	12	20.0
Total	60	100.0	60	100.0
Gestational age				
1st Trimester	12	20.0	11	18.3
2nd trimester	30	50.0	29	48.3
3rd trimester	18	30.0	20	33.3
Total	60	100.0	60	100.0

From the table above, it can be seen that the education level of pregnant women in the control group mostly had a high school education (55%), who had a junior high school education 18.3%, college 16.7% and who had an elementary education 10.0%. The education level in the case group mostly had a high school education, namely 61.7%, who had a junior high school education 16.7%, elementary school 13.3%, and who had a college education 8.3%. The occupation of pregnant women in the control group mostly had the occupation of housewives, namely 81.7%, private employees 11.7%, students 3.3%, and civil servants and self-employed 1.7%. In the case group, 81.7% of pregnant women were housewives, 11.7% were private employees, 3.3% were students, and 1.7% were civil servants and self-employed. Most of the pregnant women in the control group who had an aged of 20-30 years were 75.0%, age> 30 years 16.7%, and those aged < 20 years 8.3%.

In the case group, most pregnant women had an age of 20-30 years, 78.35, age> 30 years as much as 13.3%, and <20 years 8.3%. Pregnant women in the control group who had <=4 family members were 81.7%, and >4 people were 18.3% while in the case group, they had <=4 family members (80.0%), and those >4 people were 20.0%. Most of the pregnant women in the control

group were pregnant with their first child 51.7%, third child and more than 3 by 25.0%, and those pregnant with their second child 23.3%. In the case group, the first child was 56.7%, the second child was 23.3% and the third child and more than three were 20.0%. Pregnant women in the control group mostly had a gestational age with a trimester 2 category of 50.0%, trimester 3 as much as 30.0%, and in the trimester 1 category as much as 20.0%. In the case group, 48.3% of pregnant women in trimester 2, 33.3% in trimester 3, and 18.3% in trimester 1.

Table 2: Differential Test Results

Description	Before intervention		After intervention	
	Case group	Control group	Case group	Control group
Body Weight				
Mean	44.9183	46.1267	47.6633	48.9350
Minimum	35.00	38.00	36.00	40.30
Maximum	54.90	64.00	62.00	65.50
Upper arm circumference				
Mean	21.7800	21.7450	23.0967	23.1417
Minimum	19.00	18.50	19.50	20.00
Maximum	23.00	23.00	25.00	25.00

This research is a true experimental research. To determine the difference between the treatments (experimental group and control group), a difference test analysis was conducted. The difference test used in this study is the independent T-test, but because the data in this study are not normally distributed, the difference test used is the Mann-Whitney test (which does not meet the normality test). From the table above, it can be seen that the weight of pregnant women in the case group and control group before the intervention is different, namely in the case group has an average of 44.13 kg, with a minimum weight of 35.00kg, and a maximum of 54.90 kg, while in the control group has an average of 46.13 kg, a minimum weight of 38.00 kg and a maximum of 64.00 kg. In the case group after the intervention, the average weight of pregnant women was 47.66 kg, with a minimum value of 36.00 kg, and a maximum of 62.00, while in the control group, the average weight of pregnant women was 48.94 kg, with a minimum weight of 40.30 kg and a maximum of 65.50 kg.

The average arm circumference of pregnant women in the case group before the intervention was 21.78, minimum arm circumference 19.00 and maximum 23.00, while in the control group, the average arm circumference of pregnant women was 21.75, minimum arm circumference 18.50, and maximum 23.00. The case group and control group after the intervention are different, namely in the case group has an average of 23.09, minimum arm circumference of 19.50, and weight of 25.00, while the control group has an average arm circumference of 23.14, minimum arm circumference of 20.00, and maximum 25.00.

Table 3. Differential Test Results with Mann-Whitney Test

Test Statistics				
	Weight Before Intervention	Weight After Intervention	Upper arm circumference before intervention	Upper arm circumference after intervention
Mann-Whitney U	1679.000	1605.000	1768.000	1677.500
Wilcoxon W	3509.000	3435.000	3598.000	3507.500
Z	-.637	-1.024	-.170	-.653
Asymp. Sig. (2-tailed)	.524	.306	.865	.514
a. Grouping Variable: TREATMENT				

The table above shows that the U value for body weight before the intervention was 1679 and the W value was 3509. When converted to Z value, the amount is -637. The sig or p-value of 0.524>0.05 means that there is no significant difference between the two groups or H0 is

accepted. U value for body weight after intervention is 1605 and W value is 3435. If converted to Z value, the amount is -1.024. The sig value or p-value of 0.306>0.05 means that there is no significant difference between the two or H0 is accepted. The u value for LILA before intervention is 1768 and the W value is 3598. The sig or p-value of 0.865>0.05 means that there is no significant difference between the two groups or H0 is accepted. the U value for LILA after the intervention is 1677 and the W value is 3507. If converted to Z value, the amount is -653. The sig or p-value of 0.514>0.05 means that there is no significant difference between the two groups or H0 is accepted. The biological processes that occur during pregnancy are characterized by weight gain from several components. The changes that occur during pregnancy are measured in maternal weight gain. For this reason, for the baby to be born in normal conditions, optimal energy and nutrients are needed from the mother. Pregnant women with sufficient energy and nutrient intake will gain weight according to gestational age and the baby is born healthy. If the pregnancy process begins with malnutrition, then the weight gain during pregnancy must also consider the weight deficit, meaning that the weight gain in pregnant women with SEZ must be greater than in normal pregnant women[30].

Maternal weight before pregnancy and weight gain during pregnancy affect fetal growth. Mothers who weigh less than 10-12.5 kg during pregnancy and LILA less than 23 cm, often give birth to smaller babies than babies born to mothers with normal weight during pregnancy are significantly associated with newborn weight (Suroso, 2010)[31,32,33]. The nutritional status of pregnant women greatly affects the growth of the fetus in the womb. If the nutritional status of the mother is poor, both before pregnancy and during pregnancy will cause Low Birth Weight (LBW). The nutritional status of pregnant women can be measured from the increase in maternal weight during pregnancy based on BMI and from LILA measurements. Providing nutrition education to pregnant women can increase their weight during pregnancy. The first and second trimesters of weight gain are mostly caused by the increase in pregnancy support organs, while in the third trimester what affects weight gain is fetal growth. The nutritional status of pregnant women is more precisely assessed based on LILA, which is normal for pregnant women > 23.5 cm (Supariasa et al, 2009)[34]. Based on Table 2, there is a difference in the weight of pregnant women in both case and control groups after being given nutrition education and providing nutritious healthy food. The difference test in Table 4.9 shows that the U value for weight before intervention is 1679 and the W value is 3509. When converted to Z value, the amount is -637. The sig or p-value of 0.524>0.05 means that there is no significant difference between the two groups or H0 is accepted. U value for body weight after intervention is 1605 and W value is 3435. If converted to Z value, the amount is -1.024. The sig or p-value of 0.306>0.05 means that there is no significant difference between the two groups or H0 is accepted.

The results of this study are in line with research conducted by Bakri SH which states that there is no difference in weight gain between the intervention and control groups before and after the provision of supplementary food biscuits to pregnant women with SEZ with paired T-Test results p value 0.096[35].

According to the researcher's assumption, there was no difference in weight gain between the case and control groups after being given an intervention in the form of healthy nutritious supplementary food because although the control group was not given education in the form of counseling and counseling on nutrition for pregnant women and the concept of 1000 HPK nutrition, pregnant women already knew some information about health during pregnancy because they often checked their health at the Primary health services. The results of this study compared with Silawati's research [15] showed that there was a significant difference in the weight of pregnant women before and after being given additional food and milk for pregnant women in the experimental group (p <0.05)[36]. In another study by Candra dewi entitled The Effect of Supplementary Feeding on Increasing the Weight of Pregnant Women with Chronic Energy Deficiency in the Working Area of the Labuan Lombok Health Center, the results of the paired t-test P < 0.05 which mean that there is an effect of supplementary feeding on increasing the weight of pregnant women with chronic energy deficiency[37,38,39]. The nutritional status of pregnant women is reflected in their anthropometric measurements. The most commonly used anthropometric measures of pregnant women are maternal weight gain and upper arm circumference (LiLA)[40,41,42]. LiLA is a simple and practical anthropometric measure and has been applied in the field to identify the risk of SEZ in women of childbearing age[43,44]. LiLA is a good predictor of the risk of LBW, early neonatal death, and nutritional status of infants up to 9 years of age[45].

Based on Table 2, it is known that the average arm circumference of pregnant women in the case group before the intervention was 21.78, minimum arm circumference 19.00, and maximum 23.00, while in the control group, the average arm circumference of pregnant women was 21.75,

minimum arm circumference 18.50, and maximum 23.00. The case group and control group after the intervention are different, namely in the case group has an average of 23.09, minimum arm circumference of 19.50, and weight of 25.00, while the control group has an average arm circumference of 23.14, minimum arm circumference of 20.00, and maximum 25.00. The Mann-Whitney test U value for LILA before intervention was 1768 and the W value was 3598. The sig or p-value of 0.865>0.05 means that there is no significant difference between the two groups or H0 is accepted. the U value for LILA after the intervention was 1677 and the W value was 3507. If converted to Z value, the amount is -653. The sig or p-value of 0.514>0.05 means that there is no significant difference between the two groups or H0 is accepted.

According to the researcher's assumption, similar to the weight indicator of pregnant women with SEZ, there was no difference in LiLA in both the case group and the control group because both groups received the intervention in the form of providing nutritious healthy food. One of the causes of LBW in pregnant women is food intake. Pregnant women who experience SEVERITY must be intervened immediately. The form of additional energy can be in the form of Supplementary Feeding (PMT). PMT can be in the form of local or manufactured food and nutrient-dense drinks[46,47,48]. In Indonesia itself, the government has a PMT program in the form of biscuits and local food researched the composition of the Indonesian PMT is still insufficient to meet the needs of pregnant women with SEZ so the administration time tends to be long for 3 months, but still able to provide the same results, namely a significant improvement in nutritional status and routine supervision. The results of this study compare with research conducted[50,51]. PMT given for 10 weeks faster in the form of instant food made from corn, soybeans, and multi-micronutrient supplements and gave significant results in the form of an increase in body weight and LILA by 20%. The average PMT is given in the form of supplements with a composition containing protein, iron, folic acid, and energy. This shows that the problem of stunting can have an impact on the patient's family and have an impact not only on physical conditions but also on psychological conditions such as stress and family anxiety disorders[52,53,54,55].

Conclusion

The average weight and LiLA of both case and control groups were different before and after the nutrition intervention. The results of the mann whitney difference test, P Value> 0.05 so there is no significant difference between the case and control groups. there is no difference because most pregnant women in both case and control groups have often received education from health workers

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Conflicts of Interest

The authors declare no conflict of interest.

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