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The Effect of Family Assessment of Less Chronic Energy (LCE) Pregnant on Nutritional Status of Pregnant and Baby Birth Size

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ABSTRACT

The study aimed to determine the effectiveness of Family Assessment and Less Chronic Energy (LCE) pregnant to improve the nutritional status of pregnant and the size of the birth weight and length of babies in Bengkulu and Bandar Lampung City in 2018. The study used a quasi-experimental method. Assessment is carried out by health cadres and health workers for 6 months. Samples were LCE pregnant trimester II consisting of 30 intervention groups and 30 control groups for each study location. Data analysis using hypothesis testing different mean two independent and dependent groups. The results of the study found that family assessment effectively increased the upper arm circumference (UAC) average, there was an increase in the size of the UAC between the intervention and control groups, but there was no difference in the mean weight increase between the intervention and control groups. In Kota Bengkulu there was no difference in mean birth weight between the intervention and control group ($p=0.719$), but in Bandar Lampung City there were significant differences ($p=0.02$). There was a difference in the mean length of birth of the baby between the intervention and control group. Family assistance with LCE pregnant needs to be done to ensure that pregnant carry out healthy behaviors in nutritional intake and utilization of health services to improve the nutritional status of pregnant and the size of the baby's birth.

Keywords: Family Assessment, LCE pregnant, upper arm circumference, birth weight, birth length

Introduction

LCEs during pregnancy are a condition in which the nutritional status of a pregnant woman is in a bad condition due to the unmet needs of macro and micro nutrients, while the nutritional needs of pregnant increase than usual when they are not pregnant so there is a need to increase the consumption of nutritious foods, especially consumption of food sources of energy¹. If energy needs are not met in the long run, it produces less energy, causing chronic energy shortages.

Nationally, the prevalence of LCEs in 2007 was 21.6% and then increased in 2013 to 24.2%². Prevalence

of LCE pregnant in Indonesia is a public health problem because the prevalence is more than 20%. Ministry of Health of the Republic of Indonesia provided a budget for the recovery of under-nutrition status for infants and LCEs for pregnant with LCE through the Health Operational Assistance Fund allocated in each puskesmas, through the Supplementary Feeding Programme (SFP) to pregnant with LCE. This SFP is based on local food ingredients with a regional specialty menu that is adapted to local conditions as additional food, not substitute for daily main meals^{3,4}. But the data shows the prevalence of LCE pregnant is still high, then the SFP is also not optimal.

National data shows that only 25.2% of LCE pregnant received SFP, from those who received SFP only 89.7% of SFP from the program⁵. The study results in Jatinangor District found that only 29.5% of LCE pregnant received interventions, namely weight and UAC measurements, nutrition awareness counseling and SFP. Of the 29.5% who received the intervention, only 36.3% received the SFP of LCE pregnant. This results in pregnant from LCE unable to restore their nutritional status⁶.

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LCEs during pregnancy have a negative impact on the mother, labor and fetus and baby^{1,7,8}. Various effects of LCE on pregnant are the basis for interventions carried out for LCE pregnant². The purpose of this study was to determine the effectiveness of assessment families and LCE pregnant in improving nutritional status of pregnant and the size of weight and length birth in Bengkulu and Bandar Lampung City.

Method

This study used *Quasi experiment with non randomized control group pre-test – post-test design*. Intervention in the form of families assessment and LCE pregnant by health cadres in fulfilling nutritional intake

of LCE pregnant in trimester II pregnant to 6 months. The control group received standard Puskesmas services and were given a booklet without assistance. The study was conducted from May to October 2018. The population in this study were LCE pregnant in Bengkulu and Bandar Lampung City. Exclusion criteria are pregnant in high risk groups and pregnant suffering from diabetes mellitus, hypertension, and other comorbidities. A total sample of 60 intervention dan 60 control group pregnant with LCE. UAC data were collected and maternal weight before pregnancy or in the first trimester of the Mater¹² and Child Health (MCH) book. Data analysis using independent t test, *Mann Whitney U*, paired t tets and *Wilcoxon Rank Test*.

Results

Table 1: Changes in UAC of Less Chronicle Energy Pregnant

Bengkulu	Pre		Post		Pvalue*
	Min-Max	± SD	Min-Max	± SD	
Intervention	19-23.5	21.99 ± 1.22	23.0-26.0	23.91 ± 0.75	0.0001
Controls	18-23	21.85 ± 1.41	21-25.5	23.23 ± 1.27	0.001
Pvalue**	0.675		0.015		
Bandar Lampung	Pre		Post		Pvalue*
	Min-Max	± SD	Min-Max	± SD	
Intervention	20-23.4	22.7 ± 0.8	21-23.6	23 ± 0.7	0.0001
Controls	19.5-23.4	22.1 + 0.9	19,5-23,4	22.1 + 0.9	0.655
Pvalue**	0.052		0.0001		

*paired t tets **independent t test

Table 1 shows that in Bengkulu there were differences in the average UAC before and after in intervention and control group. In Bandar Lampung showed that the difference in average UAC before and after nutritional assistance only occurred in intervention group. Nutrition assistance is effective to improve UAC LCE pregnant.

Table 2: Changes in Body Weight of Pregnant Less Chronicle Energy

Bengkulu	Pre		Post		Pvalue*
	Min-Max	± SD	Min-Max	± SD	
Intervention	38-61	47.48 ± 5.18	45-58	52.18 ± 5.15	0.004
Controls	36-68	49.32 ± 7.78	36-68	50.95 ± 8.87	0.0001
Pvalue**	0.23		0.624		
Bandar Lampung	Pre		Post		Pvalue*
	Min-Max	± SD	Min-Max	± SD	
Intervention	39-84	8.5 ± 52.62	45-86	8.03 ± 55.5	0.002
Control	38.5-73.0	49.91 ± 6.82	42.7-74	52.4 ± 6.29	0.001
Pvalue**	0.178		0.1		

*Wilcoxon Rank Test **Mann Whitney U

Table 2 shows both City there was no difference in mean maternal weight between intervention and control group. After nutrition assistance there was no difference in mean maternal weight. By comparing the average maternal weight before and after nutritional assistance, both in the intervention and the control group there were differences in the average maternal body weight before and after in both City.

Table 3: Average Improved Pregnancy Weight LCE

Group	Bengkulu		Bandar Lampung	
	Min-Max	± SD	Min-Max	± SD
Intervention	1.0-20.0	7.15 ± 5.05	1-6	2.88 ± 1.07
Controls	-9.0-19.0	6.43 ± 6.28	1-5.2	2.48 ± 1.26
Pvalue*	0.628		0.185	

*independent t test

Table 3 show that in both City there was an increase in the average body weight in the intervention and the control group, but there was no difference in the average weight gain between the intervention and the control group (p> 0.05).

Table 4: Average Birth Weight of Babies from LCE Pregnant

Group	Bengkulu		Bandar Lampung	
	Min-Max	± SD	Min-Max	± SD
Intervention	2-4.1	2.79 ± 0.51	2-4.0	2.5±0.5
Control	1.7-3.5	2.74 ± 0.51	2-3.0	2.2±0.4
Pvalue*	0.719		0.020	

*independent t test

Table 4 show that in Bandar Lampung city, average birth weight in the intervention group was higher than the control group, but in the Bengkulu city there was no difference in mean birth weight between the intervention and control group (p=0.719).

Table 5: Average Birth Length of Infants from LCE Pregnant

Group	Bengkulu		Bandar Lampung	
	Min-Max	± SD	Min-Max	± SD
Intervention	46-50	49.13 ± 1.55	46-51	47.9±1.5
Controls	35-51	47.41 ± 3.41	44-49	46.7±1.4
Pvalue**	0.033		0.004	

*independent t test

Table 5 show that the average length of birth in the intervention group was higher than the control group, and the difference was significant in the two study locations.

Discussion

Family assessment and Nutritional Status of Pregnant: The results showed that after nutrition assistance there was also no difference in the average

weight of LCE pregnant between the intervention and control group in both cities. However, when compared to the results of measurements before and after treatment, both in the intervention and control group there was an increase in body weight before and after in both cities. Nutritional counseling can increase the knowledge and motivation of pregnant to adopt a healthy diet during pregnancy so that they have normal weight gain as a

manifestation of a healthy diet¹⁰. The study in Surabaya city also found that supplementary feeding was able to provide changes in nutritional status of LCE pregnant to normal¹¹. The government program for LCE pregnant is expected to be effective in restoring the nutritional status of LCE pregnant. SFP is carried out for 90 days and evaluates every month by looking at weight gain and UAC, so that the nutritional status of the mother becomes normal^{4,5}.

There was no difference in the average weight of pregnant between the intervention and control group in the two cities likely related to consumption of SFP in pregnant, because both in the intervention and control group received SFP in pregnant. The government has made a SFP program for pregnant, but this feeding is only focused on pregnant with LCE status and low socio-economic conditions. This is a problem because it is feared that the food provided by the government through the puskesmas is not only consumed by pregnant but also by other family members so that it is less effective¹².

The increase in UAC size and body weight in LCE pregnant is related to food consumption and SFP intake of pregnant. The provision of SFP aims to meet maternal nutritional needs during pregnancy, especially the adequacy of protein⁵. The right time in the implementation of SFP as a nutritional supplementation program for pregnant is in the second and third trimesters because at the gestational age the nutritional needs increase and fetal growth runs fast¹².

Nutritional Assistance and Infant Birth Size: The results of this study indicate the low average birth weight of LCE pregnant. This finding relevant with the results study at Yogyakarta, average birth weight of infants in LCE pregnant was 2873.33 grams while in pregnant who were not LCEs there were 3107.01 grams. There is an average difference of 233.68 grams¹³. Intervention in LCE pregnant gave a positive effect on infant birth weights, where the risk of IUGR or LBW decreased with intervention in LCE pregnant¹⁴. Research in East Java also suggested that early detection and intervention can be carried out by measuring the UAC to be carried out routinely every time a antenatal care with the aim of detecting and reducing the risk of pregnancy and birth¹⁵.

The theory explains that a pregnant woman who experiences a lack of nutritional intake will cause abnormalities in the fetus she contains. The inability

of pregnant to meet their nutritional needs will have an impact on the weight of babies born¹⁵. The study found that LCE pregnant had a risk of 7.9 giving birth to LBW compared to mothers who were not LCEs. The LCE status of pregnant greatly affects the growth of the fetus in the womb, if the maternal nutritional status is poor before and during pregnancy will cause LBW. Malnutrition in pregnant for a long time and continuously during pregnancy will result in worse for the fetus¹⁶. The other consequences of LCE pregnant is damage to the central nervous system, especially in the first stage of brain growth that occurs during the womb¹³.

The results of this study showed differences in the average length of birth of babies between LCE pregnant who receive assistance and do not receive assistance. But the average length of birth of a baby is still low, which is less than 50cm. The study found that the average length of birth from LCE pregnant was 47.86 cm¹³. In theory, the LCE pregnant means that the mother has experienced a state of malnutrition in the long term. If this happens, the nutritional needs of the fetus's growth process will be hampered, so that babies are born short and LBW. LCE causes pregnant not to have adequate reserves of nutrients to provide the physiological needs of pregnancy, namely hormonal changes and increase blood volume for fetal growth, supply of nutrients in the fetus decreases as a result of stunted fetal growth and development¹⁷.

LCE maternal companion cadres are able to motivate mothers to increase consumption of balanced foods and adhere to consuming SFP for pregnant and blood boosting tablets. The Khatijah et al (2010) states that there is a relationship between adherence to taking iron tablets with the incidence of anemia. Pregnant who consume only one tablet a week have an increased risk of anemia when they are pregnant 12 times compared to mothers who consume iron tablets every day¹⁸. Consumption of iron tablets less than 90 tablets will increase the risk of anemia 1.81 times because iron is an important component in the formation of hemoglobin¹⁹. Iron deficiency is at risk for the fetus and pregnant. The fetus will experience disorders or obstacles to growth, both body and brain cells. Besides that it can also cause death in the fetus in the womb, abortion, congenital defects and LBW²⁰. The study showed that there was an effect of giving SFP to pregnant with infant nutritional status. The SFP proved to significantly influence the birth weight¹².

This result relevant with research in India, show that energy intake has a significant effect on the incidence of LBW so that mothers who receive good nutrition will have the opportunity to have babies with greater birth weight. The intake of protein and Fe which is getting closer to the number of nutritional adequacy (RDA) will further increase the baby's birth weight. Protein is one of the macro-nutrients needed by pregnant for fetal growth and development in the womb^{21,22}.

Conclusion

The family assessment of pregnant less chronic energy effective in restoring maternal nutritional status and improving birth weight and length. Need to conduct nutrition and health interventions for LCE pregnant by empowering the community (health cadres) by fostering by health workers and the need for family empowerment to monitor and ensure that LCE pregnant consume nutritious food and receive health services. Health workers need to be trained to detect early risk factors. Complications and impacts that occur in pregnant with LCEs. Then it needs collaboration between health workers in providing care for pregnant with LCEs. Collaborating with the community to explore the potential of local food ingredients to meet the nutritional needs of LCE pregnant so that they can restore LCE conditions to normal and give birth to healthy babies with normal birth weights and lengths.

Conflict of Interest: The authors declare that there is no conflict of interest.

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Ethical Clearance: This study received Ethical Acceptance approval from the Health Research Ethics Committee of Health Polytechnic Tanjung Karang for Number 77/EC/KEP-TJK/V/2018 dated May 3 2018.

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