

# ASSISTANCE INTERVENTION in THE FORM of DISTRIBUTION of LOCAL FOOD (SERWIT) with the IMPLEMENTATION of INTERPROFESSIONAL EDUCATION- COLLABORATIVE PRACTICES on NUTRITIONAL STATUS of PREGNANT WOMEN

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## ***Abstract:***

The groups most vulnerable to malnutrition are pregnant women, infants and toddlers. Nutritional problems on pregnant women, if not addressed immediately will cause mothers to experience Chronic Energy Deficiency (CEC), a solution to overcome the problem of malnutrition of pregnant women are a form of assistance of local food consumption (serwit), by the implementations of Interprofessional Educative-Collaborative Practices (IPE-CP)

The aim of the research is to understand the effect of assistance interventions for local food consumption (serwit) with the application of Interprofessional Education-Collaborative Practice (IPE-CP) to the nutritional status of pregnant women. This research is a quantitative research, a type of quasi-experiment research, Pre-post test group design. Sample of 60 pregnant women in the third trimester, which is divided into 30 intervention groups and 30 control groups. Univariate data analysis uses the Mean formula, bivariate analysis uses the Independent Test T test, and the experiment of the influence of hypothesis uses the Cohen's Effect Size test.

Results of the assistance intervention in the consumption of local food consumption (serwit) with the application of Interprofessional Education-Collaborative Practices (IPE-CP) on the nutritional status of pregnant women: Maternal weight with a p-value of 0.003, LiLA size of pregnant women with a p-value of 0,000 and blood Hb levels of maternal with a p-value of 0.025. Effect Test which is the most important measure is maternal height with an effect size index: 0.79 standard big categories. The advice should be an existence of need to always apply IPE-CP and to continue to preserve local food consumption (serwit) to improve the nutritional status of pregnant women.

***Keywords:*** Local Food (Serwit), Interprofessional Education-Collaborative Practice (IPE-CP), Nutritional Status of Pregnant Women. *Reading List: 2010-2018.*

## INTRODUCTION

### Preface

Nutritional status is a condition that results from a balance between nutrient intake from food and nutrient requirements needed for the body's metabolism<sup>1</sup>. The nutritional status of pregnant women plays a direct role in the condition of fetal growth in pregnancy and the baby who will be born. The nutritional status of pregnant women is a measurement of success in fulfilling nutrition for pregnant women<sup>2</sup>. Adequate nutritional status and good food intake during preconception and pregnancy have been recognized as a major contributor to healthy birth outcomes<sup>3</sup>. Nutritional status assessment can be done in four ways namely; clinical, biochemical, anthropometric and food consumption surveys<sup>4</sup>. Anthropometric assessment is an assessment of maternal body size<sup>5</sup>. This research will look at indicators of maternal nutritional status by anthropometry, namely: maternal body weight (BW) and upper arm circumference (LiLA) size and biochemical assessment by looking at maternal blood hemoglobin (Hb) levels.

During pregnancy there will be an increase in energy metabolism and nutrient requirements, this increase is needed for fetal growth and development, so that if there is a deficiency of nutrients can cause fetal growth disorders<sup>6</sup>. Based on recommended dietary allowance (RDA) in 2013, pregnant women need additional energy from the energy needs needed before pregnancy occurs, during pregnancy the mother requires additional energy 300 kcal / day, carbohydrates 40 gr / day, protein 20 gr / day and fat 10 gr / day, as well as other micronutrients to help the process of fetal growth in the womb<sup>7</sup>.

To meet the energy and nutrient requirements during pregnancy, food intake and dietary arrangement are needed since the beginning of labor until the end of pregnancy which consists of 3 trimesters of pregnancy<sup>8</sup>. Daily food consumption of pregnant women will be more effective and efficient by utilizing the local eating culture in an area. Tulang Bawang Barat Lampung pepadun tribe has a cultural tradition of consuming local food (serwit) in its daily diet. Serwit is a traditional food consists of basic ingredients of fish, chili and various kinds of vegetables / vegetables as side dish, which are eaten with rice as a staple food<sup>8</sup>. But in reality, it is often found in the field, the composition and amount of local food serwit consumed by pregnant women does not yet meet the recommended dietary allowance (RDA) needed by pregnant women, so researchers feel the need to have an assisted preparation of the local food consumptions (serwit).

Based on the Recommended Energy Adequacy (AKE) in 2017 53.9% of pregnant women experienced an energy deficit (<70% AKE) and 13.1% experienced a light deficit (70-90% AKE). For Lampung province 74.4% of pregnant women experienced energy deficits (<70% AKE) and 10.2% had mild deficits (70-90% AKE). Inadequate energy and protein intake in pregnant women are to be blamed for pregnant women experiencing nutritional and health problems that will have an impact on the health and safety of both the mother and baby, as well as the poor quality of nutritional status and even the poor health of new-born baby<sup>9</sup>.

The results of monitoring nutritional status, the percentage of pregnant women which is at risk of Chronic Energy Deficiency (CEC) nationally in 2016 was 16.2%, while in 2017 the percentage was decreased by 14.8%. The percentage of (CEC) pregnant women in 2017 in Lampung province is still high at 18.5%, above the national average. The description of nutrition problems of pregnant women in Lampung province can be seen in the problems and performance of the Nutrition Programs in the Province of Lampung since 2017. In the district

of Tulang Bawang Barat, the risk of a pregnant woman under CEC is as high as: 26.3%, becoming the highest incidence in Lampung province.<sup>10</sup>

To overcome the problem of nutritional status of pregnant women, researchers conducted a strategy with the Interprofessional Educative Collaboration Practice (IPE-CP) approach. Interprofessional collaborative practice in midwifery services with an involvement of a variety of professions<sup>11</sup>. Professionals involved in tackling nutritional problems in pregnant women include staff of midwives, nutritionists, doctors and community leaders. The aim of IPE-CP is to develop collaborative practices between professions, in learning on how to work together by providing the knowledge, skills and attitudes needed to collaborate effectively<sup>12</sup>. The benefits of implementing IPE in health services are derived from an achieved of good collaboration between health practitioners for the implementation and achievement of a program<sup>13</sup>. Education provided by the team about the four pillars of balanced nutrition in third trimester (TM3) on pregnant women who were the subjects of the study, includes: consuming a variety of foods, familiarizing clean behavior, carrying out physical activities (pregnancy exercises) and monitoring body weight (BW) in a manner regularly<sup>14</sup>. The IPE-CP method in providing education to pregnant women with the assistance of providing local food (serwit) is expected to overcome nutritional problems in pregnant women.

The aim of this study is to look at the effectiveness of the influence of local food intervention assistance (Serwit) through the application of the Interprofessional Education-Collaborative Practice (IPE-CP) method about the nutritional status in TM3 pregnant women in the District of Tulang Bawang Barat, Lampung Province.

## METHOD

This type of *experimental* research with the *Quasi Experiment* research method, *Nonequivalent control group design*. Research design uses *Pretest - Posttest-Only Control Group Design*. This study measures the influence of local food consumption assistance (Serwit) through the application of *Interprofessional Education-Collaborative Practice* (IPE - CP) on a balanced nutrition of the nutritional status of pregnant women, which will be compared between the treatment and control groups.

The population is all three trimester pregnant women in Tulang Bawang Barat and Tulang Bawang Tengah in July-August 2019, the number of samples taken are based on the Federer formula obtained a sample size of 60 third trimester pregnant women. The sample is divided into 2 groups, (Intervention and control). The intervention group is treated by a team of experts (Doctors, Midwives, Nutritionists and Nurses) with the application of Interprofessional Education Collaborative Practice (IPE-CP), educational material on the four pillars of balanced nutrition and assisted intervention in local food consumption (serwit), for 30 days. Univariate data analysis uses the *Mean* formula, while bivariate analysis uses the *Independent T Test*, and to test the magnitude of the influence of the hypothesis with the *Cohen's Effec Size Test*<sup>15</sup>

## RESULTS AND DISCUSSION

a.		Univariate		Analysis
1)	<i>Characteristics</i>	<i>of</i>	<i>Pregnant</i>	<i>TM3</i>
			<i>Women</i>	

Table. 1  
of Mother

Characteristic	Intervention Grp		Control Grp	
	Amount	%	Amount	%
<b>Age of Mother</b>				
<20	1	3,3	1	3,3
20-35 yrs old	25	83,4	28	93,3
>35 yrs old	4	13,3	1	3,3
Amount	30	100	30	100
<b>Education</b>				
Elementary	4	13,3	4	13,3
Middle School	4	13,3	11	36,7
HS & College Grad	22	73,4	15	50
Amount	30	100	30	100
<b>Occupation</b>				
Employed	10	33,3	12	40
Unemployed	20	66,7	18	60
Amount	30	100	30	100
<b>Parity</b>				
Primi	10	33,3	9	30
Multi	20	66,7	21	70
Amount	30	100	30	100
<b>Income</b>				
< RMW (Rp.2.251.624)	13	43,3	8	27
> RMW (Rp.2.251.624)	17	56,7	22	73
Amount	30	100	30	100

Characteristics

Average Mother Body Weight (in kg)	Intervention Grp	Control Grp
	n.30	n.30
After intervention	62,27	53,75
Before intervention	60,77	52,77
Increased Body Weight	1,50	0,98

Results: the subjects pregnant with TM3 age studies ranged from 20 to 35 years by 83.4% in the intervention group and 93.3% in the control group, the level of maternal education namely HS and College Grad (Higher Education) as much as 73.4% in intervention group and by 50% in the control group. The majority of unemployed in both the intervention and control groups by 66.7% and 60%. The majority of multiparous parity in both the intervention and control groups were 66.7% and 70%, and the majority income of more than the RMW (Regional Minimum Wage) is obtained in the intervention group by 56.7% and the control group by 73%.

## 2) Increase in body weight of pregnant women TM3

Table 2. Weight Increase for pregnant women TM3

The results concluded an average weight gain in the intervention group experienced an average increase of 1.50 kg, in the control group the average weight gain of pregnant women TM3 is only 0.98 kg. While the average maternal weight gain after analysis with the Body Mass Index (BMI) of a mother before pregnancy is:

Table 3. Increase in Body Weight of TM3 pregnant women according to BMI

Increase Body Weight	Intervention Group		Control Group		Total	
	N	%	N	%	N	%
According BMI	23	77	12	40	35	58
Not According	7	23	18	60	25	42
Amount	30	100	30	100	60	100

The results of the study of the average weight gain of pregnant women TM3 after being adjusted to the Body Mass Index (BMI) in the intervention group in the category according to

Changes Pregnant Women	WG	N	Mean		Sd		Mean		SE Difference		t <sub>Count</sub>	PValue
			Intervention Group				Control Group					
			Before		After		Before		After			
			n	%	n	%	N	%	N	%		
Intervention		30	25	83,3	29	96,7	27	90	28	93	3,06	.003
>23,5 cm												
<23,5 cm			5	16,7	1	3,3	3	10	2	0,7		
Control		30	30	100	30	100	30	100	30	100		
Amount												

the value of 23 BMI of mothers is 77%. Whereas in the control group, the average weight gain is not according to BMI only 18 mothers, by 60%.

### 3) Upper Arm Circumference (LiLA) Pregnant women TM3

Table 4. Maternal LiLA measures

The results of the study of the average size of the upper arm circumference (LiLA) of the mother before being given the intervention, on the intervention group amounted to 33.3 and the most control group with a size of LiLA > 23.5 cm (83.3% & 90%). After intervention the average size of LiLA of the mother experienced a slight change with a size of LiLA > 23.5 cm (96.7% & 93%).

### 4) Blood levels of hemoglobin (Hb) in pregnant women TM3

Table 5. Maternal Hemoglobin (Hb) blood levels

Hb Level	Intervention Group				Control Group			
	Before		After		Before		After	
	n	%	n	%	N	%	N	%
>11 gram %	6	20	23	76,7	12	40	16	53
< 11 gram %	24	80	7	23,3	18	60	14	47
Amount	30	100	30	100	30	100	30	100

The results of the study were the average blood levels of Hemoglobin (Hb) TM3 pregnant women before being given the intervention, in the most intervention and control groups with hemoglobin levels <11 grm% (80% & 60%). After the intervention the average Hb level increased with a Hb level > 11 grm by 76% in the control group at around 53%.

## b. Bivariate Analysis

### 1) The effect of local food consumption (Serwit) assisted interventions on TM3 weight gain in pregnant women

Table 6. Results of analysis of assisted interventions for local food consumption (Serwit) on weight gain of pregnant women Trimester III

Results Analysis of data on assisted intervention of local food consumption (Serwit) on weight gain of pregnant women after the intervention. In the intervention group, the average maternal weight gain is 62,267 kg with a standard deviation of 12,079. Whereas in the Control group the maternal weight gain is only 53,747 kg with a standard deviation of 9,270. Statistical test results obtained a significant value (*P.value* = 0.003) and *t<sub>count</sub>* (3.06) is greater than *t<sub>Table</sub>* (0.05.58) (2.00) which means that there is an influence of providing assisted

Hypothesis	Effect Size (d)	Average impact	Category
Effect of assisted intervention on local food consumptions (Serwit) on the increasement of maternal body weight.	0,79	79%	Large
Effect of assisted intervention on local food consumptions (Serwit) on the size of upper arm circumference (LiLA) pregnant women	0,54	69 %	Medium
Effect of assisted intervention on local food consumptions (Serwit) on Hemoglobin (Hb) level of pregnant women	0,60	73 %	Medium

interventions of local food consumptions (serwit) on weight gain (BB) on third trimester pregnant women.

2) *The influence of local food consumption (Serwit) assisted intervention on the size of the Upper Arm Circumference (LiLA) of third trimester pregnant women.*

Table 7. Results of analysis of assistance interventions for local food consumption (Serwit) on the size of the Upper Arm Circumference (LiLA) of pregnant women

LiLA pregnant women	size	n	Mean	Sd	Mean difference	SE Difference	t <sub>Count</sub>	P Value
Intervention		30	27.593	2.843	1.610	.7636	2.11	.039
Control		30	25.983	3.067				

The results of the data analysis of the assisted intervention for local food consumption (Serwit) on the size of the Upper Arm Circumference (LiLA) of pregnant women TM3 bodies after the intervention. In the intervention group, the average maternal LiLA size is 27,593 cm with a standard deviation of 2,843. Whereas in the average group, maternal LiLA size is only 25,983 with a standard deviation of 3,067. Statistical test results obtained a significant value (*P.value* = 0.039) and *t<sub>count</sub>* (2.11) is greater than *t<sub>Table</sub>* (0.05.58) (2.00) which means that there is an effect of providing assisted interventions on local food consumptions (serwit) on the size of the Upper Arm Circumference (LiLA) third trimester pregnant women.

3) *The influence of the assisted intervention on local food consumption (Serwit) on hemoglobin (HB) blood levels of third trimester pregnant women.*

Table 8. Results of analysis of assistance interventions for local food consumption (Serwit) on hemoglobin (HB) blood levels of pregnant women

Hb level pregnant women	n	Mean	Sd	Mean Difference	SE Difference	t <sub>count</sub>	P Value
Intervention	30	11.77	1.2103	.6533	.2833	2.31	.025
Control	30	11.12	.9710				

Results Analysis of data on intervention to assist the consumption of local food (Serwit) to increase levels of Hemoglobin (Hb) blood of pregnant women after the intervention. In the intervention group, maternal hemoglobin levels were obtained on average 11.77 mg% with a standard deviation of 1,210. Whereas in the average group the maternal blood hemoglobin level is only 11.12 with a standard deviation of .9710. Statistical test results obtained a significant value (*P.value* = .025) smaller than  $\alpha$  (0.05) and *t<sub>count</sub>* (2.31) greater than *t<sub>Table</sub>* (0.05.58) (2.00) which means that there is an effect of providing assisted interventions on local food consumptions ( serwit) to the levels of hemoglobin (Hb) blood of pregnant women.

c. Effect Size Analysis

Table 9. Results of Calculation of Effect Size Analysis

(Cohen, J. (1988). *Statistical Power Analysis for the behavioral Science Second Edition*. United States of America Associates: Lawrence Erlbaum<sup>15</sup>.

Results of the analysis of the *Effect Size* calculation data for assisted interventions on local food consumption (Serwit) with the application of Interprofessional Education-Collaborative Practice (IPE-CP) have the most influence on the increase in body weight of pregnant women with the effect size index results of 0.9 with the standard of large category.

## DISCUSSION

### 1. Effect of local food consumption assistance (Serwit) intervention on the weight gain of pregnant women.

The nutritional status of the mother before and during pregnancy can affect the growth of the fetus being conceived. If the mother's nutritional status is normal in the period before and during pregnancy, it is likely to give birth to a healthy baby, enough months, with normal weight. In other words, the quality of babies born is highly dependent on the nutritional condition of the mother before and during pregnancy<sup>16</sup>. One indicator of a good mother's nutritional status during pregnancy, can be seen from the increase in maternal weight. Ideal maternal weight gain during pregnancy is recommended based on maternal weight before pregnancy, the basis for calculating maternal weight gain based on Body Mass Index (BMI)<sup>17</sup>. Weight gain for pregnant women can be monitored by weighing pregnant women at least 1 time at the end of each trimester<sup>18</sup>. The results showed that maternal weight gain after 30 days of the given intervention treatment by adjusting the local food consumptions (serwit) consumed by pregnant women in accordance with the Recommended Energy Adequacy (AKE), in quantity the average maternal body weight increased by 1.5 kg at the intervention group, whereas in the control group only 0.98 kg. When analyzed in quality, maternal weight gain in the intervention group is better than the control group, where maternal weight gain in the intervention group is mostly resulted in the group according to BMI of 77%, while in the largest weight gain group is not in line with BMI of 60%. This is in accordance with the phrase<sup>19</sup>, where the nutritional status of the mother is influenced by the intake of food consumed by the mother during pregnancy, this is associated with maternal weight gain during pregnancy, however excessive weight gain during pregnancy can be associated with large babies, so as to increase risk of complications in labor, yet if there is a low weight gain, it will pose a risk of low birth weight infants, with various possible long-term health implications. Babies born with low weight have 6-10 times higher mortality than babies born with normal weight.

The results of the study were strengthened by a study entitled *The Correlation between Nutritional Status and Eating Patterns on Pregnancy Weight Gain*<sup>20</sup>. The results show that there is a relation between nutritional status and weight gain ( $p = 0.008$ ,  $r = -0.311$ ) and there is a relation between staple food patterns and weight gain ( $p = 0.003$ ,  $r = 0.344$ ). The same research in China, that an adherence to consuming recommended nutrients with an emphasis on education about nutrition, can reduce the nutritional status disparities that occur<sup>21</sup>. Intervention assistance techniques for local food consumption (Serwit) in this study are strengthened by Interprofessional Collaborative Practices in improving the nutritional status of pregnant women. The implementation of IPE in health education has three focuses. First, to increase knowledge, skills and attitudes in the practice of collaboration between health professionals. Second, it focuses on learning about how to create effective collaboration in a

team. Third, create effective collaboration to improve the quality of service for patients<sup>22</sup>.

The IPE process forms a process of communication, brainstorming, learning, to find something favorable between different health professional workers in order to solve a problem or to improve the quality of health<sup>23</sup>. These things are in accordance with the *Framework for Action on Interprofessional Education & Collaborative Practice* issued by WHO, 2010. To recommend the implementation of IPE and collaborative practices in education systems and health services throughout the world<sup>24</sup>. The IPE-CP technique approach is very effective in overcoming the nutritional problems of pregnant women. This was strengthened in Research (Widyaningrum. 2018) titled: *The Effect of Pregnant Mother's Perception Towards the Level of Pregnant Mother Satisfaction to Interprofessional Education of Medical Faculty of Diponegoro University*, Results: showed 51.8% of pregnant women were satisfied and 48, 2% of pregnant women were dissatisfied with implementing the IPE program at the Rowosari Health Center<sup>25</sup>.

The results of the study in the intervention group showed an increase in maternal weight on average 62,267 kg with a standard deviation of 12,079. Whereas in the Control group the maternal weight gain was only 53,747 kg with a standard deviation of 9,270. Statistical test results obtained a significant value ( $P. value = .003$ ) is smaller than  $\alpha$  (0.05) and  $t_{count}$  (3.06) is greater than  $t_{Table}$  (0.05.58) (2.00) which means, there is an influence of the implementation of assisted interventions on local food consumptions (serwit) on weight gain (BB) in third trimester of pregnant women. The results of this study were strengthened by the research of Setyarahma et al (2016) entitled *The Relationship of Food Intake and Weight Gain in Pregnant Teenagers aged 15 -19 Years (Hubungan Asupan Makanan Dengan Penambahan Berat Badan pada Remaja Hamil usia 15-19 Tahun)*. The statistical results obtained p value of  $.000 < 0.05$  which means that there is a relation between the level of energy adequacy and weight gain. And there is a relation between the levels of protein adequacy with weight gain with a p-value of. 040 ( $< 0.05$ ).

The conclusion of this research can be interpreted as providing assistance for local food consumption (serwit) with the Interprofessional Educative Calaboration Practice (IPE-CP) approach, by regulating the local food menu (serwit) both its composition, quality and quantity, and the regulation of food consumed by the mother pregnant in semester III with the recommended number of calories 2500 kcal are able to control the weight gain of pregnant women in accordance with BMI.

2. Effect of Assisted Intervention of local food consumption (Serwit) on the size of the Upper Arm Circumference (LiLA) of pregnant women  
The size of the upper arm circle (LiLA) reflects the growth and development of fat and muscle tissue that does not have much effect on body fluids. This measurement is useful for screening protein malnutrition which is usually used to detect pregnant women with the risk of giving birth to LBW if LiLA  $< 23.5$  cm. If a person consumes less nutrients than his nutritional needs, that person will experience malnourishment<sup>26</sup>. Chronic Energy Deficiency has caused many complications during pregnancy especially during the first period of pregnancy<sup>27</sup>.

To prevent the occurrence of CEC in pregnant women, it requires the need for 2500 calories intake per day. The addition of calories in pregnant women is approximately 300 calories of needs before pregnancy. Fulfillment of these calories is obtained from food: 6 servings of rice, 4 servings of vegetables, 4 servings of fruit 4 portions of animal side dishes, and 3 servings of

vegetable side dishes<sup>9</sup>. During assistance, mothers are given supervision to always consume food based on whistle according to calorie requirements recommended for pregnant women. Fish, which is a basic ingredient of local food (serwit), is an animal protein source that is safe for consumption by pregnant women, besides that fish is also a source of several nutrients that are important for fetal development, such as iodine. Iodine is a raw material for thyroid hormone. This hormone plays a role for growth and development<sup>28</sup>. Additional fish consumption up to 4 portions which is the main ingredient of the contents of the whistle during pregnancy accompanied by the addition of other types of food consumed by mothers within this study, the study was able to increase the size of the maternal upper arm circumference in the intervention group where there were 5 mothers (16.7%) whose size was LiLA <23.5 cm. After the intervention have an increased LiLA size > 23.5 cm by 4 mothers and only 1 mother (3.3%) LiLA size <23.5.

This research was strengthened by Knudsen's research. 2008, which states: Protein intake during pregnancy is imperative for the process of fetal growth and embryogenesis process so that babies born can be born normally<sup>29</sup>. Lack of protein intake during pregnancy can result in impaired fetal growth in the womb which results in babies born with low birth weight and vice versa excess nutrition can also be obtained because energy intake and protein are too much so that it can inhibit the placenta and fetal growth and can also increase fetal's mortality rate. Similar research was carried out by Huybregts. 2009 in Burkina Faso on 1,175 pregnant women showed that energy and protein-enriched food supplements for pregnant women had significantly higher baby length at birth (+4.6 mm; P = 0.001) compared to pregnant women who did not get enriched food supplements energy and protein and produce a new-born weighed slightly heavier (+31 g; P = 0.197)<sup>30</sup>.

In conclusions, from the intervention to assist local food consumption (Serwit) on the size of the Upper Arm Circumference (LiLA) of pregnant women's bodies after the intervention, obtained an increasement in maternal LiLA size by an average of 27,593 cm, whereas in the average group maternal LiLA size was only 25,983 cm. Statistical test results obtained a significant value (P.value = .039) which means that there is an impact from providing local food assistance interventions (serwit) to the nutritional status of pregnant women with indications from the size of the Upper Arm Circumference (LiLA) of TM3 pregnant women in the region of Tulang Bawang Barat. The results of this study are strengthened by the study of Syarfaini *et al*, 2015 entitled: The Effect of Giving the fish brain (otak-otak) of Male Mackerel (*Rastrelliger kanagurta*) in substitution of Seaweed (*Eucheuma spinosum*) for CEC Pregnant Women. The results show that the influence of male mackerel fish brain (otak-otak) substitution of seaweed *Eucheuma spinosum* on the circumference of the upper arm of CEC pregnant women, which is marked by an average upper arm circumference LiLA > 23.5 cm, with p-value = 0.001<sup>31</sup>. Increasing the nutritional status of pregnant women can reduce the impact of malnutrition in pregnant women which can in turn, makes risks and complications for mothers during pregnancy and childbirth be prevented. Similarly, the impact on the fetus due to malnutrition which will slow the process of fetal growth and cause miscarriage, abortion, stillbirth, neonatal death, congenital defects and birth with LBW can be avoided. With the fulfilment of the nutritional needs of pregnant women, this will increase the degree of health of the mother and the fetus, and in the end will have an impact on reducing the morbidity and mortality of the mother and baby.

3. Effect of intervention on the assistance of local food consumption (Serwit) on hemoglobin (HB) blood levels of pregnant women

Anemia in pregnancy is a condition of mothers with hemoglobin levels below 11gr% in trimesters 1 and 3 or levels <10.5 gr% in trimester 2, those limit values and the difference with the condition of non-pregnant women, happens due to hemodilution, especially in trimester 2<sup>32</sup>.

The need for iron in pregnant women is on average close to 800 mg. This requirement consists of approx. 300 mg needed for the fetus and placenta and another 500 mg used to increase the mass of maternal hemoglobin in pregnant women. Food for pregnant women every 100 calories will produce about 8-10 mg of iron. Calculation of eating 3 times with 2500 calories will produce about 20-25 mg of iron per day. During pregnancy, with a calculation of 288 days, pregnant women will produce iron as much as 100 mg. Therefore, that iron needs are still lacking for pregnant women<sup>33</sup>. Other research states that *micronutrients including 20-mg Fe (MMN) or small-quantity lipid-based nutrient supplements (SQ-LNS)* produce lower Hb and iron status but have no effect on inflammation in pregnant women when compared to iron (60 mg) plus folic acid. (400µg)<sup>36</sup>.

One of the efforts to prevent anemia is to increase the consumption of Fe to meet iron needs, and to get used to eating foods with balanced nutrition, especially those containing iron and folic acid<sup>15</sup>. Consumption of iron derived from animals at least once a day because in addition to being a source of heme iron, it can also encourage the absorption of non-heme iron<sup>17</sup>. In the intervention group, maternal hemoglobin levels obtained on average are 11.77 mg%. Statistical test results obtained a significant value (*P. value* = .025) smaller than  $\alpha$  (0.05) and  $t_{\text{count}}$  (2.31) greater than  $t_{\text{Table}}$  (0.05.58) (2.00). Therefore, this means that there is an effect from providing assisted intervention of local food consumption (serwit) for blood levels of haemoglobin (Hb) TM3 pregnant women.

The results of the study were strengthened by a study by Wigutomo Gozali in 2018 entitled: Relationship between Diet and Anemia in Pregnant Women in the Work Area of Buleleng III Health Center (*Hubungan Pola Makan dengan Kejadian Anemia pada Ibu Hamil di Wilayah Kerja Puskesmas Buleleng*). The results concluded that by eating patterns of pregnant women, it is significantly associated with the incidence of anemia ( $p < 0.05$ )<sup>34</sup>. The same research conducted by Indah *et al*, 2016 entitled: The Relationship of Food Intake, Fe and Folic Acid Supplementation on Hemoglobin Levels in Pregnant Women with History of Chronic Energy Deficiency and Anemia Of Breastfeeding Women. The results namely: energy intake, fat, carbohydrates, iron and folic acid in nursing mothers, including the category of deficit (<70 RDA). Food intake and nutritional status of breastfeeding mothers are negatively related to levels of hemoglobin while breastfeeding ( $b = -0.005$ ,  $p = 0.040$  and  $B = -0.134$ ,  $p = 0.016$ ). Supplementation of Fe and folic acid in pregnant women with a history of CEC and anemia was significantly related to hemoglobin levels while breastfeeding ( $B-0.720$ ,  $p = 0.016$ )<sup>35</sup>. Other research states that providing nutrition and education about a food-based diet plan with a significant food intake correlates with an increase in hemoglobin levels, increased nutrition in a healthy diet and nutritional knowledge about anemia and diabetes in food<sup>37</sup>.

During assistance, the mother is given supervision to always consume Fe tablets regularly and always foods made from serwit-based foods that have high nutritional content. This food consists of fish based ingredients which are safe sources of animal iron consumption. Additional fish consumption up to 4 servings during pregnancy accompanied by the addition of other types of food as well as combining basic food processed with whistle, which consists of a mixture of iron sources derived from animals (fish) and plants (various delicacies) as

well as other nutritional sources that can help absorption by the mother which can in turn increase the size of the blood hemoglobin level in the mother.

## CONCLUSION

There is a significant impact upon providing a form of assisted interventions for local food consumptions with the application of Interprofessional Education-Collaborative Practice (IPE-CP) upon: weight gain in pregnant women, with p-value. 0.003, the size of the Upper Arm Circumference (LiLA), with a p-value of 0.039, and the blood hemoglobin (Hb) levels of pregnant women with a p-value of 0.025.

The biggest *Effect Size* is the impact of local food consumption (Serwit) through assisted interventions with the application of Interprofessional Education-Collaborative Practice (IPE-CP), namely on the increasement in body weight of pregnant women with the *effect size* index results of 0.9 which is a large category standard.

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