TREATMENT OF ANEMIA IN PREGNANT WOMAN USING NUTRITION CARE PROCESS (NCP) APPROACH; Case Study in Salewangeng Health Centre, Wajo Regency)

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ABSTRACT

Anemia in pregnancy is the condition with hemoglobin less than 12 gr/dl in the first and third trimester, and less than 10.5 gr/dl in the second trimester. Pregnant women are very susceptible to iron deficiency anemia because in pregnancy need more for oxygen as the triggers production of erythrocytes. The purpose of this study was to determine the nutrition intake and status of pregnant women after undergoing a Nutrition Care Process in Salewangeng Health Center, Wajo Regency. This type of research is a descriptive study with a case study approach. The study sample was anemia pregnant woman totaling 2 people. Data on nutrient was collected by 24-hour food recall method. The results of the study obtained the nutrition status of the two subjects was in a good nutrition status but they suffered from anemia. It was also found deficiency intake and wrongful behavior in eating patterns.

Keywords: anemia, nutrition care process, pregnancy

INTRODUCTION

Anemia in pregnancy is a state of pregnant women with hemoglobin (Hb) level <12 gr/dl in the first and third trimester, in the second trimester the hemoglobin level 10.5 gr/dl. Anemia in pregnancy is a potential danger for mothers and children because it requires anemia, it needs attention to all parties involved in the health sector (Bobak, 2005: Manuaba, 2010).

The cause of anemia in pregnant women is a lack of iron nutrients in the body. It is caused by a lack of folic acid and vitamin B12 due to inadequate intake or low iron availability (Alleyne, Horne & Miller, 2008: Brown, 2010).

Pregnant women are very susceptible to iron deficiency anemia because in pregnancy the need for oxygen is higher so that it triggers an increase in the production of erythropoietin. As a result, plasma volume increases and red blood cells (erythrocytes) increase. However, the increase in plasma volume occurs in a greater proportion than the increase in erythrocytes resulting in a decrease in hemoglobin (Hb) concentration due to hemodilution (Cunninggham et al, 2013; Winkjosatro, 2009).

Maternal nutritional status before and during pregnancy can affect the growth of the fetus being conceived. If mother before and during pregnancy has normal nutritional status, it is potentially to give birth with healthy baby and normal body weight. In other words, the quality of a baby born is very dependent on the nutritional condition of the mother before and during pregnancy (Ganda, 2011).

Nutrition Care Process (NCP) is a systematic problem-solving method, in which dietitians use critical thinking methods in making decisions to deal with various problems related to nutrition so that they can provide effective and high-quality nutritional care (Sumaparadja, 2011).

There were 91.020 (87,29%) pregnant women suffering from anemia from 104.271 pregnant women who were examined, classified into three categories: mild anemia 45.510 cases (50%), moderate anemia 42.043 cases (46,19%) and severe anemia 3,467 cases (3,81%) (Provincial Health Office of south Sulawesi, 2010).

In general, this study aims to determine the nutritional intake and status of anemic pregnant women after undergoing a Nutrition Care Process in Salewangeng Health Center, Wajo District.

MATERIAL AND METHODS

This type of research is a descriptive study with a case study approach to study anemia in pregnant women using a Nutrition Care Process (NCP) approach. The research location was carried out in the Salewangeng Health Center Wajo District. This research was conducted from January to June 2019.

As the subject of this study, as many as two pregnant woman who fulfilled the criteria such as anemic pregnant women, had been visiting and performing an examination at Salewangeng Health Center, ready to participate in the study and had no illness accompanied their pregnancy.

The method of data collection was firstly conducted by basic data assessment called anthropometric measurement (body

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weight, height, and upper arm circumference) Biochemical data (Hb), physical or clinical examination and nutritional history. Second, diagnose nutrition by determining nutrition care indicators, determining etiology and writing nutritional diagnosis statements with PES (Problem-Etiology-Symptoms) form, iron as well as factors that inhibit iron absorption, provide nutritional counseling regarding the given diet. The final step was conducting Nutrition Monitoring and Evaluation, namely the first Nutritional Status, was carried out for two times within one week, the first at the beginning of the observation and the second at the end of the observation. Both intake monitoring was carried out for 3 times within 1 week, namely at the beginning of the observation, mid-observation and at the end of the observation.

Data processing is performed by calculating the intake of nutrients which consist of Energy, Protein Fat, Carbohydrates and Iron Using Microsoft Excel. List of food composition used to compared with the individual needs obtained from the calculation of needs. Data analysis was carried out descriptively by comparing the results obtained with the standard or the results of other studies made using tables and narratives description.

RESULTS
Case 1

This study shows that as many as two pregnant women with anemia who have Hb < 12 gr/dl were the case for the study.
Case 1. Mrs. F, 32 years, weight before pregnant 47 kg, current weight 58 kg, upper arm circumference 25 cm, height 153 cm, Hb levels 10.5 gr/dl (mild anemia), gestational age 9 months, level of education graduated, housewife, and moslem.

Table 1
Case 1. Nutrition Care

Data Category	Data Assessment	Conclusion
ANTHROPOMETRY	Weight before pregnancy : 47 kg Current Weight : 58 kg Height : 153 cm Upper Arm Circumference : 25 cm	Good nutritional status
BIOKIMIA/ LABORATORY	Hemoglobin : 10.5 gr/dl	Mild level anemia
PHYSICAL/ CLINICAL	General state: good	Good
DIETARY HISTORY	a. First Nutritional History • Frequency of eating 2x/day • Basic food menu: rice • 2x/day, side dish: fish • Vegetable dishes 1-2x/day • Vegetable for each meal such as spinach, pumpkin, and squash • There is no taboo food and eating allergies b. Current Nutritional History • The main frequency of meals is 2x/day (no breakfast) • Good appetite Energy Protein Fat Carbo-hydrate Intake 1161.6 kcal 43.9 g 23.1 g 188.6 g Needs 2.192.872 kcal 71.55 g 48.71 g 367.25 g % KEB 53% 61.4% 47.5% 51.3%	Wrong diet Less intake
PERSONAL HISTORY	Participant lived on Jl. Jambu Sengkang. Job: Housewife. Pregnancy status: the first child's pregnancy	

Nutritional Diagnosis
• NI-2.1 Deficiency of oral food and beverage intake related to the condition of the respondent (third trimester of pregnancy) marked by the results of recall intake <80% Energy= 1161.6 kcal (53%). Protein=43.9 g (61.4%). Fat=23.1 g (47.5%) dan Carbohydrate=188.6 g (51.3%) • NI-5.10.1 Deficiency of mineral (Fe) intake related to an increase in nutrient requirements due to the condition of respondents marked with Hb<12 gr/dl which was 10.5 gr/dl. • NB- 2.3 The inability to self-regulate related to the habit of not having breakfast characterized by the frequency of eating 2x/ day

Nutritional Intervention Plan

Calculation Of Nutritional Needs

BBI = 47.7 kg

$BEE = 655 + (9.6 \times BBI) + (1.7 \times TB) – (4.7 \times U)$

$= 655 + (9.6 \times 47.7) + (1.7 \times 153)–(4.7 \times 32)$

$= 655 + 457.92 + 260.1 – 150.4$

$= 1.222.62$ calorie

$TEE = BEE \times FA \times FS$

$= 1.222.62 \times 1.3 \times 1.2$

$= 1.907.872$ kcal

ENERGY $= 1.907,872 + 286 = 2.192,872$ kcal

PROTEIN $= BBI \times 1.5$

$= 47.7 \times 1.5 = 71.55$ g

% Protein $= \frac{71.55}{2.192,872} \times 4 = 13\%$

FAT $= \frac{20\% \times 2.192,872}{9}$

$= 48.71$ g

CARBOHYDRATE $= \frac{67\% \times 2.192,872}{4}$

$= 367.25$ g

Type of Diet: high-calorie high-protein diet + Fe

Diet Goals :
- Attainment the energy and protein needs that increase due to pregnancy
- Maintain a normal weight

Dietary Requirements :
- High energy was given, which is 2.192,872 kcal by estimating stress and activity factors
- High protein was given 1.5 g/kg body weight
- Fat was given 20% of total energy needs
- Carbohydrates were given leftover from total energy requirements
- Fe was given 39 mg/day based on AKG

Form of Food: Family Food

Nutritional Intervention	Monitoring and Evaluation Plan
Given a high-calorie high protein diet + Fe	1. Total energy intake 2. Total protein intake 3. Total fat intake 4. Total carbohydrate intake 5. Total Fe intake 6. The Hb level is the final intervention

Nutrition Counselling
Given a high-calorie high protein diet, Foods that were high in the Fe content, Food that inhibits the absorption of Fe, Healthy Food Pregnant Woman, Given PM with biscuits to pregnants women from health centers

From the nutrition table of cases 1, it can be seen that the data relating to the

steps of nutrition care starting from the assessment of basic data collection such as anthropometry, physical/clinical, and dietary then followed by the diagnosis, intervention, and monitoring and evaluation.

Table 2
Increased intake Case 1

Intake	05/05/2019 (before intervention)	06/05/2019	08/05/2019	10/05/2019	Standard Needs
Energy (kkal)	1161.6	1733.8	1992.2	2058.2	2192.3
Protein(g)	43.9	68.9	70.2	73.4	71.5
Fat(g)	23.1	41.4	46.6	48.5	48.7
Carbohydrate (g)	188.6	246.6	296.0	300.5	367.2
Fe (mg)	8.1	19.7	20.6	24.8	39

From the monitoring report in Table 2, it shows that the level of intake of participant in case 1 has increased continuously from the first day to the end of the monitoring, but the increase achieved had not yet achieved the standard needs.

Table 3
Weight increase monitoring of Case 1

Times	Weight	Ideal Body Weight
Before Intervention	58 kg	47.7 kg
After Intervention	58.2 kg	

From the data in Table 3, the increase in body weight above shows that body weight has increased from the beginning of monitoring to the end of monitoring with a bodyweight of 58 kg until the end of monitoring with 50.2 kg.

Table 4
Hb increase monitoring of Case 1

Time	Hb Value	Standard
Before Intervention	10.5 gr/dl	12 gr/dl
After intervention	11 gr/dl	12 gr/dl

From the data in Tabel 4 above, it shows that Hb has increased from the beginning of monitoring with 10.5 gr/dl to the end monitoring with Hb 11 gr/dl.

Case 2
Case 2. Mrs. H, 28 years old, weight before pregnant 48 kg, current weight 56 kg, upper arm circumference 24 cm, height 156 cm, Hb levels 9.6 gr/dl (mild anemia), gestational age 6 months, level of education: senior high school, housewife, and moslem.

Table 5
Case 2. Nutrition Care

Data Category	Data Assessment	Conclusion
ANTHROPOMETRY	Weight before pregnancy : 48 kg Current Weight : 56 kg Height : 156 cm Upper Arm Circumference : 24 cm	Good nutritional status
BIOKIMIA/ LABORATORY	Hemoglobin : 9.6 gr/dl	Mild level anemia
PHYSICAL/ CLINICAL	General state: good	Good
DIETARY HISTORY	c. First Nutritional History • Frequency of eating 2x/day • Basic food menu: rice • 2x/day, side dish: fish • Vegetable dishes: rare • Vegetable for each meal such as spinach, pumpkin, and squash • There is no taboo food and eating allergies d. Current Nutritional History • The main frequency of meals is 3x/day • Good appetite Energy Protein Fat Carbo-hydrate Intake 1231.6 kcal 36.3 g 31.8 g 189.6 g Needs 2.270 kcal 75.6 g 50.4 g 380.2 g % KEB 54.3% 48% 50.4% 49,9%	Wrong diet Less intake
PERSONAL HISTORY	Participant lived on Jl. Jambu Sengkang. Job: Housewife. Pregnancy status: the third child's pregnancy	

Nutritional Diagnosis

- NI-2.1 Deficiency of oral food and beverage intake related to the condition of the respondent (second trimester of pregnancy) marked by the results of recall intake <80% Energy=1231.6 kcal (54,3%), Protein=36.3 gr (48%), Fat=31.8 gr (50.4%) dan Carbohydrate=189.6 gr (49.9%).
- NI-5.10.1 Deficiency of mineral (Fe) intake related to an increase in nutrient requirements due to the condition of respondents marked with Hb<12 gr/dl which is 9.6 gr/dl.
- NB- 1.2 Believe or wrong attitudes about food or nutrients are rarely related to the consumption of vegetable protein characterized by iron (Fe) deficiency.

Nutritional Intervention Plan

Calculation of Nutrional Needs
BBI = 5014 kg
BEE = 665 + (916 x BBI) + (117 x TB) – (417 x U)
     = 665 + (916 x 5014) + (117 x 156)–(417 x 28)
     = 665 + 483184 + 26512 – 13116
     = 1.272,144 kalori
TEE = BEE x FA x FS
     = 1.272,144 x 113 x 112
     = 1.98510 kcal
ENERGY   = 1.98510+ 286 = 2.2701006 kkal
PROTEIN   = BBI x 115

= 5014 x 115 = 7516 g
% Protein = 7516/2.2701006 x 4 = 13%
FAT = (20% x 2.2701006)/9
 = 5014 g
CARBOHYDRATE = (67% x 2.2701006)/4
 = 380122 gr
Type of Diet: high-calorie high-protein diet + Fe
 	
Diet Goals :
  Attainment the energy and protein needs that increase due to pregnancy
  Maintain a normal weight
Dietary Requirements :
  The energy of high nutrients which was 2.2701006 kcal by taking into account stress factors and activity factors
  High protein was given 1.5 g/kg body weight
  Fat was given 20% of total energy needs
  Carbohydrates were given 67% leftover from total energy requirements
  Fe was given 35 mg/day based on AKG
Form of Food: Family Food.	

Nutritional Intervention	Monitoring and Evaluation Plan
Given a high-calorie high protein diet + Fe	1. Total energy intake 2. Total protein intake 3. Total fat intake 4. Total carbohydrate intake 5. Total Fe intake 6. The Hb level is the final intervention

Nutrition Counselling
Given a high-calorie high protein diet, Foods that were high in the Fe content, Food that inhibits the absorption of Fe, Healthy Food Pregnant Woman, Given PM in the form biscuits to pregnants women from health centers.

From the Table 5, Nutrition care on nutrition case 2, it can be seen the data relating to the steps of nutrition care starting from the assessment of basic data collection such as anthropometry, physical/clinical, and dietary, then the diagnosis, intervention, monitoring, and evaluation the progress level of patient.

Table 6
Increased intake Case 2

Intake	05/05/2019 (before intervention)	06/05/2019	08/05/2019	10/05/2019	Standard Needs
Energy (kkal)	1231.6	1815.6	1974.9	2143.4	2270
Protein(g)	36.3	61.8	71.7	72.3	75.6
Fat(g)	31.8	44.1	45.0	49.5	50.4
Carbohydrate (g)	189.6	253.6	302.2	305.5	380.2
Fe (mg)	6.5	21.6	22.4	23.0	35

From the monitoring of increase intake in Case 2, Table 6 above shows that the level of intake of case 2 had increased continuously from the first day to the end of the monitoring but the increase had not yet reached the standard needs.

Table 7
Weight increase monitoring of Case 2

Times	Weight	Ideal Body Weight
Before Intervention	56 kg	
After Intervention	56 kg	50.4 kg

Referred to Table 7 about data monitoring of weight increase of Case 2, the increase in body weight above shows that body weight had not increased from the beginning of monitoring to the end of monitoring with a body weight still constant at 56 kg.

Table 8
Hb increase monitoring of Case 2

Time	Hb Value	Standard
Before Intervention	9.6 gr/dl	12 gr/dl
After intervention	11.0 gr/dl	12 gr/dl

From the data in Tabel 8 above, it shows that Hb has increased from the beginning of monitoring with 9.6 gr/dl to the end of monitoring with Hb 11 gr/dl.

DISCUSSION

In this study, as many as 2 pregnant women who had Hb value less than 12 gr/dl or had anemia. This study was conducted for seven of the provision of Nutrition Care Process (NCP) through a 24-hour food recall method to calculate nutrient intake before intervention and after the intervention to calculate nutrient intake in monitoring and evaluation, as for parameters monitored were lab values, namely Hb and nutrient including iron (Fe) intake of anemic pregnant women during the study.

Data from the research showed that both cases of the Nutrition Care Process of anemic pregnant women experienced increased intake including iron intake and increased Hb Values. This is evidenced by the results of monitoring the intake and Hb which increased from the first day to the end of the intervention, and the Hb results before the intervention until the end of the intervention of the two cases had increased.

Based on the results of the increase in Hb and intake including iron (Fe) intake it proves that the Nutrition Care Process or commonly called nutritional care is very influential in the process of increasing Hb levels in the blood and increasing intake.

The results of this study were in accordance with the study of Nina Herlina (2006) who found a tendency that the poorer the intake would be, the higher the incidence of nutritional anemia in pregnant women. So if the intake improves, the incidence of anemia in pregnant women decreases.

CONCLUSION

The results of the nutritional assessment in this study found that two cases had good nutritional status with the condition of anemic pregnant women. The nutritional diagnosis results in this study both cases deficiency oral food and beverage intake, iron deficiency, dietary errors and anemia. The results of the intervention in the form of education provided showed a change in food intake and an increase in Hb levels but had not reached the standards need in both cases. Nutrition Care Process can increase nutritional intake.

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