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Optimizing The Ability To Manage Diet And Hb (Hemoglobin) Levels In Pregnant Women With A Family Empowerment Model

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ABSTRACT

Introduction. The MMR (Maternal Mortality Rate) is a key measure of public health condition. The family is the fundamental unit of society, with various responsibilities and developments. All family members affect each other via contact and mutual support based on their responsibilities in achieving success. This study aims to determine how the family empowerment model affects the capacity to regulate food and boost hemoglobin levels. The family's structure and purpose determine the way family members interact. **Method**. The study design is a Quasi-Experimental Design with a single group pretest-posttest. In this study, purposive sampling was employed with 25 pregnant, 25 of whom received intervention. Data was analyzed using the paired t-test. **Result**. The findings revealed the effects of Hb, knowledge, attitudes, and behaviors before and after family empowerment. In pregnant women with anemia, the frequency of Hb increased following family empowerment, whereas in pregnant women who were not anemic increased by 11 responses (73.3%). Following the session, 12 families (80%) reported having good knowledge. After the intervention, 12 families had a favorable attitude (80%), and 7 families had excellent behaviors (46.7). **Conclusion**. The study found that the family empowerment model improved the capacity of pregnant women with anemia to regulate their food and boost their hemoglobin (Hb).

Keywords: Mother, Pregnant, Hb (Hemoglobin), Family

INTRODUCTION

According to the World Health Organization (WHO), every day 810 mothers in the world die due to pregnancy complications and this figure occurs in many developing countries, as much as 94% (Natasha & Niara, 2020). Based on data from the Ministry of Health in 2020, the MMR in Indonesia was 4,197 people, this figure will increase in 2021 to 4,627 people (Ministry of Health, 2020). Anemia can result in Maternal Mortality Rate (MMR) which is an important indicator of the level of public health. Based on the 2012 Indonesian Demographic and Health Survey (SDKI), the maternal mortality rate (related to pregnancy, childbirth, and postpartum) was 359 per 100,000 live births. This figure is still quite high compared to the 2007 SDKI, namely 228 per 100,000 live births, even though the MMR acceleration program has been attempted through the Millennium Development Goal's (MDG) development target which ends in 2025. In 2025, efforts will be re-launched to continue the post-Millennium Development Goal development. Sustainable Development Goals

(SDGs) are a form of refinement of the MDGs to continue the goals The MDGs that have not been achieved are maternal and child health issues. It is estimated that 60% of maternal deaths occur after pregnancy and 50% of postpartum deaths occur within the first 24 hours. (Ministry of Health, 2020)

In Indonesia, the prevalence of people suffering from anemia is quite high. A survey conducted by the Faculty of Medicine at several universities in Indonesia in 2012 found that 50-63% of pregnant women suffered from anemia. In addition, 40% of women of childbearing age also experience anemia. This survey explains the threat of anemia in Indonesia. The Asian Development Bank (ADB) noted that in 2012 as many as 22 million Indonesian children suffered from anemia, causing a decrease in IQ (*intelligence quotient*). Pusponegoro and Anemia World Map research at the same time stated that 51% of pregnant women suffered from anemia, causing up to 300 deaths per day (Atiyah, 2023). Ironically, it is estimated that under 50% of mothers do not have sufficient iron reserves during pregnancy, so the risk of iron deficiency or anemia increases with pregnancy. It has been proven in Thailand that the main cause of anemia in pregnant women is iron deficiency (43.1%). Besides that, a study in Malawi found that of 250 pregnant women, 32% had deficiencies in iron and one or more micronutrients. Likewise, this shows that anemia in pregnant women is related to iron deficiency (p=0,03), vitamin A (p=0.004), and nutritional status (LILA) (p = 0.003) (Susiloningtyas, 2012)

In pregnancy, the need for oxygen is higher, which triggers increased erythropoietin production. As a result, plasma volume increases, and red blood cells (erythrocytes) increase. However, increasing plasma volume occurs in a greater proportion when compared to increasing erythrocytes resulting in a decrease in hemoglobin (Hb) concentration due to hemodilution. When pregnant, a mother-to-be often experiences anemia. When experiencing anemia, the mother's blood does not have enough healthy red blood cells to carry oxygen to the tissues. During pregnancy, the blood volume increases by 50% from 4 to 6 L, and the plasma volume increases slightly causing a decrease in the Hb concentration and hematocrit value. This decrease was smaller in pregnant women who consumed iron. The increase in blood volume functions to meet the perfusion needs of the uteroplacental. Apart from a lack of iron in the body, other causes of a lack of Hemoglobin in pregnant women during pregnancy are due to an excessive decrease in the amount of blood such as due to bleeding from injury or surgery, several chronic diseases such as kidney disease, and serious infections or due to a lack of intake of the vitamin folic acid, namely vitamins needed by the body to produce red blood cells. However, iron deficiency in pregnant women is the most common cause of anemia (Carolin et al, 2019)

A study shows changes in Hb concentration according to increasing gestational age. In the first trimester, Hb concentrations appear to decrease, except in women who already have low Hb levels (11.5 g/dl). The lowest concentration is obtained in the second trimester, namely at around 30 weeks of gestation. In the third trimester, the Hb level is high (> 14.6 g/dl) at the first examination (Destri, 2020). If a woman is anemic during pregnancy, blood loss during childbirth, even if minimal, is not well tolerated. He is at risk of needing a blood transfusion. Approximately 80% of cases of anemia during pregnancy are iron deficiency anemia, the remaining twenty percent (20%) include cases of hereditary anemia and various variations of acquired anemia, including folic acid deficiency anemia, sickle cell anemia, and thalassemia. Pregnant women who experience anemia will have a negative impact on the health of the mother and her fetus, therefore one of the important factors that influences how pregnant women overcome times of crisis is the social support they expect. This support is the people and resources available to provide support, assistance, and care from the people closest to them, in this case, the family. (Dewi, 2021).

Family involvement or empowerment, from the beginning of pregnancy, will make it easier and faster to handle if there are complications during pregnancy such as the mother experiencing anemia so that the family can quickly take the mother to health services. The low level of family participation in maternal health and the

growing opinion that the process of pregnancy, childbirth, and baby care is only the mother's responsibility are also often a phenomenon in society (Wahyuni, 2024). It is also hoped that family support or empowerment in caring for pregnant women can reduce the risk of complications in pregnancy, childbirth, and the postpartum period which can be experienced by all pregnant women. If families know and are aware of the care needs of pregnant women, then they will try to do the right and appropriate thing in dealing with complications, including referring them to quality services. Therefore, family-centered maternity nursing (*family-centered-maternity care*) strives to provide services during pregnancy and childbirth by involving the family from an early age (Aisyah et al, 2024). One method or model of family-centered care is to empower families through the family's ability to manage diet, provide nutritious food for mothers and consume blood supplement tablets for pregnant women, recognize danger signs of pregnancy, and provide psychological comfort for pregnant women. Maternity nurses who act as advocates and educators for pregnant women and families have the responsibility to facilitate pregnant women and families in obtaining information related to the care of pregnant women who experience anemia, namely regarding diet, balanced nutrition, and consumption of Fe or blood supplement tablets. The information provided can be in the form of health education or in the form of distributing modules aimed at increasing knowledge of pregnant women and families in increasing hemoglobin levels in pregnant women who experience anemia. (Mardiyanti et al, 2024). Health education or module distribution for pregnant women and families is closely related to family empowerment, family knowledge, family attitudes, and family actions in managing diet, nutritional conditions, iron or Fe consumption in overcoming or increasing hemoglobin levels in pregnant women who experience anemia (Rao et al, 2024)

METHOD

This type of research is a *quasi-experiment group pre-post test design,* by providing treatment in the form of a family empowerment model intervention in the intervention group only without a control group or comparison group (Suhron, 2024).

RESULT

The results of the research that was carried out in 25 families who had pregnant women who experienced anemia in the Langsa Baro Community Health Center Working Area, Langsa City, data obtained from the results of primary data tabulation based on questionnaire answers from respondents obtained the following results:

Table 1. Characteristics Pregnant Women

Characteristics Pregnant Women N (25)	Frequency	%
Before Intervention Group		
Anemia	25	100
Not Anemia	0	0
Total	25	100
After Intervention Group		
Anemia	5	20
Not Anemia	20	80
Total	25	100
Knowledge Before Intervention Group		

Good	9	32
Not enough	17	68
Total	25	100
Knowledge After Intervention Group		
Good	20	80
Not enough	5	20
Total	25	100
Attitude Before Intervention Group		
Positive	5	20
Negative	20	80
Total	25	100
Attitude Before Intervention Group		
Positive	20	80
Negative	5	20
Total	25	100

Data Primer 2022

Based on the table above, shows that of the 25 respondents in the Langsa Baro Community Health Center working area, before the intervention was given, the majority of pregnant women experienced anemia, 25 respondents (100%). Apart from that, after being given intervention, the majority of pregnant women who did not experience anemia were 20 respondents (80%). As for the knowledge above, it shows that before being given the intervention, the majority of families had poor knowledge in managing diet to increase hemoglobin levels in pregnant women who had anemia, namely 17 pregnant women (68.0%), while after being given the intervention, the majority of pregnant women had good knowledge in managing it. Diet to increase hemoglobin levels in pregnant women who experience anemia, namely 20 pregnant women (80.0%). As for the attitude before being given the intervention, the majority of pregnant women had a negative attitude in managing diet, 20 pregnant women (80.0%) while after being given the intervention, the majority of families had a positive attitude, 20 pregnant women (80.0%).

Table 2. Normality Distribution

No	Variable	Kolmogorov-Sminov			
		Statistic	df	Sig (P>0.05)	Data Distribution
1	Hb 1	0.180	25	0.200	Normal
2	Hb 2	0.200	25	0.107	Normal
3	Knowledge 1	0.918	25	0.179	Normal
4	Knowledge 2	0.853	25	0.019	Abnormal
5	Attitude 1	0.816	25	0.006	Abnormal
6	Attitude 2	0.762	25	0.001	Not the norm
7	Action 1	0.725	25	0.000	Abnormal
8	Action 2	0.865	25	0.029	Abnormal

Data Primer 2022

Based on the results of the normality test, it shows that using the Kolmogorov-Sminov test of normality, Hb in the pre-test and post-test is normally distributed with a significant value > 0.005. For Hb, the Paired t.The test can be continued. The results of the normality test show that by using the Shapiro-Wilk test of normality, knowledge in the pre-test is normally distributed with a significant value > 0.05. On post-test knowledge data, attitudes and actions were tested by eliminating data that was considered extreme (appearing in the boxplot), then normality was tested again and the data was normal, then continued with the Paired t-test.

Table 3. Relationship analysis before and after intervention

No	Variable	Group Before Paired Sample test			After Paired Sample test		
		N	Correlation	Sig (P>0.05)	N	Correlation	Sig (P>0.05)
1	Hb	25	0.496	0.060	25	-5.100	0.000
2	Knowledge	12	- 0.588	0.044	12	-3.852	0.003
3	Attitude	12	- 0.084	0.796	12	-9.059	0.000

	Wilcoxon	N	Mean rank	Sum rank
Action 1- Action 2	Negative Rank	3	6.17	18.50
	Positive Rank	8	5.94	47.50
	Ties	4		
	Total	25		

No	Variable	Wilcoxon WITH	Sig (P>0.05)
1	Action	-1.303	0.193

Data Primer 2022

Based on the table above, shows that Family Empowerment contributes to Hb, Knowledge, and Attitude with a P value > 0.05. It can be seen that there is a difference before and after the Family Empowerment intervention is given. Based on Table 5.17, there is a negative rank/negative difference which shows n=3, meaning that there is a negative rank/negative difference between the empowerment results for pre and post-empowerment which is 3, which indicates there is a reduction/decrease. Value from pre to post-empowerment value = 3 families. Average reduction 6.17 (mean rank), number of negative ranks (sum of rank) = 18.50. The positive rank/positive difference between the empowerment results for pre and post-empowerment is n = 8, meaning that in 8 families there was an increase in the value of pre and post-empowerment. The average increase in the value of pre and post-empowerment is an average of 5.94, and the number of positive ranks (sum of ranks) = 47.50. Meanwhile, in the value of the tie, there is a similarity between the pre and post-empowerment values = 4, meaning that there are 4 families whose scores are the same between pre and post-family empowerment. Based on Table 5.18, the action data is not normally distributed, an alternative Paired t-test is the Wilkoxon test, it was found that there was no difference in actions before and after family empowerment was carried out (P > 0.05).

DISCUSSION

The Influence of the Family Empowerment Model on the Ability to Manage Diet and Increase Hemoglobin (Hb) in Pregnant Women with Anemia

Based on the research results, it shows that before being given the intervention, the majority of pregnant women experienced anemia and after being given the intervention, the majority of pregnant women did not experience anemia. As for the knowledge above, it shows that before being given the intervention, the majority of families had poor knowledge of managing diet to increase hemoglobin levels in pregnant women who experienced it, whereas after being given the intervention, the majority of pregnant women had good knowledge in managing diet to increase hemoglobin levels in pregnant women who experienced anemia. As for the attitude before being given the intervention, the majority of pregnant women had a negative attitude in managing diet, whereas after being given the intervention, the majority of families had a positive attitude. Apart from that, there was an influence of the family empowerment model in the ability to manage diet and increase hemoglobin (Hb) in pregnant women with anemia. The family is the basic unit of society, which has a series of tasks and development. All family members influence each other through interaction and provide support to each other according to their roles needed to achieve prosperity. Interactions between family members depend on the structure and function of the family (Ricci, 2024). Family support is an effort to increase family values, family attention and goals, family support for pregnant women can be realized by helping to overcome the problems experienced by pregnant women who experience anemia and by making decisions to care for or take pregnant women to appropriate health services. Available at the right time, maintain diet, and give Fe tablets every day. Family is the closest person and is the most valuable support system for pregnant women, especially pregnant women who experience anemia. Family support is an important factor in improving the health of pregnant women (Beckingham, 2022).

Family support can be aimed at through involvement in maintaining the health of family members during pregnancy. Pregnant women who receive attention and support from their families tend to more easily accept and follow the advice given by health workers compared to pregnant women who receive less support and attention from their families (Suparni, 2025). Knowledge is the result of knowing, this occurs after people sense an object, individuals have the urge to understand, and with their experience, they gain knowledge. A person's attitude towards an object shows the person's knowledge of the object in question. This can be interpreted that positive attitudes and negative attitudes are formed from the knowledge component. The more knowledge gained, the more positive attitudes will be formed (An et al, 2023). Attitude is a readiness or willingness to act and is not the implementation of a particular motive. Attitude is an action or activity, but it is a predisposition to a behavior (Lee et al, 2014). Anemia in pregnant women will increase the risk of having a Low Birth Weight Baby (LBW), the risk of bleeding before and during delivery, and can even cause death of the mother and baby, if the pregnant woman suffers from severe anemia. And to find out whether someone has anemia or not, it is necessary to check the hemoglobin level. One method that can be used is the hemoglobin examination method *Easy*, this method is still widely used in laboratories and is the simplest (Herlina et al, 2024)

The mother's hemoglobin (Hb) level greatly influences the weight of the baby to be born. Pregnant women who are anemic because their Hb is low not only endanger the life of the mother but also disrupt growth and development and endanger the life of the fetus. This is caused by a lack of supply of nutrients and oxygen to the *placenta* which will affect the function *placenta* In the fetus (Sari & Dhamayanti, 2024). One factor that can influence pregnant women's knowledge about anemia in pregnancy is a lack of information. Therefore, as health

workers, especially nurses or midwives who have direct contact with pregnant women in the community, they must provide sufficient information, especially about anemia during pregnancy (Khalisah, & Anwar, 2024). With sufficient information, pregnant women are able to make efforts to prevent anemia in pregnancy by consuming Fe tablets regularly so that the incidence of anemia can decrease and indirectly this will also reduce mortality and morbidity rates for mothers and babies (Aprianti, 2024). Age influences a person's knowledge. The more mature the age, the level of ability and maturity in thinking and receiving information is better compared to those who are still young or immature. One of the factors that influences knowledge is the level of education (Azizah, & Suprapti, 2024). Education is a learning process which means that in education there is a process of growth, development, or change towards a more mature, better, and more mature individual, group, or society (Nisak, et al, 2024).

Most pregnant women work as housewives (IRT) as many as 12 people (80%). Mothers who work as housewives will have more time to access information via electronic media and also take part in community activities such as PKK, RT social gatherings, and others. During the women's gathering at PKK, communication will occur, exchanging information and experiences between the women. Working mothers have a greater risk of anemia compared to non-working mothers, only the proportion depends on the workload they have (Wahyuningsih, 2023). Working mothers have a tendency to get less rest, consume unbalanced food, and therefore have a greater risk of suffering from anemia than mothers who do not work. Most pregnant women have first gravida. Pregnant women in the first gravida will find it more difficult to receive knowledge because the mother has no experience regarding pregnancy (Faisal, 2023). Pregnancies with more than four are at risk of serious complications, such as bleeding and infection which will result in a tendency for babies to be born with LBW conditions and even maternal and infant deaths. Most pregnant women's gestational age is in the second trimester (13 - 28 weeks of gestation). In the next trimester, pregnant women will have pregnancy checks more often so they will receive more information from midwives or other health workers. Meanwhile, in the first trimester, mothers often experience nausea and vomiting so mothers often experience anemia (Nata et al, 2024).

CONCLUSION

There was an increase in hemoglobin levels after providing a model for empowering family abilities in managing diet in increasing hemoglobin compared to before providing a model for empowering family abilities, that there was an effect of providing a model for empowering family abilities in managing diet in increasing hemoglobin in pregnant women with anemia.

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