

## Development of Anemic Prevention Form of Self Care Management for Increasing Haemoglobin (Hb) Levels at Pregnant Women

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### KEYWORDS

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### ABSTRACT

**Aims :** This research aimed to describes the anemic prevention of self care of pregnant women. In this phase haemoglobin concentration usually decreases at first trimester and reaches its lowest level at the end of second trimester and increases again at third trimester of pregnancy. Low hemoglobin levels can lead to prenatal death, maternal death and fetal morphological abnormalities. Pregnant women's self-care during antenatal care to increase Haemoglobin level is needed in preventing anemia. Pregnant women need for nutrition management, routine of taking Fe tablets and hemoglobin management. There are fundamental problems related to management of pregnant women, namely lack of assistance and monitoring by health workers

**Methods :** This research design used experiment method with a pretest and post test control group approach. The samples taken are 15 pregnant women for each control and intervention group, using APOS (Anemic Prevention of Self care) form instruments.

**Findings :** The findings of the paired t test showed that there was a significant relationship between Hb levels before and after treatment using the APOS form with a p value of 0.000. While for the control group there was no correlation between the pretest and post test with a p value of 0.144. The results of the independent t test showed that there was a difference in hemoglobin levels in the intervention and control groups with a p value of 0.001.

**Conclusion :** As a conclusion, there is a positive effect on changes in hemoglobin levels with the use of the APOS form.

### Introduction:

Anemia is a major health problem in Indonesia. The proportion of anemia in pregnant women has increased from 2013 to 2018 from 37.1% to 48.9% <sup>1</sup>. The increasing number of anemia sufferers in pregnancy has an impact on the health of the mother and fetus and is correlated with increased morbidity and fetal death. The impact on the mother includes difficulty breathing, fatigue, palpitations, infection, preeclampsia and bleeding. While on the fetus it has

an impact on IUGR, prematurity, and LBW<sup>2</sup>. Government efforts to prevent anemia in pregnant women include providing at least 90 Fe tablets during pregnancy<sup>3</sup>. However, from this program, there are some weaknesses in terms of compliance in consuming Fe tablets due to lack of monitoring in pregnant women. The level of consumption of TTD  $\geq 90$  tablets is 38.1%, while  $<90$  tablets is 61.9%<sup>4</sup>. In addition, low levels of education, lack of exposure to information and low ANC visits are factors causing low compliance with consumption of Fe tablets in pregnant women<sup>5,6</sup>. The occurrence of anemia in pregnant women is a pregnancy complication that can be prevented through patient self-care<sup>7</sup>.

Prevention of anemia can be done with various efforts, including primary prevention, namely through education on preventing anemia, and secondary prevention including treatment of anemia and its complications. In efforts to prevent anemia in pregnant women, the participation of health workers is needed. One of the efforts to prevent anemia is by using Self Care Management Anemia (SCMA). The Anemia Self Care Management approach can be applied to facilitate the patient's knowledge, attitudes and self-care skills together with the health team<sup>8</sup>. Health education is a factor that can increase a person's ability to improve knowledge, skills and attitudes related to self-care. Self-care aims to control Hb treat and prevent complications<sup>9</sup>. Prevention of anemia in pregnant women can be done by providing good knowledge, it is hoped that good knowledge can influence daily attitudes and behavior<sup>10</sup>. This Anemia Self Care Management has been developed by several research instruments using questionnaires, applications, booklets and leaflets<sup>11</sup>. The further research on providing health education during antenatal care is expected to increase prevention of anemia complications in pregnant women<sup>12,13</sup>. Research that has been developed using health education media has not covered all Anemia management in pregnant women Based on this, it is necessary to develop a self-care monitoring sheet for pregnant women based on information technology to facilitate monitoring by health workers

Prevention of anemia in pregnant women can be done by compliance with TTD consumption and the implementation of balanced nutritional intake. Behavior of preventing anemia was mostly poor, but in this study there were shortcomings because no educational intervention was given<sup>14</sup>. Further research about preventing anemia with Numil or education "Nutrition in Pregnant Women to Prevent Anemia" using power point, leaflets, distributing pocket books, and original food media. The research aims to determine the level of knowledge after being given education and monitoring the provision of Fe Tablets for 30 days. In this research, researchers focused on education and provision of Fe tablets<sup>15</sup>. However, this study did not monitor other aspects of anemia prevention, namely balanced nutrition. Other research conducted used interview and observation methods, in measuring compliance with Fe tablet consumption, diet and family support using questionnaires. This instrument is used to measure compliance with Fe tablets, diet and family support with anemia prevention efforts without looking at the Hb levels of pregnant women after the intervention. In this case, education has not been carried out in the study<sup>16</sup>.

The method of implementing anemia prevention is increasingly developing through several researches. The development of research that has been carried out for anemia prevention education in pregnant women by implementing anemia prevention education through an android application as an educational medium. This study measures the feasibility of the application as an educational medium in preventing anemia. The weakness in this study is that continuous monitoring has not been carried out and its function is only as a reminder<sup>17</sup>. Further research desired by the researcher is to develop a simpler and easier-to-use application. Anemia prevention education through monitoring Whats App groups and social media to control Fe consumption can improve self-care capabilities<sup>18</sup>. In addition to providing education, consumption of Fe tablets and implementation of nutritious food consumption, and physical activity to prevent anemia<sup>19</sup>. Salah satu aktivitas fisik yang dapat dilakukan adalah dengan

melakukan senam hamil. Therefore, in this research, monitoring of pregnancy exercises will be developed in efforts to prevent anemia in pregnant women.

### Material and Methods:

The research design used the true experiment method with a pretest and posttest control group design approach. This study used a control group without monitoring and evaluation every week and used an intervention group that was monitored and evaluated every week through a WA group. The sample in this study was 15 pregnant women in the control group and 15 pregnant women in the intervention group. Analysis of average Hb levels in 3 months using a paired t test, analysis in comparing differences in average blood glucose levels in 3 months in the control and intervention groups using an independent t test. The instrument used was the Anemic Prevention of self-care management form consisting of knowledge about basic information, nutritional management, routine ANC, behavior of taking Fe tablets, hemoglobin management and Pregnancy Exercise.

### Results:

**Tabel I. Univariat analysis of Ages**

| Group              | variabel | n  | minimum | maximum | mean | Std deviation |
|--------------------|----------|----|---------|---------|------|---------------|
| Control group      | ages     | 15 | 23      | 31      | 26   | 2.731         |
| Intervention group | ages     | 15 | 20      | 34      | 25.6 | 4.564         |

**Tabel II. Frequency distribution of control group and intervention group for parity, education, employment and maternal complications**

| No                        | Control group |        | Intervention group |        |
|---------------------------|---------------|--------|--------------------|--------|
|                           | f             | Persen | f                  | persen |
| Gestation ages            |               |        |                    |        |
| Trimester 1               |               |        |                    |        |
| Trimester 2               | 8             | 53.3%  | 9                  | 60%    |
|                           | 7             | 46.7%  | 6                  | 40%    |
| Parity                    |               |        |                    |        |
| Primipara                 | 10            | 66.7%  | 8                  | 53.3%  |
| Multipara                 | 5             | 33.3 % | 7                  | 46.7%  |
| Education                 |               |        |                    |        |
| Junior&Senior High School | 7             | 46.7%  | 8                  | 53.3%  |
| Diploma                   | 8             | 53.3%  | 7                  | 46.7%  |
| Bachelor                  |               |        |                    |        |
| Working                   |               |        |                    |        |
| Government employment     | 5             | 33.3%  | 4                  | 26.7%  |
| Seller                    | 2             | 13.3%  | 4                  | 26.7%  |
| laborer                   | 1             | 6.7%   | 6                  | 40%    |
| Housewife                 | 7             | 46.7%  | 1                  | 6.7%   |
| Complication              |               |        |                    |        |
| None                      | 13            | 86.7%  | 15                 | 100%   |
| Yes                       | 2             | 13.3%  | 0                  |        |
| Total                     | 15            | 100%   | 15                 | 100%   |

**Table III. Correlation test of Hb levels of pregnant women pretest and posttest in the control group and intervention group**

| Group                             | Std deviasi | Std error | t      | df | Sig 2 tailed |
|-----------------------------------|-------------|-----------|--------|----|--------------|
| Control Pretest and post test     | 0.6334      | 0.1636    | -1.549 | 14 | 0.144        |
| Intervention Pretest and posttest | 0.9787      | 0.2527    | -6.226 | 14 | 0.000        |

**Table IV. Test for differences in Hb levels in pregnant women in the control group and intervention group**

| Group                                   | F     | Sig 2 tailed | t      | df | Std error difference | lower   | upper  |
|-----------------------------------------|-------|--------------|--------|----|----------------------|---------|--------|
| Posttest control group and intervention | 1.024 | 0.001        | -3.634 | 28 | -1.1154              | -1.1154 | -.3113 |

### Discussion:

Pregnant women experience various changes, both physical and emotional. These changes are influenced by the age of the pregnant woman. The healthy age for reproduction is 20-35 years. Respondents in both groups are included in the healthy reproductive age. This is interpreted as too young or too old pregnant women will typically have numerous birth difficulties. When a mother gives birth at age 20, she is considered young, and when she gives birth after age 35, she is considered old. The mother's reproductive organs are not fully developed at fewer than 20 years of gestation. since of this, pregnant women at this age may have a longer or more difficult labor since the baby's head is larger and cannot fit through the pelvis. Furthermore, the power of the abdominal and perineal muscles has not functioned at its best, leading to lengthy or obstructed labor frequently requiring maneuvers like vacuuming.

The hemoglobin level of pregnant women is determined by the gestational age of the pregnant woman because it is related to the development of the pregnant woman's hematological system. Anemia is defined by the Centers for Disease Control and Prevention (CDC) as a hemoglobin concentration of less than 11 g/dL (hematocrit of less than 33%) in the first or third trimester of pregnancy, or less than 10.5 g/dL (hematocrit of less than 32%) in the second trimester. Reduced oxygen delivery to the tissues is the cause of Iron Deficiency Anemic symptoms, which can include pallor, exhaustion, apathy, fainting, and dyspnea. Preventing iron insufficiency is mostly dependent on nutritional intake, with a total iron consumption during pregnancy of no less than 1000 mg. Fetal growth is more adversely affected by iron shortage in the first trimester than by anemia that occurs later in pregnancy. Additionally, Iron Deficiency Anemic is linked to an increased risk of preeclampsia<sup>20</sup>.

Pregnant women need a lot of information to improve their knowledge in caring for pregnancy. The information obtained needs to be absorbed and implemented for health, especially cases of anemia .This is influenced by the level of education of pregnant women.Pregnant women's educational attainment appears to be correlated with a lower occurrence of anemia. Pregnant

women who have completed high school or more are less likely to develop anemia, most likely as a result of receiving enough vitamin intake and receiving health education<sup>21</sup>.

In the meantime, a study conducted in Pakistan found that there was no significant correlation between educational attainment and anemia during pregnancy, and that in the multivariate regression analysis, lower educational attainment was not associated with an increased risk of anemia<sup>22</sup>.

The results of the study showed that there was a significant relationship in the intervention group before and after being given the APOS form intervention in an effort to increase hemoglobin levels in pregnant women. Pregnant women's bodies undergo enormous changes, and many physiological parameters resemble pathological situations, although many aspects actually undergo physiological adjustments. Erythrocyte mass can rise by 18–25% and plasma volume by 40–50% throughout the gestational period. Hemodilution happens when the erythrocyte mass increases in tandem with an increase in plasma volume. This changes the hemoglobin concentration. Because hemoglobin levels in the blood will be lower during pregnancy, particularly in the second trimester, the diagnosis of anemia during this time may be incorrect. However, there will be a normal physiological correction and increase in the third trimester<sup>23</sup>.

APOS form consists of self-care of pregnant women during antenatal to increase Hb levels needed in preventing anemia in pregnant women including knowledge management, nutrition management, routine ANC, behavior of taking Fe tablets, use of footwear and hemoglobin management. Although there are many causes of anemia, inadequate nutrition is one of the primary ones. One of the common nutritional deficiencies found throughout the world, iron deficiency contributes to the high and ongoing prevalence of anemia. But inadequate and unbalanced diets may also be deficient in a number of other micronutrients, which can lead to micronutrient deficiencies and the development of anemia<sup>24</sup>.

Interventions focused on nutrition that target the immediate causes of anemia. Increased consumption of foods that are naturally high in specific micronutrients with high bioavailability—that is, the degree to which the micronutrient is absorbed from the diet and available for the body's functions—and that have a high concentration of factors that improve absorption combined with a low concentration of factors that inhibit micronutrient absorption is the goal of nutrition education, counseling, and promotion. The most desirable and long-lasting intervention is increasing food diversity, but it may take some time to make dietary quality improvements and promote behavior change<sup>25</sup>.

Pregnancy-related anemia is linked to a number of functional dysregulations, such as lowered immunity, heightened vulnerability to infections, low birth weight, and elevated rates of morbidity and mortality among mothers. Anaemia is thought to be a direct cause of 20% of maternal deaths in India and a contributing factor in another 20% of cases. As a result, as part of the continuing national iron folic acid supplementation programs and prenatal care, anaemia prevention and management have been given top priority<sup>26</sup>.

The supplements consist of 500 µg of folic acid and 60 mg of elemental iron. Research conducted revealed that pregnant women's hemoglobin (Hb) response to supervised iron administration at doses of 60, 120, and 240 mg daily was comparable. Beyond 60 mg of iron, there was no corresponding increase in the amount of iron absorbed because higher iron doses increased hepcidin levels and decreased iron absorption<sup>27</sup>. According to studies, iron and folate deficiencies were common in pregnant Indian women. To address these deficiencies, India started providing iron folic acid (IFA) supplements to all pregnant women<sup>28</sup>. Micronutrient deficiencies can appear alone or in combination when sufficient nutrient provision, intake, or

absorption is not possible. In response, a number of strategies that place an emphasis on improving diet have been put into place at the community level or are specifically aimed at disadvantaged populations like expectant mothers, young children, and newborns<sup>29</sup>.

Regarding the effect of iron deficiency anemia on fetal growth (including weight and height), it appears that careful follow-up of mothers from early pregnancy onwards, as well as timely diagnosis and treatment, are relatively easy and inexpensive; this is essential. In this study and others, it has been shown that high hemoglobin in the mother also causes a decrease in the baby's height and weight. Therefore, it is necessary to pay attention to high hemoglobin, typically less noticed, and eliminate possible influencing factors<sup>30</sup>.

### **Conclusion:**

The conclusion of this study is that the APOS form is able to prove a significant increase in hemoglobin levels in pregnant women. This improves the handling and prevention of anemia in pregnant women by implementing the theory of self-care. Recommendations for further research with the digitalization of the APOS form to make it easier to use in pregnant women. The APOS form has been proven effective in increasing Hb levels in pregnant women in Klaten district. This is proven by the significant increase in Hb levels in the intervention group after the intervention was implemented using the APOS form. There was a difference in Hemoglobin values in the control group and the intervention group. It is evident that there is a significant increase in haemoglobin levels in the intervention group after the intervention using APOS form. There was a difference in haemoglobin values in the control group and the intervention group.

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### **Conflict of interest:**

There is no conflict of interest in this research. all members of the research team have the same interest in disseminating the results of this study to the public so that it can be utilised.

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