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Article

# THE PREDICTORS OF ANEMIA FOR WOMEN PREGNANCY IN ETHNIC MINANGKABAU

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**A B S T R A C T**

Anemia is the most common hematologic abnormality condition in which Haemoglobin (Hb) level in the body is lower than normal. This situation causes the amount of oxygen to reach the tissue so that it interferes with the organ's tissues to function properly. In West Sumatera, the prevalence of anemia in pregnancy is 24,7%, where thus's decreased from the previous years. This study aims to reveal the predictors of anemia in women pregnancy in ethnic Minangkabau. The study was conducted among 31 pregnant women with 3rd trimester who visit Batu Hampar Public Medical Center for a routine antenatal check-up. Exclusion criteria: diabetes mellitus, hypertension, and any congenital haemoglobin disorders were excluded from the study. A pretested semi-structured questionnaire was used for collecting information on socio-demographic characteristics, reproductive and medical history of the study subjects. Information on the most recent haemoglobin level was obtained from the women's medical record. An "Easy Touch" tools digital Hb test as a tools for measuring Hb levels. The results of our study showed that all variables correlated with anemia in pregnancy, p-value; maternal age (0.000), parity (0.000), occupation status (0.000), nutritional status (0.006), educational status (0.013), family per capita monthly income (0.027), antenatal care (0.027) and range of pregnancy with previous pregnancy (0.032). Therefore, we should vigorously promote early prenatal care for these at-risk pregnant women. This would allow for iron and folic acid supplementation during pregnancy, which would potentially reduce the prevalence of anemia.

## I. INTRODUCTION

Anemia is the most common hematologic abnormality condition in which Haemoglobin (Hb) level in the body is lower than normal. This situation causes the amount of oxygen to reach the tissue so that it interferes with the organ's tissues to function properly [1] [2]. World Health Organization (WHO) estimates that over 2 billion people or roughly 30% of the world's population are affected by anemia and at least 50% of pregnant women are anaemic. And the fact, anemia shown to affect women in both high and low/ middle-income nations, the major burden of disease is found in low/ middle income countries [3].

Anemia in pregnancy is considered a serious problem because reduces haemoglobin (Hb) and causes various complications like maternal death of pregnancy. It's considered a risk factor for poor pregnancy outcomes; life of both mother and foetus, such a preterm birth, low birth weight, foetal impairment. The most common Anemia In Pregnancy (AIP) is Iron Deficiency Anaemic (IDA) and acute blood loss [1]. WHO defines anemia as Hb level less than anemia 11,0 gr/dL in the first trimester, as less than 10,5 gr/dL in the second and third trimesters, and as less than 10,0 gr/dL postpartum, owing to the increase in plasma volume that occurs during pregnancy [4] [5].

Anemia with iron deficiency is one of the most prevalent nutritional deficiency afflicting pregnant women in the world. According to WHO, IDA was affecting more than a billion people in both developed and developing countries. The highest prevalence of IDA in South-East Asia and commonly in pregnant women (56%) with low-income countries than high-income countries (18%). In prevalence in pregnancy varies considerably for example socioeconomic conditions, lifestyles, and health-seeking behaviors across different cultures. [6].

According to Indonesian Basic of Health Research (2018), 48% of pregnant women with IDA in Indonesia occurs at age 15-21 years, age 25-34 years as much as 33,7%, age 35-44 years as much as 33,6% and age 45-54 years as much as 24%. In West Sumatera, the prevalence of anemia in pregnancy is 24,7%, where thus's decreased from the previous years. [7].

West Sumatera province is located on the western side of the island of Sumatera with the majority ethnic group being the Minangkabau ethnic group which adheres to a matrilineal family system where the household system is headed by a woman. In general, women in households that are also headed by women have low levels of education and income, as well as high fertility. The work and psychological burden borne by women is very high compared to men which have implications for the condition of food that is available and can be obtained, even though it is not certain that women can use it [8]

This's also in line with the data obtained from the Food and Agriculture Organization (FAO) that twice as many women death is highest than man. It's causes nutritional problems like anemia [8]. Seeing the phenomenon, this study aims to reveal the predictors of anemia in women pregnancy in ethnic Minangkabau.

## II. METHODS

### Setting

This is cross-sectional observational study was conducted at Batu Hampar Public Medical Center Akabiluru districts, Lima Puluh Kota, West Sumatera Province, Indonesia. The population of pregnant women were obtained from Batu Hampar Public Medical Center. This study was explained to the women and they were asked if they would like to participate. Upon agreement to participate, the informed consent was obtained and a signature was required as proof of consent. Participation in the study was voluntary and no incentives were provided.

### Study Population

The study was conducted among 45 pregnant women with 3rd trimester who visit Batu Hampar Public Medical Center for aroutine antenatal check-up. Pregnant women with diabetes mellitus, hypertension, and any congenital haemoglobin disorders were excluded from the study. In this study the prevalence of determining the sample-size using the following formula: $n = \frac{N}{1+N\,(d)^2}$. Thus, the final sample size for this study was approximately 31 participants.

### Sampling technique

A consecutive sampling technique was applied. Pregnant women were selected who met the inclusion criteria and until either the required sample-size was achieved or the survey period was over during the antenatal care period.

### Data Collection

Data was collected in 1 year period (2018) with the aid of two interviewers and 1 field supervisor. A pretested semi-structured questionnaire was used for collecting information on socio-demographic characteristics, reproductive and medical history of the study subjects. The questions of the questionnaire were constructed in as simple language as possible and a pre-arranged sequence was maintained. Information on the most recent haemoglobin level was obtained from the women's medical records in Batu Hampar Public Medical Center. A digital Hb test is a tools for measuring Hb levels, namely is Easy Touch tools.

**Data Analysis**

Descriptive analysis was performed to summarize the maternal demographic characteristics. Differences in means were compared using the t-test, and differences in proportions were analyzed using the chi-square test. The relationship between anemia and maternal demographics was investigated through bivariate analysis, and stratified by anemia status. This analysis was done to determine significant associations between certain variables and anemia status. For all statistical tests a two-sided P-value <0.05 was considered significant.

## III. RESULT

**Table 1. Associated determinats among study subjects according to Maternal demographic characteristics (n = 31)**

| Variables | Anaemic n (%) | Non-Anaemic n (%) | P value ($x^2$) |
|---|---|---|---|
| **Pregnant women** | 23 (74.19) | 8 (25.81) | 0.026 |
| **Maternal age (years)** | | | |
| 20 – 35 | 1 (14.29) | 6 (85.71) | 0.000 |
| < 20 - > 35 | 22 (91.67) | 2 (8.33) | |
| **Educational status** | | | |
| High | 3 (37.50) | 5 (62.50) | 0.013 |
| Low | 20 (86.96) | 3 (13.04) | |
| **Family per capita monthly income** | | | |
| High | 4 (44.44) | 5 (55.55) | 0.027 |
| Low | 19 (86.36) | 3 (13.64) | |
| **Parity** | | | |
| ≥ 4 | 22 (95.65) | 1 (4.35) | 0.000 |
| < 4 | 1 (12.50) | 7 (87.50) | |
| **Occupation status** | | | |
| Housewife | 3 (30.00) | 7 (70.00) | 0.000 |
| Self-independent | 20 (95.24) | 1 (4.76) | |
| **Range of pregnancy with a previous pregnancy** | | | |
| ≥ 2 year | 10 (100) | 0 (0) | 0.032 |
| < 2 year | 13 (61.90) | 8 (38.10) | |

| | | | |
|---|---|---|---|
| **Antenatal Care (ANC)** | | | |
| ≥ 4 times | 4 (44.44) | 5 (55.55) | 0.027 |
| < 4 times | 19 (86.36) | 3 (13.64) | |
| **Nutrition status** | | | |
| Chronic Energy Deficiency (CED) | 21 (87.50) | 3 (12.50) | 0.006 |
| No | 2 (28.57) | 5 (71.43) | |

In table 1, The results of our study showed that all variables correlated with anemia in pregnancy, p-value; maternal age (0.000), parity (0.000), occupation status (0.000), nutritional status (0.006), educational status (0.013), family per capita monthly income (0.027), antenatal care (0.027) and range of pregnancy with previous pregnancy (0.032).

## IV. DISCUSSION

**Maternal age**. We divided it into women aged 20 - 35 years and <20 - >35 years. The incidence of pregnant women with anemia was found at the age of <20->35 years as many as 22 participants, compared to reproductive ages, only one participant suffered anemia. Generally, <20 years old is a teenage period, that needs iron for growth and development, iron loss occurs due to onset of menstruation, it's different from the >35 years old, physical function of the body have begun to decrease in absorption of iron and resulting iron deficiency [9].

**Educational status. The Educational status** of pregnant women is associated with the knowledge of conducting antenatal care visit. We found that women with high educational status as many as eight participants (two participants in high school, four participants in diploma 3, and two participants were in bachelor education). Different from a low educational group as much as 23 participants. Majority in low educational group; 19 participants with Junior High School and four participants in elementary school). This condition causes the participants not to chek for **antenatal care visit**, some participants supposed that pregnancy will be fine as long as there are no serious complications [10] The government program in providing iron tablets is not automatically accepted by pregnant women in ethnic Minangkabau.

**Family per capita monthly income**. According to our result, Family per capita monthly income in ethnic minangkabau as much as 71% participants with low family per capita monthly income IDR <2.100.000. Pregnant women with low income are associated with purchasing power for the consumption of nutritious food. Low nutritional intake will affect the health of feotus, thereby increasing maternal and neonatal risk. The different conditions that

occur in pregnant women with high income cause the concept of purchasing power and access to nutritious food is more affordable. These problems is common that occur in various countries with medium-low socioeconomic conditions. The efforts to preventing are also very complex by involving the government as the main actor and the medic as the driving force [11]

**Parity.** Results in our study showed that pregnancies with parity more than 4 were 95.65% more likely to have anemia than those with parity <4. Pregnant women more than 4 will susceptible attached anemia cause the impact of pregnancy which often increases the greater the risk of blood loss which results in a decrease in Hb levels that estimates iron loss 250 mg/ dL [10]. According to Chowdhury et al. (2015), parity 2-3 is safe to avoid in maternal death.

**Occupation status**. In this study, pregnant women who work self-independent tend to experience anemia than pregnant women as working as housewives. This result is different from the results obtained in the study of Weldekidan et al. (2018) where pregnant women with occupational status as housewives experience anemia than pregnant women with occupational status in self-independent [12]. We interviewed one of the participants who worked in self-independent and found that the pregnant women unable to process their food so they tended to consume ready-to-eat/ junk foods that had minimal nutrition but the highest fat.

**Range of pregnancy with a previous pregnancy**. Range of pregnancy with previous pregnancy will affect health problems like anemia. The lack of nutrition which is a biological mechanism for restoring hormonal factors and the maternal condition is still not recovering to the fulfillment of nutritional needs is not optimal. Based on table 1, we found the pregnant women with interval of less than 2 years tend to experience anemia in pregnancy over an interval more than 2 years. Long interval > 2 years have a low risk of anemia cause the function of the body and iron supplementation was normally for maternal and neonatal.

**Nutrition status**. Some complication of nutritional status in pregnant women, for example; Chronic Energy Deficiency (CED) is associated with anemia. Clinical assessment of nutritional status is very important as the first step to knowing the health problem. A Blood test with a level of ferritin is used to know the kind of anemia. Diagnose to Screening of CED is based on LILA <23.5 cm. The incidence of CED in pregnant women is influenced by direct factors and indirect factors. These factors are influenced by several circumstances, one of which is cultural perception. One of the problems that occur due to cultural / belief perceptions is the dietary consumption patterns of pregnant women such as the prohibition of certain types of food. [13].

## V. CONCLUSION

Our study indicated that anemia is a moderate public health problem among pregnant women in Indonesia like West Sumatera in ethnic Minangkabau. Anemia in pregnancy continues to be a health problem, All factors like maternal age, educational status, Family per capita monthly income, parity, occupation status, Range of pregnancy with a previous pregnancy, antenatal care (ANC), nutrition status contribute to this situation. Therefore, we should vigorously promote early prenatal care for these at-risk pregnant women. This would allow for iron and folic acid supplementation during pregnancy, which would potentially reduce the prevalence of anemia.

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