

# The Characteristics of Pregnant Women in Preventing Anemia and Stunting in Aceh Besar Regency, Indonesia

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## ABSTRACT

**OBJECTIVE:** This research aims to identify the characteristics of pregnant women to prevent anemia and stunting in Aceh Besar.

**METHODOLOGY:** This research is an exploratory, descriptive study. Health centres were selected using a basic random sampling technique. The sample of this study involved 80 pregnant women in their third trimester, chosen through purposive sampling. A demographic questionnaire was used for data collection, and univariate analysis was applied to analyze the data.

**RESULTS:** The findings showed that the majority of the selected pregnant women in Aceh Besar Regency had the following characteristics: non-risk age 68(85.0%), housewives 72(90.0%), pregnancy interval more than two years 50(62.5%), primiparous 32(40.0%), monthly income less than the minimum wage 68(85.0%), high school graduates 58 (72.5%), normal middle upper arm circumference 61(76.3%), and not anemic 50(62.5%).

**CONCLUSION:** Stunting can occur due to several characteristics carried by pregnant women, such as age at risk, anemia status, and the normal upper middle arm condition. Therefore, it is recommended that interventions be developed to improve the nutritional status of pregnant women to reduce the prevalence of stunting.

**KEYWORDS:** Characteristics, Pregnant women, anemia, stunting

## INTRODUCTION

Stunting, a condition where children under five years old fail to thrive, is caused by prolonged malnourishment and recurrent infections. Poor parenting styles and inadequate psychosocial stimulation, especially within the first a thousand days of birth, impact these two causative factors. One of the causes of stunting is anemia during pregnancy. Stunting and anemia are interrelated phenomena and represent ongoing issues in Indonesia, especially in Aceh<sup>1</sup>.

According to Basic Health Research published by the Ministry of Health (2018), Aceh has been Indonesia's third-highest province for stunting cases, accounting for 30.8% of all stunting cases across the nation<sup>1</sup>. Meanwhile, anemia in Indonesia increased in 2018, reaching 48.9%. An Aceh Province Basic Health (2018) study highlighted that 12.84% of pregnant women in Aceh Province had anemia<sup>2</sup>. In particular, the findings showed variations in anemia prevalence

between two neighbouring regencies or cities, namely Banda Aceh City (11%) and Aceh Besar Regency (24.09%).

Prevention of stunting and anemia can begin during pregnancy since both are intertwined and cannot be separated. One of the main goals of the MDGs is to improve the maternal status and the health of infants and toddlers by lowering morbidity and mortality rates and preventing diseases, including anemia and stunting. This goal can be achieved by expanding access to prenatal services and using a community-based approach<sup>3</sup>. This period's poor nutritional and health conditions could negatively impact children's physical and cognitive development, adversely affecting their long-term health and economic conditions<sup>4</sup>.

The characteristics of pregnant women are among the most crucial aspects that need to be researched to improve maternal health. In Aceh Besar, it is common for pregnant women to believe that stunting is normal and should not be a cause for concern. Individual characteristics of mothers could significantly contribute to the study of the mothers' knowledge and attitudes toward the effects of stunting. Therefore, examining the characteristics of pregnant women related to anemia and stunting, which can serve as a basis for further research, is necessary. This study aims to explore the characteristics of pregnant women related to anemia and stunting, which can provide fundamental information for future investigations.

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## METHODOLOGY

### Study Design

This study used an exploratory, descriptive method to obtain an overview of the characteristics of pregnant women in Aceh Besar, Indonesia, in preventing anemia and stunting.

### Population and Sample

This study's population comprised pregnant women registered at health centres in Aceh Besar Regency. The study was conducted at six of the 23 selected community health centres in Aceh Besar Regency using a simple random sampling technique (using a lottery). Furthermore, the pregnant women from these six community health centres were selected based on several criteria with the assistance of the coordinating midwife. Purposive sampling was used to select 80 third-trimester pregnant women as the study's sample. The following inclusion criteria were used to recruit the respondents: pregnant women residing in Aceh Besar; third-trimester pregnant women who have received at least three Ante Natal Care (ANC) checks; have data on hemoglobin test results from a public health centre; and have not encountered any pregnancy complications, such as blood disorders, pre-eclampsia, or hyperemesis gravidarum. The researchers collaborated with the midwife coordinator in selecting the participants based on the predetermined criteria.

### Instrument

This instrument of this research involved socio-demographic and obstetric characteristic data, consisting of age (the risk age is <20 or >35. Non-risk age is 20-35), occupation (working mother and housewife), household income (less than the minimum wage and more than the minimum wage), education level (low, middle and high), pregnancy interval (first pregnancy, <2 years and  $\geq 2$  years), and parity (Nulliparous, Primiparous and Multiparous). The researchers and community health centre officers carried out the examination of the Middle Upper Arm Circumference (Normal MUAC  $\leq 23.5$  cm and Not Normal MUAC < 23.5 cm). Meanwhile, the records of hemoglobin levels of the pregnant women (Not Anemic Hb  $11 \geq$  gr/dl and Anemic Hb > 11 gr/dl) were obtained from secondary data in the pregnant women's examination documentation book at least two weeks following the examination. Two maternity nursing department experts participated in testing the consent-gathering instrument.

### Data Analysis

Eight characteristics of pregnant women in Aceh Besar were analyzed using univariate analysis, including the frequencies and percentages of all traits. The obtained results were added to the frequency table. The formula from Notoatmodjo, S. (2018) was used to conduct an univariate analysis<sup>5</sup>.

### Ethical Statement

This research was approved by the Ethics Committee of the Nursing Faculty, Syah Kuala University, Banda

Aceh, with code number 113001060623. All participants provided written informed consent. The researchers saved the respondents' data to maintain their confidentiality. The data were not shared and were only used for data analysis. In addition, the names and addresses of the respondents were not included in the published data.

## RESULTS

The following results were obtained from the data collected on 80 pregnant respondents:

**Table I** shows the characteristics of the respondents of this study. Of the selected pregnant women, 68 (85.0%) were classified as not at risk due to their age, 72 (90.0%) were housewives, 50 (62.5%) had a pregnancy interval of more than two years, and 32 (40.0%) had primiparous parity status. Most respondents (68 women or 85.0%) had monthly incomes less than the minimum wage and were only high school graduates (58 women or 72.5%). Furthermore, 61 (76.3%) pregnant women had normal MUAC sizes, and 50 (62.5%) had non-anemic Hb levels.

**Table I: Frequency Distribution of Data on Characteristics of Pregnant Women (n = 80)**

Characteristics	Frequency	Percent
<b>Age (years)</b>		
20-35	68	85.0
<20 >35	12	15.0
<b>Occupation</b>		
Housewife	72	90.0
Working	8	10.0
<b>Income Category</b>		
< US\$ 227	68	85.0
$\geq$ US\$ 227	12	15.0
<b>Education</b>		
Elementary	9	11.3
Middle	58	72.5
High	13	16.3
<b>Pregnancy Interval</b>		
First pregnancy	22	27.5
$\geq 2$ years	50	62.5
< 2 years	8	10.0
<b>Parity</b>		
Nulliparous	20	25.0
Primiparous	32	40.0
Multiparous	28	35.0
<b>MUAC</b>		
Normal (MUAC $\geq 23.5$ cm)	61	76.3
Not Normal (MUAC < 23.5 cm)	19	23.8
<b>Hb Levels</b>		
Not Anemic (Hb $11 \geq$ gr/dl)	50	62.5
Anemic (Hb < 11 gr/dl)	30	37.5

## DISCUSSION

The following discussion explains seven characteristics of pregnant women: age, occupation and monthly income, education background, pregnancy interval, parity, MUAC (Middle Upper Arm Circumference), and hemoglobin level.

### Age

According to statistical analysis of the age factor of the collected data, 68 (85.0%) of the pregnant women in Aceh Besar Regency were not classified as being at risk for pregnancy. Twelve pregnant women (15.0%), nevertheless, still carried high-risk pregnancies, defined as those being younger than 20 years or older than 35 years.

According to a study conducted by Astuti (2016), anemia cases were more common in pregnant women under the age of 20 than in pregnant women over the age of 20.

Cases of anemia during pregnancy, which commonly occur at risk ages, can be influenced by several factors, including mothers' level of knowledge. Accordingly, a mother with a non-risky age for pregnancy tends to have a better understanding of the danger signs during pregnancy, enabling the mother to prepare herself better physically<sup>6</sup>.

A mother's age during her pregnancy is one of the risk factors that is commonly linked to the incidence of anemia in pregnancy. The increasing risk factors for anemia during pregnancy are correlated with age at risk for pregnancy or mothers who are over 35 years (p-value 0.001)<sup>7</sup>. In addition, the mother's age during pregnancy is also associated with risk factors for childhood stunting. Previous research shows that mothers who become pregnant at risk ages tend to give birth to short (34.2%) and very short (30.3%) children<sup>8</sup>.

### Occupation and Monthly Income

Socioeconomic factors often contribute to an individual's employment status and income during a specific period. This research showed that 85% (68 pregnant women) had family income below the regional minimum wage. Quoted from the Decree of the Governor of Aceh 2022, the regional minimum wage that applies throughout Aceh province is IDR 3,413,666 or US\$ 227<sup>9</sup>. When considering the income factor, pregnant women who work and make a good income tend to take better care of their pregnancy<sup>10</sup>.

It is generally accepted that pregnant women with incomes and jobs typically have more accessible social networks, enabling them to get more information than non-working mothers. These networks allow pregnant women to improve their knowledge of pregnancy by observing the experiences of people around them<sup>11</sup>. According to Budiarti, Putri, and Amelia (2018), there is a relationship between employment status, income, and

the knowledge of pregnancy<sup>6</sup>. A mother's knowledge, which her income could influence, can also impact her adherence to prenatal checkups and iron consumption during pregnancy to prevent anemia. Pregnant women with good incomes tend to be disciplined and aware of the benefits of taking iron supplements, which could lower their chance of developing anemia<sup>12</sup>.

In addition to helping mothers understand how to maintain their pregnancy, family income is also associated with the incidence of stunting. Research conducted by Halim et al. (2018) found that there was a significant correlation between parental income and the incidence of stunting, where children who have low-income parents are more likely to suffer from stunting<sup>13</sup>. A family's economic status, specifically related to their income, is a risk factor for stunting because it can affect the family's ability to meet the nutritional needs of toddlers, feeding times, and healthy living habits<sup>14</sup>.

### Education

This study showed that most pregnant respondents (58 women or 72.5%) were secondary school graduates and were not anemic (62.5%). The research conducted in Northern Ethiopia in 2015 corroborated the findings of this study, revealing that pregnant women with lower levels of education had a higher prevalence of anemia than pregnant women with higher levels of education, with an OR value of 1.56 times higher for experiencing anemia compared to pregnant women with lower levels of education. This finding could also result from pregnant women with a high level of education taking several precautions against anemia, such as regular iron consumption and proper nutrition during pregnancy<sup>15</sup>. Several studies have indicated a correlation between education and health levels. The higher the level of education, the easier it is to accept the concept of healthy living independently, creatively, and sustainably. The level of education influences someone's ability to receive and comprehend knowledge, especially nutrition-related knowledge. Someone with higher education is better able to accept and comprehend the information they received than someone with lower education level<sup>16</sup>. The ability to understand information will help individuals build healthy behaviors.

Highly educated individuals will act more rationally because they are more receptive to new ideas. Highly educated mothers will have their pregnancies checked regularly and consume nutritious food to maintain the health of both themselves and their unborn children. Thus, it is proven that there is a relationship between the level of education and the anemia status of pregnant women<sup>17</sup>. Women with middle or high levels of education are less likely to experience anemia compared to women who have a low level of

education. Higher or secondary education could help pregnant women to reduce the risk of anemia during pregnancy. Pregnant women with higher education tend to have better incomes and consume nutritious food<sup>18</sup>.

Education is a process of changing behavior toward maturity and perfecting life. Pregnant women who are highly educated can balance their diet patterns according to their gestational age. Low education will affect knowledge acquisition, comprehension, and awareness of health issues such as anemia<sup>19</sup>. Pregnant women with low levels of education may find it challenging to address family nutrition and health issues, and they may also have some limitations in receiving information, which can limit their knowledge of iron (Fe) and increase the risk of iron deficiency<sup>20</sup>. The majority of respondents in this study, who were third-trimester pregnant women, did not have anemia. This finding may be due to the educational level of the pregnant women.

#### **Pregnancy Interval**

The majority of pregnant women in this study (50 women or 62.5%) had pregnancy intervals over two years, and 22 (27.5%) were carrying the first pregnancy. Pregnancy spacing is essential for the health of the mother and fetus. Appropriate birth spacing will benefit the health of the mother and fetus, especially regarding nutritional status<sup>21</sup>. The World Health Organization states that the ideal pregnancy spacing is between 18 and 24 months, while the National Population and Family Planning Agency recommends spacing subsequent pregnancies three years apart from the previous birth<sup>22</sup>.

A study in India (2020) stated that the stunting rates increased by 28%, and the incidence of Low Birth Weight (LBW) increased by 26% in children born less than 24 months apart<sup>23</sup>. Apart from LBW, short birth spacing can cause premature birth because the mother may not be able to restore her nutritional status. Low maternal nutritional reserves combined with short birth intervals can raise the risk of intrauterine growth retardation, which has detrimental effects on the baby's prenatal nutritional stores and fetal nutrition<sup>24</sup>.

Socio-cultural factors can also influence pregnancy spacing status due to socio-cultural and spatial variations. The prevalence of childhood malnutrition varies significantly across different countries<sup>1</sup>. Therefore, it is highly recommended that interventions such as health education and family planning help to increase birth spacing or parity and that reproductive health services should be provided to improve maternal and infant nutrition.

#### **Parity**

The results of this study demonstrated that the majority of pregnant respondents were primipara (40%), multipara (35%), and anemic (37.5%). In

addition to consuming foods high in iron, pregnant women must take iron tablets, which contain between 30–60 mg of iron per day (+400 µg). Mothers who have dealt with anemia in the past will be more cautious and mindful of their subsequent pregnancies. However, several studies clarify that a woman's chance of developing anemia increases with the frequency of her pregnancies and deliveries; this is due to the effects of repeated pregnancies, which can deplete iron reserves in pregnant women<sup>25</sup>.

A study by Kassa, Muche, Berhe, & Fekadu (2017) showed that primigravida mothers had a 61% lower risk of anemia during pregnancy than multigravida mothers. The parity rate among mothers is also a factor causing stunting in children. Mothers with high levels of parity are more likely to develop anemia during pregnancy, and mothers with anemia during pregnancy are more likely to have stunted children<sup>26</sup>. Pregnant women are at risk for anemia due to several reasons, some of which are associated with the characteristics of the pregnant woman. Previous studies showed that 22.73% of mothers with multiparous parity status experienced anemia, which indicated that they tended to be at a higher risk of experiencing anemia during pregnancy (p-value = 0.001)<sup>7</sup>.

#### **MUAC (Middle Upper Arm Circumference)**

Based on the results of this study, it was found that 76.3% of the pregnant women had normal arm circumferences, while 23.7% had below-normal arm circumferences. Arm circumference is one of the measurements or anthropometry carried out on pregnant women to identify maternal nutrition during pregnancy. A pregnant mother is at risk of a chronic energy deficit if her upper arm circumference is less than the normal limit of 23.5 cm.

Chronic energy deficiency is when the mother lacks calories and protein (malnutrition), which can cause health problems during childbearing age. Nutrition is vital during pregnancy. In addition, several studies have stated that iron and protein intakes and upper arm circumference were positively correlated with hemoglobin levels (p-value <0.05). These findings indicated that someone's hemoglobin level decreased with decreasing protein and iron intake and with decreasing upper arm circumference<sup>27</sup>.

A study on pregnant women aged 16 and 36 weeks showed differences in energy consumption during pregnancy<sup>28</sup>. The findings suggested that during 16 weeks of pregnancy, it is necessary to consume more energy-containing nutrients compared to the third-trimester pregnancy (36 weeks), for example, 4,170 KJ to 24,200 KJ of carbohydrates<sup>28</sup>. The third-trimester pregnant respondents in this research, whose gestation age was 28–42 weeks, indicated that they had sufficient nutrients to prevent chronic energy deficiency.

### Haemoglobin Levels

According to the findings in this study, anemia is still a very concerning condition, although only 37.5% (29 pregnant women) experienced anemia during pregnancy, and 62.5% (50 pregnant women) did not experience anemia. Iron deficiency can pose a risk to the health of both the fetus and the mother. In this case, the fetus may experience disruption or obstacles to the growth and development of both body and brain cells, pregnancy failure, congenital defects, and a low birth weight<sup>29</sup>. Anemia during pregnancy, which has been a national health issue, reflects the socioeconomic welfare of society and can increase the risk of neonatal disease and death, as well as maternal morbidity<sup>15</sup>.

Insufficient nutritional requirements can cause the fetus to experience an unbalanced regulatory response while inside the uterus. These adjustments are needed to develop fetal cells, including the development of the brain and other organs. A malnutrition-induced regulatory response causes the body to be excreted as a short body in adulthood, resulting in premature birth and low birth weight, risk factors for stunting<sup>30</sup>. A study from sub-Saharan Africa involving 36,879 mother-baby pairs from 23 countries found that 16.4% of children had low birth weight, 29.9% of children experienced stunting, 10.6% experienced severe stunting, 74.3% of mothers experienced anemia, and 3.2% experienced severe anemia, which showed that these conditions continue to occur. Another study showed that children whose mothers had a history of consuming iron tablets and were not anemic had a reduced risk of experiencing stunting and anemia<sup>31</sup>.

A qualitative study conducted by Darmawati et al. (2020) found that the pregnant respondents considered anemia a normal condition and experienced symptoms such as weakness, nausea, and paleness, which they perceived as unserious concerns. The same misconception also affected husbands, who likewise were unaware of the anemia that their pregnant wives experienced<sup>32</sup>. Similarly, the study by Darmawati et al. (2022) also found that the participants' husbands viewed the physical symptoms of anemia, such as nausea, vomiting, weakness, and pallor during pregnancy, as normal and did not require concern. Furthermore, the same study also explored the perceptions and actions of husbands towards their wives, who were advised to take iron tablets regularly to prevent anemia. There were some responses, and some of the husbands had a good understanding of iron tablets<sup>33</sup>.

### CONCLUSION

Based on the findings, it can be concluded that the following characteristics were frequently found in pregnant women in Aceh Besar Regency: an age without risk 85.0%, housewife 90.0%, pregnancy

interval less than two years 62.5%, primiparous 40.0%, monthly income less than the minimum wage 85.0%, high school graduates 72.5%, normal middle upper arm condition 76.3%, and not anemic 62.5%. Several results, particularly the characteristics of pregnant women with anemia, still require attention, even though the percentage shows numbers that fall into the good category for pregnant women. Further intervention research needs to be conducted to obtain more specific results regarding the characteristics that most dominantly influence the occurrence of anemia. Additionally, nutrition educational interventions should be developed to reduce stunting rates.

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**Conflict of Interest:** The authors declared no conflict of interest in the study.

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### AUTHORS CONTRIBUTION

Darmawati: Coordinated the entire research process, wrote the initial manuscript, and critical review of the manuscript.

Dimiati H: Carried out health education as part of a series of interventions.

Fitri A: Conducted the data collection and contributed to the data analysis.

Rizkia M: Wrote the protocol and monitored the data collection.

Kiftia M: Conducted the data collection and contributed to the data analysis.

Saffanah N: Performed the data analysis.

Halifah E: Conducted the data collection and contributed to the data analysis.

Sufriani: Conducted the data collection and contributed to the data analysis.

All authors have approved the final version of the article.

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