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# Factors Affecting Nutritional Status of Pregnant Women: A Literature Study

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**Abstract:** Malnutrition in pregnant women has an impact on both mother and child. In children causing LBW, premature, developmental disorders, stunting. Mother, it causes chronic energy deficiency and anemia. Therefore, it is important to conduct literature studies regarding factors that affect the nutritional status of pregnant women. This literature study is purposeful to identify the influencing factors nutritional status of pregnant women and knowing whether there are other factors besides those that have been widely studied. This study used a narrative review method. Searched using EBSCOhost, PubMed, and Google Scholar database. Keywords “pregnant women” AND “nutritional status” AND “factor”. The inclusion criteria were articles that discuss the nutritional status of pregnant women, five last years, free full text, samples of pregnant women, in English, or Indonesian. The exclusion criteria were not including volume, number, and published articles. There were 16 quantitative research articles analyzed in this study. This study found factors that affect the nutritional status of pregnant women, which could be changed and which could not be changed. There were age, parity, education, knowledge, social-economic, infectious diseases, ANC, dietary habits, occupation and origin of residence. There are other factors besides those that have been widely studied, such as caffeine intake, illiteracy, and self-efficacy. Suggestions for research, it is necessary to have further research related to nutritional status by assessing weight gain and BMI, for health workers it is better to provide health education regarding factors that may be changed in pregnant women, namely nutrition knowledge, visit ANC, and diet.

**Keywords:** Factors, nutritional status, pregnant women

## 1. Introduction

The nutritional status of pregnant women has an impact on both the mother and the fetus. The impact on the mother is the risk of complications including anemia, bleeding, the mother's weight does not increase normally and can also experience infectious diseases. During the delivery process, pregnant women who experience poor nutritional status will find it difficult to give birth and labor tends to be long, labor is premature, and labor with surgery tends to increase (Waryana, 2010). In the fetus or infant, poor nutritional status in pregnant women can cause abortion in the fetus, premature birth, growth problems, LBW, it can also cause death in newborns (Marmi, 2013).

Common problems in pregnant women are related to nutritional status, namely chronic energy deficiency and anemia. Based on the results Riset Kesehatan Dasar (Riskesdas), the proportion of anemia

in Indonesian pregnant women in 2018 was 48.9%, this figure is an increase from the previous year 2013 which reached 37.1% (Risikesdas, 2018). For pregnant women anemia can increase the prevalence of maternal mortality and morbidity (Departemen Gizi dan Kesehatan Masyarakat UI, 2014).

The maternal mortality rate (MMR) up to 2019 in Indonesia is quite high, namely, 305/100.000 births (Susiana, 2019). In general, the causes of maternal death nearly 75% of all maternal deaths are due to infection, high blood pressure during pregnancy, unsafe abortion, and heavy bleeding after giving birth (WHO, 2019). Pregnant women with anemia 5.1 times the risk of experiencing postpartum hemorrhage compared to those without anemia (Ningsih, Tambunan, & Raynaldi, 2018). Pregnant women who have severe anemia, the possibility of giving birth to premature babies (Waryana, 2010).

The next nutritional problem is Chronic Energy Deficiency . The prevalence of chronic energy deficiency among pregnant women in Indonesia is 17.3% (Risikesdas, 2018). Malnutrition in pregnant women can also cause disturbances in the growth and development of children. Based on research on all toddlers in the working area of the Bontoa Community Health Center in Maros Regency, pregnant women in chronic energy deficiency was more likely to have stunted children (22.1%) compared to normal children (6.3%)

Nutrition problems in pregnant women are caused by various factors, including social and economic conditions, birth spacing too close, parity, age at first pregnancy, and level of physical work (Istiany, 2013). The previous author's explanation shows that the impact of poor nutritional status on the mother can cause many problems for pregnant women and babies. It is important for health workers, mothers, and women of childbearing age to know what are the factors that affect the nutritional status of pregnant women so that this is a preventive effort for mothers not to experience nutritional problems during pregnancy.

In this role, nurses can also become a counselor for pregnant women or women of childbearing age who want to plan their pregnancy so that there is no adverse impact on the nutritional status of pregnant women in relation to factors that affect the nutritional status of the mother that can be changed. Nurses as educators can also help mothers or women of childbearing age to provide information, especially pregnant women who are at risk of malnutrition.

## 2. Methodology

This literature review uses the *narrative review* method, to identify what factors affect the nutritional status of pregnant women and find out whether there are other factors besides those that have been widely studied.

Articles is obtained from electronic databases, namely *PubMed*, *EBSCOhost* and *google scholar*. In Indonesian, the keywords used were “wanita hamil” DAN “status gizi” DAN “faktor”. In english author used “pregnant women” AND “nutritional status” AND “factor”. The inclusion criteria are articles that discuss the nutritional status of pregnant women, the year published in the last five years free full text, samples of pregnant women, in English or Indonesian. After sorting, 16 quantitative research articles were reviewed in the literature study (Table 1 and Figure 1).

**Table 1.** Number of Articles Found.

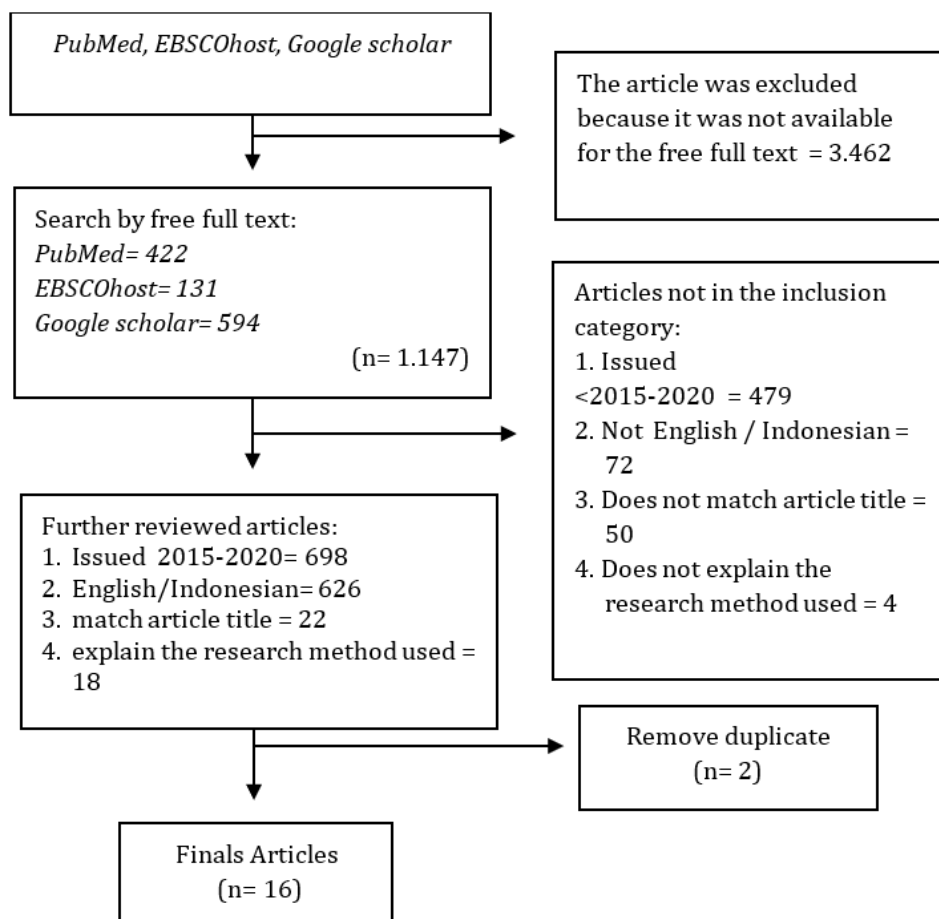
| <b>Database/ search engine used</b> | <b>Number of articles obtained</b> | <b>Number of articles that fit the inclusion criteria</b> | <b>Number of articles to be analyzed</b> |
|-------------------------------------|------------------------------------|---|--|
| <i>PubMed</i>                       | 1.064                              | 195   | 5 Articles                               |
| <i>EBSCOhost</i>                    | 295                                | 57  | 1 Articles                               |
| <i>Google Scholar</i>               | 3.250                              | 374   | 10 Articles                              |
| Total                               | 4.609                              | 626   | 16 Articles                              |

**Table 2.** Factors Affecting Nutritional Status in Pregnant Women Based on Literature Review.

| Researcher's name                                | Age of pregnant women | Parity | Education | Knowledge | Socio economic | Infectious diseases | ANC visits | Dietary habit | Occupation | Origin of residence |
|--|-----------------------|--------|-----------|-----------|----------------|---------------------|------------|---------------|------------|---------------------|
| (Diddana, 2019)                                  | -                     | -      | -         | ✓         | ✓              | -                   | ✓          | -             | -          | -                   |
| (Kumera, Gedle, Alebel, Feyera, & Eshetie, 2018) | -                     | ✓      | ✓         | -         | -              | ✓                   | -          | -             | -          | ✓                   |
| (Gudeta, Regassa, & Belay, 2019)                 | ✓                     | -      | ✓         | -         | -              | -                   | -          | -             | -          | -                   |
| (Wemakor, 2019)                                  | -                     | -      | -         | ✓         | -              | -                   | -          | -             | -          | -                   |
| (Ouzennou, Amor, & Baali, 2019)                  | ✓                     | ✓      | -         | -         | ✓              | -                   | -          | -             | -          | ✓                   |
| (Derso, Abera, & Tariku, 2017)                   | -                     | ✓      | -         | -         | ✓              | -                   | -          | -             | -          | ✓                   |
| (Wijanti, Rahmaningtyas, & Suwoyo, 2016)         | ✓                     | -      | ✓         | -         | -              | -                   | -          | -             | -          | -                   |
| (Fitrianiingtyas, Pertiwi, & Rachmania, 2018)    | -                     | -      | -         | ✓         | -              | ✓                   | ✓          | -             | -          | -                   |
| (Subekti & Sulistyorini, 2018)                   | -                     | ✓      | -         | -         | -              | -                   | -          | -             | -          | -                   |
| (Abrori, Hutagalung, & Marlenywati, 2015)        | ✓                     | ✓      | -         | -         | -              | -                   | -          | -             | -          | -                   |
| (Amini, Pamungkas, & Harahap, 2018)              | ✓                     | -      | -         | -         | -              | -                   | -          | -             | -          | -                   |
| (Mahyuni, Yunita, & Putri, 2019)                 | -                     | ✓      | -         | -         | -              | -                   | -          | -             | -          | -                   |
| (Ernawati, 2018)                                 | ✓                     | -      | -         | -         | -              | -                   | -          | -             | ✓          | -                   |
| (Afriyanti, 2020)                                | ✓                     | ✓      | ✓         | -         | ✓              | -                   | -          | -             | ✓          | -                   |
| (Hikmah, Puji, & Istioningsih, 2020)             | ✓                     | ✓      | ✓         | -         | -              | ✓                   | -          | ✓             | -          | -                   |
| (Syakur, Musaidah, Usman, & Dewi, 2020)          | ✓                     | ✓      | ✓         | ✓         | -              | -                   | -          | ✓             | -          | -                   |

### 3. Result

Based on the result of the article search, there were 16 suitable articles. The most type of cross sectional method. In this article, there are 13 factors that affect the nutritional status of pregnant women, of which 3 factors are additional factors besides those that have been in many research articles. Here are each of the factors found in the research articles obtained (Table 2).



**Figure 1.** Article Sorting Flow.

### 4. Discussion

#### *Age of Pregnant Women*

In women, the age of 20-35 years is the age for healthy and safe reproduction. Ages that are too young or less than 20 years of age are not biologically ready, and mentally immature. Younger pregnant women need additional nutrition themselves and have to share them with their fetuses (Syakur, Musaidah, Usman, & Dewi, 2020). The older a person is, the better prepared he is to accept his pregnancy both physically and psychologically so that the mother can pay attention to the welfare of her fetus (Wijanti, Rahmaningtyas, & Suwoyo, 2016). The young age of the mother is also at risk of giving birth with breech location delivery due to the condition of the mother's narrow pelvis (Amini, Pamungkas, & Harahap, 2018).

Women over 30 years of age are declared at risk because their immune system has decreased so that various diseases occur at this age (Deswati, Suliska, & Maryam, 2019). Studies in Ethiopia suggest that older pregnant women may face pregnancies with complications related to delivery and diseases that predispose the mother to anemia (Gudeta, Regassa, & Belay, 2019). The next article from Morocco states that this young age is a determining factor affecting anemia because at this young age it is associated with primiparous who has not had experience. (Ouzennou, Amor, & Baali, 2019).

### *Parity*

The risk parity for pregnant women is more than three. Pregnant women with parity of more than 3 will experience chronic energy deficiency (Syakur et al., 2020). Grand multiparity is more likely to have a higher risk of pregnancy problems (Hikmah, Puji, & Istioningsih, 2020). High parity requires women to care for their children rather than paying attention to the nutrition and health status of the pregnant women themselves (Kumera, Gedle, Alebel, Feyera, & Eshetie, 2018).

Mothers who give birth frequently will also have a higher deficiency of iron so that they are at risk of developing anemia (Abrori, Hutagalung, & Marlenywati, 2015). Subsequent pregnancies are at risk of developing anemia and bleeding again if you do not pay attention to the need for adequate nutrition (Subekti & Sulistyorini, 2018).

### *Education*

The level of education is crucial for mothers to understand and absorb the information provided by health workers so that it determines their attitude in choosing nutritious foods (Hikmah et al., 2020). The nutritional status of pregnant women is also influenced by the mother's diet in choosing food not only by paying attention to quantity but quality (Wijanti et al., 2016).

Another article states that education is related to nutritional status, pregnant women get more information about how to prevent chronic energy deficiency (Syakur et al., 2020). In a study at the University Hospital of Gondar, Ethiopia, it was stated that pregnant women who do not have formal education and basic education are at risk of malnutrition, the reason is that women with higher education levels are more likely to be exposed to information media that affect behavior in relation to the selection of nutritious foods. (Kumera et al., 2018).

Pregnant women who have no formal education, but are able to read and write are twice as likely to develop anemia compared to pregnant women whose education level is a diploma or above. (Gudeta et al., 2019). Mandiangin Community Health Center had a low level of education because many pregnant women with low economies were then financed by their husbands. Pregnant women whose education level is low causes limited acceptance of information which results in nutritional problems (Afriyanti, 2020).

### *Knowledge*

Malnutrition status is related to lack of knowledge due to lack of focus on dietary practices and causes pregnant women to be malnourished (Diddana, 2019). In nutrition awareness behavior, pregnant women will try to fulfill their nutrition and also for their babies (Fitrianiingtyas, Pertiwi, & Rachmania, 2018). The lack of information received by pregnant women about nutrition causes many respondents who do not know about chronic energy deficiency in pregnant women, generally thinking that chronic energy deficiency is caused by sleep patterns because they think someone who is lacking sleep will cause the body to become thin. (Syakur et al., 2020).

On the research from Wemakor (2019), the key independent variable of anemia between pregnant mother in the Hospital with tersier North Ghana reference is a science variable about anemia and trimester pregnancy (Wemakor, 2019). Minimum informatian on pregnant mother will affect her nutrition status so its going to change her perseption about nutrition.

### *Financial Status*

According to the result from fourth study, the financial status was affect for pregnant mother nutrition status, the fourth artical have same claimed that financial status related with income. In the first artichel, standard living for healthy food was selected by financial status (Ouzennou et al., 2019). This Incomeis important because have linier impact for pregnant mother (Hamzah, 2017). In other words, poor families are vulnerable to malnutrition because they can't afford the food (Derso, Abera, & Tariku, 2017).

This statement was related with another study, but there is another statement about anemia, anemia disease not only have experience by poor family but also have experience by a rich family with not obey to consumed Fe tablets which given by medical officer for free, so pregnant mother who have poor status also consume that (Afriyanti, 2020). The next study has been done in the Leiling Pubilc health center, where house owners also have a relation with pregnant mother, if the pregnant mother not the

owner of the house, so family income must be split with the rental cost for the house (Yurniati & Marlina, 2019).

#### *Infectious Disease*

Infectious with caused by intestine parasite its influence nutrition status with loosing nutrition due to dierrhea, so hinder metabolisme process (Kumera et al., 2018). The other study from Fitrianingtyas, et al (2018) presented that pregnant mother with have symptom infection will have a high risk to get chronic energy deficiency (Fitrianingtyas et al., 2018). These matter also presented by Hikmah, et al. (2020), Infection and Fever would caused pregnant mother hard to swallow and digest food. Then intestines parasite such worms will be growing up in the body for reducing nutritions pregnant mother (Hikmah et al., 2020).

#### *Antenatal Care Visited (ANC)*

In this study, we combined two same results for two studies before which presented the influence between antenatal Visited with nutrition (Chronic Energy Deficiency) for pregnant mothers. The first article suggested there is a relation between infection with event chronic energy deficiency pregnant mother, where respondents with minimum participate ANC will get risk 2.7-fold to get chronic energy deficiency. Fortunately, this situation can be analyzed by a medical officer with the purpose to avoid complicated pregnancy (Fitrianingtyas et al., 2018). The study which has done from Diddana (2019) has claimed the pregnant mother with have high information about healty pregnancy will be avoid the nutritions problem (Diddana, 2019).

Antenatal care is the one factor that can be changed with consistent learning from a pregnant mother. The pregnant mother must check their pregnancy four times a minimum. Then we recomended nurses to enhance social information so the pregnant mother often to ANC visit.

#### *Dietary Habit*

Poor diet from pregnant mother be presumed as main factor for fetal health. Good dietary habit pregnant mother its impact from dietary habbit before pregnancy. Even though their must completed eat activity 3 times more than before. In this study also founded pregnant mother with good eat activity but still experience chronic energy deficiency. This situation due to quality food which not good for nutrition pregnant mother (Hikmah et al., 2020).

In the second study presented, there is 75% pregnant mother with good quality and quantity food but still, experience lack of chronic energy, based on this article, except mall nutrition, its due to minimum pregnant mother has experienced nausea during pregnancy (Syakur et al., 2020). During pregnancy periods, there is a physiology change such as in the early trimester, for some mother experience nausea with or not puke and no appetite, this situation probably because increasing hCG and metabolism carbohydrate change (Lowdermilk, Perry, & Cashion, 2013).

We recommend pregnant mother to do eat activity at least more 3 times than their before pregnancy because there is two-body (mother and children) who have good nutrition. Beside eat activity, pregnant mothers also recommended getting food with high nutrition to balance their nutrition.

#### *Occupation*

Based on two articles before, represent there is a relation between occupation and nutrition for pregnant mothers. A pregnant mother with have occupation will generate self income or not depends on their husband so they have the power to collect their nutrition easily (Musni, Malka, & Asriyani, 2017).

Occupation affects nutritional status (anemia) in pregnant women because if pregnant women work, the greater the workload of pregnant women, the higher the factor of anemia during pregnancy. However, if pregnant women can handle it well, having a job will also get income to meet the daily needs of pregnant women and help their husbands (Afriyanti, 2020).

#### *Residence*

Pregnant mothers who live in the village have to get a high risk to experience mall nutrition 2 times higher than mothers who live in the city. This situation because in the village still have bad infrastructure, culture influences, and tradition agriculture for a living (Kumera et al., 2018).

The same result also represented by another study, in the village has 3 times more risk of experience anemia (pregnant mother) if we compare with the pregnant mother who lives in the city because lack of information about pregnancy-related with nutrition, facility for supporting the mother health (Derso et al., 2017). Residence also related to nutrition status, where 77% population who live in the village have high risk as poor people (Ouzennou et al., 2019).

#### *Other Additional Factors*

The first another factor is caffeine consumption by pregnant mothers, in Ethiopia, 81% of pregnant mothers commonly consumed caffeine every day. The pregnant mother who consumed caffeine two times gets risk experience anemia if we compare with the pregnant mother who not consumed caffeine. The pregnant mother suggested consuming caffeine with maximum just 200 mg every day (Adrian, 2018). This article was supported by results from other studies which have to represent tannin as caffeine and tea compound. Tanin exists within tea, coffee, and several vegetables and fruits. Tanin has an impact to slow body for absorption Fe (Awalamaroh, Rahayu, & Yuliana, 2018).

The absorption Fe by the body its influenced by the food combination at the appointed time, example tea with high concentration will affect absorption Fe. In this study also showed 42% of the pregnant mother have anemia according to their habit of consuming tea (Iriani & Ulfah, 2019). Caffeine can affect iron absorption in pregnant women, if the mother's iron absorption is disturbed, the mother is more likely to experience anemia.

Another factor is illiterate 37% of pregnant mothers in Morocco have illiterate and have experience anemia. Pregnant mothers who can read its hard to have to access the information and get the point information from the medical officer (Ouzennou et al., 2019).

Addition factor is self-efficacy. Self-efficacy is a confidence person or personal to successfully pass a certain situation (Mukhid, 2009). Self-efficacy its a preventive effort for pregnant mothers so they not have mall nutrition during their pregnancy. This effort its important use for their (Diddana, 2019). It is better for pregnant women to believe that they can change a healthy lifestyle, therefore they need motivation in these individuals (Mardiana, Sipasulta, & Albertina, 2018).

## **5. Conclusion and Suggestions**

This study found factors that affect the nutritional status of pregnant women, which could be changed and which could not be changed. There were age, parity, education, knowledge, social economic, infectious diseases, ANC, diet occupation, and origin of residence. There are other factors besides those that have been widely studied, such as caffeine intake, illiteracy, and self-efficacy.

For health workers, provide health education about nutrition for pregnant women and the factors that affect the nutritional status of pregnant women that can be changed such as knowledge of nutrition, antenatal care visits, and diet. This activity is carried out in order to know information and be more aware of nutrition during pregnancy. This health education can be given to women of childbearing age-related to the factors that affect the nutritional status of pregnant women which can be changed, namely the first age of the pregnancy, parity, knowledge, ANC visits, and diet so that they become preventive measures before pregnancy.

We also suggest the next study to more explained about factors that can affect the nutrition status of pregnant mothers wicah a related to BMI and increasing weight due to limitations in this study. We suggest further study to use more references and databases for better results. We hope the next study also proves caffeine factor, illiterate, and self efficacy for their relation to the nutrition status of pregnant mothers.

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