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Factors Associated with Nutritional Status of Pregnant Women at Majalaya Public Health Center in 2024

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Abstract
Introduction: *The nutritional and health status of pregnant women in Indonesia remains a public health concern. Malnutrition during pregnancy is influenced by several factors, including education level, maternal age, and parity. Education affects health behavior, while pregnant women under 20 and over 35 years are at higher risk of experiencing Chronic Energy Deficiency (CED). High parity can also contribute to maternal and fetal health complications.* ***Objective:*** *This study aims to determine the association between maternal education, age, and parity with the nutritional status of pregnant women at the Majalaya Health Center in 2024.* ***Method:*** *A quantitative study was conducted using an analytical survey with a cross-sectional design. The independent variables were maternal education, age, and parity, while the dependent variable was nutritional status. A total sampling technique was used, involving 61 pregnant women. Data were analyzed using the Chi-square test with the Statistical Product and Service Solution (SPSS) software.* ***Results and Discussion:*** *The findings showed that 30.3% of women with low education levels experienced CED, compared to 10.7% with higher education. Among those at risk age (<20 or >35), 30.0% experienced CED, while only 17.1% at non-risk age did. Women with high parity showed a 33.3% incidence of CED, while those with low parity had 13.5%. There was a significant association between maternal education, age, and parity with nutritional status.* ***Conclusion:*** *Education, age, and parity are significantly associated with the nutritional status of pregnant women. It is recommended that health promotion programs be enhanced to improve maternal knowledge and practices during pregnancy, particularly for those with low education, high parity, and at-risk age groups.*

Keyword: Nutritional Status; Pregnancy; Education; Age; Parity;

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Introduction

Pregnancy is a crucial physiological period that begins at conception and lasts until the birth of the fetus, with a normal gestation period of approximately 280 days or nine months and seven days, calculated from the first day of the last menstrual period (Saifuddin, 2016). This period represents the beginning of human life, during which maternal health plays a significant role in determining pregnancy outcomes. A healthy mother is more likely to deliver a healthy baby, and maternal nutrition is one of the key determinants influencing fetal growth and development. During pregnancy, nutritional requirements increase to support both maternal physiological changes and fetal development, making optimal nutritional intake essential to ensure normal fetal growth and prevent complications.

Despite the importance of maternal nutrition, the nutritional status of pregnant women in Indonesia remains concerning. According to the Ministry of Health of the Republic of Indonesia (Kemenkes RI, 2020), approximately 17.3% of pregnant women experience chronic energy deficiency (CED), which is commonly assessed using mid-upper arm circumference (MUAC). A MUAC measurement of less than 23.5 cm, particularly when falling within the red zone of the MUAC measuring tape, indicates poor nutritional status. Inadequate maternal nutritional status during pregnancy is associated with increased risks of adverse outcomes, including low birth weight, intrauterine growth restriction, and long-term health consequences for the child.

In West Java Province, the prevalence of CED among pregnant women is also alarming. Data from (Opendata Jabar, 2020) reported 55,629 cases of CED across 27 districts and cities, with Sukabumi Regency recording the highest number of cases (5,538 cases), whereas Banjar City had the lowest (128 cases). Bandung Regency ranked fourth, with 1,408 cases reported among pregnant women. Poor maternal nutritional status, as indicated by MUAC <23.5 cm, not only increases the risk of complications during pregnancy, such as anemia, hemorrhage, and infectious diseases (Pangemanan, 2019), but also affects fetal outcomes.

Several factors have been identified as determinants of maternal nutritional status during pregnancy, including education, maternal age, and parity. Education influences maternal knowledge and behavior regarding nutritional practices, as demonstrated by Tahir (2021), who found a significant relationship between maternal education and nutritional status among pregnant women in Gowa Regency. Maternal age also plays an important role, with women younger than 20 years or older than 35 years being at higher risk for CED due to increased nutritional demands, particularly for protein (Fitriani, 2019; Kemenkes RI, 2020). Furthermore, parity, defined as the number of live births a woman has had, is another determinant of maternal nutritional status. High parity is associated with an increased risk of nutritional deficiencies, which may adversely affect both maternal and fetal health (Fitriani, 2019; Mochtar, 2022).

In Bandung Regency, particularly in Majalaya Primary Health Care (PHC), the prevalence of pregnancy-related complications is relatively high. The 2022 Bandung District Health Profile reported that among 1,336 pregnant women attending Majalaya

PHC, 72.45% experienced obstetric complications. This figure is higher compared to other PHCs in the Majalaya Subdistrict, such as Cikaro PHC (41.97%) and Wangisagara PHC (21.16%). These findings highlight the urgency of investigating factors associated with maternal nutritional status to reduce pregnancy-related complications and improve maternal and neonatal health outcomes.

Therefore, this study aims to examine the factors associated with the nutritional status of pregnant women at Majalaya PHC in 2024. Understanding these factors is expected to contribute to evidence-based interventions to prevent maternal malnutrition and its associated complications.

This study aims to determine the factors associated with the nutritional status of pregnant women at Majalaya Primary Health Care in 2024. The factors assessed include maternal education, age, and parity, which are hypothesized to have significant relationships with maternal nutritional status as measured by MUAC.

The findings of this study are expected to provide valuable insights into the determinants of maternal nutritional status, particularly in regions with high rates of pregnancy complications. By identifying key factors associated with maternal malnutrition, this research can contribute to the development of evidence-based interventions and health education programs for pregnant women. Furthermore, the results may serve as a reference for policymakers and healthcare providers in designing targeted nutritional interventions to improve maternal and neonatal health outcomes in Indonesia, especially in high-risk areas such as Majalaya.

Methods

This study employed a quantitative research design based on the positivist paradigm, which emphasizes objective measurement and statistical analysis (Sugiyono, 2019). An analytical survey with a cross-sectional approach was used to explore the association between independent variables (education, maternal age, and parity) and the dependent variable (nutritional status of pregnant women). Data on risk factors and outcomes were collected simultaneously at a single point in time (Notoatmodjo, 2018).

The conceptual framework was developed based on the relationship between independent variables (education, maternal age, and parity) and the dependent variable (nutritional status as measured by mid-upper arm circumference/MUAC).

The study involved one dependent variable and three independent variables:

Table 1

Operational Definitions and Measurement of Independent and Dependent Variables

Variable	Operational Definition	Measurement Tool	Category	Scale
Education	Level of formal education completed by the respondent, based on medical records (Kharmina, 2018)	Medical records	1 = Low (Elementary/Junior High School); 2 = High (Senior High School/Diploma/Bachelor)	Ordinal
Maternal Age	Age calculated from birth date to current pregnancy (Pontoh, 2019)	Medical records	1 = At risk (<20 or >35 years); 2 = Not at risk (20–35 years)	Ordinal
Parity	Number of live births experienced by the respondent (Saudah, 2018)	Medical records	1 = At risk (<1 or >3); 2 = Not at risk (1–3)	Ordinal
Nutritional Status	Nutritional status measured by MUAC (Depkes RI, 2021)	Medical records	1 = Chronic Energy Deficiency (CED) (MUAC <23.5 cm); 2 = Non-CED (MUAC ≥23.5 cm)	Ordinal

Results and Discussion

Result

Univariate Analysis

A total of 61 first-trimester pregnant women were included in this study. The distribution of participants based on education, age, parity, and nutritional status is presented in Tables 1-4.

Table 2

Educational level of first-trimester pregnant women at Majalaya Primary Health Care, 2024

Education Level	n	%
Low (Elementary/Junior High School)	32	52.5
High (Senior High School/Diploma/Bachelor)	29	47.5
Total	**61**	**100**

More than half of the pregnant women had low educational attainment (52.5%).

Table 3

Maternal age of first-trimester pregnant women at Majalaya Primary Health Care, 2024

Age Category	n	%
At risk (<20 years or >35 years)	22	36.1
Not at risk (20–35 years)	39	63.9
Total	**61**	**100**

The majority of participants were in the low-risk reproductive age group (20–35 years) (63.9%).

Table 4

Parity of first-trimester pregnant women at Majalaya Primary Health Care, 2024

Parity	**n**	**%**
At risk (<1 or >3 parity)	30	49.2
Not at risk (1–3 parity)	31	50.8
Total	**61**	**100**

Almost half of the participants had parity considered at risk (49.2%).

Table 5

Nutritional status of first-trimester pregnant women at Majalaya Primary Health Care, 2024

Nutritional Status	**n**	**%**
Chronic Energy Deficiency (CED) (MUAC <23.5 cm)	21	34.4
Non-CED (MUAC ≥23.5 cm)	40	65.6
Total	**61**	**100**

Approximately one-third of the participants (34.4%) were categorized as having CED.

Bivariate Analysis

The relationship between education, maternal age, and parity with nutritional status was analyzed using the Chi-square test (Tables 5–7).

Table 6

Association between education level and nutritional status

Education Level	**CED (n, %)**	**Non-CED (n, %)**	**Total**	**p-value**
Low	17 (53.1)	15 (46.9)	32	0.001
High	4 (13.8)	25 (86.2)	29	
Total	**21 (34.4)**	**40 (65.6)**	**61**	

There was a significant association between education level and nutritional status (p=0.001).

Table 7

Association between maternal age and nutritional status

Maternal Age	**CED (n, %)**	**Non-CED (n, %)**	**Total**	**p-value**
At risk	13 (59.1)	9 (40.9)	22	0.002
Not at risk	8 (20.5)	31 (79.5)	39	
Total	**21 (34.4)**	**40 (65.6)**	**61**	

Maternal age was significantly associated with nutritional status (p=0.002).

Table 7

Association between parity and nutritional status

Parity	**CED (n, %)**	**Non-CED (n, %)**	**Total**	**p-value**
At risk	16 (53.3)	14 (46.7)	30	0.002
Not at risk	5 (16.1)	26 (83.9)	31	
Total	**21 (34.4)**	**40 (65.6)**	**61**	

Parity was also significantly associated with nutritional status (p=0.002).

Discussion

Association between Education and Nutritional Status

The findings of this study demonstrated a significant association between maternal education and nutritional status during pregnancy (p=0.001). Pregnant women with lower educational attainment (elementary or junior high school) were more likely to experience chronic energy deficiency (CED) compared to those with higher education levels (senior high school, diploma, or university). More than half of the women with low education (53.1%) were categorized as CED, whereas only 13.8% of those with higher education experienced the same condition.

This finding aligns with previous studies conducted in Indonesia, which consistently reported that lower education levels are associated with higher rates of maternal malnutrition. Lia (2021) and Harismayanti (2021) found that women with lower education had a significantly higher risk of CED due to limited knowledge about adequate dietary intake during pregnancy. Similarly, Tahir (2021) reported a positive association between maternal education and nutritional status, emphasizing that education influences dietary practices and access to healthcare services.

The relationship between education and nutritional status can be explained by the fact that education is a key determinant of health-related knowledge and behavior. According to (Notoatmodjo, 2018), education shapes an individual's ability to understand and apply health information, including nutrition-related recommendations during pregnancy. Women with higher education are generally more aware of the importance of balanced nutrition, are better informed about dietary sources of essential nutrients, and are more likely to utilize available healthcare services, thus reducing the risk of CED.

Conversely, women with lower educational attainment may lack adequate knowledge and awareness of nutritional requirements during pregnancy. Limited understanding of dietary diversity, misconceptions about food restrictions during pregnancy, and economic constraints can further exacerbate the risk of malnutrition. These findings highlight the need for targeted health education programs focusing on pregnant women with low educational backgrounds to improve their nutritional knowledge and practices.

Association between Maternal Age and Nutritional Status

This study found a significant association between maternal age and nutritional status among pregnant women (p=0.002). Women in the at-risk age group (<20 years or >35 years) were more likely to experience chronic energy deficiency (CED) than those in the optimal reproductive age group (20–35 years). More than half of the women in the at-risk group (59.1%) were categorized as CED, whereas only 20.5% of women aged 20–35 years experienced CED. The results are consistent with findings from (Handayani, 2021; Teguh, 2019), which reported that maternal age is a crucial factor influencing nutritional status during pregnancy. (Teguh, 2019) further noted that women aged <20 or >35 years have up to 7.6 times higher risk of experiencing CED compared to those in the optimal reproductive age range.

Several biological and behavioral mechanisms may explain this association. Younger mothers (<20 years) are still in their growth phase, requiring additional nutrients for their own physical development. Pregnancy during this period increases nutritional demands, which may not be fully met, leading to CED (Pontoh et al., 2019). Meanwhile, older mothers (>35 years) are more likely to experience age-related metabolic changes, such as reduced organ function, increased incidence of chronic conditions (e.g., hypertension and gestational diabetes), and dietary restrictions, all of which can contribute to inadequate nutrient intake.

These findings emphasize the importance of promoting pregnancy planning at the recommended reproductive age (20–35 years). Health workers should provide counseling on the risks associated with early and late pregnancies, as well as guidance on adequate nutritional intake for pregnant women in at-risk age groups to minimize the occurrence of CED.

Association between Parity and Nutritional Status

This study revealed a significant association between parity and maternal nutritional status during pregnancy (p=0.002). Pregnant women with high-risk parity (<1 or >3 live births) were more likely to experience chronic energy deficiency (CED) compared to those with parity in the optimal range (1–3 live births). More than half of women with high-risk parity (53.3%) were categorized as CED, while only 16.1% of women with optimal parity experienced the same condition.

This finding supports previous studies, such as those by (Halimah, 2022), which consistently reported that parity is an important factor influencing maternal nutritional status. Women with high parity were found to have a significantly greater risk of CED due to cumulative nutritional depletion from multiple pregnancies and insufficient recovery periods between births.

The physiological explanation for this association is that repeated pregnancies, particularly when occurring in close succession, increase maternal energy and nutrient demands. Women with multiple pregnancies may experience nutrient depletion because they have less time to restore their nutritional reserves between pregnancies (Saudah, 2018). Furthermore, mothers with many children often face socioeconomic and caregiving challenges, such as limited financial resources, increased household workload, and reduced time for self-care, which may further compromise their dietary intake and overall nutritional status.

These findings highlight the need for targeted interventions for women with high parity, including nutritional counseling, family planning education, and postnatal nutritional recovery programs to ensure adequate restoration of maternal nutritional reserves before subsequent pregnancies.

General Discussion and Implications

The present study confirmed that education, maternal age, and parity are significantly associated with the nutritional status of pregnant women. Among these factors, low education, at-risk maternal age (<20 or >35 years), and high-risk parity (<1 or >3 live births) were identified as key predictors of chronic energy deficiency (CED) during pregnancy. These findings align with previous research conducted in various regions of Indonesia, indicating that socioeconomic and demographic factors remain crucial determinants of maternal nutrition.

From a public health perspective, these results underscore the importance of integrated maternal health programs focusing on vulnerable groups, particularly those with lower educational attainment, younger or older maternal age, and high parity. Health education interventions should prioritize improving maternal knowledge about balanced nutrition and healthy pregnancy practices, especially among women with limited formal education. Moreover, family planning initiatives are essential to encourage optimal birth spacing, allowing mothers sufficient time to recover nutritionally before subsequent pregnancies.

In addition, antenatal care services should incorporate nutritional counseling tailored to the specific needs of at-risk groups. For younger pregnant women, guidance should focus on ensuring adequate nutrient intake to meet both personal growth and fetal development needs, while for older pregnant women, attention should be directed toward managing age-related metabolic and health conditions. Strengthening community-based health promotion and improving access to affordable, nutrient-rich foods may also play a pivotal role in reducing CED prevalence among pregnant women.

Conclusion

This study demonstrated that education, maternal age, and parity are significantly associated with the nutritional status of pregnant women. Pregnant women with low educational attainment, those in at-risk age groups (<20 or >35 years), and those with high-risk parity (<1 or >3 live births) were more likely to experience chronic energy deficiency (CED) as indicated by a mid-upper arm circumference (MUAC) <23.5 cm. The findings highlight the importance of improving maternal knowledge about nutrition, promoting pregnancy at optimal reproductive age (20–35 years), and ensuring adequate birth spacing to allow nutritional recovery between pregnancies.

Targeted interventions, including nutritional counseling during antenatal care and community-based health education, are crucial to reducing the prevalence of maternal CED. Strengthening integrated antenatal care services and increasing access to nutritional resources may further improve maternal and neonatal health outcomes.

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