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## The Description of Future Bride Nutritional Status Included Incidence of Anemia, Chronic Energy Deficiency (CED), and Nutritional Status Based on Body Mass Index



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### Abstract

Currently, Indonesia is still facing reproductive health problems which are marked by the high maternal mortality rate (MMR) and infant mortality rate (IMR). The low status of public health, especially women's health, is influenced by various factors. One of the factors is nutritional status. Comprehensive intervention through the continuum of care approach is important to be carried out more upstream, namely during the preconception period (future bride). Examination of the nutritional status of the bride aims to detect early problems of underweight, overweight and micronutrient deficiencies (anemia). Optimal nutritional status before pregnancy is a form of readiness for a healthy pregnancy. The purpose of this study was to describe nutritional status (incidence of anemia, chronic energy deficiency (CED), and nutritional status based on body mass index). The method of the study was descriptive quantitative. The sample for this study was 76 brides-to-be who visited the Berbah Health Center for the period August-October 2022, and were selected by purposive sampling. The data obtained was secondary data obtained from medical records. The results showed that 61.8% of women's health status was poor (one of the 3 nutritional status indicators was not in the normal category). Incidence of anemia 28.9%, chronic energy deficiency 15.8%, overweight and obesity 22.4%, very thin and thin 34.2%. Conclusion: the prevalence of problems with the nutritional status of the bride is still high. Further studies related to the causes of nutritional problems in future brides are needed.

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## INTRODUCTION

Preconception care is part of the continuum of care. The preconception phase will have an impact on the next phase, namely pregnancy, childbirth, puerperium and the intermediate period. Some literature shows that some maternal risk factors begin in childhood and adolescence. Malnourished adolescents and low body height are risk factors for obstetric intervention. This has contributed to an increase in maternal and infant mortality (Y. Wulandari & Agus safutri, 2017). The results showed that around 92% of children born to short mothers (<150 cm) were included in the “stunted” and “severely stunted” toddler groups. There is a positive correlation between short mothers and stunted toddlers with a p-value of 0.038. In the Sambas community, mothers with short stature tend to have short offspring (Tilawaty et al., 2020). Therefore it is necessary to have interventions that begin in adolescence (distal intervention) and continue throughout the reproductive age of women (proximal intervention). One of the advantages of preconception care is to improve a woman’s nutrition during pregnancy, especially overcoming obesity, problems related to nutritional deficiencies and micronutrient deficiencies (Y. Wulandari & Agussafutri, 2017).

Nutritional problems in women that still need to get attention and work hard to improve include chronic energy deficiency (CED), anemia, underweight and obesity. Based on the 2018 Basic Health Research it is known that the prevalence of CED in women of childbearing age 15-49 years (non-pregnant) in Indonesia is 14.5%, and the Special Region of Yogyakarta is ranked 7<sup>th</sup> with a prevalence of 19.1 %. The prevalence of CED in Indonesia is based on age characteristics from the highest to the lowest, including 15-19 years (36.3%), 20-24 years (23.3%), 25-29 years (13.5%). The prevalence of anemia in the age group of 15-24 years was 32%, and 25-34 years was 15.1%. The nutritional status of adult women (age > 18 years) based on body mass index (BMI), it is known that the prevalence of wasting in the age range 19-29 years includes 19 years (19%), 20-24 years (14.2%), 25 -29 years (7.5%). While the prevalence of obesity includes 19 years (10.6%), 20-24 years (15.1%), and 25-29 years (24.7%) (Tim Riskesdas, 2019).

CED is a condition in which a person experiences a long-term or chronic lack of nutrition (calories and protein). CED can be assessed by an upper arm circumference <23.5 cm. Malnutrition in pregnant women can increase the risk of anemia in the mother and fetus, bleeding during childbirth,

miscarriage, susceptible to infectious diseases, low birth weight babies (LBW), stillbirths, congenital abnormalities in the fetus (Kementerian Kesehatan Republik Indonesia, 2021). Variables associated with chronic energy deficiency in young women are diet (meal frequency and variety of food), food intake (energy, protein, fat, iron), body image, body mass index. Most young women with eating patterns that are not in accordance with balanced nutrition guidelines, iron deficiency, and negative body image experience CED. Young women with good energy, protein and fat intake mostly do not experience CED (Ardi, 2021).

Upper arm circumference (LiLA) < 23.5 cm, inadequate intake of protein and iron results in low hemoglobin levels (anemia). Anemia before conception can increase the risk of miscarriage, premature birth, bleeding, death of the mother and baby (Dieny et al., 2019). In addition to anemia, the condition of obesity also needs attention. It is important to support overweight and obese women to lose weight before becoming pregnant (Rees, 2014). Obesity is a high obstetric risk because it can increase the risk of maternal and fetal morbidity and mortality. Complications that can occur in pregnant women with obesity are an increased risk of hypertension, gestational diabetes, spontaneous abortion and postpartum hemorrhage. In the fetus it can increase the risk of stillbirth in the antepartum period, intrapartum complications such as shoulder dystocia, macrosomia and increase the risk of fetal defects such as neural tube defects, spina bifida, congenital heart disease and omphalocele (Natalia et al., 2020).

Examination of the nutritional status of the bride is one of the pre-pregnancy health services aimed at screening the health of the bride to prepare for a healthy, safe pregnancy and childbirth and to have a healthy baby based on the regulation of the Minister of Health of the Republic of Indonesia Number 21 of 2021. These health services are carried out using promotive, preventive, curative and rehabilitative approaches that are carried out in an integrated and sustainable manner (Kementerian Kesehatan RI, 2021). Berbah Health Center is one of the Health Centers in the Sleman district which has implemented interprofessional collaboration in premarital services. The collaboration includes the collaboration of the maternal and child health polyclinic, general polyclinic, nutrition polyclinic, psychology polyclinic, dental polyclinic and laboratories. Health workers who are responsible for premarital services consist of midwives, general practitioners, nutrition officers, psychologists, dentists and laboratory

workers. Examination of nutritional status carried out at the Berbah Health Center included checking Hb levels, LiLA, and measuring BMI. The importance of pre-marital nutrition preparation made researchers interested in seeing an overview of the prevalence of nutritional problems for prospective brides at the Berbah Health Center.

## METHODS

This study was a quantitative descriptive survey research that aimed to describe the prevalence of

CED, anemia, and nutritional status based on BMI. The sample of the study was 76 prospective brides who visited for integrated health checks at the Berbah Health Center for the period August to October 2022. The sample for this study was selected using a purposive sample and the completeness of the data in the examination record book was the inclusion criteria in this study. No exclusion criteria were defined in this study. Univariate data analysis by calculating the percentage of each variable based on predetermined categories.

## RESULTS

**Table 1: Characteristics of respondents**

Variable	Frequency	Percent (%)
<b>Age</b>		
High Risk	11	14.5
Reproduction Age	65	85.5
<b>Pregnancy status</b>		
Pregnant	6	7.9
Not Pregnant	70	92.1
<b>Height</b>		
< 145 cm	3	3.9
≥ 145 cm	73	96.1
Total	76	100

*Source: Secondary Data*

Based on table 1, it is known that most of the prospective brides are of healthy reproductive age (85.5%), not currently pregnant (92.1%), and height ≥ 145 cm (96.1%).

**Table 2: Nutritional Status**

Variable	Frequency	Percent (%)
<b>Body Mass Index</b>		
Severely Underweight (<17)	2	2.6
Underweight (17-<18.5)	6	7.9
Normal (18.5-25.0)	42	55.3
Overweight (>25-27)	9	11.8
Obesitas (>27)	17	22.4
<b>Anemia</b>		
Not Anemia (Hb ≥ 12 gr/dl)	54	71.1
Anemia (Hb < 12 gr/dl)	22	28.9
<b>Upper Arm Circumference</b>		
Not CED (≥ 23.5 cm)	64	84.2
CED (< 23.5 cm)	12	15.8
<b>Health Status</b>		
Poorly	47	61.8
Good	29	38.2
Total	76	100

*Source: Secondary Data*

Based on table 2 it is known that most of the prospective brides are in the normal category (55.3%) based on body mass index, 71.1% are not anemic and 84.2% are not CED. If the three indicators of nutritional status are combined, it can be concluded that only 38.2% of the prospective brides who have good health status. The good

health status referred to in the study is that the three indicators must be in good (normal) condition. If there is one indicator that is not normal, then the health status is categorized as poor.

## DISCUSSION

### 1. Characteristics of respondents

The results of this study indicate that most women decide to marry at a healthy reproductive age (20-35 years). This fulfills the marriage age limit for women, namely 19 years based on the Law of the Republic of Indonesia Number 16 of 2019 concerning marriage. The age limit is considered physically and spiritually mature to be able to enter into a marriage in order to fulfill the purpose marry well without ending in divorce, have healthy and quality offspring (*Undang-Undang Republik Indonesia No 16 Tahun 2019 Tentang Perubahan Atas Undang-Undang Nomor 1 Tahun 1974 Tentang Perkawinan*, 2019)

There are still 11 women who are married at a risky age (<20 years) as many as 2 people and 9 people aged > 35 years. The results of previous research indicated that factors associated with early marriage in young women were premarital pregnancy, family income, knowledge, culture of early marriage, and peer influence in early marriage (Nurhikmah et al., 2021). In this study, it was found that 1 woman aged <20 years was in premarital pregnancy. Understanding regarding the ideal age for marriage needs to be given as early as possible to prevent child marriage. Interventions related to maturing the age of marriage in rural areas need to be increased for youth through Family Planning Field Extension/FPFE (Angraini et al., 2021). The psychological impacts that arise from premarital pregnancy include fear, anger, stress, depression, worry, feeling unprepared to be a mother (P. Wulandari et al., 2019). The results of previous studies indicate that there are several psychological impacts on adolescents, starting from pregnancy, childbirth, until parting with a partner, namely feelings of anxiety, shame, stress and feelings of uncertainty in life. These different effects are influenced by internal and external factors. Such conditions are difficult to face and accept, especially for young women who become perpetrators of pregnancies outside of marriage. However, there are teenagers who can survive thanks to their ability to accept themselves and their circumstances, and have the support of their families and loved ones (Tjolly & Soetjningsih, 2023).

In table 1, it can be seen that there were 6 women who experienced premarital pregnancy and 1 person in their teens. Based on the results of previous studies, it can be concluded that the incidence of teenage premarital pregnancies in Sumedang

Regency is 40.5% of all teenage pregnancies. Factors related to teenage pregnancy are age at pregnancy, frequency of courtship, parenting style, parents' marital integrity and exposure to friends. Parenting style has the highest OR, namely OR = 2.90 (95% CI = 1.55-5.42). Respondents with bad parenting styles will experience premarital pregnancies 2.90 times compared to respondents with good parenting styles after controlling for other variables (Omarsari & Djuwita, 2008). The results of other studies also show that factors related to premarital pregnancy include age, pubertal age, and information exposure (Kirana et al., 2014).

Based on the height of the woman, there are still 3 people who have a height <145 cm. This shows obstetrically high-risk women. Previous studies have shown that 6.5 million premature and/or small-term births in low-middle-income countries each year can be attributed to short maternal stature. Reducing this burden requires primary prevention of birth in small gestation, promotion of postnatal growth from early childhood, and further intervention in late childhood and adolescence (Kozuki et al., 2015). The results of a literature study conducted by previous researchers also said that there was a relationship between maternal height and the birth process where mothers who had a height of less than 145 cm with or without a large fetal weight were not advised to have a normal delivery because according to the literature mothers who had less height of 145 have a narrow pelvis so there is concern that there will be cephalopelvic disproportion which will make labor take longer (Humaera et al., 2018).

### 2. Nutritional Status

#### a. Body Mass Index

The results showed that some women had normal nutritional status (55.3%). However, the prevalence of obesity dominates the nutritional problems of the bride namely 22.4%, followed by overweight (11.8%), underweight (7.9%) and severely underweight (2.6%). The prevalence of obesity has exceeded the prevalence of obesity in DIY based on 2018 Basic Health Research data (Badan Penelitian dan Pengembangan Kesehatan, 2019).

Women of childbearing age who are obese have the opportunity to experience the risk of infertility. Although obesity is not the sole risk factor for infertility, promotive and preventive efforts are

needed to increase knowledge and understanding of reproductive health for women, especially those planning their pregnancy. Physical activity, a balanced diet, healthy lifestyle and periodic check-ups are efforts to treat infertility caused by excess body weight and obesity (Jamhariyah et al., 2022). The results of the previous study showed a similar thing, namely in 46 respondents of couples of childbearing age who were diagnosed with primary infertility, 14 mothers (42.42%) were obese and diagnosed with secondary infertility, 19 mothers (57.58%) were obese. There is a relationship between obesity and the incidence of infertility in couples of childbearing age (Susilawati & Restia, 2019).

Overweight and obesity are risk factors for polycystic ovary syndrome (PCOS). According to data sources, it is estimated that 38-88% of women with PCOS are overweight. Obesity can increase androgen levels, which can exacerbate PCOS. Where androgen secretion in the ovaries of women with PCOS is excessive compared to normal women. According to several research studies, polycyclic ovarian syndrome can be prevented by modifying lifestyle, namely reducing body weight and belly fat by reducing calorie intake and exercising. This is proven to be able to reduce androgen levels, reduce insulin resistance so that it is hoped that it can return the frequency and amplitude of LH to normal so that the menstrual cycle can walk normally so that it is expected to reduce the risk of infertility in PCOS (Anisya et al., 2019). Obese women must lose 5-10% body weight, adequate exercise and adequate nutritional intake, especially folic acid before pregnancy. During pregnancy, obese women should have a suitable weight gain (Phupong, 2022).

Not only obesity will affect fertility, malnutrition will also affect fertility. Poor nutritional status (BMI below 18.5) can reduce a woman's fertility by causing hormonal imbalances that affect ovulation and the chances of getting pregnant. Compared to women in the normal BMI range, less nourished women are more likely to take longer to become pregnant. This is consistent with previous research which showed that women with an abnormal body mass index have a higher risk of infertility than women with a normal body mass index. A high risk of infertility has been found in both overweight and underweight women (Halimah et al., 2018).

## **b. Anemia**

The prevalence of anemia in prospective brides is 28.9%. This shows anemia is still a problem that needs attention. One form of anemia intervention at the Berbah Health Center is supplementation of 400 mcg of folic acid and 60 mg of Fe tablets for prospective brides who have anemia. In previous studies it was also found that the prevalence of anemia during preconception was high. This indicates that many women will enter pregnancy with less iron reserves and will increase the growth retardation of the fetus. Therefore, joint efforts are needed including iron supplementation, folic acid and nutritional counseling to improve anemia status before conception so that fetal growth is optimal and the baby is born healthy (Msemo et al., 2018).

In this study it was found that 4 out of 6 pregnant brides had anemia. This is due to the increasing need for the mother's body for iron, along with increasing gestational age. When pregnant women experience anemia, the blood does not have enough healthy red blood cells to carry oxygen to the mother's body tissues and also the fetus. Previous studies found a high prevalence of anemia in pregnant women. Low socioeconomic status, multigravida and late visits to the antenatal clinic are significantly associated with anemia in pregnancy. Therefore, awareness and education programs should be launched to make people aware about the complications of anemia during pregnancy and how to prevent it (Sinha et al., 2021).

Based on the results of a literature review conducted by previous researchers from 15 national and international journals, there are 19 statistically significant variables which are risk factors for anemia in pregnant women. These variables are age, ethnicity, education, parity, adherence to taking Fe tablets, economic status, nutritional status, trimester of pregnancy, gestational spacing, ANC frequency, living in rural areas, income, number of family members, food insecurity, diet, current clinical disease, parasitic infections, not using contraception, and body mass index (Azmi & Puspitasari, 2022). If we look at this study based on age, it is known that as many as 36.4% of women at high risk have anemia. Of the 22 people who were anemic, 50% had abnormal BMI.

The results of previous studies suggest that severe iron deficiency has a significant effect on fertility, and may be an important factor in unexplained infertility (Li et al., 2014). Anemia and

folic acid deficiency are known to cause secondary infertility. Anemia as a cause of infertility has only been seen in cases of malabsorption syndrome in developed countries. However, in developing country communities with weak economies, anemia of food deficiency is still a cause of infertility. Deficiencies of iron and folic acid can certainly interfere with reproduction and contribute to problems with ovulation disorders, cell division disorders, and implantation disorders. Apart from causing infertility, folic acid deficiency can also cause an increased risk of miscarriage (Singh et al., 2006).

### **c. Chronic Energy Deficiency**

Chronic Energy Deficiency (CED) is a condition when a person experiences a deficiency of malnutrition that lasts for years (chronic) causing health problems. In this study, the prevalence of CED was 15.8%. This prevalence is higher than the national prevalence (14.5%). The results of previous studies obtained 46% preconception of women of childbearing age or the prospective bride experiencing CED where the measurement results of the upper arm circumference are  $<23.5$  cm. CED occurs due to low intake of energy and protein in the long term (Utami et al., 2022). This is in line with previous research which found that CED in prospective brides was 48.5%. Adequate energy intake can prevent chronic energy deficiency in the prospective bride. Food consumption is one of the main factors determining a person's nutritional status (Safira Anani et al., 2022). Knowledge of nutrition, physical activity, energy intake, protein intake, and fat intake are significantly related to CED in prospective brides (Mahmudah et al., 2022).

Prospective brides who want to get pregnant immediately after marriage must meet several conditions worthy of becoming pregnant, one of which is nutritional status. Ideally the upper arm circumference  $\geq 23.5$  cm. If the upper arm circumference is  $< 23.5$  cm, it is best to postpone pregnancy first. If a woman is pregnant with the condition of CED, it increases the risk of bleeding during childbirth, miscarriage, susceptible to infectious diseases, Low Birth Weight Babies (LBW), stillbirths, and congenital abnormalities in the fetus (Direktorat Jenderal Kesehatan Masyarakat Kementerian Kesehatan RI, 2021).

The results of other studies state that the prevalence of CED is higher in pregnant women with low income, poor nutritional status, low access to food and poor adherence to consumption of Fe tablets. It is suggested to improve food security at the

family level by providing information to women at the preconception stage through counseling, flip charts and posters (Mukaddas et al., 2021). In this study it was also known that the prospective bride and groom who came to visit received counseling services as needed by utilizing the media of the reproductive health flip sheets of the prospective bride.

### **CONCLUSION**

The conclusion of this study is that 61.8% of the prospective bride have poor health status when viewed from the fulfillment of the 3 nutritional status indicators. Prevalence of anemia 28.9%, chronic energy deficiency 15.8%, overweight and obesity 22.4%, severely underweight and underweight 34.2%.

### **SUGGESTION**

There needs to be a more in-depth study related to the causes of the high nutritional problems of prospective brides at the Berbah Health Center. There needs to be a more in-depth study related to the causes of the high nutritional problems of prospective brides at the Berbah Health Center. Efforts to improve the nutritional status of the prospective brides need to get more attention by monitoring the nutritional status periodically, adjusting the diet by a nutritionist, providing vitamin and mineral supplements as needed.

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### **CONFLICTS OF INTEREST**

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### **AUTHOR CONTRIBUTIONS**

Nonik Ayu Wantini was responsible for conceptualizing research, monitoring research implementation, processing data, writing research

articles, and writing correspondence. Lenna Maydianasari was responsible for input of research data, writing and revising manuscripts. Agnes Savitri Agni was responsible in writing and revising the manuscript.

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