

## Association between Pre-Conception Health and Nutrition Knowledge-Attitude-Practice and Anemia among Pre-Marital Women in Sleman, Indonesia

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### ABSTRACT

The study aimed to assess the association between pre-conception health and nutrition Knowledge-Attitude-Practice (KAP) and anemia among Pre-Marital Women (PMW). In this cross-sectional study, Mid-Upper Arm Circumference (MUAC) measurement, 24-hour food recall interview, blood sample collection, and validated KAP questionnaire interview were conducted to 111 PMW in Sleman in 2021. The study found that 21.6%, 14.4%, and 49.1% of PMW had Chronic Energy Deficiency (CED), anemia, and lack of minimum dietary diversity, respectively. The proportions of PMW with adequate KAP were 70.5%, 67.8%, and 64.3%, respectively. Pre-conception health and nutrition practices are associated with anemia ( $p < 0.05$ ), but knowledge and attitude are not.

**Keywords:** conception, Indonesia, practices, pre-marital, women

### INTRODUCTION

Anemia is a significant health problem for women, particularly Pre-Marital Women (PMW), and affects fetal programming. Identifying the determinants of anemia is crucial for effective prevention and intervention strategies (Dean *et al.* 2014).

Understanding the relationship between pre-conception health and nutrition Knowledge, Attitude, and Practice (KAP) and anemia status is crucial for effective prevention and intervention strategies. Positive attitudes towards proper nutrition may lead to better dietary choices and reduced risk of anemia. This study aimed to explore the association between KAP and anemia among PMW in Sleman, Indonesia.

### METHODS

The study was part of a previous study that aimed to develop innovative pre-conception care in health posts for infants/toddlers and mothers

(*Posyandu*) in Sleman (Matsna *et al.* 2021). The cross-sectional survey involving 111 PMW was conducted in two community health centers (*Puskesmas*) in Sleman in 2021.

The Mid-Upper Arm Circumference (MUAC) measurement was used to determine the nutritional status, the 24-hour food recall was conducted to derive the minimum dietary diversity score, the arterial blood sample was collected by puskesmas laboratory staff to analyse the hemoglobin using haematology analyser, and a validated KAP questionnaire was used to measure the level of KAP.

The KAP questionnaire consisted of 35 questions, including 15 knowledge, 10 attitude, and 10 practice items. The median score was used to differentiate between poor and adequate KAP. The association between KAP and anemia was determined by the chi-square test using SPSS Ver. 25. This study received ethical approval from the Medical Ethics Committee, Gadjah Mada University, with reference number KE/FK/0813/EC/202.

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**RESULTS AND DISCUSSION**

The study revealed that 49.1%, 21.6%, and 14.4% of the 111 pre-marital women had low dietary diversity (<5 types of food groups consumed/day), chronic energy deficiency, and anemia, respectively (Table 1). Most of them were senior high school and university graduates. The prevalence of anemia in this study was nearly similar to the national prevalence among 15–34 years old woman (MoH RI 2018).

The study found that the proportion of respondents with adequate knowledge, attitude, and practice was 70.5%, 67.8% and 64.3%, respectively. However, anemia was significantly associated with pre-conception health and nutrition practices, but not with nutrition knowledge and attitude. The composite

questionnaire on pre-conception health and nutrition practices measures the dietary practices (i.e. consumption of fruit and vegetables in the past week, food preferences), health-seeking behaviour (i.e. use of pre-marital services), hygiene and sanitation practices, and healthy lifestyle (i.e. physical activity, adequate sleep duration). Factors influencing the behaviour and practices among PMW include self-efficacy, access to nutrition and health care, and food access and availability. Self-efficacy is defined as a person's confidence in his or her ability to perform a behaviour successfully, as described in the health belief model. Poor self-efficacy has been positively correlated with poor dietary practices (Diddana 2019). Adequate knowledge and attitudes are not sufficient for better pre-conception health and nutrition practices Table 2.

Table 1. Characteristics of the respondent (n=111)

Characteristics	Value
Age, mean (min–max)	24.5 (20–29)
Nutritional status, n %	
Chronic energy deficiency (Mid-upper arm circumference <23.5 cm)	24 (21.6)
Normal (Mid-upper arm circumference >23.5cm)	86 (77.4)
Anemia status, n %	
Anemic (<12 g/dL)	16 (14.4)
Normal (≥12 g/dL)	95 (85.6)
Minimum dietary diversity, n %	
High diversity (≥5 food groups)	56 (50.9)
Low diversity (<5 food groups)	54 (49.1)
Pre-conception health and nutrition KAP	
Knowledge score, median (min–max)	11 (7–14)
Attitude score, median (min–max)	7 (3–10)
Practice score, median (min–max)	9 (6–10)

KAP: Knowledge, Attitude, Practice

Table 2. Association between pre-conception health and nutrition KAP and the prevalence of anemia among pre-marital women (n=109)

KAP level	n (%)	Anemia (n=16) %	Normal (n=93) %	p
Knowledge				
Poor	33 (30.3)	31.2	30.1	0.927
Adequate	76 (69.7)	68.8	69.9	
Attitude				
Poor	36 (33.1)	31.3	33.3	0.870
Adequate	73 (66.9)	68.7	66.7	
Practice				
Poor	39 (35.8)	56.3	32.3	0.054*
Adequate	70 (64.2)	43.8	67.7	

KAP: Knowledge, Attitude, Practice: \*Chi-square test, p<0.1

## CONCLUSION

Pre-conception health and nutrition practices are associated with anemia status in pre-marital women. Strategy to reduce anemia in this population should combine KAP improvement that focuses on increasing facilitating factor to perform a desired behaviour such as self-efficacy, nutrition and health care access, food access, and availability.

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## DECLARATION OF CONFLICT OF INTERESTS

All authors have no conflicts of interest to declare.

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