Association of Eating Habits and Nutritional Status with Premenstrual Syndrome in Female Nursing Students in Tuban

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ABSTRACT

The high prevalence of premenstrual syndrome (PMS) among female nursing students may be associated with poor eating habits and inadequate nutritional status. This study aimed to analyze the relationship between eating habits, nutritional status, and the occurrence of PMS. A cross-sectional correlational study was conducted among 53 randomly selected female nursing students. Data were collected using a semi-quantitative Food Frequency Questionnaire (FFQ) for eating habits, BMI measurements for nutritional status, and a validated questionnaire for PMS symptoms. Data analysis included univariate and Chi-square tests. Most participants had poor eating habits (64.2%) and normal nutritional status (62.3%). The majority experienced moderate PMS symptoms (60.4%). Cross-tabulation showed that students with poor eating habits were more likely to report moderate to severe PMS. A significant association was found between eating habits and PMS (p = 0.000), indicating that poor dietary practices are linked to greater PMS severity. These findings suggest that improving eating habits may help reduce the risk and intensity of PMS symptoms in female students.

INTRODUCTION

Premenstrual syndrome (PMS) is a group of physical, emotional, and behavioral symptoms that occur cyclically during the luteal phase of the menstrual cycle and typically resolve with the onset of menstruation[1–4]. Multiple factors are believed to influence the onset and severity of PMS, including hormonal fluctuations, stress levels, physical activity, nutritional status, and dietary habits[5–8]. Diets characterized by high intakes of sugar, salt, and caffeine, along with low consumption of essential nutrients such as magnesium, calcium, and vitamin B6, have been associated with increased severity of PMS symptoms[9,10]. Poor nutritional status—whether underweight or overweight can affect hormonal regulation and elevate the risk of PMS[11].

The prevalence of PMS in Indonesia is notable. According to the Ministry of Health (2014), approximately 40% of women report experiencing PMS, and about 2–10% experience severe symptoms. Among high school students, PMS is identified as the most commonly reported menstrual disorder, affecting up to 75.8% of female adolescents[12].

PMS often occurs among adolescents and young women, including those of reproductive age, such as university students. Symptoms may include physical complaints such as breast tenderness, abdominal cramps, and headaches, as well as psychological disturbances like mood swings,

irritability, anxiety, and difficulty concentrating[13–16]. These symptoms can interfere with daily activities, reduce productivity, disrupt social interactions, and hinder academic performance[17,18]. Nursing students experience academic pressure and irregular daily routines that may further increase susceptibility to PMS[19,20].

Preliminary data from the D3 Nursing Study Program at Poltekkes Kemenkes Surabaya in Tuban indicate that 65 out of 96 female students (68%) reported experiencing PMS. This high prevalence is suspected to be linked with suboptimal nutritional status resulting from poor eating habits and unbalanced dietary intake. This study aims to analyze the association between eating habits and nutritional status with the occurrence of premenstrual syndrome as a foundation for developing effective promotive and preventive strategies to enhance reproductive health and quality of life among female nursing students.

MATERIALS AND METHODS

This study employed a quantitative correlational design with a cross-sectional approach. The research was conducted at the D3 Nursing Program of Poltekkes Kemenkes Surabaya in Tuban from January to June 2022. The population consisted of 96 female students, and a total of 53 participants were selected using simple random sampling. Inclusion criteria included female students aged 18–22 years who had experienced premenstrual syndrome (PMS) symptoms in the last three menstrual cycles and were willing to participate. Exclusion criteria included individuals with chronic diseases or those using hormonal contraceptives.

Data were collected using a structured questionnaire that had been tested for validity (Pearson Product Moment) and reliability (Cronbach's Alpha, $\alpha \geq 0.7$). Eating habits were assessed using a semi-quantitative Food Frequency Questionnaire (FFQ) based on balanced nutrition guidelines. Nutritional status was determined through Body Mass Index (BMI) calculations based on measured body weight and height, and classified according to World Health Organization (WHO) standards. PMS symptoms were assessed using a validated premenstrual syndrome questionnaire, with severity categorized as mild, moderate, or severe.

Data processing and analysis were conducted in several stages. Univariate analysis was performed to describe the characteristics of respondents based on each variable. Bivariate analysis using the Chi-square test was conducted to identify the relationship between eating habits and PMS. This study was approved by the Health Research Ethics Committee of Poltekkes Kemenkes Surabaya.

RESULT

Table 1. Distribution of Frequency of Respondents by Age of Students of the D3 Nursing Study Program at Tuban Campus in 2022

Age	Frequency (n)	Presentase (%)
19	24	45,3
20	20	37,7
21	7	13,2
22	2	3,8
Total	**53**	**100**

Source : Primary Data, 2022

Table 1 shows the frequency distribution of respondents based on age. The majority of respondents were 19 years old, totaling 24 individuals or 45.3% of the sample. This was followed by 20-year-olds, comprising 20 respondents or 37.7%. Meanwhile, 7 respondents (13.2%) were 21 years old, and only 2 respondents (3.8%) were 22 years old. These findings indicate that most participants in the study were in the younger age group, with the largest proportion being 19 years old.

Table 2. Distribution of Eating Habits of D3 Nursing Study Program Students of Tuban Campus in 2022

Eating Habits	Frequency (n)	Presentase (%)
Good	19	35,8
Bad	34	64,2
Total	**53**	**100**

Source : Primary Data, 2022

Table 2 presents the distribution of respondents based on their eating habits. The majority of students, totaling 34 individuals or 64.2%, were categorized as having poor eating habits. In contrast, only 19 respondents (35.8%) demonstrated good eating habits. These results indicate that unhealthy eating behaviors were more prevalent among the nursing students at the D3 Nursing Program in Tuban Campus during the study period.

Table 3. Distribution of Frequency of Respondents by Nutritional Status of D3 Nursing Study Program Students of Tuban Campus in 2022

Body Massa Index (BMI)	Frequency (n)	Presentase (%)
Severely underweight	5	9,4
Underweight	8	15,1
Normal	33	62,3
Overweight	1	1,9
Obese	6	11,3
Total	**53**	**100**

Source : Primary Data, 2022

Table 3 presents the frequency distribution of respondents based on their nutritional status according to Body Mass Index (BMI). The majority of respondents, totaling 33 individuals or 62.3%, had a normal BMI. Meanwhile, 8 respondents (15.1%) were classified as underweight, and 5 respondents (9.4%) were severely underweight. Additionally, 6 respondents (11.3%) were

categorized as obese, while only 1 respondent (1.9%) was classified as overweight. These results indicate that although most students had a normal nutritional status, a considerable proportion experienced both undernutrition and overnutrition, suggesting the need for greater attention to balanced dietary habits.

Table 4. Distribution of Premenstrual Syndrome for D3 Nursing Study Program Students at Tuban Campus in 2022

Premenstrual Syndrome	Frequency (n)	Presentase (%)
Mild	19	35,8
Moderate	32	60,4
Severe	2	3,8
Total	**53**	**100**

Source : Primary Data, 2022

Table 4 displays the distribution of respondents based on the severity of premenstrual syndrome (PMS). The majority of respondents, totaling 32 individuals or 60.4%, experienced moderate PMS symptoms. Meanwhile, 19 respondents (35.8%) reported mild symptoms, and only 2 respondents (3.8%) experienced severe PMS. These findings suggest that most students in the D3 Nursing Program at Tuban Campus experienced PMS to a moderate degree, with only a small percentage reporting severe symptoms.

Table 5. Cross-tabulation between Eating Habits and Premenstrual Syndrome for D3 Nursing Study Program Students of Tuban Campus in 2022

Eating Habits	Premenstrual Syndrome								p-value
	Ringan		Sedang		Berat		Total		
	n	%	n	%	n	%	n	%	
Good	14	26,4	5	9,4	0	0	19	35,8	0,000
Bad	5	9,4	27	50,9	2	3,8	34	64,2	
Total	**19**	**35,8**	**32**	**60,4**	**2**	**3,8**	**53**	**100**	

Source : Primary Data, 2022

Table 5 presents the cross-tabulation between eating habits and the severity of premenstrual syndrome (PMS) among students. Among those with good eating habits, 14 respondents (26.4%) experienced mild PMS, 5 (9.4%) experienced moderate PMS, and none experienced severe PMS. On the other hand, among those with poor eating habits, only 5 respondents (9.4%) experienced mild PMS, while the majority, 27 respondents (50.9%), reported moderate symptoms, and 2 respondents (3.8%) experienced severe PMS. These results indicate that students with poor eating habits were more likely to experience higher severity of PMS compared to those with good eating habits. Based on the results of the Chi-square test between eating habits and premenstrual syndrome (PMS) among students of the D3 Nursing Program in Tuban, a p-value of 0.000 was obtained, which is less than the significance level of 0.05. The results demonstrate a statistically significant link between dietary habits and premenstrual syndrome. Therefore, the research hypothesis is accepted, confirming that eating habits are associated with the severity of premenstrual syndrome in the studied population.

DISCUSSION

The results of this study showed that the majority of respondents had poor eating habits (64.2%), while 35.8% had good eating habits. Most of the respondents had normal nutritional status (62.3%), while the rest experienced undernutrition (24.5%) and overnutrition (13.2%). In addition, the majority of respondents experienced moderate premenstrual syndrome (PMS) (60.4%), followed by mild PMS (35.8%) and severe PMS (3.8%). Bivariate analysis showed a significant association between eating habits and PMS (p-value = 0.000), while nutritional status variables were not statistically tested for PMS because the main focus of the study was eating habits. However, the distribution of nutritional status remains relevant to analyze as it has the potential to affect hormonal balance and the severity of PMS.

The Relationship of Eating Habits to PMS

The findings of this study show that students with poor eating habits tend to experience moderate to severe PMS compared to those who have good eating habits. These results are in line with the findings of Maulani et al. who reported that the diet was unbalanced—low in vegetables, fruits, and protein; high in processed foods—correlated with more severe PMS symptoms[10]. Proposed mechanisms include disruption of the regulation of the hormones estrogen and progesterone which can be exacerbated by a diet high in sugar, fat, caffeine, as well as low intake of certain micronutrients (calcium, magnesium, vitamin B6)[5,11]. High salt intake can also worsen fluid retention, triggering complaints of edema, bloating, and breast pain[21].

In this study, most students rarely consumed fruits and vegetables and more often consumed fast food. Fast food is generally high in sodium and saturated fat, which is associated with PMS symptoms such as bloating, breast pain, and mood swings[9]. In addition, the habit of skipping breakfast or eating irregularities can disrupt the stability of blood glucose levels and be associated with symptoms of irritability and fatigue leading up to menstruation[4].

The Role of Nutritional Status on PMS

Normal nutritional status was found in the majority of respondents (62.3%), but there were 24.5% of respondents with undernutrition and 13.2% with overnutrition. Poor nutrition can lead to deficiencies in micronutrients—especially calcium, magnesium, and vitamin B6—that play an important role in the regulation of neurotransmitters and the stability of reproductive hormones[5]. In contrast, over-nutritional status, particularly obesity, is associated with increased relative estrogen levels and chronically low-level inflammatory processes that can influence the onset or severity of PMS[11].

Although the study did not conduct a direct statistical analysis of nutritional status and PMS, the data distribution showed that some respondents with obesity experienced moderate to severe PMS. These findings are theoretically consistent with the report by Hanum et al. that imbalances in intake

(including consumption of high-energy fast foods) have an impact on the nutritional status of adolescents, which can further affect endocrine function[22]. Thus, maintaining normal nutritional status through a balanced diet is one of the potential strategies for PMS prevention.

The results of this study are consistent with the study by Dika et al. which found a significant relationship between diet and PMS levels in midwifery students (p = 0.024)[23]. A similar study by Jumriani et al. on adolescent girls in Bone also reported that unbalanced eating habits were associated with more severe PMS symptoms[24]. In addition, Barus et al. emphasized that a combination of a diet high in saturated fat, low physical activity, and high stress increases the severity of STDs in adolescents[9,25]. Proposed mechanisms include increased inflammation and oxidative stress due to the consumption of high-fat foods, as well as decreased regulation of serotonin when vitamin B6 intake is low[5,9].

Numers & Yurniati's research on high school students also showed that diet, stress, and sleep patterns contribute to PMS, indicating that the determinants of PMS are multifactorial across educational settings[7]. Findings from a study of the secondary school population by Buddhabunyakan et al. show the high prevalence of PMS among adolescents and confirm the need for a promotive approach in educational institutions[12].

Differences in results were found in the aspect of physical activity contribution. A number of studies have shown that regular physical activity lowers the risk or severity of PMS (Aprilana; Liguori et al.)[4,11]. This study did not evaluate physical activity variables, so the relationship cannot be drawn from the available data.

This study was limited by its cross-sectional design, which does not allow for causal inferences between eating habits, nutritional status, and PMS. The sample was also limited to female students from a single nursing program, which may restrict the generalizability of the findings to other populations. Additionally, self-reported questionnaires were used, which may have introduced recall or reporting bias.

Potential bias may have occurred due to the reliance on self-reported data, particularly in assessing dietary habits and PMS symptoms. Respondents may have overestimated or underestimated their food intake or symptom severity, either unintentionally or due to social desirability bias. Moreover, although the instruments were tested for validity and reliability, individual interpretations of questionnaire items may still vary, which could influence the accuracy of the results.

CONCLUSION

The majority of students in the D3 Nursing Program at Tuban Campus had poor eating habits (64.2%), characterized by low intake of fruits and vegetables and frequent consumption of fast food. This pattern was reflected in their nutritional status, with several respondents classified as underweight, overweight, or obese. Most respondents (60.4%) experienced moderate premenstrual syndrome (PMS), which is common among women of reproductive age—especially those around 19 years old, the dominant age group in this study. A significant correlation was found between eating habits and PMS, indicating that students with poor dietary practices were more likely to experience PMS. Thus, improving eating habits may help reduce the risk and severity of PMS symptoms. It is recommended that health promotion programs be implemented to raise students' awareness of balanced nutrition and its role in preventing PMS.

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