

Conference Paper

Relationship Between Daily Caffeine Intake and Menstrual Cycles in Young Adult Women

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ORCIDJuwitasari: <https://orcid.org/0000-0001-9161-091X>**Abstract.**

Caffeine consumption is part of the lifestyle of students and adults. More than 80% of the world's population consumes caffeine every day. In Indonesia, caffeine consumption nationally increases by 20% per year. The behavioral factor of consuming excessive caffeine in women can induce obesity symptoms, premenstrual syndrome miscarriage, and increased risk of bone density loss. This cross-sectional study was conducted from October 2020 to January 2021 to identify the relationship between caffeine intake and the menstrual cycle in young adult women. The researchers administered a questionnaire about the menstrual cycle and daily caffeine intake to 107 female nursing students from the University of Muhammadiyah Malang who met the inclusion criteria. More than 70% of respondents were between 19-21 years old; more than half of them often consumed caffeine; and 73 respondents had normal menstrual cycles. The Spearman correlation test results showed that there was no relationship between caffeine consumption and menstrual cycles in the young adult women ($p = 0.717$).

Keywords: caffeine, menstrual cycle, nursing students, young adult women

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1. Introduction

Caffeine-containing foods and drinks are now part of the urban lifestyle, especially for young adult women. Consumption of caffeine in the world currently is very high. More than 80% of the world's population consumes caffeine every day. In Indonesia, caffeine consumption nationally increases by 20% per year, currently it is up to 90% of caffeine consumption per day [1]. Based on the results of a preliminary study conducted at a female boarding house with 10 respondents in November 2020, it was found that 50% of young adult women consume foods or beverages containing caffeine every day.

Caffeine intake in young adults, especially in women should not exceed 300 mg a day (equivalent to 5 cups of instant coffee and 5 cups of tea). Excessive caffeine consumption can cause premenstrual syndrome symptoms [2]. Some experts suggest consuming 200-300 mg of caffeine a day is an adequate amount for young adults to

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consume [3]. According to the International Coffee Organization (ICO) and the European Food Information Council (EUFIC) the recommended amount of caffeine is 300 mg per day, equivalent to five cups of tea, five cups of instant coffee, three cups of Robusta coffee and two cups of arabica coffee. Consuming caffeine should not exceed 150 mg a day and a maximum of 50 mg/serving. Among women, especially students, consuming caffeine at night is something that is often done for certain reasons namely, to overcome drowsiness, increase concentration when doing tasks or studying, and reduce stress due to workload so that women or young adult women often consume food or drink containing caffeine. Chronic caffeine addiction occurs when consuming as much as 600 mg of caffeine every day which over time can cause signs of symptoms such as disorders of the digestive system digestion of food (dyspepsia), fatigue, restlessness, headache, dizziness (vertigo), confusion, chest palpitations and insomnia [4].

Several studies have been conducted that identify caffeine intake and menstrual cycle was unrelated, and depend on the gender difference [5]. Irregularity of the menstrual cycle is caused by several factors, namely stress factors, body mass index is too high or low. Menstrual cycle irregularities usually occur 6 months to 12 months after menarche and will return to normal cycles over time. Irregular menstrual cycles can also be caused by the imbalance of reproductive hormones level. Hormonal imbalances can also be caused by stress, psychological pressure, excessive weight loss, alcohol consumption and strenuous physical activity [6]. The menstrual cycle in women is normally between 21-35 days. The menstrual cycle can affect the reaction time results, the reaction time shortens in the menstrual phase, lengthens in the proliferative phase and the most prolonged is the secretory phase. It was very difficult to explain whether caffeine intake affect the menstruation length due to most of the previous studies analyzed coffee consumption daily amount only by identifying intake frequency, although serving size and the amount of coffee consumption at a time can differ substantially within and between countries and individuals [7]. Abnormality in the menstrual cycle have several kinds, namely shortened, lengthened, not menstruating and normal [8].

A young adult woman is defined as someone whose age range is between 18 – 40 years. Young adulthood is a change from adolescence to adulthood that begins at the age of 18 years and ends at the age of approximately 40 years, with the development of tasks to get a job, build a household, take care of children, and find a partner or find a life partner and become a good citizen. Good. Young adults that between the ages of 20 to 40 years, are often associated with the fertile age, because at this fertile age, pregnancy occurs most rapidly in women [9]. Physical development which during this period can be marked by changes in the physical appearance with the growth of fine

hairs, changes in voice, and the ability of the reproductive system. Young adulthood has a physical appearance that really must be mature so that it can carry out its duties such as working, getting married and having children. The intellectual development, it is marked by the emergence of the causes of problems that can solve complex problems by way of thinking that is abstract, logical, and rational [10].

2. Methods and Research Instruments

2.1. Methods

The type of this research was descriptive correlation research design with a cross sectional approach which aims to determine whether the relationship between caffeine intake and menstrual cycle. The descriptive study was needed to identify the characteristics of young adult women population. The independent variable in this study was daily caffeine intake, while the dependent variable was the menstrual cycle in young adult women.

The population in this study were young adult women who were registered as the undergraduate bachelor's degree of nursing and transferred students from 2019th, University of Muhammadiyah Malang as many as 107 students who met the inclusion criteria. The inclusion criteria in this study were the respondents in healthy condition and agree to participate along this study process. The research activities were carried out through on-line Google form media during Pandemic of Covid 19 October 2020 to January 13, 2021, on campus II, University of Muhammadiyah Malang.

2.2. Research Instruments

The instrument used in this study was a questionnaire. The questionnaire used in this study were a Food Frequency Questionnaire (FFQ) to measure the pattern of caffeine consumption in a person or individuals in college students (both from snacks and drinks) and a Menstrual Cycle Questionnaire to identify the menstrual cycle.

Food Frequency Questionnaire (FFQ) is a questionnaire used to measure the pattern of caffeine consumption in a person or individuals. The food frequency questionnaire (FFQ) contains 19 questions. The validity range of FFQ questionnaire for each item questions were from 0.657-0.980. The validity range of menstrual cycle questionnaire were from 0.455-1.00 Which is composed of 20 questions. The Food Frequency Questionnaire (FFQ) reliability value was 0.991 with SPSS 23. The menstrual cycle

questionnaire is a questionnaire to determine the menstrual cycle in young adult women. The questionnaire has been tested for validity for each item questions were from 0.455-1.0. The menstrual cycle questionnaire reliability value was 0.934. The data collection procedure was stated by approaching the respondents by making WhatsApp group. The researchers provide explanations to respondents regarding the research process, objectives, and benefits of research. After completing the discussion, researchers provided a Google Form link for respondents to fill out the informed consent first, then completing the questionnaire. The total time needed to fill the questionnaires were estimated 15 minutes. The researcher provides the online top up voucher IDR 10.000 as a gift of their participation.

3. The Study Results

This study obtained the characteristics of respondent's data, include: age, and class. The results of daily caffeine intake and menstrual cycles of 107 respondents from University of Muhammadiyah Malang, is explained as follows:

3.1. Sociodemographic Characteristics

The age characteristics shown, that more than 70% of respondents were in the range 19-21 years old. The frequency distribution of respondents based on the class level of bachelor's degree of Nursing program shown that more than 25% of them were from Nursing III A class.

TABLE 1: Characteristics of Student Respondents.

Characteristics	f (n=107)	%
Age		
19-21 Years	76	71.0%
22-24 Years	20	18.6%
25-27 Years	2	1.8%
>27 Years	9	8.6%
Class		
Transfer Nursing	2	3.8%
Nursing III A	13	25%
Nursing III B	7	13.5%
Nursing III C	11	21.2%
Nursing III D	7	13.5%

3.2. Daily Caffeine Consumption

The results of measuring daily caffeine consumption in nursing students in University of Muhammadiyah Malang was more than half of them consuming caffeine rarely.

TABLE 2: the results of measuring respondents' caffeine consumption.

Caffeine Consumption	F	%
	(N=107)	
Often (Median Score >70)	55	51.4%
Rarely (Median Score <70)	52	48.6%

3.3. Menstrual Cycle Measurement Results

The results of the measurement of the menstrual cycle in nursing students at University of Muhammadiyah Malang were as follows:

TABLE 3: Menstrual Cycle.

Menstrual Cycle	F	%
	(N=107)	
Short Cycle	20	18.6%
Normal Cycle	73	68.2%
Long Cycle	14	13.0%

From table 3, obtained the results of measuring the menstrual cycle in respondents are shortened cycles 18.6%, normal cycles 68.2% and elongated cycles 13.0%.

3.4. The Caffeine Consumption and Menstrual Cycle

The results of the Spearman Correlation Test of caffeine consumption and menstrual cycle are as follows:

TABLE 4: Spearman's Correlation Test caffeine consumption and menstrual cycle.

	Correlation Coefficient	.035	1,000
Cycle_Menstrual	Sig. (2-tailed)	.717	.
	N	107	107

The Spearman's correlation results with SPSS 23 obtained a significance (sig) p-value of 0.717, which means (0.05). The strength of the relationship between daily caffeine

intake and the menstrual cycle is very weak because the value is 0.035 and the direction of the relationship is positive, meaning that the table above concludes that H1 is rejected, that is, there is no relationship between daily caffeine intake and the menstrual cycle in young adult women.

4. Discussion

The proportion of irregular menstrual cycles in this study was half of previous study (31.6%) as compared to previous study [11]. The respondents' characteristics can be affected by the regularity of other factors, such as hormonal, psychological, gynecological diseases, drugs and contraception as well as the habit of consuming alcohol and smoking [12]. Some theories stated that the hormonal factors between the hormone's estrogen and progesterone imbalance. Previous study shown that being there are genetic differences in the sensitivity of the receptors and the messenger systems that convey the release of sex hormones in cells. Another possibility is related to emotional disturbances, psychiatric factors, social problems, or serotonin function experienced by the sufferer

Behavioral factors are risk factors for the occurrence of premenstrual syndrome, one of them is caffeine consumption. Caffeine is a familiar thing in society. Caffeine is known in the community to be contained in coffee, but in fact it is also contained in various other foods. Caffeine is found in coffee, tea, soft drinks, energy drinks, and chocolate [2].

5. Conclusion

This study had shown that there was no relationship between consuming caffeinated beverages and the occurrence of menstrual cycle disorders. consumption of 300 mg/day can cause symptoms of menstrual cycle disorders through the mechanism of action of caffeine in the central nervous system. The regularity of the menstrual cycle is caused by an imbalance of the hormone's estrogen and progesterone [3]. From this study result, the benefits of identification of the relationship between daily caffeine intake and the menstrual cycle in young adult women can be used as health promotion in the field of nursing.

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7. Conflict of Interest

The authors have no conflict of interest to declare.

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