JMU
Jurnal Medika Udayana
ISSN: 2597-8012 JURNAL MEDIKA UDAYANA, VOL. 14 NO.02, FEBRUARI, 2025
DOAJ DIRECTORY OF OPEN ACCESS JOURNALS
Accredited SINTA 3
Received: 2024-05-03 Revision: 2024-11-30 Accepted:01-01-2025

THE RELATIONSHIP BETWEEN CAFFEINATED BEVERAGE INTAKE AND MENSTRUAL CYCLES IN MEDICAL FACULTY STUDENTS OF UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA

Adek Firda Widiana Hsb, Eka Febriyanti*
Fakultas Kedokteran Universitas Muhammadiyah Sumatera Utara
e-mail: ekafebriyanti@umsu.ac.id

ABSTRACT

The World Health Organization (WHO) states that the problem of menstrual disorders with the highest prevalence is irregular menstrual disorders around 80.7%, experiencing premenstrual syndrome (PMS) 54%, irregular menstrual duration 43.8%, dysmenorrhea 38 .1%, polimenorea 37.5% and oligomenorrhea 19.3%. In 2019 the National Coffee Association United States stated that there was an increase in caffeine consumption in adolescents aged around 18-24 years. Caffeine can be contained in coffee, tea, milk, soft drinks, chocolate and even medicines. Side effects that will be caused by caffeinated drinks include insomnia, tremors, palpitations, headaches, nausea, vomiting, anxiety and will cause dependency effects. Caffeine consumption can also affect the menstrual cycle. The purpose of this research is to determine the relationship between caffeinated drinks intake and the menstrual cycle in female students at the Faculty of Medicine, UMSU. This research is an analytic descriptive study with a cross-sectional research design, which means that the research object will be observed only once and variables will be measured during the examination. Based on the results of the study there was a significant relationship between consumption of caffeinated beverage intake and the menstrual cycle in female students of the Faculty of Medicine, Muhammadiyah University, North Sumatra. There is a relationship between intake of caffeinated beverages and the menstrual cycle in UMSU Medical Faculty students.
Keywords : Caffeine., menstrual cycle., female medical student

INTRODUCTION

The World Health Organization (WHO) states that the problems with menstrual disorders with the highest prevalence are irregular menstruation disorders around 80.7%, experiencing pre-menstrual syndrome (PMS) 54%, irregular menstrual duration 43.8%, dysmenorrhoea 38.1%, polymenorrhea 37.5% and oligomenorrhea 19.3%. In Bieniasz J et al's research, the prevalence of oligomenorrhea was around 50%, polymenorrhea was around 10.5% and other disorders were 15.8%.[1]Menstrual disorders are a condition where the menstrual process is abnormal both in terms of the length of the menstrual cycle, the duration of menstruation, and the amount of blood that comes out during menstruation.[2,3]

Caffeine is one of the pharmacological substances which is included in the group of active substances. Caffeine can be contained in coffee, tea, milk, soft drinks, chocolate and even medicines. Caffeine can work by inhibiting phosphodiesterase and also has an antagonistic effect on central adenosine receptors which can affect the central nervous system so that consciousness is maintained. Side effects that can be caused by caffeinated drinks include insomnia, tremors, palpitations, headaches, nausea, vomiting, anxiety and can cause dependency effects.[4,5]

Based on the International Coffee Organization (ICO) survey in 2017/2018, Indonesia was in sixth place for the highest caffeine consumption after Russia with an increase of 4.6 million to 4.7 million caffeine consumption. In 2019, the United States National Coffee Association stated that there was an increase in caffeine consumption among teenagers aged around 18-24 years. The caffeine content in instant coffee varies, some of which do not include caffeine content. In energy drinks, caffeine levels are high, around 80-141 per serving.[6,7]

Therefore, research was conducted to find out the relationship between intake of caffeinated drinks and the menstrual cycle of UMSU Faculty of Medicine students.

MATERIAL AND METHODS

This research method is analytical descriptive research with the design of this research is cross sectional. This research was conducted in July 2023 at the Faculty of Medicine, Universitas Muhammadiyah Sumatera Utara, with research subjects being FM UMSU students. This research was carried out after obtaining ethical approval from the KEPK FM UMSU with number 1032/KEPK/FKUMSU/2023.

Determining the sample size in this study used the consecutive sampling method with a total sample of 96 people

based on G-Power calculation. All female students who met the inclusion and exclusion criteria were recruited as subjects until the sample size was met.The subjects of this research must meet the following inclusion and exclusion criteria:

Inclusion Criteria

Medical faculty students of UMSU. Willing to be a respondent in this research and signed the informed consent.

Exclusion Criteria

Student on a diet.Pregnancy and breastfeeding woman.

History of gynecological disorders.

This research data collection technique uses primary data sources obtained from filling out questionnaires including name, age, NPM and class. In the menstrual cycle using a questionnaire and caffeine consumption using the Food Frequency Questionnaire (FFQ).The data collected in this study was analyzed using the Chi-square test with p value <0.05.

RESULTS

This study was joined by 96 respondents. They were dominated by the class of 2019 with a total of 32 respondents (33%). The age characteristics of the research subjects ranged from 18 to 23 years, with the dominant age being 21 years (26.0 %) and 20 years (25.0 %).

Table 1. Frequency Distribution of Caffeinated Drink Intake

Intake of Caffeinated Beverages	n	%
Seldom (< 4x/week)	51	53.1
Often (≥ 4x/week)	45	46.9
Total	**96**	**100**

Based on the table above, 53.1% (51 people) of respondents fall into the category of rarely (< 4 times/week) consuming these drinks. Meanwhile, the remaining 46.9% (45 people) fall into the category of frequently (≥ 4x/week) consuming caffeinated drinks.

Table 2. Distribution of the Menstrual Cycle Description

Menstrual Cycle	n	%
Normal	48	50
Abnormal :		
- Polimenorea	14	14.6
- Oligomenorea	33	34.4
- Amenore Sekunder	1	1
Total	**96**	**100**

Based on the table above 50% (48 people) of the respondents' menstrual cycles are included in the normal category. Meanwhile, 50% were in the abnormal category, where 14.6% (14 people) experienced polymenorrhea cycles, 34.4% (33 people) experienced oligomenorrhea and 1% (1 person) experienced secondary amenorrhea.

Table 3. The relationship between intake of caffeinated drinks and the menstrual cycle

Caffeinated Drinks	Menstrual Cycle						*p*
	Normal		Abnormal		Total		
	n	%	n	%	n	%	
Often	13	13.5	32	33.3	45	46.8	0.0
Seldom	35	36.5	16	16.7	51	53.2	00
Total	**48**	**50**	**48**	**50**	**96**	**100**	

Based on the table above, the results show that 33.3% of respondents who frequently consume caffeinated drinks (32 people) experience abnormal menstrual cycles. Meanwhile, respondents in the category of rarely drinking caffeinated drinks, 36.5% (35 people) had normal menstrual cycles. The results of the chi square test showed a p value <0.05, which means there is a significant relationship between the intake of caffeinated drinks and the menstrual cycle of students at the Faculty of Medicine, Muhammadiyah University, North Sumatera

DISCUSSION

In this study, the results showed that 53.1% were in the category of rarely consuming caffeinated drinks, the remaining 46.9% were in the category of frequently consuming caffeinated drinks. This research is almost the same as previous research in 2022 conducted at the Faculty of Medicine, Universitas Muhammadiyah Sumatera Utara which stated that 60.9% fell into the category of poor caffeine consumption frequency and 39.1% fell into the good caffeine consumption frequency category.[8] In Monica P. 2014 research, it was stated that University of Surabaya students consumed caffeinated drinks because they liked it and to increase their enthusiasm for studying.[9] Caffeine is one of the pharmacological substances which is included in the group of active substances. Caffeine can be contained in coffee, tea, milk, soft drinks (carbonated drinks), chocolate and even medicines. Caffeine's mechanism of action includes being an inhibitor of the cyclic hydrolysis of 3',5' adenosine monophosphate and 3',5' guanosine monophosphate as well as an adenosine antagonist.[10,11,12]

In this study, the age of the respondents was 18 to 23 years with the dominant ages being 21 years (26.0%) and 20 years (25.0%). This research is in line with research from the 2019 *National Coffee Association of the United States* which stated that there was an increase in caffeine consumption among teenagers aged around 18-24 years.[13]

Based on this research, the results showed that the menstrual cycle was 50% normal, the remaining 50% was included in the abnormal category. 14.6% experienced polymenorrhoea, 34.4% experienced oligomenorrhea and 1% experienced secondary amenorrhea.

doi:10.24843.MU.2025.V14.i2.P02

In Kurnia Aldiba's 2022 research at the Faculty of Medicine, Universitas Muhammadiyah Sumatera Utara, around 55.5% of female students had normal menstrual cycles and 44.5% experienced abnormal cycle disorders.[8] Factors that can influence the menstrual cycle are stress factors, nutritional factors, sleep duration, physical activity with too high and too low intensity.[14,15]

Based on research results, 33.3% of students who often drink caffeinated drinks experience abnormal menstrual cycles. Meanwhile, 36.5% of those who rarely drink caffeinated drinks have normal menstrual cycles. The results of the *chi square* test showed a p value <0.05, which means there is a significant relationship between the intake of caffeinated drinks and the menstrual cycle. The results of this study are in line with research at the *College of Medicine, Taibah University* which stated that women who consume caffeine are more at risk of experiencing prolonged menstrual cycle disorders or oligomenorrhea. Apart from that, caffeine is known to be a vasoconstrictor and will affect blood flow in the uterus, causing menstrual blood flow to decrease and the duration of menstruation to be shorter.[3] In another study, Wardha A. in 2020, there was a relationship between coffee consumption and the regularity of the menstrual cycle in students at the Faculty of Medicine, Muhammadiyah University of Makassar and oligomenorrhea disorders.[16] This research is not in line with research conducted by Silitonga at the University of North Sumatra in 2019-2020 which concluded that there was no relationship between coffee consumption and the menstrual cycle.[17]

Caffeine can affect the menstrual cycle because caffeine is a substance that has a working mechanism as an adenosine antagonist. Caffeine will work by blocking the action of adenosine, causing the effect of adenosine to be less than optimal and reduced. The reduced action of adenosine receptors will cause an increase in central nervous system excitation. Furthermore, due to the inhibition of adenosine, the central nervous system is responsible for the production of steroid hormones and will also influence the hormones estrogen and progesterone, which are hormones related to the menstrual cycle, to become unbalanced, which will cause oligomenorrhea menstrual cycle disorders.[12]

1. CONCLUSION

There is a significant relationship between consumption of caffeinated drinks and the menstrual cycle in female students at the Faculty of Medicine, Universitas Muhammadiyah Sumatera Utara. Further research is needed with more complex methods and more varied subjects to see the relationship between caffeinated drinks and the menstrual cycle. The next research may be to identify the type of caffeinated drink and compare which type of drink has a greater influence on the menstrual cycle.

REFERENCES

1. Miraturrofi'ah M. Kejadian Gangguan Menstruasi Berdasarkan Status Gizi Pada Remaja. J Asuhan Ibu dan Anak. 2020;5(2):31-42. doi:10.33867/jaia.v5i2.191.
2. Setiawati SE. Pengaruh Stres Terhadap Siklus Menstruasi pada Remaja. J Major. 2015;4(1):94-98.
3. Bakhri K, Wijayanti T. Literature review: Hubungan aktivitas fisik dengan siklus menstruasi pada mahasiswi. Borneo Student Res. 2021;3(1):405413.
4. Liveina AIGA. Program Studi Pendidikan Dokter Pattern and Side Effects of Caffeinated Drinks Consumption Among Medical Students At Udayana. Fak Kedokt Univ Udayana. Published online 2011:1-12.
5. Novita L, Aritonang B. Penetapan kadar kafein pada minuman berenergi sediaan sachet yang beredar di sekitar pasar petisah medan. J Kim Saintek dan Pendidik. 2017;I(1):37-42.
6. Widya Ningsih P. Pengaruh Konsumsi Kafein Terhadap Pre Menstrual Syndrome pada Mahasiswi Fakultas Kedokteran Universitas Muhammadiyah Sumatera Utara. 2022. 2022; 84.
7. Melizza N, Kurnia AD, Masruroh NL, Prasetyo YB, Ruhyanudin F, Mashfufa EW, et al. Prevalensi Konsumsi Kopi dan Hubungannya Dengan Tekanan Darad. Faletehan Heal J. 2021;8(01):10–5.
8. Aldiba K. Hubungan Tingkat Stres Dengan Siklus Menstruasi Pada Mahasiswi Program Pendidikan Profesi Dokter Fakultas Kedokteran Universitas Muhammadiyah Sumatera Utara. 2022. 2022;68.
9. Purdiani M. Hubungan Penggunaan Minuman Berkafein Tergadap Pola Tidur dan Pengaruhnya Pada Tingkah Laku Mahasiswa/i Universitas Surabaya. Calyptra J Ilm Mhs Univ Surabaya. 2014;3(1):1–15.
10. Bin Mahmoud AZ, Makhdoom AN, Mufti LA, Alreheli RS, Farghal RG, Aljaouni SE. Association between menstrual disturbances and habitual use of caffeine. J Taibah Univ Med Sci. 2014;9(4):341-344. doi:10.1016/j.jtumed.2014.03.012.
11. Atakişi E, Başer L, Aygörmez S. SEVERAL ASPECTS OF CAFFEINE. Functional Foods and Nutraceuticals: Bioactive Compounds. 2022 Jun 15:271.
12. Ősz BE, Jîtcă G, Ștefănescu RE, Pușcaș A, Tero-Vescan A, Vari CE. Caffeine and its antioxidant properties—it is all about dose and source. International journal of molecular sciences. 2022 Oct 28;23(21):13074.
13. Widya Ningsih P. Pengaruh Konsumsi Kafein Terhadap Pre Menstrual Syndrome pada Mahasiswi Fakultas Kedokteran Universitas Muhammadiyah Sumatera Utara. 2022. 2022; 84.
14. Yolandiani RP, Fajria L, Putri ZM. Faktor-faktor yang mempengaruhi ketidakteraturan Siklus menstruasi pada remaja Literatur Review. E-Skripsi Univ Andalas. 2021;68:1–11.

15. Critchley HO, Babayev E, Bulun SE, Clark S, Garcia-Grau I, Gregersen PK, Kilcoyne A, Kim JY, Lavender M, Marsh EE, Matteson KA. Menstruation: science and society. American journal of obstetrics and gynecology. 2020 Nov 1;223(5):624-64.
16. Adetiyaningsih W, Anugoro D, Tahir Z. Pengaruh Konsumsi Kafein terhadap Siklus Menstruasi Mahasiswi Program Studi Pendidikan Dokter Universitas Muhammadiyah Makassar. Jurnal Universitas Muhammadiyah Makassar. 2020.
17. Silitonga. Hubungan Antara Konsumsi Kopi dengan Siklus Menstruasi pada Mahasiswi Fakultas Kedokteran Universitas Sumatera Utara Angkatan 2019-2021. 2022.