The Relationship between Chronotype and Consumption Habits of Coffee to Dysmenorrhea Pain in Adolescent

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Keywords: Chronotype, Coffee, Dysmenorrhea Pain, Adolescent.

Abstract: The prevalence of dysmenorrhea in young women between 16.8-81%. A Lifestyle like awake and sleep habits (chronotypes) can affect women's reproductive health such as menstrual disorders. This habit can affect the drinking of coffee that has perception of coffee can help drowsiness. The aim of this study was to learn about relationship between chronotype and consumption of coffee to dysmenorrhea pain. The study was a cross-sectional analytic study. The population of this study was students of SMAN 1 Kesamben in Blitar district aged 15-18 years old with a subject of 100 students. The data retrieval of the study used the MEQ, SQ-FFQ, and a pain dysmenorrhea questionnaire. Data analysis used Chi-Square statistical test at a significant level = 0,05. The result showed that 87% of students were dominated by the morning type with 50% mild pain and 48% of the students who were habitually drinking coffee with 29% mild pain. According to statistics, there was a positive correlation between chronotype and dysmenorrhea pain (p=0.031) and no substantial correlation between the drinking of coffee and dysmenorrhea (p= 0.248). In conclusion, students with morning type tend to have mild dysmenorrhea pain as well as no substantial correlation between coffee and dysmenorrhea pain.

1 INTRODUCTION

Dysmenorrhea is a menstrual condition in which menstrual backache extends to the waist, lower back, and thigh. The reason for dysmenorrhea is the menstrual period where prostaglandin appears in excess f2 minerals, which stimulate hyperactivity and the muscular spasms of the uterus (Wulan, 2018). In Indonesia, dysmenorrhea incident is 54.89% of primary dysmenorrhea and 9.36% of secondary dysmenorrhea (Savitri, 2015). In Blitar District, 75% of adolescents aged 16-18 years have dysmenorrhea. Dysmenorrhea can interfere with women's normal activities. A study reported that girls with dysmenorrhea symptoms have a higher risk of slow activity, the tension of their hips, back pain, headaches, and fatigue.

There are several factors that can trigger the occurrence of dysmenorrhea, both internal and external factors. In Pejčić .'s research and Janko (2016) stated that several things can affect the occurrence of dysmenorrhea such as caffeine intake, smoking, exercise habits, age of menarche, length of menstruation and lifestyle. Lifestyle is determined by many things and affects each other for example sleep and eat pattern.

Every people has phases of waking and sleeping consistently with their activities and habits or their sleep pattern. It's called chronotype. Chronotype is divided into the morning type (morningness), the evening type (eveningness), and the intermediate type. Chronotypes can reflect variations in their individual circadian rhythms (Solomon, 2019). Disturbed circadian rhythms can increase the risk of health problems because the internal clock of the human body is designed to be active day and night.

Indonesians have conceptions and habits of consuming coffee as sleepiness deficiency. Coffee becomes one of the beverages consumed to prevent drowsiness especially when active at night. Coffee is a high-caffeine-containing food. It can increase instant intelligence and one's mental vigilance. Studies show that drinking caffeine during the day increases mind awareness, so caffeine is often combined with energy drinks to improve mental performance (Agha et al., 2014)

Caffeine is one of the most widely digested active pharmacological substances. The quick digestive

Ardina, S., Widyaningsih, V. and Lestari, A.
The Relationship between Chronotype and Consumption Habits of Coffee to Dysmenorrhea Pain in Adolescent.
DOI: 10.5220/0011642500003608
In *Proceedings of the 4th International Conference on Social Determinants of Health (ICSDH 2022)*, pages 49-52
ISBN: 978-989-758-621-7; ISSN: 2975-8297

tract in the intake of caffeine is then channeled throughout the network (Bedoya et al., 2013). According to Faramarzi (2014), it is unclear how caffeine can cause dysmenorrhea, but it is possible because the vasocongenital effect of caffeine causes pelvis pain. Based on the lack of coffee habits, it was found that more respondents had dysmenorrhea than those who did not. Women with high caffeine diets have a risk of 2.084 times higher than dysmenorrhea (unsal et al., 2010).

Based on that background, the researcher want to research about the relationship between chronotype and consumption habits of coffee to dysmenorrhea pain in adolscent in SMAN 1 Kesamben Blitar.

2 METHODS

The study used annalytic observational with croos sectional design to learn relationship between chronotype connections and coffee habits to degrees of dysmenorrhea. Determination of the minimum number of subjects is calculated using the OpenEpi formula (Open Source Epidemiological Statistics for Public Health) which is calculated from the results of the most independent variables in this study. The study was conducted on SMAN 1 Kesamben Blitar with a sample of 100 students who had the criteria for 15-18 years of inclusion and didn't smoke.

Sample sampling is a proportional random sampling technique to get a minimum sample in every class. The data retrieval of the study uses the MEQ (morning-eveningness Questionnaire) for chronotype data result. This questionnaire consists of 19 question items with a grid in the form of aspects in the morning/wake up, bedtime, waking time, feeling in the morning, time of daily/physical activity, peak performance and planning. SQ-FFQ (Semiquantitative Food Frequency Questionnaire) for consumption habits of coffee result, and a degree of pain dysmenorrhea questionnaire. all data results obtained from interviews with that questionnaire.

The chronotype data, consumption habits of coffee and dysmenorrhea pain were analyzed with the help of Microsoft Excel and then exported to SPSS 20 software. The chronotype measurement results category is the morning type if the score is <42, the intermediate type with the score 42-58, and the evening type with the score >58. The consumption habits of coffee measurement results category is habits (consumption > three time in a week) and not habits (consumption < three time in a week). The results of dysmenorrhea pain are obtained from the dysmenorrhea pain scale, 0 means no pain, 1-2 means mild pain, 3-6 means moderate pain, 7-9 means severe pain and 10 means very severe pain.

The data in this study to determine the relationship between variables using the Chi-Square test with a 95% confidence level or sig (p) <0.05.

3 RESULT AND DISCUSSION

There are 93% students in SMAN 1 Kesamben had dysmenorrhea pain with 54% mild pain, 33% moderate pain and 6% severe pain. In category of chronotype there are 60% of students with morning type, 34% with intermediate type and 6% with night type. In category of coffee habits there are 48% with habits and 52% with not habit drinking coffee.

Table 1: Dysmenorrhea Pain, Chronotypes, and Coffee Abuse on SMAN 1 Kesamben.

Dysmenorrhea Pain	N	(%)
No Pain	7	7
Mild Pain	54	54
Moderate Pain	33	33
Severe Pain	6	6
Chronotype		
Morning Type	60	60
Intermediate Type	34	34
Night Type	6	6
Coffee Habits		
Habit	48	48
Not Habit	52	52
Total	100	100

* all values are expressed by n (%)

The students who have the most chronotype in the morning, 50% suffer from mild pain. Whereas the students who have the most chronotype of the night suffer from a moderate amount of pain at 5 (5%). Based on the chart above by using the chi-square exam, it got an asymptotic margin of 0.031. Due to asymptotic readings 0.031 < 0.05, there is a meaningful connection between the chronotype and the degree of dysmenorrhea pain.

Table 2: Crosstable Chronotype with Dysmenorrhea Pain.

Chronotype	*Dysmenorrhea Pain*				*Total*	*p-value*
	No Pain	Mild Pain	Moderate Pain	Severe Pain		
Morning type	4	39	15	2	60	0,031
Intermediate type	2	13	16	2	34	
Night type	1	2	5	3	6	
Total	7	54	33	6	100	

* Chi-square test, signifikan if p<0,05

The students who were not used to drinking the highest amounts of coffee were given a mild pain of 25 (25%). Whereas the girls with the highest concentration of coffee habits had 29 mild pains (29%). Based on the chart above by using the chi-square exam, it got an asymptotic margin of 0.248. Because of the asymptotic dysmenial value 0.248 > 0.05, there is no significant connection between the drinking of coffee with dysmenorrhea pain

Table 3: Crosstable In The Coffee Culture With Dysmenorrhea Pain.

Coffee Habits	Dysmenorrhea Pain				Total	p-value
	No Pain	Mild Pain	Moderate Pain	Severe Pain		
Not Habit	5	25	17	5	52	0,248
Habit	2	29	16	1	48	
Total	7	54	33	6	100	

* Chi-square test, signifikan if p<0,05

This study shows that 87% of students are dominated by the chronotype morning compared to the chronotypes that have the chronotypes by night. This is in line with the afghaniy research (2013) in high school children who tend to be dominated by children who have chronotypes by morning. It can also be influenced by a school schedule in the morning so that one is required to be active in the morning because of having to participate in teaching activities.

Based on the dysmenorrhea pain chart, the result is that only 7 people (7%) did not feel pain during dysmenorrhea while 93 people (93%) felt pain. Menstrual pain often occurs in young women because they not reaching biological maturity (particularly those of the reproductive apparatus of endometrium growth are still rudimentary. (Rustam,2015)

Whereas the results seen in the cross chart between chronotypes with degrees of dysmenorrhea pain suggest that there is a meaningful connection between chronotypes with degrees of dysmenorrhea. The student with the dominant chronotype received mild pain by 57 people (50%). Chronotypes are closely associated with circadian rhythm or biological rhythm. Biological rhythms play an important role in reproductive regulation such as in regulating the production, release, synthesis, and operation of hormone reproductive tools. Night sleep turned into a reason for symptoms of menstruation to rise (negriffs, 2011). Therefore when bedtime is not disturbed, menstrual symptoms such as dysmenorrhea can be reduced.

The table of drinking habits shows that 52% of girls do not have the habit of drinking coffee with 25 (25%) girls suffering moderate pain. While 48% of the students who drank coffee were physically ill with as many as 29 people (29%). Based on the cross-chart of coffee habits with dysmenorrhea pain indicates there was no meaningful connection between of both. Minor pain experienced by adolescents who habitually drink coffee can be affected by caffeine consumption limits daily. High caffeine intake is over-defined if caffeine consumption exceeds prescribed encouragement.

In the study, researchers have also found that research limits have been found that researchers have lost control of the design factors, such as stress, sleep quality, and other foods that may affect menstrual dysmenorrhea pain.

4 CONCLUSIONS

Based on the results it was determined that there was a relationship between chronotype and dysmenorrhea pain in the SMAN 1 Kesamben Blitar, but there was no substantial correlation between the drinking of coffee and the degree of dysmenorrhea pain. Adolescents with morning chronotypes tend to develop degrees of mild pain at dysmenorrhea

ACKNOWLEDGEMENTS

We want to express our thanks to the Blitar district education service that has granted us permission to carry out research on the Blitar region and the under director of the student council on SMAN 1 Kesamben Blitar, which has given us permission and benefits to perform the research on the student of SMAN 1 Kesamben Blitar.

REFERENCES

Ammar, U. R. (2016) 'Faktor Risiko Dismenore Primer pada Wanita Usia Subur di Kelurahan Ploso Kecamatan Tambaksari Surabaya', *Jurnal Berkala Epidemiologi*, 4(1), pp. 37–49. doi: 10.20473/jbe.v4i1.37-49.

Agha Aghili, H., Mohammad Hoseini, S., Yassaei, S., Fatahi meybodi, S. A., Toudeh Zaeim, M. H. and Goldani Moghadam, M. (2014) 'Effects of Carbonated Soft Drink on Consumption on Orthodontic Tooth Movements in Rates.', Journal of Dentistry of Tehran University of Medical Sciences, vol. 11, no. 2, pp. 123–130.

Solomon, N. L. and Zeitzer, J. M. (2019) 'The impact of chronotype on prosocial behavior', *PLoS ONE*. doi: 10.1371/journal.pone.0216309

Faramarzi, M. and Salmalian, H. (2014) 'Association of psychologic and nonpsychologic factors with primary dysmenorrhea', *Iranian Red Crescent Medical Journal*, 16(8). doi: 10.5812/ircmj.16307.

Chocano-Bedoya, P. O. *et al.* (2013) 'Intake of selected minerals and risk of premenstrual syndrome', *American Journal of Epidemiology*, 177(10), pp. 1118–1127. doi: 10.1093/aje/kws363.

Gustina, T. (2015) *Hubungan Antara Usia Menarche Dan Lama Menstruasi Dengan Kejadian Dismenore Primer Pada Remaja Putri Di Smk Negeri 4 Surakarta*, *Artikel Publikasi Ilmiah*. Available at: http://www.elsevier.com/locate/scp.

Ningsih, R., Setyowati, S. and Rahmah, H. (2013) 'Efektivitas Paket Pereda Nyeri Pada Remaja Dengan Dismenore', *Jurnal Keperawatan Indonesia*, 16(2), pp. 67–76. doi: 10.7454/jki.v16i2.4.

Pejčić, A. and Janković, S. (2016) 'Risk factors for dysmenorrhea among young adult female university students', *Annali dell'Istituto superiore di sanita*. doi: 10.4415/ANN_16_01_16

Unsal, A. *et al.* (2010) 'Prevalence of dysmenorrhea and its effect on quality of life among a group of female university students', *Upsala Journal of Medical Sciences*, 115(2), pp. 138–145. doi: 10.3109/03009730903457218.

Negriff, S. *et al.* (2011) 'Morningness/eveningness, pubertal timing, and substance use in adolescent girls', *Psychiatry Research*.

Rustam, Erlina (2015) 'Gambaran Pengetahuan Remaja Puteri Terhadap Nyeri Haid (Dismenore) dan Cara Penanggulangannya. Jurnal Kesehatan Andalas. 2014; 3(1)

Savitri, R. (2015) 'Gambaran Skala Nyeri Haid Pada Usia Remaja', *No date [cited 2018 february 13] available from http://jurnalkeperawatan.stikes-aisyiyahbandung.ac.id/file/RahayuSavitri_JKA_Vol2_No2_Desember_2015_04.pdf*.

Wulandari, A., Rodiyani and Sari, R. D. P. (2018) 'Pengaruh Pemberian Ekstrak Kunyit (Curcuma longa linn) dalam Mengatasi Dismenorea [Effect of Turmeric Extract (Curcuma longa linn) in Reducing Dysmenorrhoea]', *Majority*, 7(2), pp. 193–197.