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Relationship between nutritional status and menstrual cycle in medical student of Tarumanagara University

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ABSTRACT

The prevalence of women with menstrual cycle disorders is around 45% based on a statement from the World Health Organization (WHO) in 2012. Several factors affect the menstrual cycle including nutritional consumption, hormonal drugs, smoking, stress, endocrine disorders, and nutritional status. This study aims to determine the relationship between nutritional status and menstrual cycle in medical students of Tarumanagara University. This study was conducted on 161 respondents using a cross-sectional research design. Data was collected by distributing questionnaires through Google Forms and then tested using the chi-square test method. The results showed no significant relationship between undernutrition status and menstrual cycle with a p-value of 0.219. The results of this study found a non-meaningful relationship between over-nutrition status and menstrual cycle with a p-value of 0.427. In this study, it was found that there was no significant relationship between nutritional status either less or more with the menstrual cycle in female students of the Faculty of Medicine, Tarumanagara University.

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INTRODUCTION

Menstruation signifies the reproductive period in a woman's life cycle, which is due to the absence of fertilization that causes the decay of the uterine wall accompanied by bleeding. Starting from the time of menarche or the first time of menstruation until menopause (Novita, 2018; Sinaga et al., 2017). While the menstrual cycle is the amount of time or days that are calculated starting on the first day of menstruation until the arrival of the next menstruation (Tombokan et al., 2017).

Adolescents are included in the age group that is prone to menstrual disorders such as irregular menstrual cycles, dysmenorrhea, length and amount of menstrual blood, and other disorders (Novita, 2018). According to the World Health Organization (WHO) in 2012, the prevalence of menstrual cycle disorders in women is around 45% (Paspariny, 2017). Based on data from the 2013 Basic Health Research, 13.7% of women in Indonesia in the age range of 10-59 years

had irregular menstrual cycles in the past year (Sari, 2019). In addition, based on data from the Ministry of Health of the Republic of Indonesia in 2010, there were 14.4% of women in the age range of 20-24 years who had abnormal menstrual cycles (Mulyani & Ladyani, 2018).

Nutritional status is a condition that results from the balance between the nutritional status consumed and used in the body (Daris et al., 2013). Based on a number of studies, it is found that the menstrual cycle is related to a person's nutritional status. Research by Kamidah et al found that 68% of respondents with normal nutritional status had irregular menstrual cycles (Isnaini, 2020).

This study uses students at Tarumanagara University as subjects. College students are known for their unhealthy lifestyle and eating patterns. Medical students are also known for their considerable pressure which can indirectly cause changes in the menstrual cycle. Some of these things are novelty in this research.

This study aims to determine the relationship between nutritional status and menstrual cycle in students of the Faculty of Medicine, Tarumanagara University.

RESEARCH METHOD

The research was conducted using analytic with cross sectional design. Nutritional status was measured by body mass index obtained from measuring height and weighing the respondents. Menstrual cycle was measured using a questionnaire. The dependent variable is the menstrual cycle and the independent variable is nutritional status. Data obtained using SPSS version 26 and presented based on frequency distribution in the form of tables. Data analysis of the relationship between variables was analyzed using the pearson chi square test. This research was conducted in February-April 2021. The sample of this study was 161 female students of the Faculty of Medicine who were taken from the class of 2018, 2019, and 2020. This research was conducted via online media using a google form questionnaire.

RESULTS AND DISCUSSIONS

Result

The characteristics of the respondents in this study can be seen in Table 1. Respondents consisted of 161 female students of the Faculty of Medicine, Tarumanagara University. Most of them were 19 years old with 67 female students (41.61%), 20 years old with 61 (37.88%), 21 years old with 23 (14.28%), 22 years old with 8 (4.96%), 23 years old with 2 (1.24%).

Table 1. Characteristics of female students

Characteristics	Total Student (n= 161)	Percentage (%)
Age		
19 years old	67	(41,61%)
20 years old	61	(37,88%)
21 years old	23	(14,28%)
22 years old	8	(4,96%)
23 years old	2	(1,24%)
Force		
2018	53	(32,91%)
2019	91	(56,52%)
2020	17	(10,55%)

Most of the respondents had a normal nutritional status totaling 85 female students (52.79%), who were Underweight totaling 26 female students (16.14%), who were Overweight totaling 22 female students (13.66%), who were Obesity-1 totaling 24 female students (14.9%), who were Obesity-2 totaling 4 (2.48%) of 161 female students. The characteristics of this nutritional status can be seen in Table 2.

Table 2. Nutritional Status of Female Student

Nutrition Status	Total	Percentage(%)
Underweight	26	16,14
Normal	85	52,79
Overweight	22	13,66
Obesity-1	24	14,9
Obesity-2	4	2,48
Total	161	100%

Menstrual cycle characteristics can be seen in Table 3. Most of the female students had a menstrual cycle <24 days, totaling 28 female students (17.39%), who had a menstrual cycle of 24-38 days totaling 126 female students (78.26%), who had a menstrual cycle >38 days totaling 8 female students (4.96%) out of 161 female students.

Table 3. Menstrual cycle of female students

Menstrual Cycle (Days)	Total	Percentage (%)
< 24	28	17,39
24-38	126	78,26
> 38	8	4,96
Total	161	100%

The characteristics of menstrual duration can be seen in Table 4. Most female students had a menstrual duration of 3-7 days, totaling 158 female students (98.13%), who had a menstrual duration of <3 days amounted to 1 female student (0.62%), who had a menstrual duration of >7 days amounted to 2 female students (1.24%).

Table 4. Duration of Menstruation in Female Students

Duration of Menstruation (Days)	**Total**	**Percentage (%)**
< 3	1	0,62%
3-7	158	98,13%
> 7	2	1,24%
Total	**161**	**100%**

Menarche age characteristics can be seen in Table 5. Most of them have menarche age at the age of 12 years totaling 50 female students (31.05%), who have menarche age 13 years totaling 43 female students (26.7%), who have menarche age 14 years totaling 16 female students (9.93%), who have menarche age 15 years totaling 6 female students (3.72%), who have menarche age 16 years totaling 3 female students (1.86%)

Table 5. Age of Menarche of Female Student

Age of *Menarche* (year)	Total	Percentage (%)
9	2	5,59
10	12	6,21
11	29	18,01
12	50	31,05
13	43	26,7
14	16	9,93
15	6	3,72
16	3	1,86
Total	161	100

The characteristics of amenorrhea can be seen in Table 6. Most of 151 female students (93.78%) did not have a history of amenorrhea out of 161 female students.

Table 6. Amenorrhea history of female students

Amenorrhea	Total	Percentage (%)
There is	10	6,21%
None	151	93,78%
Total	161	100%

From the results of pearson chi-square statistical analysis, it was found that there was no significant relationship between the relationship between undernutrition status and menstrual cycle with a p value of 0.219. Likewise, there is no significant relationship between over nutritional status and menstrual cycle with a p value of 0.427. The results of the relationship between nutritional status and menstrual cycle in medical students of Tarumanagara University are presented in Table 7 and Table 8.

Table 7. Relationship between Menstrual Cycle and Undernutrition Status of Female Students

Nutrition Status	Menstrual Cycle		Total	*p value*
	Regular	Irregular		
Less	21	5	26	
Normal	101	34	135	0,219
Total	122	39	161	

Table 8. Relationship between Menstrual Cycle and Overweight Status of Female Students

Nutrition Status	Menstrual Cycle		Total	*p value*
	Regular	Irregular		
Less	41	9	50	
Normal	81	30	111	0,427
Total	122	39	161	

Discussion

This study was conducted on female students of the Faculty of Medicine at Tarumanagara University with a total subject of 161 female students. In this study, most female students had a normal nutritional status, namely 85 female students (52.79%) followed by an overweight status of 50 female students (31.05%) with details of Overweight totaling 22 female students (13.66%), 24 female students (14.9%) had Obesity-1 nutritional status, and 4 female students (2.48%) with Obesity-2 nutritional status. This is in accordance with research conducted by urul Maulid D. and Sri A. in 2019, found that most of the 83 respondents had normal nutritional status. Many factors can cause, namely direct causal factors, including food intake and the presence of infections, and indirect causal factors in the form of individual and family factors, physical activity, social level, and economy (Diana et al., 2013).

Other factors that can affect nutritional status are lifestyle and the amount of food consumption, where excessive food consumption and sedentary lifestyles will increase the risk of overweight to obesity. In accordance with Arisman's statement in 2007, where there is an imbalance between energy intake and expenditure resulting in changes in body weight. The environment can also affect students, especially about nutrition (Dieny, 2014).

In this study, most female students had a normal menstrual cycle, namely 126 female students (78.26%) with a duration range of 24-38 days and as many as 36 female students (22.36%%) had an abnormal menstrual cycle with details of 28 female students (17.39%) having a menstrual cycle <24 days and 8 female students (4.96%) with a menstrual cycle> 38 days. Research conducted by Yuli T, Tri A found that most (60%) had a regular menstrual cycle and as many (40%) were irregular. According to the study, several factors that cause menstrual cycle disorders are

changes in activity, eating time, disturbances in central GnRH, real weight loss, excessive stress, and sleep time (Amperaningsih & Fathia, 2019).

The age of menarche is thought to also be related to nutritional status, where the better the nutritional status will get menarche at the proper age. In this study, most female students had a menarche age of 12 years totaling 50 female students (31.05%), followed by a menarche age of 13 years totaling 43 female students (26.7%) and a menarche age of 14 years totaling 16 female students (9.93%). Menarche usually occurs at the age of 10-15 years. This is also in accordance with Waryono's research in 2010, where good nutritional intake can affect the formation of hormones that can have an effect on the age of menarche, causing women with good nutrition to experience menarche at a normal age compared to women with poor nutrition (Santi & Pribadi, 2018).

In this study, most female students had a history of amenorrhea, totaling 10 female students (6.21%). According to WHO, the incidence of amenorrhea in adolescents ranges from 10 - 15%. The development of modernization today causes changes in lifestyle, including eating patterns which are believed to play a role in shifting the age of menarche towards an earlier age from time to time. (Junita, 2020).

In this study respondents with irregular menstrual cycle patterns with more nutritional status amounted to 9 female students (5.59%), nutritional status did not amount to 30 female students (18.63%), out of 161 female students. Based on the results of chi-square analysis, the p value is 0.427, which means that there is no relationship between over nutritional status and menstrual cycle in female students of the Faculty of Medicine, Tarumanagara University. This is not in accordance with Caroline's statement in Yuli T and Tri A, where excess weight can cause irregular menstrual cycles due to cholesterol contained in excess body fat, where cholesterol is a precursor to estrogen resulting in excess estrogen production (Trisnawati & Anasari, 2018).

In this study, it was found that irregular menstrual cycle patterns with poor nutritional status amounted to 5 female students (3.10%), nutritional status was not lacking in 34 female students (21.11%), out of 161 female students. Based on the results of chi-square analysis, the p value is 0.219, which means that there is no relationship between nutritional status and menstrual cycle in female students of the Faculty of Medicine, Tarumanagara University. Research conducted by Dya and Adiningsih in 2019 stated that respondents with poor nutritional status still had a normal menstrual cycle. This is due to various other factors besides nutritional status that can affect the menstrual cycle. This is inversely proportional to research conducted by Dita N., et al in 2018 where there was a significant relationship between nutritional status and menstrual cycle p=0.041. This can be influenced by several factors such as nutrition, weight (Huhmann, 2020), physical activity (Kulshrestha & Durrani, 2019), genetic, stress levels and age (Trisnawati & Anasari, 2018).

Due to the limitations of the pandemic, data collection was carried out through distributing google form questionnaires, causing a lack of explanation to female students so that it could affect the subject's accuracy in answering the questions. Bias in this study cannot be avoided such as recall bias and subject bias cannot be avoided because data collection is based on a questionnaire that only relies on the respondent's memory, besides that the subject's interpretation may vary for each question in the questionnaire. Other factors may also affect the respondent's menstrual cycle such as stress, nutritional content of the food consumed, hormonal factors and others.

CONCLUSION

The study concluded that 161 respondents were female, aged 19 years as many as 41.61% and as many as 37.88% of respondents aged 20 years, as many as 32.91% of respondents were female students of class 2018, 56.52% of class 2019, 10.55% of class 2020, and as many as 22.36% had irregular menstrual cycles.

The study found that most respondents 78.26% of female students had a normal menstrual cycle with a duration of 24-38 days and 22.36% had an irregular menstrual cycle where 17.39% of

female students had a duration of less than 24 days and 4.96% of female students had a duration of more than 38 days.

The study found that most respondents 52.79% of female students had normal nutritional status, 16.14% had underweight nutritional status, and 31.05% had more nutritional status where 13.66% had overweight nutritional status, 14.9% had obesity-1 nutritional status, 2.48% had obesity-2 nutritional status.

In this study, it was found that there was no significant relationship between less nutritional status and menstrual cycle with a p value of 0.219, and there was no significant relationship between more nutritional status and menstrual cycle with a p value of 0.427 in female students of the Faculty of Medicine, Tarumanagara University.

Suggestions for further research are to use other variables so that the factors that can cause changes in the menstrual cycle can be identified. Future research can also use more research subjects for more valid results

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References

Amperaningsih, Y., & Fathia, N. (2019). HUBUNGAN STATUS GIZI DENGAN SIKLUS MENSTRUASI PADA REMAJA DI BANDAR LAMPUNG. *Jurnal Ilmiah Keperawatan Sai Betik*, *14*(2). https://doi.org/10.26630/jkep.v14i2.1306

Daris, C., Wibowo, T., Notoatmojo, H., & Rohmani, A. (2013). *Hubungan Antara Status Gizi dengan Anemia pada Remaja Putri di Sekolah Menengah Pertama Muhammadiyah 3 Semarang Relationship Between Nutritional Status With Anemia in Young Women in Junior High School of Muhammadiyah 3 Semarang*. *1*, 3–7.

Diana, R., Yuliana, I., Yasmin, G., & Hardinsyah, H. (2013). FAKTOR RISIKO KEGEMUKAN PADA WANITA DEWASA INDONESIA. *Jurnal Gizi Dan Pangan*, *8*(1). https://doi.org/10.25182/jgp.2013.8.1.1-8

Dieny, F. F. (2014). Permasalahan Gizi Pada Remaja Putri. In *Graha Ilmu* (Vol. 4, Issue 3).

Huhmann, K. (2020). Menses Requires Energy: A Review of How Disordered Eating, Excessive Exercise, and High Stress Lead to Menstrual Irregularities. In *Clinical Therapeutics* (Vol. 42, Issue 3). https://doi.org/10.1016/j.clinthera.2020.01.016

Isnaini, L. (2020). Strategi Kepemimpinan Abad 21: Visioner, Kreatif, Inovatif, Dan Cerdas Emosi. *PRODU: Prokurasi Edukasi Jurnal Manajemen Pendidikan Islam*, *1*(2), 162–182. https://doi.org/10.15548/p-prokurasi.v1i2.1845

Junita, D. (2020). Status Gizi dan Status Menstruasi Remaja Putri di Kecamatan Pelawan Kabupaten Sarolangun. *Media Gizi Pangan*, *27*(1).

Kulshrestha, S., & Durrani, A. M. (2019). Prevalence of Menstrual Disorders and Their Association with Physical Activity in Adolescent Girls of Aligarh City. *International Journal of Health Sciences & Research (Www.Ijhsr.Org)*, *9*(8).

Mulyani, T. D., & Ladyani, F. (2018). Hubungan Indeks Massa Tubuh (Imt) Dengan Siklus Menstruasi Pada Mahasiswi Fakultas Kedokteran Angkatan 2013 Universitas Malahayati Bandar Lampung Tahun 2016. *Jurnal Ilmu Kedokteran Dan …*, *70*(Ci).

Novita, R. (2018). Hubungan Status Gizi dengan Gangguan Menstruasi pada Remaja Putri di SMA Al-Azhar Surabaya Correlation between Nutritional Status and Menstrual Disorders of Female Adolescent in SMA Al-Azhar Surabaya. *Amerta Nutr*.

Paspariny, C. (2017). Tingkat Stres Mempengaruhi Gangguan Siklus Menstruasi. *Jurnal Ilmiah Kesehatan*, *1*(1), 79–82. https://doi.org/10.35952/jik.v6i2.97

Santi, D. R., & Pribadi, E. T. (2018). Kondisi Gangguan Menstruasi pada Pasien yang Berkunjung di Klinik Pratama UIN Sunan Ampel. *Journal of Health Science and Prevention*, *2*(1).

Sari, E. P. (2019). Faktor – Faktor Yang Berhubungan Dengan Perubahan Siklus Menstruasi Pada Mahasiswi Dharma Husada Pekanbaru Tahun 2019. *Jurnal Maternity and Neonatal*, *2*(7).

Sinaga, E., Saribanon, N., Sa'adah, N., Salamah, U., Murti, Y., Trisnamiati, A., & Lorita, S. (2017). *Manajemen Kesehatan Menstruasi*.

Tombokan, K. C., Pangemanan, D. H. C., & Engka, J. N. A. (2017). Hubungan antara stres dan pola siklus menstruasi pada mahasiswa Kepaniteraan Klinik Madya (co-assistant) di RSUP Prof. Dr. R. D. Kandou Manado. *Jurnal E-Biomedik*, *5*(1). https://doi.org/10.35790/ebm.5.1.2017.15978

Trisnawati, Y., & Anasari, T. (2018). Korelasi Indeks Masa Tubuh dengan Siklus Menstruasi pada Mahasiswa Akademi Kebidanan YLPP Purwokerto. *Jurnal Publikasi Kebidanan*, *9*(1).