JURNAL MULTIDISIPLIN MADANI (MUDIMA)

Homepage: https://journal.formosapublisher.org/index.php/mudima
ISSN: 2808-5639 (Online)
Research Article

Volume 3, No 12, December (2023)	DOI: https://doi.org/10.55927/mudima.v3i12.6553	Page: 2459-2467

Factors Associated with Menstrual Cycle in Female Students at Al-Hidayah Islamic Boarding School Depok

Kadek Ayu Dessyana[1], Iin Fatmawati[2*], Avliya Quratul Marjan[3], Firlia Ayu Arini[4]
University of National Development "Veteran" Jakarta
Corresponding Author: Iin Fatmawati iinfatmawatiimrar@upnvj.ac.id

ARTICLE INFO

Keywords: Fat Intake, Protein Intake, Menstrual Cycle Disorders, Sleep Quality, Academic Stress Level

Received : *1 November*
Revised : *16 November*
Accepted : *16 December*

ABSTRACT

Menstrual disorders are still a problem which is often found. In Indonesia, the prevalence of menstrual cycle disorders in adolescent females is 11.7%. It can occur due to several factors; such as, imbalanced nutritional intake, the level of academic stress experienced by adolescent, and sleep quality. If menstrual cycle disorders are not treated properly, it can affect the quality of life related to health; such as, increasing the risk of various uterine cancers, bone fractures and infertility. The aim of this study is that to analyze the relationship between protein, fat intake, academic stress levels and sleep quality with menstrual cycle in adolescent females at the Al-Hidayah Islamic Boarding School. This study was a quantitative study by using a cross sectional study design. The sampling technique was stratified random sampling with a sample size of 104 respondents. Moreover, the data in this study was obtained from filling out questionnaires and interviews. Meanwhile, bivariate analysis was conducted by using the chi square test. The results of the chi square test shows that there is a significant relationship between protein intake (p-value = 0.026) and fat intake (p-value = 0.029) with the menstrual cycle. Meanwhile, variables which are not related are academic stress level (p-value = 0.0.491) and sleep quality (p-value = 0.5). It is expected to be more paid attention to food intake based on balanced nutrition

INTRODUCTION

Adolescence is a transitional phase from childhood to adulthood between the ages of 10 - 19 years (Armayanti et al., 2021). In adolescence phase a person will experience puberty. There are very real changes during puberty in adolescent females; such as, breast development, hips enlargement, and menstruation for the first time.

Menstruation is the discharge of blood, mucus and cell debris from the uterine mucosa accompanied by periodic and cyclic shedding of the endometrium which begins around 14 days after ovulation (Paspariny, 2017). Furthermore, the menstrual cycle usually ranges from 21 – 35 days with an average cycle of 28 days, with menstruation lasting 2 – 8 days (Siregar et al., 2022). The menstrual cycle process sometimes changes every month which can cause problems with menstrual disorders (Satya Sai Shita & Purnawati, 2016). Menstrual disorders most commonly occur when a person experiences their first menstruation that is around 75% of adolescents experience menstrual disorders (Moulinda et al., 2023). Data on the prevalence of menstrual cycle disordersbased on WHO in 2017 showed that 45% of adolescents experienced menstrual cycle disorders while based on Riskedas in 2018 the prevalence of 15-19 year olds who experienced menstrual disorders was 11.7% (Riskesdas, 2018).

Menstrual cycle disorders in adolescents can occur due to several factors; such as, imbalanced nutritional intake. Lack of nutritional intake in adolescents can have an impact on reducing reproductive function (Noviyanti et al., 2018). Moreover, Imbalanced nutritional intake can influence menstrual irregularities in adolescents. Insufficient protein intake in a person will result in a decrease in the peak frequency of Luteinzing Hormone (LH) and result in a shortened follicular phase which can cause pressure on the ovaries and disruption of the menstrual cycle (Purba, 2022). In addition, fat intake is a factor which influences the menstrual cycle and it has an influence on the estrogen hormone. In addition, high fat intake can cause fat levels in the body to increase which lead to high estrogen secretion. This condition can cause menstrual cycle irregularities (Nahdah et al., 2022).

Another factor which can affect a person's menstrual cycle is stress. One type of stress that is often experienced by adolescents is academic stress. It is a situation where a person cannot face academic demands and always perceives these demands as a disturbance (Damayanti et al., 2021).

Conditions of academic stress occur more often in adolescents who attend boarding schools compared to adolescents who attend non-boarding schools. Furthermore, according to research which had been conducted by Hidayah's (2020) on adolescents who live in dormitories and non-dormitories at the Samarinda Health Vocational School, it shows that the level of academic stress in adolescents who live in dormitories is higher compared to adolescents who live in non-dormitories. The result stated that of the 42 respondents who live in dormitories, 33.3% of adolescents experience academic stress while for non-dormitory adolescents, 14.3% of the 42 respondents experience academic stress (Hidayah et al., 2020). The prevalence of non-dormitory adolescents experiencing academic stress may be lower since adolescents who return home will receive social support from familiar environments; such as, family. Meanwhile, adolescent females who live in dormitories experience academic stress due to busy boarding school activities, homesick problems, piling up school assignments and lots of memorization. This academic stress factor can influence menstrual cycle irregularities in adolescent females. The academic stress experienced by a person can affect the failure of the production of follicle stimulating hormone in the hypothalamus which will cause egg cells not to develop so that the hormones estrogen and progesterone will not be formed in which can cause menstrual cycle disorders (Andriani, 2020).

Apart from academic stress, adolescent are at risk of experiencing sleep problems; such as, lack of sleep and insomnia. Based on most epidemiological studies, adolescent females have a prevalence of sleep problems of 20% – 40%. Poor sleep quality will

affect menstrual cycle irregularities. A previous study showed that menstrual problems are significantly related with sleep problems including poor sleep quality and insomnia symptoms (Wang et al., 2019). Moreover, poor sleep quality will reduce melatonin production. The function of the melatonin hormone is that to inhibit the production of estrogen. If the production of the melatonin hormone is not optimal, it will increase estrogen levels in the body which will affect the menstrual cycle (Siregar et al., 2022).

Based on the description above, menstrual disorders are one of the reproductive disorders which commonly occur in adolescent females. Researchers are interested in conducting research on adolescent females at the Al-Hidayah Islamic Boarding School, Depok since in previous research which had been conducted in the Depok area, out of 90 respondents, 67.8% of respondents had abnormal menstrual cycles (Fadillah et al., 2022). Furthermore, researchers are interested in studying polymenorrhea and oligomenorrhea menstrual cycle disorders since these menstrual cycle disorders often occur in adolescents in the first 3-5 years of menstruation (Tonda, 2019). In addition, related to the explanation related to academic stress which had been discussed above, according to research (Hidayah et al., 2020), the level of academic stress for adolescents who live in dormitories is higher compared to adolescents who live at home. Therefore, it is motivated researchers to conduct research regarding the relationship between protein, fat intake, academic stress levels and sleep quality with the menstrual cycle in adolescent females at the Al-Hidayah Islamic Boarding School, Depok.

METHODS

The method of this study was quantitative observational with a cross sectional design. The dependent variable in this study was the menstrual cycle while the independent variables were protein, fat intake, academic stress levels, and sleep quality. This study was conducted in January 2023-July 2023 at the Al-Hidayah Islamic Boarding School, Depok.

The populations in this study were all female students at the Al-Hidayah Islamic Boarding School, Depok. The sampling technique used in this study was Stratified Random Sampling with a sample size of 104 samples which met the inclusion and exclusion criteria. The inclusion criteria in this study were MTS and MA respondents, respondents who had menstruated, and respondents who were not on a diet. Meanwhile, the exclusion criteria for this study were respondents who were taking hormonal drugs.

The data used in this study was primary data consisting of name, age, menstrual cycle questionnaire, academic stress, sleep quality and the SQ-FFQ form. The menstrual cycle questionnaire contained 11 questions related to menstrual history. Furthermore, the menstrual cycle was divided into 2 categories that are regular (menstrual cycle 21-35 days) and irregular (menstrual cycle <21 days or <35 days). Protein and fat intake data were obtained from the SQ-FFQ form in order to see the respondents' eating habits. Protein intake levels were divided into 2 categories that are sufficient intake (≥65 g) and insufficient intake (<65 g). Meanwhile, fat intake was considered to be sufficient (≥70 g) and insufficient (<70 g). Sleep quality data in this study used the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The questionnaire consisted of 7 components. Meanwhile, sleep quality was categorized into 2 categories that were good sleep quality (score <5) and poor quality (≥5). Academic stress data was obtained by using the Educational Stress Scale for Adolescent (ESSA) questionnaire. In addition, the level of academic stress was divided into 3 categories that were mild academic stress (score 16-36), moderate academic stress (score 37-58), severe academic stress (score 59 -80).

The data which had been obtained was then analyzed by using univariate and bivariate analysis. Univariate analysis is used to determine the description of each independent variable and dependent variable. Meanwhile, bivariate analysis in this study used the chi square test. In the chi square test, it is said that there is a significant relationship if the sig (1 – tailed) value is <0.05. Meanwhile, if the sig (1 – tailed) value is > 0.05 means there is no significant relationship between these 2 variables.

RESULTS

Based on the results of table 1, it shows that the numbers of early adolescents in this study are 83 respondents (79.8%) and middle adolescents are 21 respondents (20.2%). According to Suyamti (2018), puberty is reached in the early adolescent phase. At that time, time sexual hormones; such as, progesterone and estrogen will increase (Suyamti & Hastuti, 2018). Respondents with irregular menstrual cycles were divided into 2 categories that were polymenorrhea and oligomenorrhea. In this study, 12 respondents (54.5%) experience polymenorrhea menstrual cycle disorders and 9 respondents (40.9%) experience oligomenorrhea.

Most respondents have insufficient protein intake that are 93 respondents (89.4%) and 11 respondents (10.6%) have sufficient protein intake. Furthermore, in this study, respondents with less protein intake can be caused by a lack of consumption of foods high in protein; such as, beef, chicken, chicken eggs, etc. Some female students can only consume vegetable protein since students are allergic to meat and seafood.

The majority of respondents have insufficient fat intake that are 86 respondents (82.7%), and respondents with sufficient intake are 18 respondents (17.3%). In addition, food sources of fat that were frequently consumed by respondents in this study are chocolate, cheese and fried foods.

Most of the academic stress levels in the study are in the medium category (59.6%). Seen from the results of filling out the questionnaire in this study, some respondents stated that they feel that competition with classmates in achieving grades make respondents feel depressed; besides, they feel that they have disappointed their teachers and parents when their quiz or exam scores do not match their expectations.

Regards to the sleep quality in this study, most respondents have poor sleep quality (78.8%). It shows that the average sleeping time for female students is from 22.00 WIB to 04.00 WIB, but there are still many female students who are still awake until after 22.00 WIB. Therefore, many respondents have less than 6 hours of sleep.

Table 1. Frequency Distribution of Respondents

	Frequency	%
Respondent's Age		
12-15 years old (early adolescent)	83	79,8
16-18 years old (middle adolescent)	21	20,2
Menstrual Cycle		
Regular	82	78,8
Irregular	22	21,2
Protein Intake		
Sufficient	11	10,6
Insufficient	93	89,4
Fat Intake		
Sufficient	18	17,3
Insufficient	86	82,7
Academic Stress Levels		
Mild	29	27,9
Moderate	62	59,6
Severe	13	12,5
Sleep Quality		
Good	22	21,2
Bad	82	78,8

Relationship Between Protein, Fat Intake, Academic Stress Levels and Sleep Quality with the Menstrual Cycle

Based on the results of the bivariate analysis in this study, it can be seen in table 2 that 17 respondents (18.3%) have insufficient protein intake with irregular menstrual cycles while 5 respondents have sufficient protein intake (45.5%) with irregular menstrual cycles. Based on the results of statistical analysis by using the chi square test, it shows p value of 0.026 which shows that there is a significant relationship between protein intake and the menstrual cycle.

The fat variable shows that 15 respondents (17.4%) have insufficient fat intake with irregular menstrual cycles while 7 respondents with sufficient protein
intake (38.9%) have irregular menstrual cycles. In addition, based on the results of statistical analysis by using the chi square test, it shows p value of 0.029 which shows that there is a significant relationship between fat intake and the menstrual cycle.

Based on the academic stress variable, the results of statistical tests show that there is no relationship between academic stress and the menstrual cycle with p value of 0.491. It is the same as sleep quality which shows p value of 0.500 that means there is no relationship between sleep quality and the menstrual cycle.

Table 2. Relationship Between Protein, Fat Intake, Academic Stress Levels and Sleep Quality with the Menstrual Cycle

Variable	Menstrual Cycle						OR (95% CI)	P Value
	Irregular		Regular		Total			
	n	%	n	%	n	%		
Protein Intake								
Sufficient	5	45,5	6	54,5	11	100	0,268 (0,073-0,983)	0,026
Insufficient	17	18,3	76	81,7	93	100		
Fat Intake								
Sufficient	7	38,9	11	61,1	18	100	0,332 (0,111-0,997)	0,029
Insufficient	15	17,4	71	82,6	86	100		
Academic Stress								
Mild	6	20,7	23	79,3	29	100	-	0,491
Moderate	13	21	49	79	62	100		
Severe	3	23,1	10	76,9	13	100		
Sleep Quality								
Good	1	14,3	6	85,7	7	100	1,658 (0,189-14,54)	0,500
Bad	21	21,6	76	78,4	97	100		

DISCUSSION

Relationship Between Protein Intake and the Menstrual Cycle

This study shows that there is a relationship between protein intake and the menstrual cycle. These results are in line with research which had been conducted by Wahyuni's (2018) on vegetarian adolescent females. The results of this study show that there is a significant relationship between protein intake and the menstrual cycle (Wahyuni & Dewi, 2018). Furthermore, the study stated that low protein intake is caused by the only source of protein coming from tofu, tempeh and nuts, respondents rarely consume animal protein sources. In addition, research which had been conducted by Arisanti's (2022) on adolescents at the Sai Study Group Denpasar showed that there is a relationship between the level of protein intake and the menstrual cycle with p value of 0.009 (Arisanti, 2022).

Insufficient protein intake can reduce the peak frequency of LH (Luteinizing Hormone) and shorten the follicular phase. Based on this study, respondents who went on a diet with minimal meat consumption for two

months experienced a decrease in peak LH and a shortening of the follicular phase while respondents on a diet that consumed animal protein had a lengthened follicular phase and increased FSH (Follicle Stimulating Hormone). Moreover, according to Murbawani (2015), high consumption of animal protein can increase the risk of infertility due to anovulation. Anoulation causes changes in the corpus luteum and its inability to develop which at the end of the cycle causes no progesterone secretion and shortening of the luteal phase which causes menstrual cycle disorders (Rachmawati & Adi Murbawani, 2015).

Relationship Between Fat Intake and Menstrual Cycle

Based on the results of statistical analysis, it shows that there is a significant relationship between fat intake and the menstrual cycle. This study is in line with research which had been conducted by Sitoayu's (2017) on adolescent females at Senior High School 21 Jakarta on 90 respondents. The result of this study shows a p value of 0.003 which means there is a relationship between adequate fat intake and the menstrual cycle in adolescents at Senior High School 21 Jakarta (Sitoayu et al., 2017).

Insufficient fat intake in adolescent females can affect the decline in function of their reproductive organs. It can happen since fat affects the gonadotropin hormones in urine and serum. When gonadotropin hormone levels decrease, LH (Luteinizing Hormone), FSH (Follicle Stimulating Hormone), estrogen and progesterone will be disrupted. A decrease in LH will cause the ovaries to be unable to produce mature eggs, which will result in irregular menstrual cycles. Moreover, fat intake will have an effect on increasing the hormone androsterone which is used to produce the hormone estrogen. The process of producing the hormone estrogen occurs in granulosa cells and fat tissue. Therefore, the more body fat tissue, the more estrogen hormone will be produced and it will disrupt the menstrual cycle.

Relationship Between Academic Stress Levels and Menstrual Cycle

Based on the results of statistical analysis, it shows that there is no significant relationship between academic stress levels and the menstrual cycle. This study is in line with research which had been conducted by Permatasari (2021). In this study, statistical test results are obtained with a p value of 0.937 which means that there is no relationship between academic stress and the menstrual cycle (Permatasari et al., 2021). It is in line with research which had been conducted by Paspariny's (2017) on adolescent females at Sukoharjo Pringsewu Lampung State High School and obtained statistical test results with a p value of 0.300 which means there is no relationship between academic stress and the menstrual cycle (Paspariny, 2017).

Academic stress can cause changes in the menstrual cycle. When the body is in a state of academic stress, the hypothalamic pituitary adrenal (HPA) axis is activated which will cause the hypothalamus in order to produce CRH (Corticotropin Releasing Hormone) (Loa et al., 2022). Furthermore, CRH secretion will stimulate the release of ACTH by the anterior pituitary which in turn ACTH (Adrenocorticotropic Hormone) will stimulate the adrenal glands to secrete cortisol. Cortisol will suppress LH (Luteinizing Hormone) by inhibiting the anterior pituitary response to GnRH (Gonadotropin Realizing Hormone). The effect of increasing the concentration of the hormone cortisol will cause the menstrual cycle to become irregular (Andriani, 2020).

In this study, respondents experience academic stress due to several reasons for academic demands; such as, competition with classmates to get grades which made students feel depressed, feelings of disappointment when they got test scores that did not meet expectations. Moreover, academic stress is a factor which causes irregular menstrual cycles, but there are many other factors which can influence the menstrual cycle; such as, poor diet patterns, a person's nutritional status, and drastic weight gain and loss can also affect the function of the ovaries so that it can affect menstrual cycle (Nathalia, 2019).

Relationship Between Sleep Quality and Menstrual Cycle

This study shows that there is no relationship between protein intake and the menstrual cycle. This study is in line with research which had been conducted by Salsabilla (2023) which was conducted on female students at Senior High School 8 Tangerang on 77 respondents. The result is a p value of 0.297 which means that there is no significant relationship between sleep quality and the menstrual cycle (Salsabilla et al., 2023). In addition, another research which had been conducted by Veronika, in 2021 stated that there is no significant relationship between sleep quality and menstrual cycle in Medical Faculty students at the University of North Sumatra with a p value of 0.296 (Veronika, 2021).

Poor sleep quality can inhibit the production of the hormone melatonin. The hormone melatonin is the hormone which has the greatest influence on the mechanism of sleep. The hormone melatonin is synthesized in the pineal gland. The secretion of the hormone melatonin has an effect on drowsiness; besides, it can affect sleep quality. The hormone melatonin has a function as an inhibitor of estrogen production so that if someone has poor sleep quality, the production of the hormone melatonin in the body is not optimal which will result in estrogen levels in the body increasing which can directly cause menstrual cycle disorders (Siregar et al., 2022).

Poor sleep quality among respondents can be caused by several factors; such as, waking up at night due to nightmares, waking up to go to the bathroom and others. Even though the majority of respondents have poor sleep quality, the number of respondents with regular menstrual cycles is greater. It is thought to be one of the factors that there is no relationship between sleep quality and the menstrual cycle.

CONCLUSION

There is a relationship between protein intake and fat intake and the menstrual cycle in adolescent females at the Al-Hidayah Islamic Boarding School, Depok. In addition, there is no relationship between academic stress and sleep quality and the menstrual cycle in adolescent females at the Al-Hidayah Islamic Boarding School, Depok.

Respondents are expected to be more paid attention to food intake which is in accordance with balanced nutrition. Respondents can follow the recommendations of balanced nutrition guidelines which recommend consuming 2-4 portions of animal or vegetable protein side dishes a day. In addition, it is expected that respondents will prioritize consuming unsaturated fats found in foods; such as, fish, poultry, avocado and others.

REFERENCES

Andriani. (2020). Hubungan Stres Terhadap Siklus Menstruasi Pada Siswi Pondok Pesantren Putri UMMU Sulaim Pekanbaru Tahun 2018. Kesehatan Medika Udayana, 6(2), 123–133.

Arisanti, N. K. R. (2022). Hubungan Tingkat Konsumsi Protein, Zat Besi, dan Vitamin C Terhadap Siklus Menstruasi Remaja di Sai Study Group Denpasar. Poltekes Kemenkes Denpasar.

Armayanti, L. Y., Damayanti, P. A. R., & Damayanti, P. A. R. (2021). Faktor-Faktor Yang Mempengaruhi Keteraturan Siklus Menstruasi Pada Remaja Putri Di Sma Negeri 2 Singaraja. Jurnal Media Kesehatan, 14(1), 75–87. https://doi.org/10.33088/jmk.v14i1.630

Damayanti, S. S., Ningrum, E. W., & Haniyah, S. (2021). Hubungan Tingkat Stres Akademik dan Kualitas Tidur dengan Siklus Menstruasi Selama Pandemi Covid-19 Mahasiswi Keperawatan Universitas Harapan Bangsa. Borneo Nursing Journal (Bnj), 4(1), 48–57. https://akperyarsismd.e-journal.id/BNJ

Fadillah, R. T., Usman, A. M., & Widowati, R. (2022). Hubungan Tingkat Stres Dengan Siklus Menstruasi Pada Siswi Putri Kelas X Di SMA 12 Kota Depok. MAHESA : Malahayati Health Student Journal, 2(2), 258–269. https://doi.org/10.33024/mahesa.v2i2.5907

Hidayah, A. N., Rahmah, Y., & Hasanah, N. (2020). Perbedaan Tingkat Stres, Keteraturan Makan Dan Kejadian Sindrom Dispepsia Pada Siswa Asrama Dan Non Asrama Di Smk Kesehatan Samarinda. Health Science Journal, 2(1), 1–12.

Loa, W. W., Nabuasa, E., & Sir, A. B. (2022). HUBUNGAN ANTARA BERAT BADAN, DIET, AKTIVITAS FISIK DAN TINGKAT STRES DENGAN GANGGUAN SIKLUS MENSTRUASI (Studi pada Mahasiswi Fakultas Kedokteran, Universitas Nusa Cendana). Media Kesehatan Masyarakat, 4(1), 34–43. https://doi.org/10.35508/mkmhttps://ejurnal.undana.ac.id/MKM

Moulinda, A. A., Imrar, I. F., Puspita, I. D., & Amar, I. (2023). Relationship of Nutritional Status, Sleep Quality and Physical Activity with The Menstrual Cycle in Adolescent Girls at SMAN 98 Jakarta. Jurnal Gizi Dan Kesehatan, 15(1), 1–12.

Nahdah, R. A., Safitri, D. E., & Fitria, F. (2022). Asupan Lemak, Serat, Kalsium Dan Kualitas Tidur Kaitannya Dengan Siklus Menstruasi Pada Remaja Putri. Journal of Nutrition College, 11(2), 163–170. https://doi.org/10.14710/jnc.v11i2.33212

Nathalia, V. (2019). HUBUNGAN TINGKAT STRES DENGAN SIKLUS MENSTRUASI PADA MAHASISWI STIT DINIYYAH PUTERI KOTA PADANG PANJANG. Jurnal Penelitian Dan Kajian Ilmu, XIII(5), 124. https://jurnal.umsb.ac.id/index.php/menarailmu/article/view/1397

Noviyanti, D., Dardjito, E., Hariyadi, B., & Hariyadi, B. (2018). Correlation Between Nutritional Status and Level of Nutrients Intake with Menstrual Cycle Among Adolescent Girls in Distric Kedungbanteng. J.Gipas, Mei 2018, Volume 2 Nomor 1 ISSN 2599-0152 EISSN 2599-2465, 2. ttp://jos.unsoed.ac.id/index.php/

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

Permatasari, D., Suyami, & Tyas, R. N. (2021). Hubungan Tingkat Stres Dalam Menghadapi Pandemi Covid- 19 Dengan Siklus Menstruasi Pada Remaja Putri Di Dukuh Ngawinan-Tegalsari, Jurangrejo, Karanganom, Klaten. Proceeding of The URECOL, 857–863.

Purba, D. M. G. (2022). Hubungan Asupan Protein, Zat Besi, Vitamin C, Dan Zinc Dengan Siklus Menstruasi Mahasiswa Jurusan Kebidanan Politekkes Kemenkes Bengkulu Tahun 2022. 8.5.2017, 2003–2005.

Rachmawati, P. A., & Adi Murbawani, E. (2015). HUBUNGAN ASUPAN ZAT GIZI, AKTIVITAS FISIK, DAN PERSENTASE LEMAK TUBUH DENGAN GANGGUAN SIKLUS MENSTRUASI PADA PENARI. Journal of Nutrition College, 4, 39–49. http://ejournal-s1.undip.ac.id/index.php/jnc%0AHUBUNGAN

Riskesdas. (2018). Laporan Nasional Riskesdas 2018. badan penelitian dan pengembangan kesehatan.

Salsabilla, B., Anwar, K., & Maskar, D. H. (2023). Status Gizi , Kadar Hemoglobin , Kualitas Tidur dan Siklus Menstruasi pada Siswi di SMAN 8 Tangerang. 2(1), 16–23. https://doi.org/10.25182/jigd.2023.2.1.16-23

Satya Sai Shita, N., & Purnawati, S. (2016). Prevalensi Gangguan Menstruasi Dan Faktor-Faktor Yang Mempengaruhi Pada Siswi Peserta Ujian Nasional Di Sma Negeri 1 Melaya Kabupaten Jembrana. E-Jurnal Medika Udayana, 5(3), 1–9.

Siregar, H. S. N., Mustika, S. E., Pane, A. H., & Wardani, K. (2022). Hubungan Kualitas Tidur Dengan Siklus Menstruasi Pada Mahasiswi Fk Uisu Tahun 2021. Jurnal Kedokteran STM …, V(Ii). https://www.jurnal.fk.uisu.ac.id/index.php/stm/article/view/319%0Ahttps://www.jurnal.fk.uisu.ac.id/index.php/stm/article/download/319/267

Sitoayu, L., Pertiwi, D. A., & Mulyani, E. Y. (2017). Kecukupan zat gizi makro, status gizi, stres, dan siklus menstruasi pada remaja. Jurnal Gizi Klinik Indonesia, 13(3), 121. https://doi.org/10.22146/ijcn.17867

Suyamti, E., & Hastuti, W. (2018). Gambaran Tingkat Kecemasan Remaja Putri Kelas VII dan VIII Yang Mengalami Pubertas. Profesi (Profesional Islam) : Media Publikasi Penelitian, 16(1), 78. https://doi.org/10.26576/profesi.295

Tonda, K. C. (2019). Analisis Penyebab Polymenorrhea di Kalangan Remaja. 35. https://osf.io/dpku8/download/?format=pdf

the references you cited in the article by using the American Psychological Association (APA) 6th Edition style. Reference writing must use a reference application engine such as Mendeley, EndNote, and Zotero.

Veronika, L. (2021). Hubungan Kualitas Tidur dengan Keteraturan Siklus Menstruasi Mahasiswi Fakultas Kedokteran Universitas Sumatera Utara Tahun 2020.

Wahyuni, Y., & Dewi, R. (2018). Gangguan siklus menstruasi kaitannya dengan asupan zat gizi pada remaja vegetarian. 6(2), 76–81.

Wang, Z. Y., Liu, Z. Z., Jia, C. X., & Liu, X. (2019). Age at menarche, menstrual problems, and daytime sleepiness in Chinese adolescent girls. Sleep Research Society, 42(6), 1–8.