Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

The Factors Associated With Menstrual Disorder In Female Students Of The Institute Of Home Affairs Governance

Rahma Amalyah[1], Rosita[2], Yanti Herawati[3], Sri Hennyati A[4]
[1,2,3,4]Program Studi Sarjana dan Pendidikan Profesi Kebidanan, STIKes Dharma Husada Bandung

Article Info
Keywords:
Menstrual disorder,
Nutritional status,
Stress levels,
Physical activity.

ABSTRACT
World Health Organization (WHO) 2020 report, the prevalence of menstrual cycle disorders in women is around 45%. Basic Health Research data (2018), explains that in Indonesia, women aged 10-59 years experience irregular menstrual problems as much as 13.7% in 1 year. A preliminary survey conducted by researchers on 22 female students at Institute of Home Affairs Governance found that female students who experienced dysmenorrhea were 50%, menstrual cycle disorders (polymenorrhea, oligomenorrhea and amenorrhea) were 22.72%, premenstrual syndrome was 22.72% and hypermenorrhea was 4.5%. Purpose of the study is to determine the factors associated with menstrual disorders in female students at the Institute of Home Affairs Governance. Research method is analytical research with a cross sectional time approach. The sampling technique used total sampling which amounted to 171 adolescent girls. The results of statistical tests using the Chi Square test and the alternative test of fisher freeman halton test showed there was a relationship between stress levels and menstrual disorders with a p-value of 0.04. There was no relationship between nutritional status and physical activity with menstrual disorders with p-value 0.22 and 0.48. There is a significant correlated between stress levels and menstrual disorder on female student at Institute of Home Affairs Governance.

Corresponding Author:
Rahma Amalyah
Program Studi Sarjana dan Pendidikan Profesi Kebidanan, STIKes Dharma Husada Bandung
rahmaamalyah08@gmail.com

INTRODUCTION

The menstrual cycle is one of the signs of the maturation process of the reproductive organs and is affected by hormones in the body. This cycle usually begins when a woman is 17-18 years old, but can also happen 3-5 years after menarche. The average menstrual cycle is 28 days. Cycles can range from 21 to 35 days in adult women. Some women have irregular menstrual cycles, which may be a sign of fertility problems if they persist for a long period of time.

The World Health Organization (WHO) 2020 report, the prevalence of menstrual cycle disorders in women is around 45%. Basic Health Research data (2018), explains that in Indonesia, women aged 10-59 years experience irregular menstrual problems as much as 13.7% in 1 year. Irregular menstrual cycle disorders in Indonesian women aged 17-29 years and 30-34 years are quite a lot at 16.4%.

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Students in government institutions often face high academic pressure and stress, which can potentially cause menstrual disorders to worsen. Similar to female students or praja at the Institute of Home Affairs Governance (IPDN), the dense and scheduled daily activity schedule including teaching, training and nurturing activities (Jarlatsuh) carried out will cause some physical and mental tiredness. Physical tiredness and emotional instability can affect the menstrual cycle, which is called menstrual cycle disorder. This problem becomes more complex because of changes in lifestyle, diet that will affect nutritional status and increased stress levels among female students. In addition, in some cases there is still social stigma surrounding menstruation that can make the negative impacts experienced even worse.

According to Devi, E.N; Mifbakhuddin; Mulyanti, there are several causes of menstrual cycle disorders including weight, physical activity, anxiety, diet, environmental exposure and working conditions, and lastly, impaired hormonal function. Anxiety is a feeling of discomfort or uncertain worry caused by an unspecified danger or threat. According to Imasari, someone who experiences anxiety will activate the amygdala in the limbic system which stimulates the release of *corticotropin releasing hormone* (CRH) from the hypothalamus. CRH will inhibit the secretion of gonadotropin releasing hormone (GnRH), GnRH which is inhibited certainly cannot stimulate *follicle stim* ulating hormone (FSH) and *lutenizing hormone* (LH). FSH and LH that do not come out will affect estrogen and progestron levels. Estrogen and progesterone are hormones that are influential in regulating the menstrual cycle. Low estrogen and progesterone will certainly disrupt the menstrual cycle.

Based on a preliminary survey conducted by researchers on 22 female students at the Institute of Home Affairs Governance (IPDN) Jatinangor, it was found that female students who experienced dysmenorrhea were 50%, menstrual cycle disorders (polymenorrhea, oligomenorrhea and amenorrhea) were 22.72%, *premenstrual syndrome* was 22.72% and hypermenorrhea was 4.5%.

After conducting pre-research interviews with 2 female students at the IPDN Primary Clinic, Jatinangor it was found that extra self-adjustment to life in the campus environment, especially in terms of dense physical activity when carrying out Latsarmendispra (Basic Mental and Discipline Praja Training) for female students at the beginning of education, MKP (Manggala Korps Praja) and UKP (Praja Activity Unit) cadre in third-year students, turned out to be stress inducing among female students. In addition, life in the dormitory with a food menu that has been arranged according to nutritional standards but does not match the taste or desire at that time makes female students tend to increase food consumption outside the menza to fulfill their wants. Consumption habits like this cause some female students to gain more weight /overweight which of course will also affect nutritional status which has an impact on the menstrual cycle.

From the background described above, researchers are interested in conducting research on "What are the menstrual disorders experienced and what factors are associated with menstrual disorders in female students at the Institute of Home Affairs Governance." Through this study, researchers can find out what factors are associated with menstrual disorders in female students at the Institute of Home Affairs Governance so that researchers can identify appropriate prevention efforts and can be implemented through a special

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

program related to adolescent reproductive health that can be carried out continuously according to factors related to menstrual disorders experienced by female students at the Institute of Home Affairs Governance.

METHODS

The research method used in this study is analytic with a cross sectional time approach. The population in this study were 171 female first year students. The sampling technique used *total sampling* technique so that the sample used was the same as the population of 171 participants.

The data used is primary data obtained directly from female students through filling out questionnaires in the form of Google forms to assess the presence or absence of menstrual disorders, BMI assessment based on Weight and Height data, stress level assessment using the DASS-42 questionnaire and physical activity using the IPAQ-SF questionnaire which has been tested for validity and reliability.

RESULTS AND DISCUSSION

Univariate Analysis Results

Table 1. Frequency Distribution of Menstrual Disorders

Menstrual Disorders	Frequency (n)	Percentage (%)
Not Having Menstrual Disorders	34	19.9
Having Menstrual Disorders	137	80.1
Total	171	100

Source: Processed Primary Data, 2024

Based on the data, it is known that out of 171 respondents in the study, 137 respondents (80.1%) having menstrual disorders and 34 respondents (19.9%) do not having menstrual disorders.

Table 2. Frequency Distribution of Nutritional Status

Nutritional Status	Frequency (n)	Percentage (%)
Thin	8	4.7
Normal	148	86.5
Fat	15	8.8
Total	171	100

Source: Processed Primary Data, 2024

Based on the data, it is known that of the 171 respondents in the studied, 148 respondents (86.5%) had normal nutritional status, 15 respondents (8.8%) had fat nutritional status and 8 respondents (4.7%) had thin nutritional status.

Table 3. Frequency Distribution of Stress Levels

Stress Levels	Frequency (n)	Percentage (%)
Low	54	31.5
Medium	88	51.5
Heavy	29	17

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Stress Levels	Frequency (n)	Percentage (%)
Total	171	100

Source: Processed Primary Data, 2024

Based on the data, it is known that of the 171 respondents in the the studied, 88 respondents (51.5%) had medium stress levels, 54 respondents (31.5%) had low stress levels and 29 respondents (17%) had heavy stress levels.

Table 4. Frequency Distribution of Physical Activity

Physical Activity	Frequency (n)	Percentage (%)
Medium	3	1.8
High	168	98.2
Total	171	100

Source: Processed Primary Data, 2024

Based on the data, it is known that of the 171 respondents in the study, 168 respondents (98.2%) did high physical activity and as many as 3 respondents (1.8%) did medium physical activity.

Bivariate Analysis Results

Table 5. Relationship between Nutritional Status and Menstrual Disorders

Nutritional Status	Menstrual Disorders				Total		*p-value*
	Not Having Menstrual Disorders		Having Menstrual Disorders				
	f	*%*	*f*	*%*	*f*	%	0.22
Thin	3	1.8	5	2.9	8	4.7	
Normal	27	15.8	121	70.8	148	86.6	
Fat	4	2.3	11	6.4	15	8.7	
Total	34	19.9	137	80.1	171	100	

Source: Processed Primary Data, 2024

Based on the statistical test results, the probability value (*p-value*) is 0.22. The *p-value* > 0.05 then Ha is rejected and H0 is accepted, so it can be concluded that there is no relationship between nutritional status and menstrual disorders in female students of the the Institute of Home Affairs Governance.

Table 6. Relationship between Stress Level and Menstrual Disorders

Stress Level	Menstrual Disorders				Total		*p-value*
	Not Having Menstrual Disorders		Having Menstrual Disorders				
	f	*%*	*f*	*%*	*f*	%	0.04
Low	16	9.4	38	22.2	54	31.6	
Medium	16	9.4	72	42.1	88	51.5	
Heavy	2	1.1	27	15.8	29	16.9	
Total	34	19.9	137	80.1	171	100	

Source: Processed Primary Data, 2024

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Based on the statistical test results, the probability value (*p-value*) is 0.04. The *p-value* <0.05 then Ha is accepted, so it can be concluded that there is a relationship between stress level and menstrual disorders in female students of the the Institute of Home Affairs Governance.

Table 7. Relationship between Physical Activity and Menstrual Disorders

Physical Activity	Menstrual Disorders				Total		*p-value*
	Not Having Menstrual Disorders		Having Menstrual Disorders				
	f	%	*f*	%	*f*	%	0.48
Medium	1	0.6	2	1.2	3	1.8	
High	33	19.3	135	78.9	168	98.2	
Total	34	19.9	137	80.1	171	100	

Source: Processed Primary Data, 2024

Based on the statistical test results, the probability value (*p-value*) is 0.48. The *p-value* > 0.05 then Ha is rejected and H0 is accepted, so it can be concluded that there is no relationship between physical activity and menstrual disorders in female students of the the Institute of Home Affairs Governance.

Menstrual disorders in first-year female students of the Institute of Home Affairs Governance.

The results showed that the prevalence rate of menstrual disorders among first-year female students was 80.1%. The high incidence of menstrual disorders among female students was dominated by symptoms of *premenstrual syndrome* and *dysmenorrhea*. According to the researcher, this can be caused by several factors, one of which is stress due to difficulty adapting to a new environment. Before entering and participating in education, female students are very dependent on parents but when on campus are required to be independent. The scheduled and dense cycle of activities starting from waking up to sleeping again and the many physical activities that must be done certainly require a lot of energy. When female students experience stress due to these changes, the hormones produced by the body will also be disrupted so that the opportunity to experience dysmenorrhea and premenstrual syndrome is also greater.

The high incidence of menstrual disorders among female students is also in line with research conducted by Miraturrofi'ah in 2020 on the incidence of menstrual disorders based on nutritional status in adolescents where the results showed that the prevalence of menstrual disorders occurred at 93.13% (20). In previous research conducted by Ansong in 2019 on menstrual characteristics, disorders and associated risk factors among female international students in Zhejiang Province also showed that almost half of the respondents (49.1%) reported various changes in menstrual patterns(5). The difference in the percentage of research results conducted by Ansong and those conducted by this researcher is possible due to differences in the number of samples and characteristics of the research samples used.

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

In the research conducted by the researcher, the sample involved was only 171 respondents who were adolescent female students who had met the criteria. While the research conducted by Ansong et al, used a much larger sampling of 409 respondents, so that the out put also varied in each of the results obtained[5]

To understand the main causes and find effective solutions to reduce menstrual disorders in female college students, the factors that can cause menstrual disorders must be studied more deeply. Some of the main factors that can affect this high prevalence besides stress can also be caused by poor diet, changes in lifestyle and environment, and lack of knowledge about reproductive health itself.

This is in line with research conducted by Ansong et al, which states that the causes of menstrual irregularities vary in each woman, various conditions ranging from hormonal imbalances, malignant diseases, infections, traumatic diseases to the use of certain drugs. New environmental factors, trends and lifestyles such as physical activity, stress, age, weight gain and diet are also closely correlated with menstrual disorders. (5)

In general, based on the results of the study conducted by the researchers, it can be concluded that more than half of the group studied experienced menstrual disorders. This finding has a very significant impact because menstrual disorders can affect the quality of life of female college students, including physical and emotional comfort, as well as academic productivity. In addition, menstrual disorders that are not properly treated can affect health in the long term, including the possibility of experiencing other health problems such as infertility and other reproductive complications. Therefore, it is imperative to take appropriate action to address these issues. Health providers can facilitate education and counseling on reproductive health, psychological support and counseling, and sufficient medical services.

Relationship between nutritional status and menstrual disorders in female students of the Institute of Home Affairs Governance.

Data analysis on the relationship between nutritional status and menstrual disorders initially used the Chi-Square test, but the results showed that there were 2 cells (33.3%) had an expected frequency below 5. While the requirement for using the Chi-Square test in the 3x2 table is that there is no 1 cell with an expected frequency value below 5. So the researchers used an alternative test, namely using the fisher freeman halton test and obtained a probability value (p-value) of 0.22. The p-value> 0.05, so it can be concluded that there is no relationship between nutritional status and menstrual disorders in female students of the Institute of Home Affairs Government.

According to the researcher, there is no relationship between the two variables because the majority of the nutritional status of female students is in the normal category. The nutritional status of female students is in the normal category because during the selection process to enter as a prospective student, one of the requirements is a body weight that is proportional to height, namely BMI in the normal category. This is needed to support various activities carried out during the education process.

In this case, the nutritional status of female students during their education is also supported by the dining room facility known as “Menza”. Menza provides food that has been arranged according to good nutritional standards by the nutritionist on duty in the section. So

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

it can be ensured that students will get the right nutrition in the midst of various physical activities that are very energy-draining. The institution also provides a canteen to facilitate students if they want to eat outside of meal hours. This canteen is managed under the supervision of the IPDN cooperation so that the food provided is also certainly in accordance with the standards.

The nutritional status of female students will be maintained because it is also balanced with sports activities that are carried out regularly so that calorie input and output also remain stable. Good nutritional status is indicated by ideal body proportions and this will support the performance of female students. Performance is one of the important things that must be considered by students at IPDN because in principle praja as a prospective state civil servant who will become a public servant is required to always be able to look presentable so as to give the impression of authority and charisma.

There is no relationship between nutritional status and menstrual disorders because these problems are often influenced by other factors besides nutrition. Menstrual disorders can be caused by hormonal imbalances, stress, or medical conditions. While good nutrition supports the overall health of the body, menstrual disorders are often the result of specific factors that are not necessarily related to nutritional status.

This is in line with research conducted by Ansong, et al (2019) which examines BMI as one of the risk factors for menstrual disorders among female international students in Zhejiang Province, China where the p-value is 0.142 which means BMI does not show a strong significant relationship with menstrual disorders.

Research conducted by Thaief (2022) on the analysis of the relationship between nutritional status and the incidence of menstrual disorders in female adolescents in Makassar City High School where the results of data analysis obtained a p-value of 0.000 which means there is a significant relationship between nutritional status and the incidence of menstrual cycles in female adolescents. (23)

The difference in the results of this study may be due to the influence of other factors such as psychological stress, physical activity, and genetic factors that are more dominant in influencing menstrual disorders. In addition, individual variations in diet and metabolism may also play an important role, so nutritional status cannot be considered as the only factor affecting menstrual disorders.

Relationship between stress level and menstrual disorders in female students of the Institute of Home Affairs Governance.

Based on data, the *Chi square* statistical test results obtained a *p-value* of 0.04, so it can be concluded that there is a relationship between stress levels and menstrual disorders in female students of the Institute of Home Affairs Governance. This is in line with research conducted by Suhri, A.A. (2022) on the Relationship between Stress and Menstrual Cycles in College Students at the Faculty of Medicine where a *p-value* of 0.001 was obtained, which means there is a significant relationship between stress levels and Menstrual Cycles in College Students.

According to researchers, the stress that occurs and is felt by first-year students at IPDN can be caused by several stressors, such as difficulty adapting to a new environment

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

because they have to live in a dormitory and away from their families, an environment with strict discipline, dense physical activity, and academic loads with many tasks that require significant time, concentration, and effort.

IPDN students who have just graduated from high school must give up 4 years of their youth to pursue education with various strict regulations. All kinds of praja activities have been regulated in the Pedoman Tata Kehidupan Praja (Petadupra) in accordance with Permendagri No. 63 of 2015. Praja must follow a system of education based on a centralized "Trinity", namely "Teaching, Training and Coaching".

Activities while in the dormitory are regulated from the time they wake up until they go back to sleep. In addition to academic activities such as lectures which are held from 08.00 to 15.30 WIB, praja are also required to follow the cycle according to the schedule to get a coaching point and attend training activities after class lectures are completed. Praja is not allowed to go in and out of campus freely without permission, but praja is given excursion time once a week or permission to spend the night on certain holidays according to institutional policy. The life of IPDN students who are bound by such rules and disciplines certainly requires adjustment or adaptation that is not easy and sometimes even becomes a stressor for students.[24]

According to the researcher, there is a relationship between the level of stress level and menstrual cycle in female students because the majority of female students who experience menstrual disorders fall into the category of moderate stress level with a score of 15-25. The results of this study are consistent with the existing literature and show that stress can affect the function of hormones in the body that regulate the menstrual cycle. Chronic stress can increase the production of the hormone cortisol, which in turn can disrupt the balance of reproductive hormones such as estrogen and progesterone. This hormonal disruption can lead to various menstrual problems.[9]

Research conducted by Ansong, et al (2019) also showed similar results where the *p-value* was 0.037 so that a significant relationship was found between stress factors and menstrual disorders. The main stressors found in this study population were language barriers, food, loneliness and longing.[5]

Stress will activate the amygdala in the limbic system, which inhibits the secretion of *gonadotropin releasing hormone* (GnRH) from the hypothalamus. The inhibited GnRH cannot stimulate *follicle stim* ulating *hormone* (FSH) and *lutenizing hormone* (LH). If FSH and LH are not released, this will affect estrogen and progestron levels. Low estrogen and progestrone will certainly disrupt the menstrual cycle.[3]

This study shows that managing stress is very important to maintain reproductive health. To manage their stress, female students who experience moderate and high levels of stress may need special assistance, such as relaxation techniques, psychological support and guidance by counseling. In addition, the awareness and knowledge of female students and community members about the relationship between stress and menstrual health should be increased.

In dealing with female students health problems, applying a holistic approach can provide long-term benefits. Support from family, friends, and a healthy and supportive

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

campus environment also play an important role in helping female students manage stress. Accordingly, comprehensive stress management can improve not only menstrual health, but also overall health.

Relationship between physical activity and menstrual disorders in female students of the Institute of Home Affairs Governance.

Based on data analysis on the relationship between physical activity and menstrual disorders, it was found that there were 2 cells that had an expected frequency below 5. While the requirement for using the *Chi-Square* test in the 2x2 table is that there is no 1 cell with an expected frequency value below 5. Researchers used an alternative test, namely using the *Fisher exact* test and obtained a probability value (*p-value*) of 0.48, so it can be concluded that there is no relationship between physical activity and menstrual disorders in female students of the Institute of Domestic Government. In addition, there was a tendency that respondents who experienced menstrual disorders had high physical activity more at 78.9% compared to the moderate physical activity group at 1.2%.

According to the researcher, the condition of female students at the time the researcher conducted the study already had a fairly good level of adaptation to high physical activity. Heavy physical activity carried out by female students is also not necessarily done immediately but through the introduction process first, namely through "Pengenalan Kehidupan Kampus dan Budaya Akademik (PKKBA) dan Latihan Dasar Mental dan Disiplin Praja (Latsarmendispra"). This activity is carried out annually, before prospective praja are confirmed as praja pratama or level one students on the IPDN campus.

Based on the distribution of the research data, almost all female students were involved in high physical activity so this created a lack of variation in the physical activity variable itself. In other words, the very similar distribution of physical activity makes it difficult to see meaningful differences in menstrual disorders caused by physical activity so that the results of the analysis did not find a relationship between the two variables.

The results of this study are in line with previous research conducted by Ilmi, Selasmi (2019) that there is no relationship between physical activity and menstrual cycle with statistical test results (p = 0.246). The results of the study are in line with the theory which states that physical activity with heavy intensity can cause physiological disorders of the menstrual cycle. Disorders that occur can be in the form of absence of menstruation (amenorrhea), bone thinning (osteoporosis), irregular menstruation or intermenstrual bleeding, abnormal growth of the uterine wall, and infertility. Fatigue due to increased activity also increases the delay of menstruation even accompanied by pain (dysmenorhea), the resulting fatigue affects egg release (ovulation). [15] These findings suggest that other factors may have a greater influence on menstrual disorders in this population, even though physical activity is often associated with reproductive health.

CONCLUSION

From the research it can be concluded that most of the first-year female students of the Institute of Home Affairs Governance had menstrual disorders with a percentage of 80.1%. There is no relationship between nutritional status and physical activity with menstrual

disorders in female students of the Institute of Home Affairs Governance . There is a relationship between stress level and menstrual disorders in female students of the Institute of Home Affairs Governance

REFERENCE

Manay H, Ristiani, Riza Nelva. Kupas tuntas gangguan menstruasi dan penanganannya. Bogor: Guepedia; 2023.

Azzura F, Fajria Lili, Weda Wahyu. Siklus menstruasi pada kualitas tidur. Indramayu; Adab; 2023.

Yuni P, Ari M. Gangguan siklus menstruasi akibat aktivitas fisik dan kecemasan. Jurnal Kebidanan dan Keperawatan Aisyisyah Bandung. 2020; 16 (2): 217-228

Botutihe Fauziah, dkk. Aktivitas fisik dan tingkat stres dengan gangguan menstruasi. Gowa: Ruang Tentor; 2022.

Ansong, dkk. Menstrual characteristics, disorders and associated risk factors among female international students in Zhejiang Province China. BMC Journal. 2019; 35(1): 1-10

Kementerian Dalam Negeri RI. Peraturan Menteri Dalam Negeri Nomor 80 Tahun 2022 tentang Statuta Institut Pemerintahan Dalam Negeri. Jakarta: Kementerian Dalam Negeri RI; 2022

Sinaga, E. dkk. Manajemen kesehatan menstruasi. Jakarta: Universitas Nasional IWWASH Global One; 2017.

Fahmi MM, SB Rivai, Nurlisis. Gangguan pola siklus haid pada pesenam di Kota Pekanbaru. Jurnal Photon. 2020; 10(2): 147-157

Ilmi, A.F. dan E.W Selasmi. Faktor-faktor yang berhubungan dengan siklus menstruasi pada remaja putri kelas XII di SMAN 6 Tangerang Selatan. Edu Masda Jurnal. 2019; 3 (2): 175-180

Situmorang, M. Penentuan indeks massa tubuh (IMT) melalui pengukuran berat dan tinggi badan berbasis mikrokontroler AT89S51 dan PC. Jurnal Teori dan Aplikasi Fisika. 2015; Hal. 102.

Munawaroh, H., & *Supriyadi*, S. Tingkat stres dan aktivitas fisik berhubungan dengan siklus menstruasi. Jurnal Keperawatan. *2020*; 12(4), 501–512.

Wahyuningsih E. Tingkat stres remaja dengan siklus mentruasi di SMK Bakti Indonesia Medika Jombang. Jurnal Husada Mahakam. 2018; 3(9)

Iqbal, Dien Muhammad. Hubungan aktivitas fisik dengan kualitas tidur mahasiswa perantau di Yogyakarta. Jurnal UNY. 2017; 6(11): 1-11

Yolandiani RP. Faktor-faktor yang mempengaruhi ketidakteraturan siklus menstruasi pada remaja. J Keperawatan Indonesia. 2020; 68(2):1– 10

Sunarsih. Hubungan status gizi dan aktivitas fisik terhadap keteraturan siklus menstruasi mahasiswa program studi kebidanan universitas Malahayati tahun 2017. Jurnal Kebidanan. 2017; 3(4): 190-195.

Prasetyo, Mahendro. Buku pemantauan Aktivitas Fisik. Yogyakarta: ISBN; 2020.

Nursalam. Metodologi penelitian ilmu keperawatan: pendekatan praktis edisi 4. Jakarta: Salemba Medika; 2017.

Jurnal Eduhealth
Volume 15 , Number 03, 2024, DOI 10.54209/eduhealth.v15i03
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Arikunto Suharsim*i.* Prosedur penelitian suatu pendekatan praktik. Jakarta: Rineka cipta; 2019.

Manurung, dkk. Tingkat stres pada anak dalam pembelajaran jarak jauh di masa pandemi covid-19. *Open Journal System*. 2023; 17(10) , 1978-3787.

Rahmah, SRA. Hubungan aktivitas fisik dengan berat badan pada remaja selama masa pandemi covid-19 di wilayah Padang Harapan Kota Bengkulu. Bengkulu: Poltekkes Kemenkes Bengkulu; 2021

Suhri, AA. Hubungan stres dengan siklus menstruasi pada mahasiswi di fakultas kedokteran dan ilmu kesehatan UIN Alauddin Makassar. Makassar: Universitas Islam Negeri Alauddin Makassar; 2022.

Kementrian Kesehatan RI. Riset Kesehatan Dasar 2018. Jakarta: Kementerian Kesehatan RI; 2018

Thaief, Arham. Analisis hubungan status gizi dengan kejadian gangguan haid pada remaja wanita di SMA Kota Makassar. Makassar: Universitas Islam Negeri Alauddin Makassar; 2022.

Kementerian Dalam Negeri RI. Peraturan Menteri Dalam Negeri Nomor 63 Tahun 2015 tentang Pedoman Tata Kehidupan Praja Institut Pemerintahan Dalam Negeri. Jakarta: Kementerian Dalam Negeri RI; 2015