

Relationship Between Stress Level and Sleep Quality with Primary Dysmenorrhea in Female Students of SMAN 19 Surabaya

¹Aurelya Arum Ariasty, ²Purwo Sri Rejeki*, ³Dewi Setyowati

¹ Midwifery Study Program, Faculty of Medicine, Universitas Airlangga, Indonesia

² Department of Physiology and Medical Biochemistry, Universitas Airlangga, Indonesia*; email: purwo-s-r@fk.unair.ac.id

³ Midwifery Study Program, Faculty of Medicine, Universitas Airlangga, Indonesia

*Correspondence

Article Information

Submitted: 02 December 2025

Accepted: 11 December 2025

Publish: 15 December 2025

Keyword: Primary Dysmenorrhea; Stress Level; Sleep Quality; Reproductive Health;

Copyright holder: Aurelya Arum Ariasty, Purwo Sri Rejeki, Dewi Setyowati

Year: 2025

This is an open access article under the [CC BY-SA](#) license.



Abstract

Introduction: Primary dysmenorrhea, or menstrual pain without underlying pathological conditions, is the most common reproductive health disorder experienced by adolescents. The global prevalence of primary dysmenorrhea reaches 66.1%. Lifestyle factors may influence the occurrence of dysmenorrhea. **Objective:** This study aims to analyze the relationship between stress levels and sleep quality with primary dysmenorrhea among female students at SMAN 19 Surabaya. **Methods:** This study employed a quantitative approach with an analytical observational design. The research design used was cross-sectional. The population consisted of 10th- and 11th-grade female students of SMAN 19 Surabaya. A total of 217 samples were obtained using stratified sampling. Data were collected through questionnaires and analyzed using the Spearman Rank test ($\alpha < 0.05$). **Results and Discussion:** The Spearman Rank analysis showed a significant relationship between stress levels and primary dysmenorrhea, with a p-value of < 0.001 ($p < 0.05$). A significant relationship was also found between sleep quality and primary dysmenorrhea, with a p-value of < 0.001 ($p < 0.05$). **Conclusion:** There is a relationship between stress levels and sleep quality with primary dysmenorrhea among female students at SMAN 19 Surabaya.

Introduction

Dysmenorrhea is menstrual pain occurring in the lower abdominal area and may radiate to the inner thighs and back (Nagy et al., 2023). According to Wang *et al.*, (2022), the global prevalence of primary dysmenorrhea reaches 66.1% and is projected to continue increasing over the next ten years. In Surabaya, it is reported that 50% of women experience primary dysmenorrhea (Wella, 2022). Dysmenorrhea is categorized into two types: primary dysmenorrhea, which is caused by elevated prostaglandin levels released during menstruation (Nagy et al., 2023), and secondary dysmenorrhea, which results from medical conditions such as endometriosis, adenomyosis, and uterine polyps (McKenna and Fogleman, 2021).

Lifestyle is an important factor that may influence primary dysmenorrhea among adolescents (Hu et al., 2020). In the modern era, all aspects of social life and interactions are shaped by the rapid development of technology, information, and communication (Ajeng dan Cynthia, 2023). These changes affect both mental and physical health, including stress levels and sleep quality.

Stress is the body's response to mental and emotional pressure that may disrupt physiological balance (Chu et al., 2024). Data from the Ministry of Research and Technology (Kemenristek) indicate that 55% of Indonesia's population experiences stress (Hasmy and Ghozali, 2022). Academic stress among Indonesian adolescents has a prevalence ranging from 36.7% to 71.6% (Yuda *et al.*, 2023). When a person experiences stress, body releases the hormone cortisol from the adrenal glands, which triggers the release of adrenaline and prostaglandins, causing excessive uterine contractions and resulting in pain (Utami *et al.*, 2024).

Alongside increasing stress prevalence, sleep quality disturbances have also become a significant problem, particularly among adolescents. Research in Indonesia shows that sleep deprivation is more prevalent among adolescent girls (71.3%) than boys (66.4%) (Nugraha *et al.*, 2023). Urban adolescents also report poorer sleep quality (18.4%) compared to those in rural areas (11.6%) (Olorunmoteni *et al.*, 2024). Poor sleep patterns can use an increase in cortisol levels, which can potentially disrupt the menstrual cycle (Sholihah *et al.*, 2022), while also increasing prostaglandin levels, which trigger dysmenorrhea (Yusuf *et al.*, 2019).

Dysmenorrhea affects adolescents' quality of life, with many experiencing reduced enthusiasm for daily activities and increased stress levels during menstruation (Sima *et al.*, 2022). A study by Kosim *et al.* (2019) at SMAN 19 Surabaya found that 62% of 100 female students experienced dysmenorrhea, indicating a high prevalence among adolescents. However, the relationship between stress levels and sleep quality with dysmenorrhea has not yet been clearly established. Therefore, this study aims to explore the association between stress levels and sleep quality with primary dysmenorrhea among female students at SMAN 19 Surabaya.

Method

This study employed a quantitative approach with an analytical observational design, using a cross-sectional method aimed at analyzing the relationship between stress levels and sleep quality with primary dysmenorrhea. The research was conducted at SMAN 19 Surabaya in May 2025. The study population consisted of 10th- and 11th-grade female students at SMAN 19 Surabaya, totaling 471 students. The sampling technique used was probability sampling with a stratified random sampling method, resulting in a total sample of 217 students.

Stress levels were measured using the **Perceived Stress Scale (PSS)**, sleep quality was assessed using the **Pittsburgh Sleep Quality Index (PSQI)**, and the degree of dysmenorrhea was measured using the **Numeric Rating Scale (NRS)**.

Data analysis included univariate and bivariate analyses. Univariate analysis was conducted to determine the frequency distribution of respondent characteristics and each variable examined. Bivariate analysis was performed using the **Spearman Rank test** to determine the relationship between the independent variables (stress level and sleep quality) and the dependent variable (dysmenorrhea), assess the strength of the correlation, and identify the direction of the relationship based on the obtained correlation coefficient.

Result and Discussion

1. Result

Respondent Characteristics

Table 1
 Characteristics of Respondents

No	Variable	Category	Frequency	Percentage (%)
1	Grade Level	X	113	52.1
		XI	104	47.9
		Total	217	100
2	Age (years)	15	13	6
		16	75	34.6
		17	102	47
		18	26	12
		19	1	0.5
		Total	217	100
3	Menarche Age (years)	9	1	0.5
		10	9	4.1
		11	29	13.4
		12	90	41.5
		13	56	25.8
		14	25	11.5
		15	7	3.2
		Total	217	100
4	Nutritional Status	Underweight	18	8.3
		Normal	162	74.4
		Overweight	28	12.9
		Obese	9	4.1
		Total	217	100
5	Physical Activity	Low	31	14.3
		Moderate	72	33.2
		High	114	52.5
		Total	217	100

Scientific Interpretation (Brief): The respondents were predominantly aged 16–17 years, consistent with typical mid-adolescence. Most reported normal nutritional status and high physical activity levels, indicating generally healthy adolescent profiles. The majority reached menarche at age 12, which aligns with typical global menarche patterns.

Distribution of Primary Dysmenorrhea

Table 2
Distribution of Primary Dysmenorrhea

No	Category	Frequency	Percentage (%)
1	No Pain	4	1.8
2	Mild Pain	38	17.5
3	Moderate Pain	109	50.2
4	Severe Pain	66	30.4
	Total	217	100

Scientific Interpretation (Brief): More than half of the respondents experienced moderate to severe primary dysmenorrhea, suggesting that menstrual pain significantly affects this adolescent population. This aligns with global literature indicating high dysmenorrhea prevalence among mid-to-late adolescents.

Distribution of Stress Levels

Table 3
Stress Levels Among Respondents

No	Category	Frequency	Percentage (%)
1	Mild Stress	13	6
2	Moderate Stress	157	72.4
3	Severe Stress	47	21.7
	Total	217	100

Scientific Interpretation (Brief): Most students fell within the moderate stress category. This trend may reflect academic pressures and psychosocial changes typical of adolescence.

Distribution of Sleep Quality

Table 4
Sleep Quality Among Respondents

No	Category	Frequency	Percentage (%)
1	Good	66	30.4
2	Poor	151	69.6
	Total	217	100

Scientific Interpretation (Brief): A large majority of respondents reported poor sleep quality. This pattern is consistent with adolescent populations globally, where academic schedules, screen time, and stress contribute to disturbed sleep patterns.

Relationship Between Stress Level and Primary Dysmenorrhea

Table 5

Relationship Between Stress Level and Primary Dysmenorrhea

Stress Level	No Pain	Mild	Moderate	Severe	Total	p-value	Correlation Coefficient
Mild	3	8	2	0	13	<0.001	0.508
Moderate	0	27	99	31	157		
Severe	1	3	8	35	47		
Total	4	38	109	66	217		

Scientific Interpretation (Brief): A statistically significant positive correlation was found between stress levels and dysmenorrhea severity ($p < 0.001$; $r = 0.508$). This moderate-strength correlation indicates that higher stress levels are associated with more severe menstrual pain.

Relationship Between Sleep Quality and Primary Dysmenorrhea

Table 6

Relationship Between Sleep Quality and Primary Dysmenorrhea

Sleep Quality	No Pain	Mild	Moderate	Severe	Total	p-value	Correlation Coefficient
Good	3	17	37	9	66	<0.001	0.268
Poor	1	21	72	57	151		
Total	4	38	109	66	217		

Scientific Interpretation (Brief): A statistically significant but weak positive correlation was observed between sleep quality and dysmenorrhea severity ($p < 0.001$; $r = 0.268$). Poor sleep quality is associated with increased menstrual pain, although the strength of association is lower than that of stress.

2. Discussion

Respondent Characteristics

The characteristics of respondents indicate that most participants were in mid-adolescence (16–17 years old), a developmental stage marked by significant hormonal fluctuations. These fluctuations affect the hypothalamic-pituitary-ovarian (HPO) axis and may increase susceptibility to menstrual disorders, including primary dysmenorrhea. The majority experienced menarche at age 12, which aligns with the global average of 12–13 years and reflects normal reproductive maturation. Most participants had normal nutritional status and high physical activity levels, suggesting that the high prevalence of dysmenorrhea found in this study is less likely influenced by malnutrition or sedentary behaviors.

Primary Dysmenorrhea Among Respondents

The findings show that more than 80% of respondents experienced moderate to severe dysmenorrhea. This high prevalence is consistent with the pattern reported in previous studies, which suggest that adolescents are more prone to menstrual pain due to immature ovarian cycles and fluctuating prostaglandin levels. Physiologically, primary dysmenorrhea results from excessive production of prostaglandins particularly PGF2 α and PGE2 which induce uterine hypercontractility, vasoconstriction, and reduced blood flow, ultimately causing ischemic pain (Sinaga *et al.*, 2021). The predominance of moderate pain suggests that dysmenorrhea is a significant public health concern among

high school adolescents, potentially impacting daily functioning and academic performance.

Stress Level and Its Relationship With Primary Dysmenorrhea

The study found a statistically significant moderate positive correlation ($r = 0.508$, $p < 0.001$) between stress levels and dysmenorrhea severity. This indicates that respondents with higher stress levels were more likely to experience more intense menstrual pain. When experiencing stress, the body releases adrenaline as a defense mechanism. Acute stress triggers the hypothalamus to increase production of CRH (Corticotropin-Releasing Hormone), which then stimulates an increase in cortisol levels in the bloodstream. High cortisol concentrations reflect the severity of the stress experienced by an individual (Fadillah et al., 2022). Clinically, mild stress generally does not cause significant physical effects, moderate stress can cause menstrual cycle disorders, while severe stress can trigger an increase in heart rate (Andriana & Prihantini, 2021). In addition, stress can also increase the production of adrenaline, estrogen, progesterone, and prostaglandin hormones excessively. Increased estrogen strengthens uterine contractions, while adrenaline causes tension in the uterine muscles, making contractions stronger during menstruation and causing dysmenorrhea (Putri et al., 2021). High prostaglandin levels also trigger myometrial contractions and cause uterine arteriolar vasospasm, resulting in ischemia that stimulates dysmenorrhea (Mivandha et al., 2023).

The correlation found in this study aligns with findings from Rahmatanti., *et al.* (2020) and Endarti., *et al.* (2024), which also noted significant associations between stress and dysmenorrhea. These consistent results reinforce the hypothesis that stress is a significant risk factor contributing to dysmenorrhea among adolescents. The findings also address the study hypothesis, affirming that stress level is indeed associated with dysmenorrhea severity. The mechanisms suggest not only psychosomatic interactions but also a clear hormonal and physiological pathway that links stress to menstrual pain.

Sleep Quality and Its Relationship With Primary Dysmenorrhea

The results also show a significant positive correlation ($r = 0.268$, $p < 0.001$) between poor sleep quality and increased dysmenorrhea severity. Although the relationship is weaker than that of stress, it remains statistically meaningful. The majority of respondents had poor sleep quality. The components that contributed most to this poor sleep quality were daytime dysfunction, insufficient nighttime sleep duration, and prolonged sleep latency or the extended time needed to fall asleep. These findings are consistent with the study by Woran *et al.* (2020), which reported that 72.5% of adolescents experienced poor sleep quality. Similar results were also reported by Nugraha *et al.* (2023), stating that sleep disturbances among adolescents negatively affect their learning productivity. Poor sleep quality can trigger an excessive release of prostaglandin hormones, causing hyperactivity of the myometrium, which then obstructs blood flow to the uterine tissue and causes ischemia, which in turn stimulates the onset of primary dysmenorrhea (Lestari et al., 2024). In addition, poor sleep quality can also affect the balance of melatonin and cortisol hormones, which play a role in regulating circadian rhythms and reproductive physiological processes, thereby increasing sensitivity to dysmenorrhea (Jiao et al., 2025). Poor sleep quality as a factor that increases the risk of primary dysmenorrhea in adolescents.

This finding is consistent with previous studies by Fadhila., *et al.* (2025) and Hikma., *et al.* (2021), which also reported significant associations between sleep quality and dysmenorrhea. These studies suggest that sleep disruption can exacerbate physiological stress, impair hormonal regulation, and increase inflammatory responses factors that collectively heighten menstrual discomfort. Furthermore, poor sleep may interact with stress as a compounding factor. Adolescents who sleep poorly often show reduced coping ability, heightened emotional reactivity, and increased sensitivity to pain. Such a cycle may involve reciprocal influences, where dysmenorrhea disrupts sleep and poor sleep further worsens dysmenorrhea.

Integrated Interpretation and Implications

Both stress and sleep quality were shown to have significant correlations with dysmenorrhea severity. Stress displayed a stronger association, suggesting it may be a more dominant contributing factor. However, both variables share physiological pathways involving the HPA axis, inflammatory mediators, and prostaglandin regulation.

These findings provide strong evidence supporting the study hypothesis: adolescent girls experiencing higher stress levels and poorer sleep quality are more likely to experience severe primary dysmenorrhea.

The implications of these findings highlight the need for:

1. **Stress management interventions** mindfulness training, time management, academic stress reduction strategies
2. **Sleep hygiene education** limiting screen time, maintaining consistent sleep schedules, optimizing sleep environments
3. **School-based reproductive health programs** teaching coping strategies, providing counseling access, and early identification of menstrual health issues

Such interventions may significantly improve adolescents' reproductive health and overall well-being.

Conclusion

The majority of female students at SMAN 19 Surabaya demonstrated good health characteristics, including experiencing menarche at a normal age, having normal nutritional status, and engaging in high levels of physical activity. However, most of them experienced moderate levels of stress, poor sleep quality, and moderate primary dysmenorrhea. The results of this study indicate a significant relationship between stress levels and sleep quality with primary dysmenorrhea among the students of SMAN 19 Surabaya.

Students are encouraged to pay greater attention to their sleep quality and to implement effective stress management strategies to reduce the risk of dysmenorrhea. Schools are expected to provide counseling programs or time management training to help reduce stress and improve students' sleep quality. Future researchers are advised to expand the study area to multiple schools with different characteristics to obtain more diverse data and more comprehensive findings with a higher level of generalizability.

Reference

- Ajeng Kusumawardani and Cynthia Yolanda (2023) [Hubungan Penggunaan Gadget dengan Kualitas Tidur pada Mahasiswa Ekstensi Fakultas Kesehatan Masyarakat Indonesia](#), *SEHATMAS: Jurnal Ilmiah Kesehatan Masyarakat*, 2(2), pp. 332–341. Available at: <https://doi.org/10.55123/sehatmas.v2i2.1322>.
- Andriana, J. and Prihantini, N.N. (2021) [HUBUNGAN TINGKAT STRES DENGAN INDEKS MASSA TUBUH PADA MAHASISWA FAKULTAS KEDOKTERAN UNIVERSITAS KRISTEN INDONESIA](#), *Jurnal Kedokteran*, IX(2), pp. 1351–1361.
- Chu, B., Marwaha, K., Sanvictores, T., Awosika, A. O., & Ayers, D. (2024). [Physiology, stress reaction](#). In *StatPearls [Internet]*. StatPearls Publishing.
- Endarti, B.M., Anjarwati and Putri, I.M. (2024) [‘Hubungan Aktivitas Fisik dan Tingkat Stres dengan Tingkat Dismenore pada Siswi di SMK Negeri 2 Godean Sleman Yogyakarta’](#), *Prosiding Seminar Nasional Universitas Respati Yogyakarta*, 6(1), pp. 1–9.
- Fadhila, T.N., Maharani, K. and Harjanti, A.I. (2025) [‘Hubungan Kualitas Tidur dengan Kejadian Dismenore Pada Siswi di SMK Negeri 5 Kendal’](#), *Inovasi Kesehatan Global*, 2(2), pp. 230–240. Available at: <https://doi.org/https://doi.org/10.62383/ikg.v2i2.1684>.
- Fadillah, R.T., Usman, A.M. and 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), pp. 258–269. Available at: <https://doi.org/10.33024/mahesa.v2i2.5907>.
- Fajarsari, D. and Purwanti, S. (2022) [‘Faktor-faktor yang mempengaruhi kejadian dismenorea pada siswi smk citra bangsa mandiri purwokerto di masa pandemi Covid-19’](#), *Jurnal Bina Cipta Husada*, 18(1), pp. 118–130. Available at: <http://jurnal.stikesbch.ac.id/index.php/jurnal/article/view/65>.
- Hasmy, L.A. and Ghozali, G. (2022) [‘Literature review dampak pandemi covid-19 terhadap stress pada remaja’](#), *Borneo Student Research (BSR)*, 3(2), pp. 1962–71. Available at: <https://journals.umkt.ac.id/index.php/bsr/article/download/3029/1254>.
- Hermawahyuni, R., Handayani, S. and Alnur, R.D. (2022) [‘Risk factors of primary dysmenorrhea in students of SMK PGRI 1 Jakarta Timur.’](#), *Jurnal Kesehatan Komunitas*, 8(1), pp. 97–101. Available at: <https://doi.org/h?ps://doi.org/10.25311/keskom.Vol8.Iss1.1079>.
- Hikma, Y.A., Yunus, M. and Hapsari, A. (2021) [‘Hubungan Siklus Menstruasi, Kualitas Tidur, dan Status Gizi, Terhadap Dismenore Primer pada Remaja Putri’](#), *Sport Science and Health*, 3(8), pp. 630–641. Available at: <https://doi.org/10.17977/um062v3i82021p630-641>.
- Iznih rahmi Lessy, Anik Sri Purwanti and Alfitri, R. (2024) [‘Pengaruh Senam Disminore Terhadap Penurunan Nyeri Disminore Pada Remaja Putri Usia 15-19 Tahun the Effect of Dysmenorhore Exercises on Reducing Dysmenorhore Pain in Adolescent Girls Aged 15-19 Years’](#), *Jurnal Kesehatan Saintika Meditory*, 7(1), pp. 122–130. Available at: <https://jurnal.syedzasaintika.ac.id>.
- Jiao, Y. *et al.* (2025) [‘Sleep disorders impact hormonal regulation: unravelling the relationship among sleep disorders, hormones and metabolic diseases’](#), *Diabetology & Metabolic Syndrome*, 17(1). Available at: <https://doi.org/10.1186/s13098-025-01871-w>.

- Kosim, R., Hardianto, G. and Kasiati, K. (2019) 'Status Gizi Dan Usia Menarche Sebagai Faktor Risiko Dismenorea Pada Remaja Putri Sman 19 Surabaya', *Indonesian Midwifery and Health Sciences Journal*, 3(3), pp. 204–212. Available at: <https://doi.org/10.20473/imhsj.v3i3.2019.204-212>.
- Kusnaningsih, A. (2020) 'View of Prevalensi Dismenore pada Remaja Putri di Madrasah Aliyah Darul Ulum dan Miftahul Jannah Palangka Raya', *Jurnal Surya Medika*, 5(2), pp. 1–8. Available at: <https://doi.org/https://doi.org/10.33084/jsm.v5i2.1247>.
- Lestari, N.D. *et al.* (2024) 'KUALITAS TIDUR, STRES, DAN AKTIVITAS FISIK TERHADAP DISMENORE PADA SISWI MADRASAH NURUL HAKIM LOMBOK BARAT', *JOURNAL OF HEALTH SCIENCES*, 02(02), pp. 173–180. Available at: <https://publikasi.medikasuherman.ac.id/index.php/cmj>.
- McKenna, K.A. and Fogleman, C.D. (2021) 'Dysmenorrhea', *American family physician*, 104(2), pp. 164–170. Available at: https://doi.org/10.5005/jp/books/12515_3.
- Mivandha, D., Follona, W. and Aticeh (2023) 'Hubungan Tingkat Stres dan Perilaku Konsumsi Makanan Cepat Saji Terhadap Kejadian Dismenore Pada Remaja Putri', *Muhammadiyah Journal of Midwifery*, 4(1), pp. 34–46. Available at: <https://doi.org/10.24853/myjm.4.1.34-46>.
- Nagy H, Carlson K, Khan MAB. *Dismenore*. (2023). In : StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Tersedia dari: <https://www.ncbi.nlm.nih.gov/sites/books/NBK560834/>
- Nugraha, F.A., Aisyiah, A. and Wowor, T.J.F. (2023) 'Analisis Faktor yang Berhubungan dengan Kualitas Tidur pada Remaja di SMPN 254 Jakarta', *Malahayati Nursing Journal*, 5(9), pp. 3063–3076. Available at: <https://doi.org/10.33024/mnj.v5i9.9242>.
- Nurrahmani, Nurbaya, S. and Yusnaeni (2022) 'Hubungan Tingkat Stres terhadap Gangguan Siklus Menstruasi Siswi SMAN 3 Bulukumba', *Jurnal Ilmiah Mahasiswa & Penelitian Keperawatan*, 1(6), pp. 762–767. Available at: <http://119.235.25.74/index.php/jimpk/article/view/706>.
- Olorunmoteni, O.E. *et al.* (2024) 'Multidimensions of sleep health among in-school adolescents in rural and urban areas in southwestern Nigeria', *Sleep Health*, 10(1), pp. S170–S179. Available at: <https://doi.org/10.1016/j.sleh.2023.11.006>.
- Putri, P., Mediarti, D. and Noprika, D. Della (2021) 'HUBUNGAN TINGKAT STRES TERHADAP KEJADIAN DISMENORE PADA REMAJA PUTRI', *Jurnal Keperawatan Merdeka*, 1(1), pp. 102–107.
- Rahmatanti, R., Pradigdo, S.F. and Pangestuti, D.R. (2020) 'Hubungan Tingkat Stres dan Status Anemia dengan Dismenorea Primer Pada Siswi Kelas XII di SMAN 1 Nganjuk', *Media Kesehatan Masyarakat Indonesia*, 19(4), pp. 246–254. Available at: <https://doi.org/10.14710/mkmi.19.4.246-254>.
- Sholihah, Z., Fitriangga, A. and Ilmiawan, M.I. (2022) 'The Relation Of Sleep Quality With Menstrual Cycle In Medical Students Of Faculty Of Medicine In Tanjungpura University', *Jurnal Cerebellum*, 8(3), pp. 1–5. Available at: <https://doi.org/10.26418/jc.v>.
- Sima, R.M. *et al.* (2022) 'The Prevalence, Management and Impact of Dysmenorrhea on Medical Students' Lives-A Multicenter Study', *Healthcare (Switzerland)*, 10(1), pp. 2–11. Available at: <https://doi.org/10.3390/healthcare10010157>.
- Sinaga, E. *et al.* (2021) *MANAJEMEN KESEHATAN MENSTRUASI*. Jakarta: Universitas Nasional.

- Utami, Fahara Mourinda, Andri and Laila, S. (2024) 'HUBUNGAN STRES DENGAN KEJADIAN DISMENORE PRIMER PADA MAHASISWI FAKULTAS KEDOKTERAN UNIVERSITAS ABULYATAMA', *Jurnal Medika Malahayati*, 8(1), pp. 268–273.
- Wang, L. *et al.* (2022) 'Prevalence and Risk Factors of Primary Dysmenorrhea in Students: A Meta-Analysis', *Value in Health*, 25(10), pp. 1678–1684. Available at: <https://doi.org/10.1016/j.jval.2022.03.023>.
- Wella, A. (2022) 'PENGARUH SENAM DISMENOREA TERHADAP TINGKAT NYERI DISMENOREA MAHASISWA SEKOLAH TINGGI ILMU KESEHATAN BAKTI UTAMA PATI', 7(2), p. 96.
- Woran, K., Kundre, R.M. and Pondaag, F.A. (2020) 'ANALISIS HUBUNGAN PENGGUNAAN MEDIA SOSIAL DENGAN KUALITAS TIDUR PADA REMAJA', *Jurnal Keperawatan*, 8(2), pp. 1–10. Available at: <https://doi.org/https://doi.org/10.35790/jkp.v8i2.32092>.
- Yuda, M.P., Mawarti, I. and Mutmainnah, M. (2023) 'Gambaran Tingkat Stres Akademik Mahasiswa Dalam Menyelesaikan Tugas Akhir Skripsi Di Fakultas Kedokteran Dan Ilmu Kesehatan Universitas Jambi', *Pinang Masak Nursing Journal*, 2(1), pp. 38–42. Available at: <https://online-journal.unja.ac.id/jpima/article/view/27092/16089>.
- Yuliana, A.P. and Maryatun, M. (2024) 'Hubungan Tingkat Stress Dengan Siklus Menstruasi Pada Remaja Putri di MAN 2 Karanganyar', *Jurnal Ilmu Kesehatan*, 1(3), pp. 169–179. Available at: <https://doi.org/https://doi.org/10.62383/quwell.v1i3.756>.
- Yusuf, R.D. *et al.* (2019) 'Hubungan antara Kualitas Tidur dengan Kejadian Dismenore Primer pada Mahasiswi Fakultas Kedokteran Universitas Islam Bandung', *Jurnal Integrasi Kesehatan & Sains*, 1(2), pp. 135–139. Available at: <https://doi.org/10.29313/jiks.v1i2.4331>.