GENIUS JOURNAL
general nursing science journal
e-ISSN: 2723-7729
Vol. 7 No. 1 PP. 191-199 E-ISSN 2723-7729

Differences in Dysmenorrhea Levels among Female Adolescent Users of Conventional and Electronic Cigarettes

Vynna Leyra Pertiwi[1], Emi Lindayanti[1], Ida Nurhidayah[1]
[1]*Universitas Pendidikan Indonesia, Sumedang, Indonesia*

Correspondence author: Vynna Leyra Pertiwi
Email: vynnaleyrapertiwi@upi.edu
Address: Jln. Mayor Abdul Rahman No. 211 Kotakaler Sumedang Utara Sumedang Telp. (0261) 201244
DOI: https://doi.org/10.56359/gj.v7i1.963

Abstract

Introduction: Dysmenorrhea is a common reproductive health problem among adolescent females and is often associated with various lifestyle factors, including smoking behavior. The increasing use of conventional cigarettes and electronic cigarettes among young women raises concerns regarding their potential impact on menstrual pain.
Objective: This study aimed to compare the level of dysmenorrhea between adolescent females who use conventional cigarettes and those who use electronic cigarettes.
Method: This research employed a quantitative approach with a cross-sectional design and involved 70 respondents aged 15–24 years in Sumedang Regency, consisting of 35 conventional cigarette users and 35 electronic cigarette users. Data were collected using an online and offline questionnaire that included demographic characteristics, smoking behavior adapted from the Global Youth Tobacco Survey (GYTS), and menstrual pain measured using the Numeric Rating Scale (NRS). The data were analyzed using the Mann–Whitney test with a significance level of 0.05.
Result: The results showed that most respondents in both groups experienced severe dysmenorrhea, with mean pain scores of 7.114 for conventional cigarette users and 7.200 for electronic cigarette users. Statistical analysis indicated no significant difference between the two groups (p = 0.833).
Conclusion: These findings suggest that both types of smoking may have similar biological impacts on menstrual pain due to the presence of nicotine. Further studies are recommended to assess additional confounding factors and measure nicotine exposure more precisely.

Keywords: adolescents, cigarettes, dysmenorrhea, menstrual pain

Introduction

Adolescence is a critical developmental period characterized by physical, emotional, and social changes that influence long-term health outcomes (Suryana et al., 2022). The WHO (2023) defines adolescents as individuals aged 10–19 years, while the Indonesian National Population and Family Planning Agency (BKKBN) uses a broader range of 10–24 years to describe individuals who are still undergoing developmental adaptation (BKKBN, 2023). During this period, adolescent girls begin to experience reproductive maturation marked by the onset of menstruation ((Purba & Hutagaol, 2023). One of the most common issues that arises during this stage is dysmenorrhea, a menstrual pain condition influenced by a tenfold increase in prostaglandins, leading to excessive uterine contractions and symptoms such as abdominal cramps, nausea, and decreased concentration (Guimarães & Póvoa, 2020). Dysmenorrhea may be classified as primary or secondary, and approximately 15–20% of adolescents experience pain severe enough to disrupt daily activities (Wahtini et al., 2021). Its impact extends beyond physical complaints, affecting academic and psychological aspects, including reduced concentration, school absenteeism, and academic stress (Selvina Widianti et al., 2024).

Dysmenorrhea is one of the most prevalent menstrual disorders among adolescents. Hormonal imbalance involving progesterone and elevated prostaglandin levels up to ten times higher than normal is a major trigger of severe pain resulting from excessive uterine contractions (Guimarães & Póvoa, 2020). Dysmenorrhea is classified into primary dysmenorrhea, which occurs without anatomical abnormalities, and secondary dysmenorrhea, which is caused by pathological conditions such as endometriosis or uterine myomas (Anggraini et al., 2022). The pain associated with dysmenorrhea significantly affects daily functioning, with 15–20% of adolescents experiencing severe pain that interferes with school and social activities (Wahtini et al., 2021). Beyond physical symptoms, dysmenorrhea also contributes to academic and psychological disturbances such as decreased concentration, school absenteeism, and academic stress (Selvina Widianti et al., 2024).

In recent years, unhealthy lifestyle behaviors including smoking have increasingly been identified as factors that exacerbate dysmenorrhea. Conventional cigarettes contain various toxic substances such as nicotine, tar, and carbon monoxide, which can increase prostaglandin levels, cause vasoconstriction, and reduce oxygen supply to uterine tissues, thereby intensifying menstrual pain (Kusumastuti & Suarsih, 2023). A study by Susanti et al. (2024) found that 74.1% of female active smokers experienced moderate to severe dysmenorrhea, a substantially higher proportion than that of non-smokers. Qin et al. (2020) also reported that female smokers have a 1.45 times higher risk of experiencing dysmenorrhea compared to non-smokers.

In addition to conventional cigarettes, the use of electronic cigarettes has increased rapidly among adolescents. E-cigarettes are often perceived as safer alternatives, yet their liquids contain nicotine, propylene glycol, glycerin, and flavoring agents that can produce formaldehyde when heated a carcinogenic compound that triggers oxidative stress and chronic inflammation (Pamungkas et al., 2025). A study by Pratiwi & Kusumaningsih (2024) found that e-cigarette users have a 1.8 times higher risk of experiencing dysmenorrhea compared to non-smokers.

Globally, the prevalence of dysmenorrhea ranges from 45% to 90%, Across various countries, its prevalence falls between 64% and 90%, while in Indonesia it reaches 64.25%, with the majority consisting of primary dysmenorrhea (Salsabila & Zakiyah, 2022). In West Java, the prevalence is reported at 54.9% (Darmawan et al., 2024), and data from the

Sumedang District Health Office (2024) recorded 437 adolescent girls aged 15–19 experiencing menstrual disorders.

Meanwhile, the prevalence of smoking among females has also shown an increasing trend. The WHO estimated that 6.5% of women globally were active smokers in 2020. In Indonesia, 3.3% of adult women use tobacco products, and 3% use electronic cigarettes (Dai et al., 2023). In West Java, the prevalence of female smokers is 1.3% (Statistik, 2024). Preliminary findings from the researcher's online survey revealed that 217 adolescent girls (12.2%) in Sumedang were active smokers who experienced dysmenorrhea with varying pain levels, indicating that this phenomenon is indeed present in the adolescent population of Sumedang.

Previous studies have demonstrated an association between smoking and dysmenorrhea; however, most have focused solely on one type of cigarette, predominantly conventional cigarettes. Studies on e-cigarettes exist but rarely compare the effects of both cigarette types on menstrual pain intensity (Kusumastuti & Suarsih, 2023). Furthermore, no local studies conducted in Sumedang Regency have examined the impact of both cigarette types on dysmenorrhea.

This study aims to address this gap by analyzing the differences in the effects of conventional and electronic cigarettes on the severity of dysmenorrhea among adolescent girls. This comparison is important given the rising trend of e-cigarette use and the widespread misconception that e-cigarettes are safer. The findings of this study are expected to contribute to scientific knowledge related to lifestyle factors affecting adolescent reproductive health and to support promotive and preventive efforts in community health nursing.

Based on the focus of this research, a hypothesis was formulated to examine the potential differences in menstrual pain levels between adolescent conventional smokers and e-cigarette smokers. The null hypothesis (H_o) states that there is no difference in menstrual pain levels between the two groups of adolescents in South Sumedang District. Conversely, the alternative hypothesis (H_1) states that there is a difference in menstrual pain levels between adolescent conventional smokers and e-cigarette smokers in the same area. The results of this study will determine which hypothesis is supported by the empirical data.

Objective

This study aimed to compare the level of dysmenorrhea between adolescent females who use conventional cigarettes and those who use electronic cigarettes.

Method

This study employed a quantitative approach with a cross-sectional design and a two-group comparison. The research was conducted in South Sumedang District, Indonesia, focusing on adolescent females who actively smoke either conventional or electronic cigarettes.

The study population consisted of adolescent females residing in South Sumedang District who were active smokers. Active smokers were defined as individuals who consumed at least one conventional cigarette or one electronic cigarette stick per day within the past month. The inclusion criteria were females aged 15–24 years who had regular menstrual cycles during the last three months. Respondents with a history of gynecological disorders or those using hormonal contraception were excluded from the study.

Purposive sampling was applied due to the absence of an official sampling frame for adolescent female smokers. To increase sample accessibility, snowball sampling was also employed, whereby initial respondents referred other eligible participants. A total of 70 respondents were recruited, consisting of 35 conventional cigarette users and 35 electronic cigarette users. This sample size was considered sufficient to compare dysmenorrhea intensity between the two groups.

Data were collected using three instruments: a respondent characteristics questionnaire, a smoking behavior questionnaire adapted from the Global Youth Tobacco Survey (GYTS), and the Numeric Rating Scale (NRS). The characteristics questionnaire collected demographic and menstrual-related information. The adapted GYTS questionnaire assessed smoking habits, peer influence, perceived health risks of smoking, and psychological factors related to smoking behavior.

The validity of the adapted GYTS questionnaire was tested using Pearson correlation analysis. Thirteen items were declared valid with correlation coefficients greater than 0.30 and p-values below 0.05. Reliability testing yielded a Cronbach's Alpha value of 0.925, indicating excellent internal consistency. Dysmenorrhea intensity was measured using the Numeric Rating Scale (NRS), ranging from 0 (no pain) to 10 (worst possible pain). The validity and reliability of the NRS instrument were supported by previous studies (Lesmana, 2024).

Data collection was conducted both online and offline between October and November 2025. Online data were obtained through social media platforms such as WhatsApp and Instagram, while offline data were collected by directly approaching respondents in the study area. All participants provided informed consent prior to participation.

Prior to statistical analysis, data were processed through editing, coding, scoring, data entry, cleaning, and tabulation to ensure data accuracy and consistency. All data processing and statistical analyses were performed using JASP software (latest version).

Univariate analysis was conducted to describe respondent characteristics and study variables, including age, age at menarche, type of cigarette used, dysmenorrhea intensity scores, and activity disturbance, presented as frequencies and percentages. Bivariate analysis was performed to compare dysmenorrhea intensity between conventional cigarette users and electronic cigarette users. Normality testing was conducted using the Kolmogorov–Smirnov test. Since the data were not normally distributed, the Mann–Whitney U test was applied. A p-value of <0.05 was considered statistically significant. Ethical approval for this study was obtained from the Research Ethics Committee of Ngudi Waluyo University.

Result

Based on Table 1 on the characteristics of respondents, this study involved 70 adolescent female smokers, equally divided between conventional cigarette users (n = 35) and electronic cigarette users (n = 35). The respondents' age distribution ranged from 16 to 24 years. In the conventional cigarette group, the highest proportion of respondents was 21 years old (22.9%), followed by those aged 18 and 22 years (17.1% each). Meanwhile, in the electronic cigarette group, the most dominant age was 22 years (31.4%), followed by 20 years (17.1%). Overall, the majority of respondents in both groups were in late adolescence.

Table 1. Respondents' Characteristics (n = 70)

Respondent Category	Conventional Cigarettes (n=35)		Electronic Cigarettes (n=35)	
	n	%	n	%
Age (years)				
16	0	0.0	1	2.9
17	2	5.7	3	8.6
18	6	17.1	2	5.7
19	4	11.4	1	2.9
20	1	2.9	6	17.1
21	8	22.9	4	11.4
22	6	17.1	11	31.4
23	4	11.4	4	11.4
24	4	11.4	3	8.6
Age at Menarche (years)				
10	1	2.9	0	0.0
11	10	28.6	14	40.0
12	10	28.6	14	40.0
13	14	40.0	7	20.0
Type of Cigarette	35	100.0	35	100.0
Menstrual Pain Intensity (NRS)				
0 (no pain)	0	0.0	0	0.0
1-3 (mild)	0	0.0	0	0.0
4-6 (moderate)	10	28.6	10	28.6
7-10 (severe)	25	71.4	25	71.4
Activity Disturbance				
None	0	0.0	1	2.9
Mild	5	14.3	5	14.3
Moderate	23	65.7	23	65.7
Severe	7	20.0	6	17.1

The age of menarche among respondents ranged from 10 to 13 years. In the conventional cigarette group, most respondents experienced menarche at 13 years old (40.0%), while in the electronic cigarette group, the largest distribution occurred at ages 11 and 12, each accounting for 40.0%. This pattern indicates that most respondents from both groups had menarche within the normal age range.

For the variable of menstrual pain intensity based on the NRS scale, both groups showed identical distributions. None of the respondents were categorized as experiencing no pain or mild pain. A total of 28.6% in each group experienced moderate pain (score 4–6), while 71.4% were in the severe pain category (score 7–10). This demonstrates that most respondents, whether conventional or electronic cigarette users, experienced high-intensity menstrual pain.

Activity disruption caused by menstrual pain also showed a similar pattern in both groups. Among conventional cigarette users, the highest proportion reported moderate disruption (65.7%), followed by severe disruption (20.0%) and mild disruption (14.3%). Similarly, in the electronic cigarette group, most respondents experienced moderate activity

disruption (65.7%), followed by mild disruption (14.3%) and severe disruption (17.1%). Only 2.9% of electronic cigarette users reported no activity disruption at all.

Table 2. Differences in Dysmenorrhea Levels Between the Two Groups

Variable	N	Mean	P-Value
Conventional Cigarettes	35	7.11	0.833
Electronic Cigarettes	35	7.20	

Discussion

Table 2 shows the comparison of dysmenorrhea levels between conventional and e-cigarette smokers. The mean dysmenorrhea score in the conventional cigarette group was 7.11, while the e-cigarette group showed a mean score of 7.20. The statistical analysis resulted in a *p*- value of 0.833, indicating no significant difference between the two groups. These findings suggest that the type of cigarette used does not substantially influence the severity of menstrual pain.

The characteristics of the respondents may contribute to this outcome. Most participants were in late adolescence, an age group with relatively stable reproductive function and more consistent menstrual patterns, which can influence the uniformity of pain perception (Handayani et al., 2024). The majority also reported a normal menarche age, indicating typical reproductive development, which supports the reliability of dysmenorrhea assessment in this population (Darma & Pribadi, 2020).

Among conventional cigarette users, the majority experienced severe menstrual pain. This aligns with biological mechanisms associated with nicotine, tar, and carbon monoxide, which induce vasoconstriction, elevate prostaglandin levels, and increase uterine contractions, thereby intensifying menstrual pain (Hermawati et al., 2023). Similar findings were reported by Agustin et al. (2023) , who demonstrated that exposure to conventional cigarettes increases the risk of moderate to severe dysmenorrhea.

A nearly identical pattern was found among e-cigarette users, with 71.4% reporting severe pain. Although e-cigarettes contain lower tar levels, their aerosols still deliver nicotine, aldehydes, and heavy metals such as nickel and lead, which contribute to cellular inflammation and oxidative stress in reproductive tissues (Chun et al., 2024). These mechanisms may explain the similarity in pain severity between the two groups and support the interpretation that nicotine exposure regardless of delivery method plays a central role in dysmenorrhea intensity.

The absence of a significant statistical difference suggests that the physiological effects of nicotine and other harmful constituents are more influential than the form of the cigarette itself. Both types of cigarettes may lead to increased uterine contractility and impaired uterine blood flow, mechanisms strongly associated with menstrual pain (Kusumastuti & Suarsih, 2023).

However, this study did not measure several potential confounding variables such as duration of smoking, daily consumption, nicotine concentration in e-liquids, sleep quality, stress levels, physical activity, and nutritional status. Prior research has shown that these factors can significantly influence menstrual pain severity (Chen et al., 2023; Nurfadillah et al., 2021). Their absence from the analysis limits the ability to fully isolate the effect of cigarette type on dysmenorrhea.

Despite these limitations, the results contribute to the growing body of evidence suggesting that both conventional and e-cigarettes pose similar reproductive risks. This study

adds value by directly comparing the two types of smoking, an area with limited empirical findings in adolescent populations. Future research should incorporate biomarkers of nicotine exposure (e.g., urinary cotinine), detailed vaping frequency assessments, and control for lifestyle-related confounders to provide a more comprehensive understanding of the relationship between smoking behavior and menstrual pain.

Conclusion

This study aimed to compare the levels of menstrual pain among adolescent girls who smoke conventional cigarettes and those who use electronic cigarettes in Sumedang Regency. The results showed no significant difference between the two groups, with both exhibiting similarly high dysmenorrhea intensity. These findings indicate that nicotine exposure regardless of whether it comes from conventional cigarettes or electronic cigarettes produces comparable physiological effects that contribute to severe menstrual pain. The study highlights that e-cigarettes, often perceived as a safer alternative, pose reproductive risks similar to conventional smoking. Overall, the conclusion reinforces the study's central message that both forms of nicotine use are associated with severe dysmenorrhea, underscoring the need for continued awareness and health education regarding the reproductive consequences of smoking among adolescents.

Acknowledgement

The author would like to express sincere gratitude to the advisors, academic supervisors, and Universitas Pendidikan Indonesia, Sumedang Campus, for their guidance and support throughout the completion of this research. Appreciation is also extended to the participating institutions and individuals who contributed to the data collection process.

Author Contribution

Vynna Leyra Pertiwi contributed to the study design, data collection, data analysis, interpretation of results, and manuscript writing, while Emi Lindayanti provided supervision, guidance, and critical revision of the manuscript, and Ida Nurhidayah contributed to supervision, methodological review, and final approval of the manuscript.

Conflict of Interest

The author declares no conflict of interest related to the research, authorship, or publication of this article.

Ethical Clearance

This study received ethical approval from the Research Ethics Committee of Universitas Ngudi Waluyo with approval number 770/KEP/ECUNW/2025.

Funding

This research received no external funding and was fully supported by the author.

References

1. Agustin, Akbar, H., & Saleh, S. N. H. (2023). *Paparan Asap Rokok Dengan Kejadian Dismenorea Pada Remaja Putri Kelas XII SMA*. *6*(1).
2. Anggraini, M. A., Lasiaprillianty, I. W., & Danianto, A. (2022). Diagnosis dan Tata Laksana Dismenore Primer. *Cermin Dunia Kedokteran*, *49*(4), 201–206. https://doi.org/10.55175/cdk.v49i4.219
3. Badan Kependudukan dan Keluarga Berencana Nasional. (2023). *Ketahanan keluarga berbasis kelompok kegiatan poktan*. https://kampungkb.bkkbn.go.id/kampung/4792/intervensi/464856/ketahanan-keluarga-berbabasis-kelompok-kegiatan-poktan?utm_source=chatgpt.com
4. Chen, T., Wu, M., Dong, Y., Ren, H., Wang, M., Kong, B., Cai, Y., Hei, C., Wu, K., Zhao, C., Li, Y., Fan, Y., & Chang, Q. (2023). Ovarian toxicity of e-cigarette liquids: Effects of components and high and low nicotine concentration e-cigarette liquid in vitro. *Tobacco Induced Diseases*, *21*(October), 1–8. https://doi.org/10.18332/TID/170631
5. Chun, L. F., Moazed, F., Calfee, C. S., Mathhay, M. A., & Gotts, J. E. (2017). Pulmonary toxicity of e-cigarettes. *American Journal of Physiology - Lung Cellular and Molecular Physiology*. https://journals.physiology.org/doi/full/10.1152/ajplung.00071.2017
6. Dai, C., Fang, C., Schwartz, D., Enderson, J., McMann, A., Hyde, R., & Serfin, J. (2023). *Standardized protocol for chest tube management for trauma patients significantly decreases complications. Surgery Research and Practice*. 1–5.
7. Darma, D. R., & Pribadi, E. T. (2020). Kondisi Gangguan Menstruasi pada Pasien yang Berkunjung di Klinik Pratama UIN Sunan Ampel. *Journal of Health Science and Prevention*, *2*(1), 14–21.
8. Darmawan, F. H., Sumarni, R., & Laira, R. S. (2024). *Durasi Olahraga Dan Status Gizi Sebagai Faktor Risiko Dismenorea Primer Pada Remaja Di SMAN 2 Sumedang*. *4*(1), 6631622–6631624.
9. Guimarães, I., & Póvoa, A. M. (2020). Primary Dysmenorrhea: Assessment and Treatment. *Revista Brasileira de Ginecologia e Obstetricia*, *42*(8), 501–507. https://doi.org/10.1055/s-0040-1712131
10. Handayani, R., Anggraeni, E., Handayani, Y., & Sari, M. P. (2024). Edukasi Kesehatan : Pelatihan Pembuatan Air Rebusan Jahe sebagai Terapi Herbal Non-Farmakologi Untuk Mengatasi Dismenore. *Indonesian Journal of Community Dedication in Health (IJCDH)*, *4*(01), 13. https://doi.org/10.30587/ijcdh.v4i01.7111
11. Hermawati, A. H., Pratiwi, C. D., & Lathifah, Q. A. (2023). *Nikotin, Tembakau, dan Rokok*. https://books.google.co.id/books?hl=id&lr=&id=pPi9EAAAQBAJ&oi=fnd&pg=PP1&dq=cdc+nikotin+pembuluh+darah&ots=zbzcWIl31S&sig=JwMvoR1EvLIe-N2Y8vQVKcIz7wM&redir_esc=y#v=onepage&q&f=false
12. Kusumastuti, N. A., & Suarsih, A. (2023). Analisis Status Gizi, Siklus Menstruasi, dan Konsumsi Rokok Elektrik terhadap Nyeri Dismenorea pada Wanita Usia Subur. *Sang Pencerah: Jurnal Ilmiah Universitas Muhammadiyah Buton*, *9*(3), 556–564. https://doi.org/10.35326/pencerah.v9i3.2732
13. Lesmana, H. (2024). *Pengaruh Massage Punggung Terhadap Penurunan Skala Nyeri dengan Menggunakan*. *17*(2).
14. Nurfadillah, H., Maywati, S., & Aisyah, I. S. (2021). Faktor-Faktor Yang Berhubungan Dengan Kejadian Dismenore Primer Pada Mahasiswi Universitas Siliwangi. *Jurnal Kesehatan Komunitas Indonesia*, *17*(1), 247–256. https://doi.org/10.37058/jkki.v17i1.3604

15. Pamungkas, J. L., Nanda, D., Fauziah, D., Kusnadi, N. S. R., Nurfadhilah, N., Faulina, R. A., Manik, N., Fitriyani, Putra, A., Maula, A. N., Mansoben, N. A., & Sopiah, P. (2025). Potensi kandungan zat kimia dalam vape terhadap sel kanker paru-paru. *Jurnal Ilmiah Keperawatan*, *11*.
16. Pratiwi, L. A., & Kusumaningsih, D. (2024). *Optimalisasi handover dengan teknik komunikasi SBAR di Puskesmas Rawat Inap Kemiling , Kota Bandar Lampung*. *4*(2), 59–64.
17. Purba, D. M., & Hutagaol, R. (2023). *Hubungan beban kerja perawat dengan mutu pelayanan di ruang rawat inap. Jurnal Ilmu Keperawatan dan Kebidanan*. *14(1)*, 22–30. https://doi.org/10.35451/jikk.v14i1.6789
18. Qin, L. L., Hu, Z., Kaminga, A. C., Luo, B. A., Xu, H. L., Feng, X. L., & Liu, J. H. (2020). Association between cigarette smoking and the risk of dysmenorrhea: A meta-analysis of observational studies. *PLoS ONE*, *15*(4), 1–13. https://doi.org/10.1371/journal.pone.0231201
19. Salsabila, alisha z, & Zakiyah, N. (2022). Efek Farmakologi Minuman Kunyit (Curcuma domestica) Asam dan Jahe (Zingiber officinale) Sebagai Pereda Nyeri Dismenore Primer Pada Remaja di Indonesia. *Farmaka*, *20*(3), 1–9.
20. Selvina Widianti, Irma Herliana, & Saiful Gunardi. (2024). Hubungan Dismenore Primer Dengan Aktivitas Belajar Siswi SMK Bina Putra Nugraha Kadupandak Cianjur Jawa Barat Tahun 2023. *Jurnal Riset Rumpun Ilmu Kesehatan*, *3*(1), 176–188. https://doi.org/10.55606/jurrikes.v3i1.2746
21. Statistik, B. P. (2024). *Persentase Penduduk Berumur 15 Tahun ke Atas yang Merokok Tembakau selama Sebulan Terakhir Menurut Provinsi*. https://www.bps.go.id/id/statistics-table/2/MTQzNSMy/persentase-penduduk-berumur-15-tahun-ke-atas-yang-merokok-tembakau-selama-sebulan-terakhir-menurut-provinsi.html
22. Suryana, E., Wulandari, S., Sagita, E., & Harto, K. (2022). Perkembangan Masa Remaja Akhir (Tugas, Fisik, Intelektual, Emosi, Sosial dan Agama) dan Implikasinya pada Pendidikan. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *5*(6), 1956–1963. https://doi.org/10.54371/jiip.v5i6.664
23. Susanti, N., Mrp, A. D., & Azwa, N. A. (2024). Perilaku Pencegahan Kanker Serviks Pada Wanita. *Jurnal Kesehatan Tambusai*, *5*(3), 6061–6070.
24. Wahtini, S., Hidayah, F., & Wahyuntari, E. (2021). Coklat Hitam Menurunkan Nyeri Dismenore. *Biomedika*, *13*(1), 28–35. https://doi.org/10.23917/biomedika.v13i1.10827
25. World Health Organization. (2023). *Adolescent and young adult health*. https://www.who.int/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions