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A Cross – Sectional Study: The Correlation Between Premenstrual Syndrome and Quality of Life Among Midwifery Students at Universitas Pendidikan Ganesha

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Abstract. *Premenstrual syndrome (PMS) is a common condition among women of reproductive age, characterized by recurrent physical, emotional and behavioral symptoms during the luteal phase of the menstrual cycle. These symptoms may negatively affect academic performance and quality of life (QoL), particularly among midwifery students. This study aimed to examine the correlation between PMS severity and quality of life among midwifery students. A cross – sectional study was conducted among midwifery students using the Premenstrual Syndrome Scale (PMSS) and the WHOQOL – BREF questionnaire. PMS severity and QoL domains – physical health, psychological health, social relationship and environment – were analyzed using Pearson correlation with significance level of p < 0,05. The findings showed that 9,52% of participants had poor QoL, 60,71% had moderate QoL and 29,76% had good QoL. PMS severity was significantly and negatively correlated with all QoL domains (p = 0,001). The strongest correlation was observed in the physical domain (r = -0,605), followed by psychological health (r = -0,574), social relationship (r = -0,459) and environment (r = -0,405). These results indicate that higher PMS severity is associated with lower QoL scores among midwifery students. PMS significantly affects the quality of life of midwifery students, especially in physical and psychological aspects. Early management and supportive interventions are essential to improve students well – being and academic performance.*

Keywords: *Correlation Study; Midwifery Students; Premenstrual Syndrome; Quality of Life; WHOQOL – BREF*

1. INTRODUCTION

Menstruation is a normal physiological process in women, characterized by cyclic bleeding from the reproductive tract resulting from the shedding of the endometrium when fertilization does not occur (Thiyagarajan et al., 2024). The average menstrual cycle lasts 21 – 35 days, with a blood loss volume of approximately 10 – 80 ml per day (Magnay et al., 2018). Despite being a normal biological process, many women experience menstrual – related disorders that may affect their physical and psychological well – being. One of the most common conditions is premenstrual syndrome (PMS), which affects approximately 53,4 % of women worldwide (Dilbaz & Aksan, 2021).

Premenstrual Syndrome (PMS) refers to a collection of recurring physical, emotional and behavioral symptoms that appear during the luteal phase of the menstrual cycle and subside soon after the onset of menstruation (Liguori et al., 2023). Common symptoms include irritability, anxiety, insomnia, headache, abdominal bloating, nausea and breast tenderness (Tiranini, 2022). In more severe cases, PMS may manifest as depression, fear, difficulty concentrating and worsening of physical discomfort (Modzelewski et al., 2024). The etiology of PMS is multifactorial, involving hormonal imbalance, genetic predisposition, environmental

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and sociocultural influences (Nexha et al., 2024). Hormonal fluctuation, especially the imbalance between estrogen and progesterone, along with genetic variations in receptor sensitivity, has been considered a major contributor (Cheng et al., 2025).

Based on symptom patterns, premenstrual syndrome (PMS) can be classified into four main types. Type A (Anxiety) is characterized by tension and irritability, Type H (Hyperhydration) is associated with bloating and breast tenderness, and Type C (Craving) is marked by increased appetite and fatigue. Meanwhile, Type D (Depression) is identified by mood swings, sleep disturbances, and confusion (Chou et al., 2009).

The severity of premenstrual syndrome (PMS) can be quantitatively measured using the Premenstrual Syndrome Scale (PMSS). This standardized instrument consists of 40 items that evaluate both physical and psychological symptoms. Higher scores on the scale indicate greater severity of PMS (Padmavathi et al., 2014).

Earlier research has demonstrated that Premenstrual Syndrome (PMS) significantly affects women's quality of life (QoL). QoL reflects an individual's perception of their overall position in life within the context of cultural and value systems, encompassing aspects such as physical health, psychological well-being, social relationships, and environmental conditions (Wang et al., 2025). The WHOQOL-BREF, a 26-item questionnaire, is widely used to assess these multidimensional components (Rondung et al., 2023).

Although many studies have explored PMS and its impact on women's daily life, research focusing on midwifery students in Indonesia remains limited, particularly within the academic setting of Universitas Pendidikan Ganesha. Previous investigations have largely emphasized the prevalence and symptom severity of PMS, yet there has been insufficient analysis of how PMS correlates with specific domains of quality of life, such as physical, psychological, social and environmental well – being. Furthermore, many studies conducted in Indonesia have employed non – standardized or non – validated instruments, resulting in inconsistent data and limited generalizability across different populations. This indicates a research gap in understanding how PMS influences quality of life among women in the midwifery field – students who are expected to maintain both personal health and professional readiness for clinical responsibilities.

A preliminary study conducted on August 12, 2025, involving ten midwifery students at Universitas Pendidikan Ganesha, revealed that 70% of respondents experienced symptoms of Premenstrual Syndrome (PMS). The most commonly reported symptoms included breast tenderness, acne, mood swings, and food cravings. These findings indicate that PMS is

prevalent among female students and may negatively affect their daily activities and academic performance.

Therefore, this study aims to examine the correlation between premenstrual syndrome (PMS) and quality of life among midwifery students at Universitas Pendidikan Ganesha. The findings are expected to improve understanding of how PMS affects the well-being of young women. Additionally, the results may provide valuable insights for developing effective strategies to manage PMS symptoms within academic environments.

2. LITERATURE REVIEW

Definition and Clinical Features of PMS

Premenstrual syndrome (PMS) is a clinically recognized condition characterized by a recurring set of physical, emotional and behavioral symptoms that manifest during the luteal phase of the menstrual cycle and subside shortly after menstruation begins (Hantsoo & Payne, 2023). Common physical manifestations include breast tenderness, abdominal bloating, headaches, and alterations in appetite, whereas psychological symptoms often involve irritability, anxiety, mood fluctuations and difficulties with concentration (Andualem et al., 2024). In more severe cases, PMS may present with features that overlap with Premenstrual Dysphoric Disorder (PMDD), a condition marked by more profound affective disturbances and significant impairment in daily functioning (Liguori et al., 2023).

Etiology and Risk Factors of PMS

The etiology of PMS is multifactorial. Leading hypothesis implicate sensitivity to normal cyclical fluctuations of ovarian steroid hormones (estrogen and progesterone), neurotransmitter changes (notably serotonergic pathways), genetic predisposition and psychosocial stressors (Lahnsteiner et al., 2025). Lifestyle factors (sleep quality, diet, exercise), comorbid gynecological conditions and cultural attitudes toward menstruation also modulate symptom perception and reporting (Dilbaz & Aksan, 2021).

Prevalence Among Young Women and University Students

Reported PMS prevalence varies widely – partly due to heterogeneous definitions and measurement methods, but many studies of university students report high rates, often exceeding 50% and in some samples approaching 70 – 80% (Rani, 2020; Soliman et al., 2022). Regional investigations within Indonesia similarly indicate substantial burden of menstrual complaints among female students, including dysmenorrhea and PMS symptoms, underscoring the relevance of this issue in academic populations (Situmorang & Anastasya, 2024; Syafila et al., 2024).

Impact of PMS on Quality of Life (QoL)

Quality of life (QoL) is a multidimensional construct encompassing physical health, psychological state, social relationship and environmental context. The WHOQOL-BREF is a validated 26 item instrument widely used to quantify these domains (Rondung et al., 2023). Multiple cross – sectional studies indicate that women who experience PMS report significantly lower QoL scores, especially in physical and psychological domains. For example, university – based studies have found that students with PMS have reduced WHOQOL – BREF scores and report impaired academic functioning, decreased social participation and diminished daily productivity (Chauhan et al., 2024). Evidence from PMDD research similarly demonstrates marked reductions in role functioning and vitality (Okamoto et al., 2024).

Mechanism Linking PMS and Reduced QoL

Several plausible pathways link PMS to lower QoL. Intense somatic symptoms can directly limit physical functioning and sleep, while affective symptoms compromise psychological well – being and interpersonal relationship. These combined effects can impede academic performance and increase absenteeism or presenteeism in student populations (Okamoto et al., 2024). Additionally, maladaptive coping strategies, stigma around menstruation and limited access to menstrual health education or clinical support may exacerbate the negative QoL impact (Victor et al., 2019).

3. METHOD

Study Design and Setting

This study employed a quantitative, cross-sectional design to examine the correlation between premenstrual syndrome (PMS) and quality of life (QoL) among midwifery students. The research was conducted at the Department of Midwifery, Universitas Pendidikan Ganesha, Indonesia, from September to October 2025. The design allowed for the assessment of both variables simultaneously to identify potential relationships between PMS symptoms and students' overall quality of life.

Population and Sample

The study population consisted of all female undergraduate students enrolled in the Department of Midwifery during the 2025 academic year. The inclusion criteria were: (1) being within reproductive age (18 – 25 years), (2) having regular menstrual cycles for the past six months, (3) providing informed consent to participate and (4) having normal body mass index. Exclusion criteria included: (1) current use of hormonal contraceptives, (2) diagnosis of

psychiatric, endocrine disorders, or reproductive disorders. A total sample of 84 respondents was determined using purposive sampling technique, ensuring participants met all inclusion criteria. The sample size was considered sufficient to achieve adequate statistical power for correlation analysis.

Instruments

Premenstrual Syndrome Scale (PMSS)

PMS symptoms were measured using the Premenstrual Syndrome Scale (PMSS) developed by Padmavathi et al. (2014). The instrument consists of 40 items assessing both physical and emotional symptoms on a five – point Likert scale ranging from 1 "no symptoms" to 5 "very severe symptoms". Higher total scores indicate greater severity of PMS. The PMSS has demonstrated good internal consistency (Cronbach's $\alpha = 0,89$ in prior validation studies).

World Health Organization Quality of Life – BREF (WHOQOL – BREF)

Quality of life was assessed using the WHOQOL – BREF questionnaire, a standardized tool developed by the World Health Organization. The instrument contains 26 items covering four domains: physical health, psychological well – being, social relationship and environmental conditions. Each item is rated on a five – point Likert scale. Domain scores were calculated according to WHO scoring guidelines, where higher scores reflect better perceived quality of life.

Data Collection Procedure

Data were collected through self – administrated questionnaires distributed during regular class sessions after obtaining permission from the department. Participants were given explanations about the study objectives, procedures and confidentiality. Completed questionnaires were collected on the same day to ensure a high response rate and data integrity.

Data Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 27.0. Descriptive statistics (mean, standard deviation, frequency and percentage) were used to describe participant characteristics, PMS levels and QoL scores. The normality test was performed using the Kolmogorov – Smirnov test. To assess the correlation between PMS and quality of life, Pearson's correlation test was applied for normally distributed data, while Spearman's rank collection was used for non – parametric data. The level of statistical significance was set at $p < 0,05$.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of Universitas Udayana (Approval No: 2332/UN14.2.2.VII.14/LT/2025). All participants received information about the study and provided written informed consent prior to data collection. Participation was voluntary and confidentiality of the data was maintained throughout the research process.

4. RESULT AND DISCUSSION

Participant Characteristics

A total of 84 respondents participated in this study. The participants were female students aged between 18 and 22 years, with a mean age of 18,92 ± 0,90 years. Most participants reported a normal menstrual cycle of 28 – 30 days, and the majority (76,19%) experienced menstruation lasting 4 – 6 days.

Table 1. Demographic Characteristics of Participants (n = 84)

Characteristics	Category	Frequency (n)	Percentage (%)
Age (years)	18 – 20	80	95,24
	21 – 22	4	4,76
Menstrual cycle length (days)	21 – 27	18	21,43
	28 – 30	45	53,57
	31 – 35	21	25
Menstrual duration (days)	≤ 3	17	20,24
	4 – 6	64	76,19
	≥ 7	3	3,57
Family history of PMS	Yes	48	57,14
	No	36	42,86

Distribution of Premenstrual Syndrome (PMS) Severity

Based on the Premenstrual Syndrome Scale (PMSS) results, the majority of participants experienced mild PMS symptoms 48,81% while 28,57% had moderate symptoms and 17,86 had severe symptoms. The most frequently reported symptoms were breast tenderness (77,38%), abdominal bloating (72,62%), acne (67,86%), mood swings (65,48%) and food cravings (60,71%).

Table 2. Distribution of PMS Severity among Respondents

PMS Severity	Frequency (n)	Percentage (%)
No PMS Symptoms	1	1,19
Mild PMS Symptoms	41	48,81
Moderate PMS Symptoms	24	28,57
Severe PMS Symptoms	15	17,86
Very Severe PMS Symptoms	3	3,57
Total	**84**	**100**

Quality of Life Scores (WHOQOL – BREF)

The analysis of respondent's quality of life (QoL) revealed three distinct categories : poor, moderate and good. Based on the WHOQOL – BREF assessment, 9,52% of midwifery students with premenstrual syndrome (PMS) were classified as having a poor quality of life ; 60,71% were in the moderate category and 29,76% reported a good quality of life.

Table 3. Distribution of Quality of Life Category among Respondents (n = 84)

Category of QoL	Frequency (n)	Percentage (%)
Poor	8	9,52
Moderate	51	60,71
Good	25	29,76
Total	**84**	**100**

The findings indicate that the majority of respondents experienced a moderate level of quality of life, suggesting that while most students were able to maintain their daily activities, PMS symptoms continued to interfere with their physical comfort, emotional stability and social interactions. A smaller proportion of participants demonstrated a good quality of life, reflecting better adaption and effective management of premenstrual symptoms. These students may process adequate coping mechanism and social support systems that help sustain their psychological well – being and productivity. Conversely, those in the poor quality of life category reported significant difficulties, particularly in the physical and psychological domains. Common complaints included fatigue, irritability and reduced concentration, which often led to lower academic performance.

Correlation between Premenstrual Syndrome and Quality of Life

The normality test using the Kolmogorov – Smirnov test indicated that both PMSS and WHOQOL – BREF data were normally distributed ($p > 0,05$). Therefore, Pearson's correlation test was used to analyze the correlation between PMS severity and quality of life. The analysis revealed a significant negative correlation between PMS and overall QoL scores ($r = - 0,813$; $p < 0,001$), indicating that higher PMS severity was associated with lower quality of life. Among the QoL domains, the psychological and physical health dimensions showed the strongest negative correlations.

Table 4. Correlation between PMS Severity and Quality of Life Domains (n = 84)

QoL Domain	Mean ± SD	r – value	*p* – value	Interpretation
Physical Health	25,55 ± 3,89	-0,605	0,001	Strong correlation
Psychological Health	21.58 ± 4.21	-0,574	0,001	Moderate correlation
Social Relationship	10.08 ± 1.88	-0,459	0,001	Moderate correlation
Environmental	29.38 ± 4.62	-0,405	0,001	Moderate correlation

Further analysis of the four domains of quality of life showed varying levels of impact among midwifery students. The physical health domain was most affected, with many respondents reporting fatigue, pain and sleep disturbances related to PMS. The psychological

domain also showed a noticeable decline, characterized by mood changes, irritability and difficulty concentrating. Similarly, the social relationship domain showed a moderate negative correlation, implying that interpersonal interactions and social support may be moderately affected by PMS symptoms. The environmental domain exhibited a comparable moderate negative correlation, suggesting that factors such as living conditions, access to facilities and learning environments also influence students perceived well being. Overall, these results indicate that PMS severity significantly and negatively correlates with all domains of quality of life, with the strongest effect observed in the physical health domain.

Discussion

This study aimed to examine the relationship between premenstrual syndrome (PMS) and quality of life (QoL) among midwifery students at Universitas Pendidikan Ganesha. The findings revealed that PMS is highly prevalent in this population, with the majority of respondents experiencing mild level of PMS symptoms. These results are consistent with the findings of Soliman et al. (2022), who reported that 53,4% of female nursing students experienced PMS of varying severity.

The most frequently reported symptoms in this study, breast tenderness, abdominal bloating, mood swings and food cravings are in line with the symptom patterns identified by Rani (2020), who categorized PMS manifestations into physical, emotional and behavioral domains. The predominance of these symptoms among students may be associated with hormonal fluctuations, dietary habits and academic stressors common among young adult females (Nworie, 2018).

The analysis demonstrated a significant negative correlation between PMS severity and overall quality of life ($r = -0,813$; $p < 0,001$). This suggests that increased PMS severity leads to a decline in QoL, particularly in psychological and physical health domains. These findings are consistent with studies by Victor et al. (2022) and Soliman et al. (2022), which reported that women with severe PMS experience lower psychological well – being, increased fatigue and reduced social functioning. PMS – related hormonal changes, such as fluctuations in estrogen and progesterone levels, may influence neurotransmitter activity – especially serotonin – which plays a role in mood regulation and emotional stability (Liguori et al., 2023; Tiranini & Nappi, 2022).

Furthermore, the study reinforces the multidimensional impact of PMS on women's lives. Beyond physical discomfort, PMS significantly affects emotional regulation, interpersonal relationship and academic performance. Similar findings have been highlighted

in Ikeda et al. (2020), who demonstrated that PMS symptoms are associated with decreased productivity and life satisfaction among female university students in Japan.

The psychological domain of QoL demonstrated the strong correlation with PMS severity, indicating that emotional and cognitive responses to hormonal changes have substantial implications for well – being. This aligns with Padmavathi et al. (2014), who emphasized the importance of early screening using the Premenstrual Syndrome Scale (PMSS) to identify individuals at risk for poor mental health outcomes.

Given these findings, there is a pressing need for preventive and educational interventions in university settings. Strategies such as menstrual health counseling, stress reduction programs, nutritional education and peer support groups could help students manage PMS symptoms more effectively. Health education programs emphasizing self – care and hormonal awareness can also empower students to maintain better physical and psychological balance during their menstrual cycles.

Despites its strengths, this study acknowledges several limitations. The cross – sectional design limits causal inference, and the sample size was limited to one institution, which may affect the generalizability of the findings. Future investigations are recommended to utilize longitudinal approach to explore symptoms variations across menstrual cycles and examine potential moderating factors such as diet, stress level and physical activity.

5. CONCLUSION

This study concludes that premenstrual syndrome (PMS) has a significant negative impact on the quality of life of midwifery students. The majority of participants experienced mild PMS symptoms and the severity of these symptoms was inversely correlated with quality of life, particularly in the physical and psychological aspects. These findings underscore the need for universities and healthcare providers to integrate reproductive health education, stress management and early PMS screening programs into student health services. Early identification and appropriate management of PMS can enhance students well being, academic performance and overall quality of life.

Future studies should focus on evaluating intervention programs aimed at reducing PMS symptoms and improving coping strategies among young women. It is also recommended that future research employ multicenter and longitudinal study designs to enhance the generalizability of the findings and to provide a deeper understanding of the long – term effects of PMS on women’s health and daily functioning.

REFERENCES

Andualem, F., Melkam, M., Takelle, G. M., Nakie, G., Tinsae, T., Fentahun, S., Rtbey, G., Seid, J., Gedef, G. M., Bitew, D. A., & Godana, T. N. (2024). Prevalence of premenstrual syndrome and its associated factors in Africa: A systematic review and meta-analysis. *Frontiers in Psychiatry, 15*(January), 1–11. https://doi.org/10.3389/fpsyt.2024.1338304

Chauhan, A., Juneja, K., Tyagi, N., & Agarwal, V. (2024). Impact of premenstrual syndrome (PMS) on quality of life among adolescent girls of rural area of Gautam Buddh Nagar: A cross sectional study. *Indian Journal of Community Health, 36*(5), 697–702. https://doi.org/10.47203/IJCH.2024.v36i05.011

Cheng, M., Jiang, Z., Yang, J., Sun, X., Song, N., Du, C., Luo, Z., & Zhang, Z. (2025). The role of neuroinflammation and stressors in premenstrual syndrome/premenstrual dysphoric disorder: A review. *Frontiers in Endocrinology, 16*(March), 1–17. https://doi.org/10.3389/fendo.2025.1561848

Chou, P., Morse, C., Xu, H., & Wiebrecht, A. (2009). A controlled trial of Chinese herbal medicine for premenstrual syndrome. *Deutsche Zeitschrift für Akupunktur, 52*(1), 53–54. https://doi.org/10.1016/j.dza.2009.02.011

Dilbaz, B., & Aksan, A. (2021). Premenstrual syndrome, a common but underrated entity: Review of the clinical literature. *Journal of the Turkish German Gynecology Association, 22*(2), 139–148. https://doi.org/10.4274/jtgga.galenos.2021.2020.0133

Hantsoo, L., & Payne, J. L. (2023). Towards understanding the biology of premenstrual dysphoric disorder: From genes to GABA. *Neuroscience & Biobehavioral Reviews, 149*, 105168. https://doi.org/10.1016/j.neubiorev.2023.105168

Ikeda, Y., Egawa, M., Hiyoshi, K., Ueno, T., Ueda, K., Becker, C. B., Takahashi, Y., Nakayama, T., & Mandai, M. (2020). Development of a Japanese version of the Daily Record of Severity of Problems for diagnosing premenstrual syndrome. *Women's Health Reports, 1*(1), 11–16. https://doi.org/10.1089/whr.2019.0004

Lahnsteiner, A., Hidalgo-Lopez, E., Noachtar, I., Hausinger, T., Gnaiger, A., Griesbach, K., Scutelnic, D., Risch, A., & Pletzer, B. A. (2025). Genetic contributions to premenstrual symptoms: Revisiting the role of the *ESR1* gene. *medRxiv*, 2025.01.13.25320449. https://doi.org/10.1101/2025.01.13.25320449

Liguori, F., Saraiello, E., & Calella, P. (2023). Premenstrual syndrome and premenstrual dysphoric disorder's impact on quality of life, and the role of physical activity. *Medicina (Lithuania), 59*(11). https://doi.org/10.3390/medicina59112044

Magnay, J. L., O'Brien, S., Gerlinger, C., & Seitz, C. (2018). A systematic review of methods to measure menstrual blood loss. *BMC Women's Health, 18*(1), 1–13. https://doi.org/10.1186/s12905-018-0627-8

Modzelewski, S., Oracz, A., Żukow, X., Iłendo, K., Śledzikowka, Z., & Waszkiewicz, N. (2024). Premenstrual syndrome: New insights into etiology and review of treatment methods. *Frontiers in Psychiatry, 15*(April), 1–39. https://doi.org/10.3389/fpsyt.2024.1363875

Nexha, A., Caropreso, L., de Azevedo Cardoso, T., Suh, J. S., Tonon, A. C., & Frey, B. N. (2024). Biological rhythms in premenstrual syndrome and premenstrual dysphoric disorder: A systematic review. *BMC Women's Health, 24*(1). https://doi.org/10.1186/s12905-024-03395-3

Nworie, K. M. (2018). Premenstrual syndrome: Etiology, diagnosis and treatment – A mini literature review. *Journal of Obstetrics and Gynecological Investigations, 1*(1), 41–46. https://doi.org/10.5114/jogi.2018.78010

Okamoto, M., Matsumura, K., Takahashi, A., Kurokawa, A., Watanabe, Y., Narimatsu, H., & Yoshida, H. (2024). The association between menstrual symptoms and presenteeism: A cross-sectional study for women working in central Tokyo. *International Journal of Environmental Research and Public Health, 21*(3). https://doi.org/10.3390/ijerph21030313

Padmavathi, P., Sankar, R., Kokilavani, N., Dhanapal, K., & Ashok, B. (2014). Validity and reliability study of Premenstrual Syndrome Scale (PMSS). *International Journal of Advances in Nursing Management, 2*(1). https://doi.org/10.5958/2454-2652

Rani, R. (2020). A study to assess the effect of premenstrual syndrome on quality of life among college students at Chennai. *International Journal of Health Sciences and Research, 10*(6), 110. Retrieved from http://www.ijhsr.org

Rondung, E., Oliveira, S., & Esteves, F. (2023). Validity and reliability of the WHOQOL-BREF in a pregnant population. *Health and Quality of Life Outcomes, 21*(1), 1–11. https://doi.org/10.1186/s12955-023-02166-2

Situmorang, M., & Anastasya, M. (2024). Analysis of the relationship between stress and dysmenorrhea in female students. *International Journal on ObGyn and Health Sciences, 2*(3), 125–133. https://doi.org/10.35335/obgyn.v2i3.182

Soliman, F., Essa, H., & Elbialy, A. (2022). The effect of premenstrual syndrome among adolescent nursing female students on their quality of life. *Tanta Scientific Nursing Journal, 24*(1), 252–273. https://doi.org/10.21608/tsnj.2022.221605

Syafila, S., Imrar, I. F., & Simanungkalit, S. F. (2024). Factors related to the incidence of primary dysmenorrhea in adolescent females at SMAIT Raflesia Depok in 2024. *Amerta Nutrition, 8*(3SP), 190–199. https://doi.org/10.20473/amnt.v8i3SP.2024.190-199

Thiyagarajan, D. K., Basit, H., & Jeanmonod, R. (2024). Physiology, menstrual cycle. In *StatPearls*. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK500020/

Tiranini, L., & Nappi, R. E. (2022). Recent advances in understanding and management of premenstrual dysphoric disorder/premenstrual syndrome. *Faculty Reviews, 11*. https://doi.org/10.12703/r/11-11

Victor, F. F., Souza, A. I., Barreiros, C. D. T., Barros, J. L. N. de, Silva, F. A. C. da, & Ferreira, A. L. C. G. (2019). Quality of life among university students with premenstrual syndrome. *Revista Brasileira de Ginecologia e Obstetricia, 41*(5), 312–317. https://doi.org/10.1055/s-0039-1688709

Wang, Q., Keijser, R., Chen, Y., Yu, H., Hysaj, E., Hägg, S., Valdimarsdóttir, U. A., Bertone-Johnson, E., Aleknaviciute, J., & Lu, D. (2025). Premenstrual disorders and quality of life in Sweden. *JAMA Network Open, 8*(9), e2533823. https://doi.org/10.1001/jamanetworkopen.2025.33823