GIVING HONEY AND VITAMIN C SUPPLEMENTS ON THE INTENSITY OF DYSMENORRHEA PAIN

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ABSTRAK: PEMBERIAN MADU DAN SUPLEMEN VITAMIN C TERHADAP INTENSITAS NYERI DISMENORE

Latar Belakang: Dismenore merupakan nyeri haid yang umum terjadi pada remaja putri dan berdampak pada aktivitas, kualitas hidup, serta kesehatan mental. Terapi farmakologis efektif namun memiliki efek samping, sehingga diperlukan alternatif yang lebih aman. Madu dan vitamin C dikaji karena sifat antioksidan dan antiinflamasi yang dapat menghambat prostaglandin dan menurunkan stres oksidatif, penyebab nyeri haid. Perlunya terapi non-farmakologis yang aman, alami, dan diterima baik oleh remaja.

Tujuan: Penelitian ini bertujuan mengevaluasi pengaruh kombinasi madu dan vitamin C terhadap penurunan intensitas nyeri dismenore pada siswi SMK Muhammadiyah 1 Pringsewu.

Metode: Penelitian *quasi-experimental* dengan *pretest-posttest control group design*. Sampel terdiri dari 30 responden, dibagi menjadi kelompok intervensi (madu dan vitamin C) dan kontrol (madu), masing-masing 15 responden. Intensitas nyeri diukur menggunakan *Numeric Rating Scale (NRS)* sebelum dan sesudah intervensi. Analisis data dengan *Independent T-test* atau *Mann-Whitney U* jika data tidak berdistribusi normal.

Hasil: Sebelum intervensi, skor nyeri kedua kelompok tidak berbeda signifikan ($p > 0,05$). Setelah intervensi, terjadi penurunan signifikan pada kelompok intervensi (7,20 ± 1,15 menjadi 3,40 ± 1,25; $p = 0,001$), sementara kelompok kontrol tidak menunjukkan perbedaan signifikan (7,10 ± 1,05 menjadi 6,80 ± 1,30; $p = 0,098$).

Simpulan: Secara teoritis, hasil ini memperkuat bukti bahwa kombinasi madu dan vitamin C dapat menurunkan nyeri dismenore melalui mekanisme antiinflamasi dan antioksidan. Secara praktis, intervensi ini dapat diterapkan di lingkungan sekolah sebagai edukasi gizi dan upaya mandiri remaja putri dalam mengelola nyeri haid.

Saran: Disarankan penelitian lebih lanjut dengan desain uji klinis terkontrol dan jumlah sampel yang lebih besar untuk menguatkan temuan ini serta mengetahui dosis optimal dan potensi efek samping jangka panjang dari penggunaan kombinasi madu dan vitamin C.

Kata Kunci: Dismenore, Madu, Nyeri Haid, Vitamin C

ABSTRACT

Background: Dysmenorrhea is a common menstrual pain experienced by adolescent girls and can affect their daily activities, quality of life, and mental health. Pharmacological therapy is effective but may cause side effects, making it necessary to seek safer alternatives. Honey and vitamin C have been studied due to their antioxidant and anti-inflammatory properties, which can inhibit prostaglandin production and reduce oxidative stress, both of which contribute to menstrual pain. There is a need for non-pharmacological therapies that are safe, natural, and well-accepted by adolescents.

Objective: This study aims to evaluate the effect of a combination of honey and vitamin C on reducing the intensity of dysmenorrhea pain among female students at SMK Muhammadiyah 1 Pringsewu.

Method: This quasi-experimental study used a pretest-posttest control group design. The sample consisted of 30 respondents, divided into an intervention group (honey and vitamin C) and a control group (honey only), with 15 respondents in each group. Pain intensity was measured using the Numeric Rating Scale (NRS) before and after the intervention. Data were analyzed using the Independent T-test or the Mann-Whitney U test if the data were not normally distributed.

Results: Before the intervention, the pain scores of both groups showed no significant difference ($p > 0.05$). After the intervention, there was a significant reduction in the intervention group (from 7.20 ± 1.15 to 3.40 ± 1.25; $p = 0.001$), while the control group showed no significant change (from 7.10 ± 1.05 to 6.80 ± 1.30; $p = 0.098$).

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Conclusion: Theoretically, these findings strengthen the evidence that the combination of honey and vitamin C can reduce dysmenorrhea pain through anti-inflammatory and antioxidant mechanisms. Practically, this intervention can be implemented in school settings as part of nutrition education and a self-care strategy for adolescent girls in managing menstrual pain.

Suggestion: Further research is recommended using a controlled clinical trial design and a larger sample size to strengthen these findings and to determine the optimal dosage and potential long-term side effects of using the combination of honey and vitamin C.

Keywords: Dysmenorrhea, Honey, Vitamin C, Menstrual Pain

INTRODUCTION

Menstruation is a monthly physiological process for women, often accompanied by various complaints before or during the cycle (Puspariny, 2023). One of the most common complaints is dysmenorrhea, which refers to menstrual pain frequently experienced by adolescent girls and women of reproductive age (Koçoglu, 2025; Wahyuni, 2024). Dysmenorrhea presents a variety of physical symptoms and can significantly affect daily activities, academic performance, sleep quality, and mental health, such as increased anxiety and depression (Bernardi et al., 2017).

Dysmenorrhea prevalence differs by country, with approximately 10-15% of women worldwide suffering from severe menstrual pain that affects work productivity and daily activities (Puspariny, 2025). In Southeast Asia, dysmenorrhea prevalence is 69.4% in Malaysia, 84.2% in Thailand, and 64.25% in Indonesia, with 54.89% classified as primary dysmenorrhea and 9.36% as secondary dysmenorrhea (Arisani & Wahyuni, 2022). Data from the Lampung Provincial Health Service in 2019 indicated that dysmenorrhea affected 1.12% to 1.35% of adolescents who consulted health workers (Yuviska & Yuliasari, 2024). Dysmenorrhea is more commonly found in women aged 20–24, with the most severe pain intensity occurring before the age of 25 (Bae et.al., 2025). Moreover, Conesa-Albaladejo et al. (2025) pointed out that risk factors contributing to the severity of dysmenorrhea include early menarche, prolonged menstrual periods, obesity, and smoking habits. They added that most women with dysmenorrhea require treatment to relieve the pain, with 84.1% experiencing dysmenorrhea during each menstrual cycle and 55.2% of them needing medication. Available treatment methods, according to Luo, et al. (2025), include both pharmacological and non-pharmacological therapies. Non-pharmacological therapies encompass various techniques such as relaxation, distraction, acupuncture, cupping therapy, aromatherapy, and hypnotherapy, which aim to reduce the side effects of pharmacological drugs (Brunton, 2018; Luo, et.al., 2025).

While NSAIDs (Non-Steroidal Anti-Inflammatory Drugs) and hormonal contraceptives are commonly used therapies for dysmenorrhea, they can cause side effects including digestive issues, hormonal imbalances, and potential long-term dependence (Arisani & Wahyuni, 2022; Bain, 2023). Increasingly, research is focusing on non-pharmacological approaches that are more natural and pose minimal risk of side effects. One emerging alternative is the combination of honey and vitamin C, which has yet to be thoroughly explored for treating dysmenorrhea.

One potential alternative non-pharmacological therapy is the use of honey. Currently, the use of herbal ingredients and alternative therapies, such as honey, is increasingly popular in the treatment of primary dysmenorrhea. Honey possesses therapeutic properties, including antioxidant, anti-inflammatory, and analgesic effects that can help reduce menstrual pain (Amiri et al., 2017). It contains various bioactive compounds, including flavonoids, enzymes (*amylase, diastase, invertase, catalase, peroxidase, lipase*), and antioxidant compounds such as glucose oxidase and catalase, which play a role in reducing prostaglandin synthesis and decreasing the intensity of menstrual pain (Safitri & Purnobasuki, 2022). Research shows that consuming honey can help reduce the intensity of dysmenorrhea (menstrual pain) in adolescent girls. One study found that giving acacia honey significantly reduced the pain scale of dysmenorrhea, making it an effective non-pharmacological therapy alternative (Putri et al., 2023).

Moreover, honey contains varying concentrations of vitamin C, depending on its type and storage. Vitamin C acts as an antioxidant, combating free radicals, and can enhance the effectiveness of certain antibiotics due to its pro-oxidant properties (Sum et.al., 2025; Wibawa et al., 2020). Honey combined with vitamin C exhibits effective antioxidant and anti-stress properties for

adolescent girls with dysmenorrhea. Research indicates that this combination is more effective at controlling inflammation and alleviating dysmenorrhea pain than either substance used alone (Adeyomoye et al., 2021).

Several previous studies have examined the effects of honey on menstrual pain, but most have focused on using honey as a single therapy (Putri et al., 2023). Research on vitamin C is more frequently focused on its effects on the immune system and skin health rather than its role in alleviating dysmenorrhea (Wibawa et al., 2020). The novelty of this study lies in the combination of honey and vitamin C as an intervention that may provide a synergistic effect in reducing inflammation and suppressing prostaglandin production, which is a key factor in the mechanism of dysmenorrhea pain. Considering the benefits of honey and vitamin C in alleviating menstrual pain, this study aims to determine the effect of combining honey and vitamin C supplements in reducing the intensity of dysmenorrhea pain in women of reproductive age. The findings of this study are expected to offer a safe and effective non-pharmacological therapy alternative for individuals suffering from dysmenorrhea.

RESEARCH METHODS

This study employed a quasi-experimental design using a non-equivalent post-test only design. The research subjects were observed before the intervention and re-observed after the intervention was administered. The study utilized a pre- and post-test group design with a control group, involving two groups: an intervention group and a control group (Bruce et.al., 2013). In this study, the intervention group received a combination therapy of honey and vitamin C, while the control group was given honey only. Following the treatment, observations were conducted on the intensity level of dysmenorrhea and vital signs such as pulse rate and blood pressure.

The research was conducted from January to February. The research sample consisted of adolescents from SMK Muhammadiyah 1 Pringsewu, with a total of 30 respondents evenly divided between the intervention and control groups, each comprising 15 respondents. The sampling technique used was purposive sampling. The inclusion criteria for this study were: (1) adolescents who experience regular monthly menstruation, (2) have had a regular menstrual cycle over the past two months, (3) have a history of dysmenorrhea within the last three months, and (4) do not have any skin diseases. Meanwhile, the exclusion criteria included: (1) experiencing severe pain, (2) dysmenorrhea accompanied by gynecological disorders (secondary dysmenorrhea), and (3) taking medications or undergoing other therapies for pain relief.

Bivariate analysis in this study was conducted using the Independent T-test, which is used to compare the means between two unrelated groups. Pain intensity was measured using the Numeric Rating Scale (NRS), in which participants rated their pain on a scale from 0 to 10, with 0 indicating no pain and 10 indicating the most severe pain. Measurements were taken on the first and second days of menstruation and averaged. Enumerators guided the students in selecting a number that reflected their perceived level of pain. Data were recorded for analysis before and after the administration of honey and vitamin C.

The research stages included administering the intervention to two groups: the experimental group and the control group. The experimental group received a combination of honey and vitamin C, while the control group was given honey only. The intervention was administered once daily for three consecutive days prior to and on the first day of menstruation. Data collection was carried out by measuring pain intensity using the Numeric Rating Scale (NRS) at two points: before the intervention (pre-test) and after the intervention (post-test) for both groups. Observations were conducted over three days of menstruation, during which pain assessments were recorded daily to monitor gradual changes in pain intensity.

Data analysis was performed using the Independent T-test if the data were normally distributed. However, if the data were not normally distributed, the non-parametric Mann-Whitney U test was used to compare the mean pain scores between the intervention and control groups. The data processing and analysis were conducted with the help of statistical software. Prior to the main analysis, a normality test was carried out to determine the distribution characteristics of the data.

RESEARCH RESULTS

This study involved 30 respondents divided into two groups: the intervention group (receiving honey and vitamin C) and the control group (without any specific intervention). Respondents' characteristics based on age showed that the majority were between 15 and 18 years old (100%). All respondents had regular menstrual cycles over the past two months, with an average cycle length of 28–32 days and a menstrual duration of 3–7 days.

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All respondents had experienced dysmenorrhea within the past three months.

Before the intervention, the average pain scores in the intervention and control groups showed no significant difference ($p > 0.05$). However, after the intervention, there was a significant decrease in the average pain score in the intervention group compared to the control group.

Table 1
Comparison of Pain Intensity Before and After Intervention

Group	Before Intervention (Mean ± SD)	After Intervention (Mean ± SD)	p-value
Intervention (Honey and Vitamin C)	7.20 ± 1.15	3.40 ± 1.25	0.001*
Control (Honey)	7.10 ± 1.05	6.80 ± 1.30	0.098

*p-value < 0.05 indicates a significant difference

The analysis revealed a significantly greater reduction in pain for the intervention group, which saw an average decrease of 3.8 points, compared to just 0.3 points in the control group.

Vital signs measured before and after the intervention revealed a decrease in average heart rate and blood pressure in the intervention group, indicating a relaxing effect from the combination of honey and vitamin C.

Table 2
Changes in Vital Signs

Parameter	Intervention Group (Before)	Intervention Group (After)	Control Group (Before)	Control Group (After)
Pulse Rate (bpm)	85.4 ± 5.2	78.3 ± 4.8	84.9 ± 4.9	83.5 ± 5.1
Systolic Blood Pressure (mmHg)	118.2 ± 7.3	112.6 ± 6.8	117.5 ± 7.1	116.9 ± 6.9
Diastolic Blood Pressure (mmHg)	76.1 ± 5.5	72.4 ± 4.9	75.8 ± 5.4	75.2 ± 5.3

The greater reduction in pulse rate and blood pressure in the intervention group indicates that the consumption of honey and vitamin C may provide a calming effect in addition to reducing pain intensity. The statistical analyses used in this study were the Independent T-test and the Mann-Whitney U test, depending on the data distribution. The Independent T-test was applied to compare the mean post-intervention pain scores between the control and intervention groups for normally distributed data. Meanwhile, the Mann-Whitney U test was used as a non-parametric alternative for non-normally distributed data to ensure result consistency. The findings showed a significant difference between the intervention group (honey + vitamin C) and the control group (honey only) after the treatment, with a p-value of 0.001 in the Independent T-test. The Mann-Whitney U test also produced consistent and significant results ($p < 0.05$).

At the pre-test stage, both groups had relatively similar pain levels, indicating comparable baseline conditions. However, after the intervention (post-test), the intervention group experienced a greater reduction in pain compared to the control group. Therefore, it can be concluded that the combination of honey and vitamin C is more effective in reducing the intensity of dysmenorrhea pain than honey alone. These results support the use of nutritional interventions as a safe and potential non-pharmacological therapy for adolescent girls.

DISCUSSION

The results of this study indicate that the combination of honey and vitamin C is effective in reducing the intensity of dysmenorrhea pain in adolescent girls. This finding aligns with Adeyomoye et al. (2021), who states that honey's anti-inflammatory and analgesic effects can inhibit prostaglandin production, thereby alleviating menstrual pain. In addition, research by Safitri & Purnobasuki (2022) also shows that regular consumption of honey can reduce the intensity of menstrual pain.

Pathophysiologically, dysmenorrhea pain is caused by increased production of prostaglandins, especially prostaglandin F2α (PGF2α), which

causes stronger uterine contractions, vasoconstriction, and endometrial tissue hypoxia, resulting in pain (Oladosu et al., 2018). Honey contains bioactive compounds like flavonoids and polyphenols that exert anti-inflammatory effects by inhibiting prostaglandin synthesis through the cyclooxygenase-2 (COX-2) pathway (Shaikh et.al., 2019). Honey contains the enzyme glucose oxidase, which helps produce hydrogen peroxide, enhancing cellular defenses against oxidative stress that can exacerbate menstrual pain. Regular consumption of honey may reduce dysmenorrhea pain by up to 50% (Dewi et al., 2022). Honey can affect anti-inflammatory and immunostimulatory mediators (Lupu, 2025: Zhu, 2025), so it can directly or indirectly inhibit the onset of pain. These effects can occur at the central or peripheral nervous system level or the site of autonomic receptors (Rang, 2015; Koçoglu, 2025). The cyclooxygenase pathway may play a role in this mechanism. Lazim (2017) and Bustamam (2021), in their study to 30 female students from the Faculty of Medicine at the Veterans National Development University (UPN) in Jakarta found that consuming two tablespoons of honey daily, starting two days before menstruation until the third day of menstruation (a total of 5 days), can reduce pain intensity and the severity of dysmenorrhea.

In addition, vitamin C has been shown to have analgesic (pain-relieving) properties in several clinical conditions (Li, et. al. 2016). In this review, the researchers focused on human studies examining vitamin C's role in orthopedics, viral infections, cancer, and post-surgery pain. Preclinical pain models are not always directly comparable to pain conditions in clinical settings (Carr & McCall, 2017). Another study by Wibawa et al. (2020) found that vitamin C enhances the efficacy of certain antibiotics and helps reduce oxidative stress related to menstrual pain. An international study conducted by Shaikh et al. (2019) confirmed that the combination of natural antioxidants such as vitamin C and honey has a significant impact on controlling inflammation that contributes to menstrual pain. Vitamin C acts as a cofactor in collagen synthesis and the regeneration of tissue damaged by excessive uterine contractions, thereby helping to reduce inflammation and pain sensitivity (Lestari et al., 2021). Furthermore, vitamin C plays a role in suppressing the production of pro-inflammatory cytokines, such as interleukin-6 (IL-6) and tumour necrosis factor-alpha (TNF-α), which contribute to the sensation of pain during menstruation (Park et al., 2020).

Research conducted by Dewi et al. (2022) revealed that regular consumption of honey can reduce dysmenorrhea pain by up to 50%. Similarly, a study by Lestari et al. (2021) also found that vitamin C enhances iron absorption, supports hormonal balance during menstruation, and may reduce menstrual pain. According to Ezzati et al. (2022), iron deficiency can increase pain sensitivity by impairing oxygen transport to uterine muscle tissue; thus, vitamin C supplementation may help restore balance. Synergy between honey and other natural ingredients may occur due to interactions between their polyphenol components in or because both affect the same mechanistic pathways, thereby enhancing the overall biological effect (McLoone et al., 2020). Honeydew honey (100%) supplemented with vitamin C (100 mg/g honey) showed better antibiofilm activity than honey alone, and successfully eliminated all bacterial species in the biofilm after 48 hours. Hermanns and Cremers (2019) highlighted that vitamin C is known to have antibacterial activity, and they suggest that the antibacterial effect of the combination of honey and vitamin C is likely due to increased production of reactive oxygen species in bacterial cells. Thus, in addition to reducing the pain of dysmenorrhea, it can also prevent infections during menstruation. This relates to menstrual problems, not only dysmenorrhea but also personal hygiene (Puspariny et all, 2022).

The analysis of the relationship between variables showed that honey and vitamin C work synergistically in reducing pain. The antioxidant and anti-inflammatory effects of these two substances help suppress prostaglandin production and promote bodily relaxation (Oladosu, 2018; Veronese, 2022), as indicated by the decrease in pulse rate and blood pressure in the intervention group. The pattern observed in this study suggests that nutrition-based interventions can be an effective alternative for managing dysmenorrhea, compared to pharmacological methods that often have side effects. The significant reduction in pain intensity in the intervention group indicates that this therapy can be widely applied as a safe and accessible non-pharmacological method for adolescent girls.

The broader implication of these findings is that honey and vitamin C-based therapy can be used as a more natural and sustainable strategy for managing menstrual pain. Additionally, healthcare professionals and educators can utilize this information to provide education on managing menstrual pain without relying on pharmaceutical drugs.

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CONCLUSION

This study examined the effectiveness of the combination of honey and vitamin C in reducing dysmenorrhea pain among adolescent girls. Considering the side effects of pharmacological therapies, safe non-pharmacological alternatives are greatly needed. The results of the study showed that the combination of honey and vitamin C significantly reduced pain intensity, as well as lowered pulse rate and blood pressure, indicating a relaxing effect. Other factors, such as dietary patterns and physical activity, also influence the severity of the pain. Theoretically, these findings support the idea that natural nutrition can reduce inflammation and menstrual pain. Practically, this combination can serve as an alternative therapy that is easy to implement in school settings as part of adolescent health promotion.

SUGGESTION

Further research with a larger sample size and longer duration is recommended to confirm the effectiveness and safety of using honey and vitamin C for dysmenorrhea pain management.

REFERENCES

Adeyomoye, O. I., Olaniyan, O. T., Adewumi, N., & Anyakudo, M. M. (2021). Honey supplemented with Vitamin C prevents dyslipidaemia and oxidative stress induced by exposure to lead acetate in Wistar rats. *Indian Journal of Physiology and Pharmacology*, *65*(4), 229–236. https://doi.org/10.25259/IJPP_445_2021

Amiri, F. L, Hasanpoor-Azghdy, S. B, & Kasraei H, H. T. (2017). Comparison of the effect of honey and mefenamic acid on the severity of pain in women with primary dysmenorrhea. *Arch Gynecol Obstet*, *296*(2), 277–283.

Arisani, G., & Wahyuni, S. (2022). The Effectiveness of telecounseling on anxiety and self-care dysmenorrhea in young women. *Journal of Health Education*, *7*(2), 82–88. https://doi.org/10.15294/jhe.v7i2.57312

Bae, K., Park, M., & Yi, J. (2025). Herbal decoctions for dysmenorrhea under universal health coverage pilot project: Evidence from a nationwide claims database in the Republic of Korea. *Integrative Medicine Research*, 14, 101152. ttps://doi.org/10.1016/j.imr.2025.101152

Bain, C.R., et al., 2023. Postoperative systemic inflammatory dysregulation and corticosteroids: a narrative review. Anaesthesia 78, 356–370. https://doi.org/10.1111/anae.15896

Bernardi, M., Lazzeri, L., Perelli, F., Reis, F. M., & Petraglia, F. (2017). Dysmenorrhea and related disorders. *F1000Research*, *6*, 1645. https://doi.org/10.12688/f1000research.11682.1

Bruce, N., Pope, D., & Stanistreet, D. (2013). *Quantitative Methods for Health Research: A Practical Interactive Guide to Epidemiology and Statistics*. John Wiley & Sons, Ltd.

Brunton, L. L., Hilal-Dandan, R., & Knollmann, B. C. (2018). *Goodman & Gilman's: The Pharmacological Basis of Therapeutics* (13th ed.). McGraw-Hill Education.

Bustamam, N., et al. (2021). Pengaruh madu terhadap tingkat nyeri dismenore dan kualitas hidup mahasiswi Fakultas Kedokteran Universitas Pembangunan Nasional Veteran Jakarta. *Jurnal Kesehatan Reproduksi, 12*(1), 39–46.

Carr, A. C., & McCall, C. (2017). The role of vitamin C in the treatment of pain: New insights. *Journal of Translational Medicine*, *15*(1), 1–14. https://doi.org/10.1186/s12967-017-1179-7

Conesa-Albaladejo, M., Espí-L´opez, G. V., Martínez-Graullera, E., & Arnal-G´ omez, A. (2025). Potential effects of combining osteopathic manual therapy and menstrual awareness on pain and associated symptoms in women with primary dysmenorrhea: A randomized clinical trial. *International Journal of Osteopathic Medicine*, 56, 100761. https://doi.org/10.1016/j.ijosm.2025.100761

Dewi, R. S., Sari, D. P., & Yuliana, M. (2022). Efektivitas madu dalam mengurangi intensitas nyeri dismenore primer pada remaja putri. *Jurnal Kesehatan Wanita*, *5*(2), 78–85.

Ezzati, M., Torkzahrani, S., & Moradi, M. (2022). The role of iron and vitamin C in menstrual health: A biochemical perspective. *Iranian Journal of Obstetrics and Gynecology*, *25*(3), 112–119.

Hermanns R, Cremers NAJ, L. J. van der W. E. (2019). Sweet relief: determining the antimicrobial activity of medical grade honey against vaginal isolates of Candida albicans. *J Fungi (Basel)*, *5*, 85. https://doi.org/doi:10.3390/jof5030085

Koçoglu, S. Sevgin, O.,& Hosbas, B. D. (2025). Comparison of motor imagery focused pelvic floor exercises and relaxation exercises for

treating dysmenorrhea: A randomized controlled study. *Taiwanese Journal of Obstetrics & Gynecology*, 64, 671-677. https://doi.org/10.1016/j.tjog.2024.12.029

Lazim, N. M. and A. B. (2017). Honey—a natural remedy for pain relief. *Academy Press*, *10*(1), 123–134. https://doi.org/https://doi.org/10.1016/B978-0-12-805186-3.00010-

Lestari, H., Nugroho, A. D., & Pratama, F. A. (2021). Vitamin C and its role in hormonal balance during menstruation: A review. *Indonesian Journal of Biomedical Sciences*, *14*(3), 120–128.

Li, R., Shen, L., Yu, X., Ma, C., & Huang, Y. (2016). Vitamin C enhances the analgesic effect of gabapentin on rats with neuropathic pain. *Life Sciences,* 157, 25-31. https://doi.org/10.1016/j.lfs.2016.05.035

Luo, Y., Wu, Z., Ji, R., Shen, L., & He, X. (2025). Integrated network pharmacology and metabolomics to analyze the mechanism of Shaofu Zhuyu Decoction in treatment of dysmenorrhea of cold coagulation and blood stasis. *Chinese Herbal Medicines*, https://doi.org/10.1016/j.chmed.2025.02.002

Lupu, D., Sammani, M. S., Palacio, E., Hancu, G., & Ferrer, L. (2025). Distinctive mineral and physicochemical parameters assessment of carob honey (Mallorca Island) from Spanish honeys exploiting dimensionality reduction tools and cluster analysis, 492, 145448. https://doi.org/10.1016/j.foodchem.2025.145448

McLoone, P., Tabys, D., & Fyfe, L. (2020). Honey combination therapies for skin and wound infections: A systematic review of the literature. *Clinical, Cosmetic and Investigational Dermatology*, *13*, 875–888. https://doi.org/10.2147/CCID.S282143

Oladosu FA, Tu FF, & Hellman KM. Nonsteroidal antiinflammatory drug resistance in dysmenorrhea: epidemiology, causes, and treatment. *Am J Obstet Gynecol*. 2018 Apr;218(4):390-400. doi: 10.1016/j.ajog.2017.08.108. Epub 2017 Sep 6. PMID: 28888592; PMCID: PMC5839921.

Park, S. K., Kim, K., & Bae, J. H. (2020). The anti-inflammatory effects of vitamin C in menstrual-related pain syndromes: A review of molecular mechanisms. *Journal of Nutritional Biochemistry*, *78*, 108323.

Puspariny et all. (2022). Buku Ajar Asuhan Kebidanan pada Remaja dan Perimenpopouse. Deepublish. In *Buku Ajar Asuhan Kebidanan Pada Remaja*. https://books.google.co.id/books?id=JtrBEAAAQBAJ

Puspariny, C. (2023). Hubungan kualitas tidur dengan prementruasi sindrom pada remaja putri di desa Bumi Ayu. *ISJM*, *1*(2), 42–48.

Puspariny, C. (2025). Optimalisasi edukasi penanganan nyeri dismenore melalui kombinasi madu dan vitamin c bagi remaja putri. *Jurnal Optimal Untuk Negeri*, *1*(2), 7–11.

Putri, H. E., Arlym, L. T., & Widowat, R. (2023). Pengaruh konsumsi madu akasia terhadap dismenore pada remaja. *Jurnal Menara Medika*, *5*(2), 159–165.

Rang, H. P., Dale, M. M., Ritter, J. M., Flower, R. J., & Henderson, G. (2015)**.** *Rang & Dale's Pharmacology* (8th ed.). Elsevier.

Safitri, E., & Purnobasuki, H. (2022). *Aplikasi madu sebagai aktivator stem cell*. Retrieved from https://www.google.co.id/books/edition/Aplikasi_Madu_sebagai_Aktivator_STEM_CEL/mspuEAAAQBAJ?hl=id&gbpv=0

Shaikh, F., Ahmad, M., & Al-Mahmood, A. (2019). Antioxidant and anti-inflammatory properties of honey and vitamin c in menstrual pain management. *International Journal of Women's Health*, *11*(4), 67–79.

Sum, Z. Q., Yusri, A. S., & Sarbon, N. M. (2025). Investigation of physicochemical characterization, thermal inactivation kinetics of enzymes, and shelf-life study of pandan coconut water with honey addition. *Food Chemistry Advances*, 8, 101052. https://doi.org/10.1016/j.focha.2025.101052

Veronese, N., et al., 2022. Possible synergic action of non-steroidal anti-inflammatory drugs and glucosamine sulfate for the treatment of knee osteoarthritis: a scoping review. BMC Muscoskelet. *Disord*. 23, 1084. DOI: 10.1186/s12891-022-06046-6

Wahyuni, S. K. (2024). Buku Ajar Masalah Gangguan Reproduksi. In *Buku Ajar Masalah Gangguan Reproduksi*.

Wibawa, J. C., Wati, L. H., & Arifin, M. Z. (2020). Mekanisme vitamin c menurunkan stres oksidatif setelah aktivitas fisik. *JOSSAE : Journal of Sport Science and Education*, *5*(1), 57. https://doi.org/10.26740/jossae.v5n1.p57-63

Yuviska, I. A., & Yuliasari, D. (2024). Karakteristik remaja putri dengan dismenore di SMA Muhammadiyah 2 Bandar Lampung. *Malahayati Nursing Journal*, *6*(6), 2460–2467. https://doi.org/10.33024/mnj.v6i6.12073

Zhu, H., Liu, L., Wang, R., Wang, Z., Wang Y., Dong, J., Wang Q., Qiao, J., & Zhang, H. (2025). Unveiling the phytochemical profiles of Ziziphus jujuba honey: An authenticity assurance approach. Food Chemistry: X, 29, 102622. https://doi.org/10.1016/j.fochx.2025.102622