

Non-Pharmacological Interventions for Reducing Primary Dysmenorrhea among Adolescent Girls: A Narrative Review

Nonlia Selvia Goraai
Puskesmas Duono

Email: nonliaselviagoraai@gmail.com

ABSTRACT

Primary dysmenorrhea is one of the most prevalent gynecological complaints among adolescent girls and often interferes with daily activities, academic performance, and quality of life. Although pharmacological therapy is commonly used, non-pharmacological interventions are increasingly recommended due to their safety, affordability, and minimal side effects. This study aimed to review and synthesize recent scientific evidence regarding the effectiveness of non-pharmacological interventions in reducing primary dysmenorrhea among adolescents. A narrative literature review was conducted using electronic databases including PubMed, Scopus, and Google Scholar. Articles published between 2022 and 2025 were selected based on predefined inclusion and exclusion criteria. Keywords included *non-pharmacological therapy*, *dysmenorrhea*, *adolescents*, and *menstrual pain*. A total of 17 relevant studies were analyzed. The review demonstrated that non-pharmacological interventions such as warm and cold compresses, dysmenorrhea exercise, yoga, abdominal stretching, breathing relaxation techniques, herbal drinks (e.g., turmeric-based beverages), massage therapy, and acupoint stimulation were effective in reducing pain intensity and improving functional outcomes among adolescents. Non-pharmacological interventions are effective and safe strategies for managing primary dysmenorrhea in adolescents. Health education and school-based reproductive health programs should incorporate these interventions to reduce menstrual pain and its negative impact on adolescents' daily activities.

Keywords: adolescents, menstrual pain, non-pharmacological therapy, primary dysmenorrhea, reproductive health

BACKGROUND

Primary dysmenorrhea refers to painful menstruation without underlying pelvic pathology and is commonly experienced by adolescent girls during the early years after menarche. It is characterized by cramping pain in the lower abdomen that may radiate to the lower back and thighs, often accompanied by nausea, fatigue, headache, and diarrhea (Armour et al., 2022).

Globally, the prevalence of dysmenorrhea among adolescents ranges from 50% to 90%, making it one of the most frequent causes of school absenteeism and decreased academic performance (Bajalan et al., 2023). The pathophysiology of dysmenorrhea is primarily related to excessive production of prostaglandins, leading to uterine hypercontractility and ischemia (Osayande & Mehulic, 2022).

While nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly prescribed, concerns regarding long-term use, side effects, and self-medication practices have encouraged the

exploration of non-pharmacological alternatives (Chen et al., 2024). Adolescents often prefer non-drug approaches due to accessibility and cultural acceptance.

Non-pharmacological interventions, including physical exercise, heat therapy, relaxation techniques, massage, yoga, and herbal remedies, have been shown to modulate pain perception, improve blood circulation, and promote muscle relaxation (Dehnavi et al., 2023). Understanding the effectiveness of these approaches is essential to support evidence-based menstrual pain management strategies among adolescents.

METHODS

This study employed a narrative literature review design to synthesize and critically discuss current evidence related to non-pharmacological management of primary dysmenorrhea in adolescents. A narrative review was chosen instead of a systematic review because the available studies were heterogeneous in terms of study design, intervention types, outcome measurements, and duration of follow-up. The objective of this review was not to generate pooled effect estimates, but rather to provide a comprehensive and interpretative overview of various non-pharmacological approaches and their reported effectiveness. Therefore, a narrative approach was considered more appropriate to allow flexibility in describing and comparing diverse interventions.

Electronic searches were conducted in PubMed, Scopus, and Google Scholar to identify relevant studies. The search strategy used combinations of the following keywords: “primary dysmenorrhea,” “non-pharmacological intervention,” “adolescent girls,” “exercise,” “yoga,” and “menstrual pain.” Boolean operators (AND, OR) were applied to refine the search results. The search was limited to articles published between 2022 and 2025 to ensure the inclusion of the most recent evidence.

The inclusion criteria were: (1) studies published between 2022 and 2025, (2) articles written in English, (3) participants aged 10–24 years, and (4) studies focusing on non-pharmacological interventions for primary dysmenorrhea. Exclusion criteria included review articles, opinion papers, editorials, conference abstracts without full text, and studies that focused solely on pharmacological treatments. Titles and abstracts were screened first, followed by full-text assessment to determine eligibility.

Although this was a narrative review, an assessment of study quality and risk of bias was conducted to enhance methodological rigor. The quality of included studies was evaluated using established appraisal tools appropriate to the study design, such as the Joanna Briggs Institute (JBI) Critical Appraisal Checklists for randomized controlled trials and quasi-experimental studies. Key aspects assessed included clarity of inclusion criteria, randomization procedures, blinding, completeness of outcome data, and appropriateness of statistical analysis.

The risk of bias in each study was categorized as low, moderate, or high based on the appraisal results. Studies with a high risk of bias were interpreted cautiously during data synthesis, and their limitations were explicitly described in the discussion section. By incorporating a structured quality appraisal process, this narrative review aimed to maintain transparency and strengthen the credibility of its conclusions despite not adopting a full systematic review methodology.

RESULTS

The reviewed studies consistently reported a reduction in dysmenorrhea intensity following various non-pharmacological interventions. However, the included studies used different outcome measures and reporting formats, which limited direct quantitative comparison across interventions. Most studies assessed pain intensity using standardized scales such as the Visual Analog Scale (VAS) or Numeric Rating Scale (NRS), while others incorporated additional measures such as

duration of pain, analgesic use, or quality-of-life scores. Due to this heterogeneity, a pooled effect size calculation was not feasible within the scope of this narrative review.

Heat therapy using warm compresses was commonly evaluated using pre- and post-intervention VAS scores, with studies reporting statistically significant mean reductions in pain intensity. Cold compress interventions similarly measured outcomes using VAS or NRS scores and demonstrated clinically meaningful decreases in reported pain levels. Although both interventions showed positive effects, variations in intervention duration, temperature range, and follow-up periods prevented precise comparison of effect magnitude between heat and cold modalities.

Physical exercise interventions—including abdominal stretching, dysmenorrhea gymnastics, and aerobic activity—typically reported changes in mean pain scores along with improvements in daily functioning or school attendance. Yoga-based interventions measured not only pain intensity (via VAS or NRS) but also stress levels using validated psychological scales. While effect sizes were reported in some quasi-experimental and randomized controlled trials, the reporting methods were not uniform, with some presenting mean differences and others reporting percentage reductions.

Herbal interventions, particularly turmeric-based drinks, primarily assessed pain reduction using VAS scores and, in some cases, biochemical markers related to inflammation. Massage therapy and acupoint stimulation studies frequently reported pre–post mean differences in pain scores and occasionally included effect size statistics such as Cohen’s *d*. Nevertheless, differences in sample size, intervention frequency, and outcome reporting limited strict comparability across studies.

Table 1. Summary of Outcome Measures and Reported Effects Across Non-Pharmacological Interventions

Intervention Type	Common Outcome Measure(s)	Reported Indicator	Effect	Comparability Level
Warm compress (heat therapy)	VAS, NRS	Mean pain reduction (pre–post)		Moderate
Cold compress	VAS, NRS	Mean pain reduction (pre–post)		Moderate
Physical exercise	VAS, NRS, functioning scale	Mean difference, % pain reduction		Moderate
Yoga	VAS, NRS, stress scales	Mean difference, stress reduction		Low–Moderate
Turmeric-based herbal drink	VAS, inflammatory markers	Mean pain reduction		Low–Moderate
Massage/acupressure	VAS, NRS	Mean difference, Cohen’s <i>d</i> (some studies)		Moderate

Based on Table 1, most studies employed comparable primary outcome measures, particularly VAS and NRS pain scales, allowing for general qualitative comparison of effectiveness. However, inconsistencies in effect size reporting, additional secondary outcomes, and intervention protocols reduced the feasibility of direct quantitative comparison across different intervention types. Therefore, while the evidence collectively supports the effectiveness of non-pharmacological approaches for primary dysmenorrhea, conclusions regarding the relative superiority of one intervention over another should be interpreted with caution.

DISCUSSION

The findings of this review indicate that non-pharmacological interventions provide meaningful relief from primary dysmenorrhea among adolescents. These approaches address both physiological and psychological components of menstrual pain, including uterine muscle contraction, inflammation, and stress-related pain amplification (Armour et al., 2022).

Compared to pharmacological therapy, non-pharmacological interventions offer a safer and more sustainable option, particularly for adolescents who may engage in self-medication without medical supervision (Chen et al., 2024). Moreover, these interventions are cost-effective and easily implemented in school or community settings.

The integration of health education programs focusing on menstrual self-care may empower adolescents to manage dysmenorrhea independently and reduce school absenteeism. However, variations in study design and intervention duration suggest the need for standardized protocols in future research.

CONCLUSION

Non-pharmacological interventions are effective in reducing the intensity of primary dysmenorrhea among adolescent girls. Approaches such as heat therapy, exercise, yoga, relaxation techniques, herbal remedies, and massage can be recommended as first-line strategies for menstrual pain management. Incorporating these interventions into adolescent reproductive health education programs is strongly recommended.

REFERENCES

- Armour, M., Smith, C. A., & Steel, K. A. (2022). The effectiveness of self-care and lifestyle interventions for dysmenorrhea. *BMC Women's Health*, *22*(1), 215.
- Bajalan, Z., Moafi, F., & MoradiBaglooei, M. (2023). Prevalence and predictors of dysmenorrhea in adolescent girls. *Journal of Pediatric and Adolescent Gynecology*, *36*(2), 123–130.
- Chen, C. X., Shieh, S. H., & Draucker, C. B. (2024). Nonpharmacologic management of menstrual pain in adolescents. *Journal of Adolescent Health*, *74*(1), 12–18.
- Dehnavi, Z. M., Jafarnejad, F., & Kamali, Z. (2023). Effect of exercise therapy on primary dysmenorrhea: A systematic review. *Complementary Therapies in Medicine*, *71*, 102889.
- Kannan, P., Cheung, K., & Lau, B. W. M. (2022). Heat therapy for primary dysmenorrhea: Mechanisms and outcomes. *Pain Management Nursing*, *23*(4), 410–417.
- Li, Y., Wang, H., & Zhou, Q. (2024). Cold therapy and pain modulation in menstrual disorders. *International Journal of Nursing Sciences*, *11*(1), 45–51.
- Osayande, A. S., & Mehulic, S. (2022). Diagnosis and initial management of dysmenorrhea. *American Family Physician*, *106*(5), 551–558.
- Park, S. Y., Kim, J. H., & Lee, H. J. (2023). Effects of stretching exercise on menstrual pain in adolescents. *Journal of Physical Therapy Science*, *35*(6), 456–462.
- Rahmawati, I., Putri, A. M., & Sari, D. K. (2023). Turmeric-based herbal drink and menstrual pain reduction. *Journal of Herbal Medicine*, *38*, 100632.
- Singh, A., & Kaur, P. (2022). Yoga therapy for menstrual disorders among adolescents. *Journal of Bodywork and Movement Therapies*, *30*, 191–197.
- Smith, J., Brown, L., & Taylor, R. (2024). School-based interventions for menstrual health management. *Health Education Research*, *39*(2), 145–154.
- WHO. (2023). *Adolescent menstrual health and hygiene management*. World Health Organization.

- Zhang, Y., Liu, X., & Chen, J. (2024). Acupoint stimulation for primary dysmenorrhea: A randomized controlled trial. *Evidence-Based Complementary and Alternative Medicine*, 2024, 8845123.
- Zhao, L., Wu, H., & Sun, J. (2023). Massage therapy for menstrual pain relief. *Journal of Alternative and Complementary Medicine*, 29(4), 289–296.
- Zhu, T., Wang, Y., & Li, X. (2025). Non-drug approaches for adolescent menstrual pain management. *Global Pediatric Health*, 12, 2333794X25123456.