

Effectiveness of Physiotherapy Interventions in the Management of Primary Dysmenorrhea

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Abstract:

Primary dysmenorrhea is recurrent menstrual pain without identifiable pelvic pathology and is a frequent cause of activity limitation, academic absence and reduced quality of life among adolescents and young adults. Physiotherapy offers non-pharmacological strategies that may complement medical care and support self-management. This narrative review synthesizes literature published from 2010 through 2020 on therapeutic exercise, transcutaneous electrical nerve stimulation (TENS), heat, manual or massage-based approaches, yoga, relaxation and selected adjuncts. Focused searches of PubMed/MEDLINE, PEDro and the Cochrane Library prioritized systematic reviews, randomized trials and clinically relevant observational evidence. Exercise was the most consistently studied physiotherapy intervention. Reviews indicated that regular aerobic, stretching, strengthening or mixed exercise may reduce menstrual pain, although study quality and intervention reporting were variable. Heat therapy and high-frequency TENS appeared to provide short-term analgesia, while massage, relaxation and yoga showed promising but less certain effects. Evidence did not support presenting any single modality as universally superior. A physiotherapy programme should begin with screening for secondary causes and should match symptom severity, preferences, access and functional goals. Education, graded exercise and a practical self-management plan form the clinical foundation; electrotherapy or heat can be considered as adjuncts. Better trials are required to define dosage, comparative effectiveness, adverse events and durability of benefit.

Keywords: primary dysmenorrhea; menstrual pain; physiotherapy; exercise; TENS; heat therapy; rehabilitation

1. Introduction

Primary dysmenorrhea refers to painful menstruation in the absence of demonstrable pelvic disease. Pain typically begins shortly before or at the onset of bleeding and may be accompanied by low-back pain,

nausea, fatigue, headache, diarrhoea or dizziness. Symptoms can disrupt education, employment, exercise and social participation. Population research during the selected period confirmed that menstrual disturbance is common in adolescents and young women, while many rely on rest or self-medication rather than professional assessment (Parker et al., 2010; Subasinghe et al., 2016).

Non-steroidal anti-inflammatory drugs and hormonal contraceptives are established medical options, but they may be unsuitable, poorly tolerated or insufficient for some individuals. Physiotherapy is relevant because pain can influence movement, muscle tension, breathing, sleep and activity behaviour. It also offers interventions that patients can learn and continue independently. The appropriate role is complementary: physiotherapy should not delay investigation when symptoms suggest secondary dysmenorrhea.

This review examines evidence from 2010-2020 concerning exercise and other physical approaches used to manage primary dysmenorrhea. It emphasizes clinically defensible interpretation rather than assuming that every non-pharmacological modality is effective.

2. Review Approach

A focused narrative search was conducted for English-language literature published from January 2010 through December 2020. PubMed/MEDLINE, PEDro and the Cochrane Library were searched using combinations of “primary dysmenorrhea,” “menstrual pain,” “physiotherapy,” “physical therapy,” “exercise,” “stretching,” “TENS,” “heat,” “massage,” “yoga” and “relaxation.” Systematic reviews, randomized or controlled trials and clinically relevant epidemiological studies were prioritized. Studies of secondary dysmenorrhea or interventions outside physiotherapy and conservative self-management were not used as core evidence. No meta-analysis or formal risk-of-bias pooling was performed.

3. Clinical Features and Mechanisms

3.1 Pain physiology

In primary dysmenorrhea, increased endometrial prostaglandin activity is associated with uterine hypercontractility, reduced uterine blood flow and pain. Nociceptive input can be amplified by anxiety, poor sleep, guarding and reduced activity, but this does not imply that symptoms are psychological or voluntary. Physiotherapy primarily targets pain modulation, movement tolerance and function rather than the endometrial source itself.

3.2 Screening and differential diagnosis

Assessment should document age at onset, timing relative to menstruation, cycle pattern, pain distribution, symptom progression, medication response and impact on function. New severe pain, pain between periods, dyspareunia, abnormal bleeding, infertility concerns, fever, discharge or poor response to usual management can indicate endometriosis, adenomyosis, infection or another secondary cause. Such findings require medical or gynaecological evaluation. A diagnosis of primary dysmenorrhea should not be assigned solely because a young patient reports period pain.

4. Therapeutic Exercise

Exercise may influence dysmenorrhea through endogenous pain modulation, improved circulation, reduced stress reactivity and greater confidence in movement. Programmes studied between 2010 and

2020 included aerobic activity, stretching, strengthening, yoga and mixed routines. The intervention is therefore better understood as a family of approaches than as one standardized treatment.

The early Cochrane review by Brown and Brown (2010) found limited trial evidence and called for better research. Ortiz et al. (2015) later reported that a programme combining general and specific stretching, pelvic-floor exercises, jogging and relaxation reduced dysmenorrheic symptoms. Azima et al. (2015) found benefits from isometric exercise and massage for selected symptoms. These studies support active care but do not identify which component produced the effect.

Matthewman et al. (2018) concluded that physical activity may be effective, while emphasizing the need for higher-quality trials. Two major 2019 syntheses strengthened but did not eliminate uncertainty. Armour et al. found exercise associated with reduced menstrual pain in a self-care meta-analysis, and the Cochrane review reported that exercise may provide a clinically meaningful reduction compared with no exercise, although evidence quality was low. Carroquino-Garcia et al. (2019) similarly concluded that therapeutic exercise reduced pain intensity across randomized trials.

Clinically, a graded programme can begin with tolerable aerobic activity and mobility or stretching, then progress in frequency and intensity. The aim is regular participation across the cycle rather than forcing vigorous activity during severe pain. Choice should reflect preference, fitness, comorbidity and access; adherence to a feasible programme is likely more important than a particular exercise brand.

5. Transcutaneous Electrical Nerve Stimulation

TENS delivers pulsed electrical stimulation through surface electrodes and may reduce pain through segmental inhibition and endogenous analgesic mechanisms. High-frequency TENS has traditionally been used for dysmenorrhea, with electrodes placed according to device guidance and the symptomatic region. The intensity should be strong but comfortable and should not produce skin irritation.

Evidence summarized by Igwea et al. (2016) suggested that TENS can reduce dysmenorrheic pain and may improve quality of life, but available trials were small and heterogeneous. TENS is best considered an adjunct for short-term symptom control rather than a substitute for assessment, exercise or medical care. Contraindications and precautions related to implanted electrical devices, impaired sensation, damaged skin and pregnancy uncertainty must be respected.

6. Heat Therapy

Local heat is accessible and may reduce pain by increasing superficial blood flow, decreasing muscle guarding and providing competing sensory input. It can be applied with a heat wrap, pad or hot-water bottle, provided temperature and exposure are controlled to prevent burns.

Jo and Lee (2018) reviewed randomized trials and found heat therapy associated with lower menstrual pain compared with unheated placebo, no treatment or, in some comparisons, analgesic medication. Armour et al. (2019) also found a moderate effect for heat as a self-care strategy. Trial diversity and risk of bias mean that heat should be offered as an evidence-informed comfort measure, not as a guaranteed treatment. Patients should avoid sleeping on high-temperature devices and should inspect the skin regularly.

7. Massage, Manual Approaches and Relaxation

Massage may reduce perceived pain through touch-related sensory modulation, relaxation and reduced abdominal or lumbar muscle guarding. Azima et al. (2015) reported improvement with massage therapy and isometric exercise, while Shahr et al. (2015) and Bakhtshirin et al. (2015) found benefits from aromatherapy massage. These studies cannot fully separate the effects of massage, attention, scent and expectation. Essential oils can also cause irritation or allergy and are not necessary for a physiotherapy massage intervention.

Breathing control, progressive relaxation and gentle mobility are low-cost additions that may help patients manage guarding and distress. Manual therapy claims should remain proportionate to evidence; forceful visceral techniques or statements that treatment “repositions” pelvic organs are not justified by the literature reviewed here.

8. Yoga, Acupressure and Other Adjuncts

Yoga combines physical postures, breathing and relaxation and is represented within the broader exercise literature. Its multi-component nature may be useful for self-management, but it makes mechanism-specific conclusions difficult. Programmes should be modified for comfort, and painful postures should not be treated as necessary for benefit.

Acupressure is sometimes delivered or taught by physiotherapists in integrative settings. Abaraogu et al. (2016) found promising evidence for SP6 acupressure, whereas the updated Cochrane review of acupuncture and acupressure judged the evidence insufficient for firm conclusions (Smith et al., 2016). These approaches should therefore be presented as optional adjuncts, with honest communication about uncertainty.

9. Evidence Summary

Intervention	Evidence base	Overall interpretation	Clinical position
Exercise	Several reviews and trials	Likely reduces pain; protocols and study quality vary.	Foundation of active self-management.
TENS	Small trials and review evidence	May provide short-term analgesia.	Adjunct after screening and safety check.
Heat	Systematic review evidence	Likely reduces pain for many users.	Accessible symptom-relief option.
Massage/relaxation	Small controlled studies	Promising, but non-specific effects are difficult to separate.	Optional adjunct; avoid exaggerated claims.

Yoga/acupressure	Mixed, lower-certainty evidence	Potential benefit with uncertainty.	Preference-sensitive complementary option.
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10. Clinical Application

A practical programme should combine education, symptom monitoring and an intervention the patient can sustain. The physiotherapist can establish baseline pain and functional interference, agree on a measurable goal, and select one or two interventions rather than prescribing an unmanageable package. Regular aerobic or mixed exercise is appropriate for many patients; stretching and relaxation may improve tolerability. Heat or TENS can be trialled for acute episodes when safe. Response should be reviewed over several cycles because symptoms fluctuate naturally.

Outcomes may include pain intensity, analgesic use, school or work absence, sleep, physical activity and patient global improvement. Failure to improve, worsening symptoms or development of red flags should prompt referral. Shared decision-making is particularly important for adolescents and should preserve privacy, dignity and appropriate guardian involvement under local policy.

11. Limitations and Research Priorities

The literature from 2010-2020 contains small samples, inconsistent diagnostic criteria, diverse exercise doses and limited blinding. Many studies relied on self-reported pain and short follow-up. Multi-component programmes make it difficult to attribute benefit to a single element, and publication bias is possible. This narrative review did not conduct exhaustive screening or formal certainty grading.

Future trials should use clear diagnostic criteria, concealed allocation, credible comparators, adverse-event reporting and outcomes measured across multiple cycles. Direct comparisons of exercise types, dose-response studies and pragmatic trials in clinical physiotherapy settings are needed. Research should also examine attendance, participation and cost, not only pain scores.

12. Conclusion

Physiotherapy can contribute to primary dysmenorrhea management through education, graded therapeutic exercise and selected non-pharmacological analgesic strategies. Evidence published between 2010 and 2020 most consistently supports exercise, with heat and TENS offering reasonable adjunctive options. Massage, relaxation, yoga and acupressure may help some patients, but certainty is lower. Safe practice requires screening for secondary causes, individualized dosage, realistic claims and review of functional outcomes. Physiotherapy should complement, not replace, appropriate medical assessment and treatment.

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