International Journal of Nursing and Health Research
www.nursingjournal.in
Online ISSN: 2664-6420
Received: 02-12-2025, Accepted: 01-01-2026, Published: 15-01-2026
Volume 8, Issue 1, 2026, Page No. 1-2

A nurse-led experimental study on the effectiveness of pudina extract in managing dysmenorrhea among adolescent girls in a selected community area of Chhattisgarh

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Abstract
Dysmenorrhea is one of the most prevalent gynecological complaints among adolescent girls, often resulting in pain, absenteeism from school, and decreased quality of life. Conventional pharmacological management, while effective, may cause side effects and is not always accessible in community settings. Traditional herbal remedies like *Pudina* (Mentha piperita) have analgesic and antispasmodic properties, suggesting potential benefit in menstrual pain relief. This nurse-led experimental study assessed the effect of pudina extract on dysmenorrhea among 120 adolescent girls in a selected community area of Chhattisgarh, India. Participants were randomized into experimental and control groups. The experimental group received pudina extract capsules for three menstrual cycles, while the control group received a placebo. Pain intensity was measured using the Numeric Pain Rating Scale (NPRS). Findings demonstrated a significant reduction in pain scores among the experimental group compared to controls. Results support pudina extract as a safe, effective adjunct for dysmenorrhea management in community settings. The study underscores the role of nurses in integrating evidence-based traditional remedies within primary care.

Keywords: Dysmenorrhea, pudina extract, adolescent girls, community health nursing, menstrual pain

Introduction

Dysmenorrhea, defined as painful menstruation without underlying pathology, affects up to 90% of adolescent girls worldwide (Dawood, 2006; Latthe *et al*., 2006) [3, 7]. In India, prevalence ranges from 50–87% and contributes to academic disruption, reduced physical activity, and psychosocial distress (Bharathi *et al*., 2018) [2]. Standard treatment modalities include nonsteroidal anti-inflammatory drugs (NSAIDs) and hormonal contraceptives. However, concerns about side effects and accessibility in rural communities necessitate alternative approaches.

Mentha piperita (*pudina*), a widely cultivated herb in India, contains menthol and has demonstrated antispasmodic, analgesic, and anti-inflammatory properties in preliminary studies (McKay & Blumberg, 2006) [8]. Nurse-led community interventions offer strategic platforms to evaluate culturally acceptable and cost-effective dysmenorrhea management strategies.

This study aimed to determine the effectiveness of pudina extract in reducing dysmenorrhea intensity among adolescent girls in a selected community area of Chhattisgarh.

Literature Review

Dysmenorrhea: Prevalence and Impact

Dysmenorrhea significantly affects adolescents' daily functioning, school performance, and quality of life (Iacovides *et al*., 2015) [6]. Pain is believed to result from elevated prostaglandin levels triggering uterine contractions (Harel, 2006) [5]. While effective, pharmacological interventions may not be readily available or accepted in rural contexts.

Herbal Interventions for Dysmenorrhea

Historical use of herbal remedies for menstrual pain includes ginger, fennel, and peppermint (*pudina*) (Proctor & Farquhar, 2006) [9]. Studies suggest peppermint's menthol component relaxes smooth muscle, reduces prostaglandin synthesis, and modulates pain perception (McKay & Blumberg, 2006; Grigoleit & Grigoleit, 2005) [4, 8]. However, empirical evidence among adolescents remains limited.

Role of Nurses in Community Health

Community health nurses are pivotal in implementing culturally relevant health interventions and promoting self-management of common conditions (Benton *et al*., 2016) [1]. Integrating traditional herbal remedies into nursing care may enhance acceptability and adherence.

Methods

Study Design

A randomized, double-blind experimental design was employed.

Setting and Participants

The study was conducted in a community area of Chhattisgarh between June and December 2025. Using purposive sampling, 120 adolescent girls (ages 13–19) experiencing moderate to severe dysmenorrhea were recruited. Inclusion criteria were: regular menstrual cycles, no known gynecological disorders, and consent provided.

Intervention

The experimental group received standardized pudina extract capsules (300 mg twice daily) for three consecutive menstrual cycles. The control group received placebo capsules identical in appearance.

Outcome Measure

Pain intensity was assessed using the Numeric Pain Rating Scale (0–10). Baseline pain scores were obtained before

intervention. Follow-up assessments were completed during each menstruation cycle.

Randomization and Blinding
Participants were randomized using a computer-generated sequence. Nurses and participants were blinded to group allocation.

Ethical Considerations
Parental consent and participant assent were obtained. The study was approved by the Institutional Ethics Committee of the affiliated nursing college.

Data Analysis
Data were analyzed using SPSS version 25. Descriptive statistics summarized demographics. Repeated measures ANOVA evaluated differences in pain scores between groups across cycles.

Results

Participant Characteristics
Of 120 enrolled participants, 116 completed the study (experimental = 58; control = 58). Mean age was 16.7 years (SD = 1.8). Demographic characteristics, including nutritional status, menstrual history, and socioeconomic background, were comparable between groups ($p > .05$).

Pain Intensity Outcomes
At baseline, mean pain scores did not differ significantly (experimental = 7.8 ± 1.0; control = 7.7 ± 1.1; $p = .82$). Across three cycles, the experimental group showed consistent reduction in pain scores:

Cycle	Experimental Mean ± SD	Control Mean ± SD
1	5.4 ± 1.2	7.5 ± 1.0
2	4.1 ± 1.0	7.4 ± 1.1
3	3.5 ± 0.9	7.3 ± 1.0

Repeated measures ANOVA indicated a significant time × group interaction ($F [2,228] = 112.45$, $p < .001$), demonstrating greater pain reduction in the pudina group.

Adverse Events
No serious adverse events were reported. Minor complaints included mild gastrointestinal discomfort in three participants (experimental group), which resolved without intervention.

Discussion

The study showed pudina extract significantly reduced dysmenorrhea pain among adolescent girls compared to placebo. These results support existing literature on peppermint's antispasmodic and analgesic effects (McKay & Blumberg, 2006) [8]. The community setting and nurse-led implementation highlight the feasibility of integrating herbal therapies into primary care.

Mechanisms may involve menthol's calcium channel block and prostaglandin inhibition, contributing to reduced uterine contractions (Grigoleit & Grigoleit, 2005) [4]. The sustained pain reduction over three cycles suggests potential cumulative benefits.

Comparison with Previous Studies
Findings align with prior research on herbal remedies like ginger and fennel (Razlog *et al*., 2012) [10] but provide novel evidence specifically for pudina in adolescent populations.

Limitations
Limitations include reliance on self-reported pain scores and single-community sampling, which may limit generalizability. Future multicenter trials with larger samples and longer follow-up are recommended.

Conclusion

Pudina extract significantly reduced menstrual pain among adolescent girls and was well-tolerated. Nurse-led community interventions incorporating pudina extract can be effective, culturally acceptable dysmenorrhea management strategies in resource-limited settings.

Implications for Nursing Practice
- Nurses can integrate evidence-based herbal therapies as adjuncts in dysmenorrhea care.
- Community health sessions should include education on safe use of traditional remedies.
- Policy frameworks may consider support for nurse-driven herbal intervention programs.

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