

Effect of Contrast Hip Bath on Pain Modulation and Quality of Life in Subjects with Primary Dysmenorrhea

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Abstract

Background: Primary dysmenorrhea is recurrent menstrual pain occurring in the absence of pelvic pathology, largely attributed to excessive prostaglandin production and uterine hypercontractility. Contrast hip bath is a classical naturopathic hydrotherapeutic procedure that alternates hot and cold immersion to modulate pelvic circulation and pain.

Objectives: To evaluate the effect of contrast hip bath on pain intensity and quality of life in young women with primary dysmenorrhea.

Materials and Methods: A single-group pre–post interventional study was conducted on 10 women aged 18–21 years (mean 18.8 ± 1.0 years) with primary dysmenorrhea at Government Nature Cure and Yoga Medical College & Hospital, Mysore. Contrast hip bath (hot water $40\text{--}42^\circ\text{C}$ for 3 minutes alternating with cold water $12\text{--}18^\circ\text{C}$ for 1 minute, repeated thrice; total 13–15 minutes) was administered daily for 10 days. Outcomes were assessed using the WaLIDD score, Wong–Baker FACES Pain Rating Scale, Visual Analogue Scale (VAS), and a Quality of Life (QOL) questionnaire before and after the intervention. Data were analysed using Wilcoxon signed-rank tests and paired t-tests; effect sizes were expressed as Cohen's d.

Results: All outcomes improved significantly. Mean WaLIDD score decreased from 8.10 ± 0.88 to 5.70 ± 1.34 ($\Delta -2.40$, $p = 0.002$, $d = -2.23$). Wong–Baker scores decreased from 7.40 ± 1.35 to 4.40 ± 1.26 ($\Delta -3.00$, $p = 0.002$, $d = -2.85$). VAS decreased from 7.60 ± 0.97 to 5.00 ± 0.67 ($\Delta -2.60$, $p = 0.002$, $d = -5.03$). QOL scores increased from 59.00 ± 8.60 to 63.00 ± 7.07 ($\Delta +4.00$, $p = 0.002$, $d = 1.13$). Every participant improved on every measure.

Conclusion: Contrast hip bath therapy produced highly significant short-term reductions in pain severity and improvements in quality of life in young women with primary dysmenorrhea. Larger controlled trials are recommended.

Keywords: *Primary dysmenorrhea; contrast hip bath; hydrotherapy; WaLIDD; Wong–Baker; Visual Analogue Scale; quality of life; naturopathy*

1. Introduction

Primary dysmenorrhea refers to painful menstruation occurring in the absence of identifiable pelvic pathology. Pain typically begins shortly before or at the onset of menstruation and lasts 24–72 hours. Worldwide prevalence ranges from 45% to 95% among women of reproductive age, with 2–29% experiencing severe pain [2,3]. The condition is largely attributed to excessive endometrial production of prostaglandins (particularly PGF₂ α and PGE₂), which induce strong, dysrhythmic uterine contractions, increase uterine tone, and reduce uterine blood flow, resulting in ischaemic, cramp-like pain [1,4].

First-line pharmacological management relies on NSAIDs and hormonal contraceptives. Non-pharmacological options, including hydrotherapy, are of interest because of favourable safety profiles and accessibility [9–11]. Naturopathy emphasises drugless approaches; contrast (alternate) hip bath is believed to improve pelvic circulation, relieve congestion, and normalise uterine muscle tone through alternating vasodilatation and vasoconstriction [5–8,33].

The present study evaluated the effect of a 10-day course of contrast hip bath on pain intensity and quality of life in young women with primary dysmenorrhea.

2. Aims and Objectives

Aim: To evaluate the effect of contrast hip bath in modulating pain in subjects with primary dysmenorrhea.

Objectives:

1. To assess change in pain intensity using the Visual Analogue Scale (VAS) and Wong–Baker FACES Pain Rating Scale.
2. To assess change in dysmenorrhea severity using the WaLIDD score.
3. To assess change in quality of life before and after the intervention.

3. Review of Literature

Primary dysmenorrhea is linked to ovulatory cycles and prostaglandin-mediated uterine hyperactivity and ischaemia [1,4]. Conventional management centres on NSAIDs and hormonal contraceptives [10,11]. Non-pharmacological approaches, including exercise, acupuncture, TENS, and hydrotherapy, have been investigated as adjuncts or alternatives [21–32]. Contrast hip bath produces alternating vasodilatation and vasoconstriction of pelvic vasculature, improves local circulation, reduces congestion, and exerts analgesic and sedative effects without altering menstrual flow [33]. Evidence specific to contrast hip bath in primary dysmenorrhea remains limited, supporting the need for further clinical evaluation.

4. Materials and Methods

4.1 Study Design and Setting

A single-group pre–post interventional study was conducted at the Outpatient Department of Government Nature Cure and Yoga Medical College & Hospital (GNCYMCH), Mysore.

4.2 Participants

Ten female participants aged 18–21 years (mean 18.8 ± 1.0 years) with clinically diagnosed primary dysmenorrhea were enrolled. All completed the protocol with no dropouts.

Inclusion criteria:

- Female subjects with primary dysmenorrhea
- Age 18–24 years
- Willingness to provide written informed consent

Exclusion criteria:

- Secondary dysmenorrhea or identifiable pelvic pathology
- Systemic illness that could interfere with the study or place the participant at risk
- Contraindication to contrast hydrotherapy

4.3 Ethical Considerations

Written informed consent was obtained from all participants after explanation of the study purpose, procedures, benefits, and potential risks. Participation was voluntary and confidentiality was maintained.

4.4 Intervention

Contrast hip bath was administered daily for 10 days. Participants first sat in hot water (40–42°C) for 3 minutes, then in cold water (12–18°C) for 1 minute; this cycle was repeated thrice (total duration approximately 13–15 minutes). Participants consumed one or two glasses of water before the procedure. The intervention was supervised.

4.5 Outcome Measures

WaLIDD Score: Composite measure of working ability, location, intensity, and days of pain; higher scores indicate greater severity.

Wong–Baker FACES Pain Rating Scale (0–10): Higher scores indicate greater pain intensity.

Visual Analogue Scale (VAS, 0–10): Higher scores indicate greater pain intensity.

Quality of Life (QOL) questionnaire: Higher scores indicate better quality of life.

4.6 Statistical Analysis

Descriptive statistics (mean, SD, median, min, max) were calculated. Normality of difference scores was assessed with the Shapiro–Wilk test. Because several difference distributions departed from normality, the Wilcoxon signed-rank test was used as the primary inferential test; paired-samples t-tests were reported for completeness. Effect size was quantified with Cohen’s d for paired designs. Statistical significance was set at two-tailed $\alpha = 0.05$.

5. Results

All 10 participants completed the intervention. Mean age was 18.8 ± 1.0 years (range 18–21).

5.1 Primary Outcomes

Table 1 presents descriptive statistics and Table 2 summarises change scores and inferential results.

Outcome	Time	Mean	SD	Median	Range
Quality of Life	Pre	59.00	8.60	61.0	45–72
	Post	63.00	7.07	65.0	50–74
WaLIDD Score	Pre	8.10	0.88	8.0	7–9
	Post	5.70	1.34	5.5	4–8
Wong–Baker FACES	Pre	7.40	1.35	8.0	6–10
	Post	4.40	1.26	4.0	2–6
VAS (Pain)	Pre	7.60	0.97	8.0	6–9
	Post	5.00	0.67	5.0	4–6

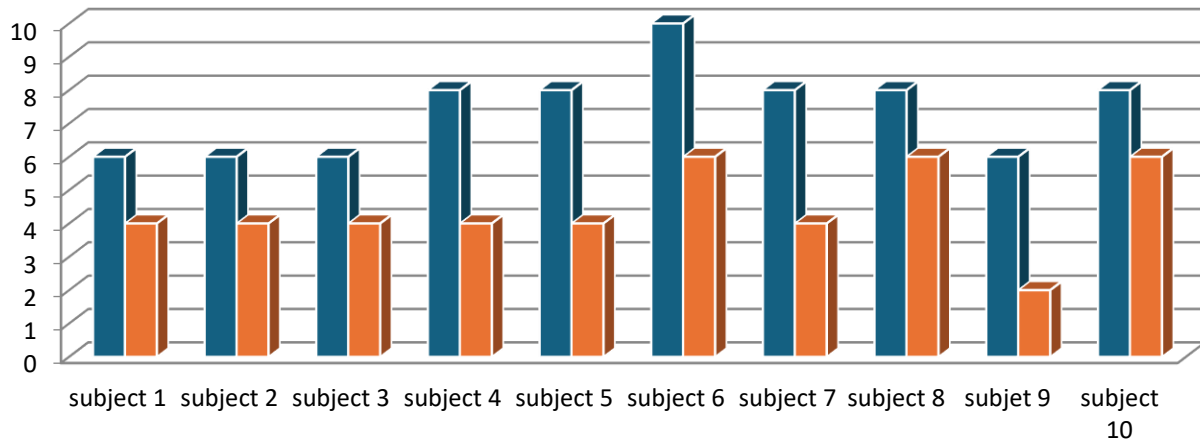
Table 1. Descriptive statistics for all outcome measures ($n = 10$)

Outcome	Mean Δ	SD Δ	Wilcoxon p	t-test p	Cohen’s d
Quality of Life	+4.00	3.53	0.002	0.0059	1.13
WaLIDD Score	–2.40	1.07	0.002	<0.0001	–2.23
Wong–Baker FACES	–3.00	1.05	0.002	<0.0001	–2.85
VAS (Pain)	–2.60	0.52	0.002	<0.0001	–5.03

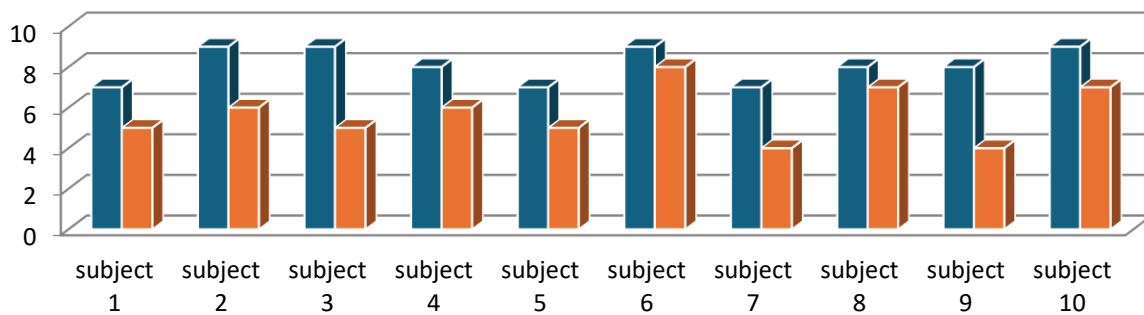
Table 2. Change scores and inferential statistics ($n = 10$)

All four outcomes showed highly significant improvement (Wilcoxon $p = 0.002$ for all). Effect sizes ranged from large (QOL) to extremely large (VAS). Every participant improved on every outcome measure; there were no non-responders.

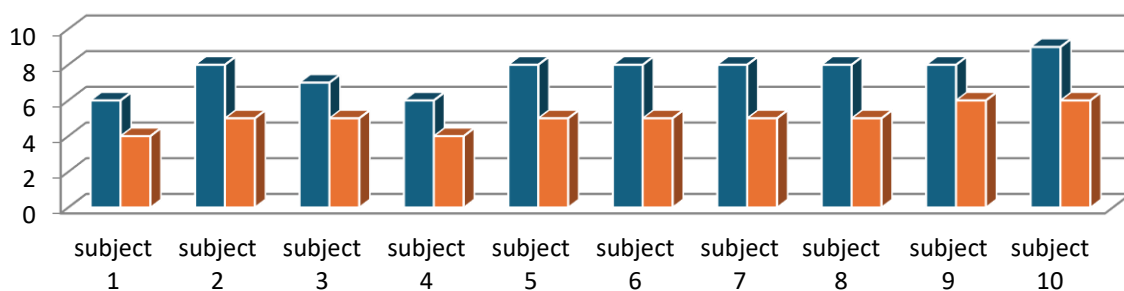
Wong Baker scale Pre-Post

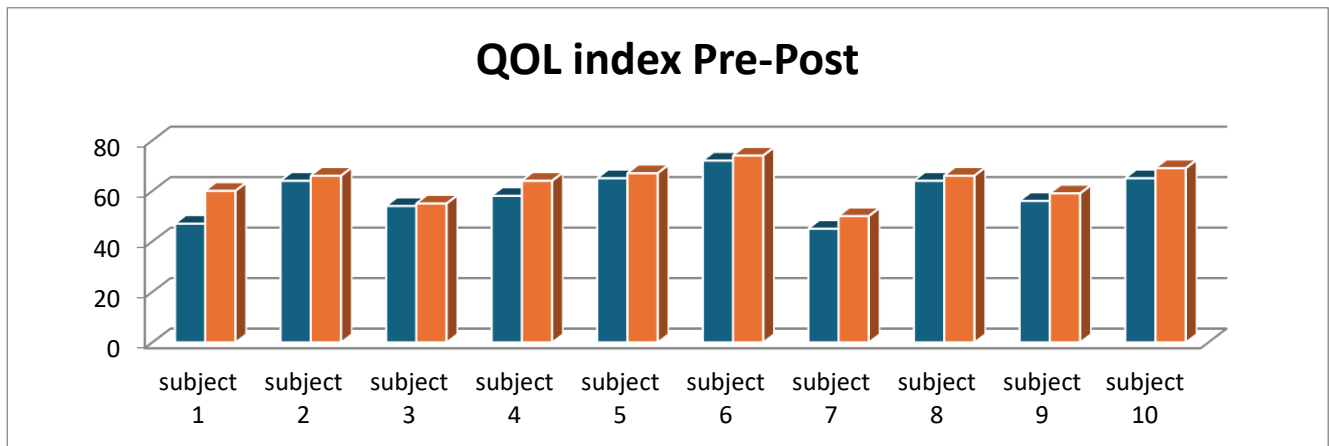


WalIDD score Pre-Post



Visual analogue scale Pre-Post





6. Discussion

In this single-group pre–post study, a 10-day course of contrast hip bath produced highly significant reductions in dysmenorrhea severity (WaLIDD) and pain intensity (Wong–Baker and VAS) and a significant improvement in quality of life. Effect sizes were large to extremely large, and improvement was universal across participants.

These findings are consistent with the proposed physiological effects of contrast hydrotherapy—alternating vasodilatation and vasoconstriction of pelvic vasculature, improved local circulation, reduced congestion, and analgesic effects [33]—and with the broader literature supporting non-pharmacological approaches for primary dysmenorrhea [21–32].

Limitations include the small sample size ($n = 10$), absence of a concurrent control group, lack of blinding (inherent to a physical intervention), short assessment window, and single-centre design. Causal attribution cannot be definitively established; natural variation across the menstrual cycle or placebo effects cannot be excluded. Larger randomised controlled trials are needed.

Despite these limitations, the consistency of improvement, magnitude of effect sizes, safety, and practicality of the protocol support further investigation of contrast hip bath as a non-pharmacological adjunct for primary dysmenorrhea.

7. Conclusion

Within the limitations of this single-group pre–post study, contrast hip bath therapy significantly reduced pain intensity and dysmenorrhea severity and improved quality of life in young women with primary dysmenorrhea. The intervention was safe and well tolerated. These preliminary findings support its potential as a non-pharmacological option and warrant confirmation in larger controlled trials.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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