



Effect of Yoga Versus Jacobson's Relaxation Technique On Pain Severity And Menstrual Symptoms In Primary Dysmenorrhea Among College-Going Girls: A Randomized Controlled Trial.

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Abstract

Background:

Primary dysmenorrhea is a common gynaecological problem among adolescent and young adult females, often affecting daily activities and quality of life. Non-pharmacological interventions such as Yoga and Jacobson's Progressive Muscle Relaxation Technique (JPMRT) have shown beneficial effects in reducing menstrual pain and associated symptoms.

Methods:

A randomized controlled trial was conducted among 34 college-going girls aged 18–25 years with primary dysmenorrhea. Participants were randomly allocated into two groups: Group A (Yoga) and Group B (JPMRT). Yoga was performed for 6 weeks, 4 sessions per week, while JPMRT was practiced twice daily during menstrual days for two consecutive cycles. Pain intensity was assessed using the Numerical Pain Rating Scale (NPRS-11) and menstrual symptoms using the Menstrual Symptom Scale (MSS) before and after the intervention. Paired and unpaired t-tests were used for statistical analysis.

Results:

Both groups showed statistically significant improvement ($p < 0.0001$). However, post-intervention comparison showed significantly greater reduction in NPRS ($p = 0.0130$) and MSS ($p = 0.0054$) scores in the Yoga group compared to the JPMRT group.

Conclusion:

Yoga was found to be more effective than Jacobson's Progressive Muscle Relaxation Technique in reducing pain intensity and menstrual symptoms in primary dysmenorrhea.

Keywords: Primary dysmenorrhea, Yoga, Jacobson relaxation, NPRS, MSS

Introduction :-

Menstruation is a physiological process unique to females ^[1]. Adolescence is a transitional stage from childhood to adulthood characterized by physical, emotional, endocrine, and mental development along with increasing independence. The onset of menstruation, known as menarche, is a major physiological milestone in adolescent girls.

Menstruation refers to the cyclic shedding of the uterine endometrium through the vagina. Although it is a normal biological process, some females experience painful menstruation ^[2]. Normal menstruation represents cyclic shedding of the uterine secretory endometrium due to a decline in estradiol and progesterone production caused by a regressing corpus luteum. ^[3]

Dysmenorrhea, derived from the Greek term meaning "difficult monthly flow," refers to painful menstruation ^[4]. A more practical definition includes pain severe enough to interfere with daily activities ^[3]. Dysmenorrhea is one of the most common gynaecological complaints among young females and is classified into primary and secondary dysmenorrhea ^[5].

Primary dysmenorrhea (PD) is defined as cramp-like pain in the lower abdomen at the onset of menstruation without any identifiable pelvic pathology ^[6]. It may be accompanied by symptoms such as back pain, nausea, vomiting, bloating, breast tenderness, and diarrhoea ^[6].

The prevalence of dysmenorrhea is high worldwide, ranging from 70% to 95%, with reported prevalence in India being 87.87% and incidence 33.5% among adolescent girls [15,16].

Secondary dysmenorrhea is associated with underlying pelvic pathology such as endometriosis, pelvic inflammatory disease, intrauterine devices, ovarian cysts, polyps, adhesions, or cervical stenosis ^[7].

Yoga is derived from the Sanskrit word "yuj," meaning union. It integrates mind, body, and soul through physical postures, breathing techniques, and meditation ^[8, 9]. Yoga has been shown to reduce pain through the release of β -endorphins, which are associated with pain reduction and improved physiological and psychological functions ^[10]. It is a simple, cost-effective, and non-pharmacological intervention that can be performed easily without equipment ^[9].

Jacobson Progressive Muscle Relaxation Technique (JPMRT) is a behavioural therapy that involves systematic tensing and relaxing of muscle groups to promote relaxation of both body and mind [2]. It has been shown to reduce the duration and severity of dysmenorrhea symptoms [2]. JPMRT has been found useful in reducing menstrual pain intensity, anxiety, and improving quality of life and functional performance in women with primary dysmenorrhea [14].

Pain intensity in this study was measured using the Numerical Pain Rating Scale (NPRS-11), an 11-point scale ranging from 0 (no pain) to 10 (worst possible pain) [24]. Menstrual symptoms were assessed using the Menstrual Symptom Scale (MSS), a 24-item Likert scale developed by Chesney and Tasto (1975) and adapted by Güvenç et al. (2014) [15,16].

Although previous studies have demonstrated the individual effectiveness of Yoga and Jacobson's relaxation technique in managing primary dysmenorrhea, very few studies have directly compared these two interventions. Therefore, the present study aimed to compare the effectiveness of Yoga and Jacobson's Progressive Muscle Relaxation Technique on pain intensity and menstrual symptoms among college-going girls with primary dysmenorrhea.

Methods :-

Ethical committee approval was obtained from the institutional ethical committee. Subjects were screened according to the inclusion and exclusion criteria, and the main criterion in this study was that females with primary dysmenorrhea were included, while females with secondary dysmenorrhea were excluded using the Menstrual Symptoms Scale. Written informed consent was obtained.

“A total of 34 females participated in the study and were randomly allocated into two groups: Group A (Yoga) and Group B (Jacobson's Progressive Muscle Relaxation Technique) using the lottery method.”

The Yoga intervention was administered for duration of 6 weeks. Participants performed Yogasanas four times per week, of which two sessions were supervised. The intervention was not performed during the first two days of the menstrual cycle. Each asana was held for at least 10 seconds and repeated for five repetitions. The total duration of each session was approximately 30 minutes, with a rest interval of 30 seconds between consecutive asanas. The Jacobson Progressive Muscle Relaxation Technique was administered for 30 minutes per session during menstrual days over two consecutive menstrual cycles. Participants practiced the technique twice daily during the days of menstruation as per the standard protocol described in previous literature.

The respective procedures were explained to both groups. At the beginning of the study, demographic data were collected, and a pre-test was conducted using the NPRS scale for the severity of dysmenorrhea pain and the MSS scale for the severity of menstrual symptoms.

Intervention Protocol

Participants were divided into two groups based on the study design.

Group A (Yoga Group):

Participants in Group A performed a structured yoga program for a duration of 6 weeks. The intervention was conducted 4 times per week, of which 2 sessions were supervised. The yoga protocol included specific asanas such as Child Pose (Balasana) [19], Baddhakonasana [15,16], Vajrasana [16], Apanasana [5], and Bhujangasana (Cobra Pose) [8,11,15]. The intervention was not performed during the first two days of the menstrual cycle. Each asana was held for at least 10 seconds and repeated 5 times. The total duration of each session was approximately 30 minutes, with a rest interval of 30 seconds between consecutive asanas. [5]

Group B (Jacobson Progressive Muscle Relaxation Group):

Participants in Group B performed Jacobson Progressive Muscle Relaxation Technique for 30 minutes per session over two consecutive menstrual cycles [4]. The intervention was performed twice daily during menstrual days [20].

Outcome Measures

Pain intensity and menstrual symptoms were assessed using standardized outcome measures.

The Numerical Pain Rating Scale (NPRS-11) was used to assess pain intensity. It is an 11-point self-reported scale ranging from 0 (no pain) to 10 (worst possible pain) [8]. The NPRS is widely used due to its simplicity, validity, and reliability. It has demonstrated strong correlation with the Visual Analogue Scale (VAS) ($r = 0.86-0.95$) and high test-retest reliability ($r = 0.95-0.96$) in patients with chronic pain conditions [17, 18].

Menstrual symptoms were evaluated using the Menstrual Symptom Scale (MSS) [19]. It is a 24-item Likert-type scale used to assess physical, psychological, and behavioral symptoms associated with menstruation. Each item is scored from 1 (never) to 5 (always), with a total score range of 24–120. Higher scores indicate greater severity of menstrual symptoms. The MSS has demonstrated high reliability (Cronbach's alpha = 0.933)

4. Statistical Analysis

The data were analyzed and presented in the form of graphical tables using Graph Pad Prism software version 5.0. A paired t-test was applied for within-group analysis, while an unpaired t-test was used to compare between-group differences. The level of statistical significance was set at $p < 0.05$.

5. Results

Within-Group Analysis

Within-group analysis was performed using paired *t*-tests to evaluate pre- and post-intervention changes in both groups.

Table 1: Within-Group Comparison of NPRS and MSS Scores

Outcome Measure	Group	N	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	t-value	p-value
NPRS	(A)	17	6.8 ± 1.8	3.9 ± 1.9	12.0	<0.0001
NPRS	(B)	17	7.5 ± 1.1	5.4 ± 1.5	9.4	<0.0001
MSS	(A)	17	74 ± 13	53 ± 9.4	5.9	<0.0001
MSS	(B)	17	71 ± 14	65 ± 13	7.7	<0.0001

Interpretation:

Both Group A (Yoga) and Group B (Jacobson Relaxation Technique) showed statistically significant improvements in pain (NPRS) and menstrual symptoms (MSS) following the intervention ($p < 0.0001$).

Between-Group Analysis: - Between-group comparisons were performed using unpaired *t*-tests.

Table 2: Between-Group Comparison of NPRS and MSS Scores

Outcome Measure	Comparison	t-value	p-value
NPRS (Pre-test)	A vs B	1.4	0.1716
NPRS (Post-test)	A vs B	2.6	0.0130*
MSS (Pre-test)	A vs B	0.65	0.5213
MSS (Post-test)	A vs B	3.0	0.0054*

Interpretation:

There was no statistically significant difference between the groups at baseline ($p > 0.05$), indicating comparability. However, post-intervention analysis showed a statistically significant reduction in NPRS ($p = 0.0130$) and MSS ($p = 0.0054$) scores in Group A compared to Group B. These findings indicate that **Yoga (Group A)** was more effective than **Jacobson Progressive Muscle Relaxation Technique (Group B)** in reducing pain intensity and menstrual symptoms.

6. Discussion

The present study evaluated and compared the effects of Yoga and Jacobson's Relaxation Technique on menstrual pain and symptoms in primary dysmenorrhea among college-going girls using the Numerical Pain Rating Scale (NPRS) and Menstrual Symptom Scale (MSS).

In the present study, the NPRS score in the Yoga group reduced from **6.8 ± 1.8 to 3.9 ± 1.9**, while in the JPMRT group it reduced from **7.5 ± 1.1 to 5.4 ± 1.5**. Similarly, MSS scores reduced from **74 ± 13 to 53 ± 9.4** in the Yoga group and **71 ± 14 to 65 ± 13** in the JPMRT group, indicating greater effectiveness of Yoga.

Dysmenorrhea is highly prevalent among adolescent girls, with reported prevalence ranging from 70% to 95% globally and 87.87% in India ^[13, 14]. In the present study, participants were randomly allocated into two groups, ensuring comparability at baseline.

The results demonstrated statistically significant improvements in both groups; however, the Yoga group showed greater reduction in pain intensity and menstrual symptoms compared to the Jacobson relaxation group. These findings are consistent with previous studies that have reported the effectiveness of Yoga in reducing dysmenorrhea-related pain and improving quality of life ^[10].

The effectiveness of Yoga may be attributed to its multidimensional effects on both physiological and psychological mechanisms. Yoga improves blood circulation to the pelvic region, promotes muscle relaxation, and reduces prostaglandin activity, thereby decreasing uterine contractions and pain. It also enhances parasympathetic activity and reduces stress through modulation of the hypothalamic–pituitary–adrenal (HPA) axis ^[10].

Previous studies have demonstrated that regular Yoga practice significantly reduces menstrual pain intensity and improves overall well-being (Kanchibhotla et al., 2023; Sarshin et al., 2023). Similar findings were reported by Mrunmayee Mande et al. (2022), who concluded that Yoga is effective in managing primary dysmenorrhea among females aged 18–25 years.

Jacobson's Progressive Muscle Relaxation Technique was also found to be effective in reducing pain and symptoms. Its mechanism involves reduction of muscle tension, decreased sympathetic activity, and improved relaxation response ^[2, 12]. Previous studies have reported significant reduction in dysmenorrhea symptoms following Jacobson's relaxation technique (Manalu et al., 2020; Moradpour, 2019). According to Hanan Ibrahim Ibrahim ⁽¹⁾, Hanan Abd-Elrahman Kandeel et al. 2023; Jacobson relaxation technique is also a type of therapy for primary dysmenorrhea that focuses on tightening and relaxing specific muscle groups in sequence. One of the mechanisms is releasing endorphins from the brain and spinal cord, which act as natural sedative, that cause a sense of comfort. However, progressive relaxation technique is simply easy to adopt, self-administered, and has no side effects. Therefore it has beneficial effect on reduction of dysmenorrhea and associated symptoms which turns, improve the quality of life and self-esteem. ^[21]

Studies by Yogini Warulkar et al. (2020) and S. Akilandeswari (2017) also support the effectiveness of Jacobson's relaxation technique in reducing pain associated with dysmenorrhea.

However, Jacobson's technique primarily targets muscular relaxation, whereas Yoga provides a more comprehensive approach by influencing endocrine, neurological, and psychological functions. This difference may explain the greater effectiveness of Yoga observed in the present study.

Thus, the findings of this study support the use of Yoga as an effective non-pharmacological intervention for managing primary dysmenorrhea.

7. Conclusion

The present study concludes that Yoga is significantly more effective than Jacobson's Progressive Muscle Relaxation Technique in reducing pain intensity and menstrual symptoms in college-going girls with primary dysmenorrhea.

8. Limitations

The study had a small sample size..

9. Clinical Implications

Yoga can be recommended as a cost-effective, non-pharmacological, and easily implementable intervention for managing primary dysmenorrhea in young female

10. Future Scope :- Future studies with larger sample sizes.

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