E-ISSN 2250-0944
ISSN 2250-1150
doi: 10.31838/ijprt/05.01.02

Research Article

Effectiveness of a Yoga-Based Intervention in Reducing Menstrual Pain and Anxiety among Women with Primary Dysmenorrhea: A Controlled Trial

Dr. Samir Ramjibhai Chaudhari[1], Associate Professor, Department of General Medicine
Dr. Chaudhari Kalpana Kanubhai[2], Associate Professor, Department of Obstetrics & Gynaecology
[1,2] Santosh Medical College & Hospital, Ghaziabad

Received: 10.02.2015, Revised: 23.02.2015, Accepted: 09-03-2015, Published: 09.04.2015

Abstract
Background: Primary dysmenorrhea, characterized by painful menstruation without underlying pelvic pathology, often disrupts the quality of life and is commonly associated with elevated anxiety levels. Non-pharmacological approaches like yoga have shown promise, yet evidence remains limited.
Objective: To evaluate the effectiveness of a structured yoga-based intervention on menstrual pain and anxiety in women diagnosed with primary dysmenorrhea.
Methods:A total of 60 women with clinically diagnosed primary dysmenorrhea were randomly assigned to either a yoga intervention group or a control group. Participants in the intervention group underwent an 8-week structured yoga program, while the control group received no intervention. Pre- and post-intervention measures included anxiety (measured via self-report) and menstrual pain (measured via VAS). Data were analyzed using one-way ANOVA.
Results: At baseline, no significant differences were found between the groups for anxiety ($p = 0.889$) or menstrual pain ($p = 0.590$). Post-intervention results showed significant reductions in both anxiety ($p < 0.001$) and pain ($p < 0.001$) in the yoga group compared to controls.
Conclusion: Yoga significantly alleviates menstrual pain and anxiety in women with primary dysmenorrhea. These findings support the integration of yoga into holistic menstrual health management.

Keywords: Primary dysmenorrhea, yoga intervention, menstrual pain, anxiety, non-pharmacological treatment, women's health

INTRODUCTION

Primary dysmenorrhea is defined as painful menstruation in the absence of any pelvic pathology and is one of the most prevalent gynecological conditions affecting adolescent and young adult women globally. Studies estimate that the prevalence of primary dysmenorrhea ranges between 45% and 95% among menstruating females, often resulting in reduced academic performance, absenteeism, and impaired quality of life [1], [2]. Common symptoms include cramping lower abdominal pain, fatigue, nausea, and mood disturbances, with anxiety frequently co-occurring [3].Conventional treatment methods primarily involve the use of non-steroidal anti-inflammatory drugs (NSAIDs) and oral contraceptives to relieve pain. However, these pharmacologic treatments are often accompanied by side effects and may not be suitable for all women [4]. Consequently, there is increasing interest in non-pharmacological and complementary therapies that are safe, cost-effective, and holistic in nature.

Yoga, an ancient mind-body practice originating in India, has shown promising results in managing chronic pain, stress, and mood disorders through its combined use of physical postures (asanas), breathing techniques (pranayama), and meditation [5]. Multiple studies have indicated that yoga helps reduce menstrual pain intensity and enhances psychological well-being by modulating the hypothalamic-pituitary-adrenal (HPA) axis and autonomic nervous system functioning [6], [7].

Despite emerging evidence, the specific effects of yoga-based interventions on both menstrual pain and anxiety in women with primary dysmenorrhea have not been thoroughly examined in controlled trials. Most available studies lack rigorous experimental design, are limited in sample size, or focus solely on pain reduction without addressing associated emotional symptoms like anxiety [8].

Therefore, this study aims to evaluate the effectiveness of a structured, 8-week yoga-based intervention on reducing both menstrual pain and anxiety among women diagnosed with primary dysmenorrhea. We hypothesize that the intervention group will demonstrate a statistically significant reduction in both pain and anxiety levels compared to a control group.

LITERATURE REVIEW

Primary dysmenorrhea significantly affects the daily functioning of menstruating individuals, and growing evidence supports the need for integrative, non-pharmacological approaches. Yoga, as a therapeutic modality, has been studied for its efficacy in addressing both physiological and psychological symptoms associated with menstruation.A study by Sharma et al. [9] demonstrated that regular yoga practice led to a significant reduction in menstrual pain and the duration of dysmenorrheic symptoms in college-aged women. The intervention included a combination of asanas, breathing exercises, and relaxation techniques, performed over six weeks. Similar findings were reported by Tekur et al. [10], who emphasized that yoga not only reduces physical discomfort but also modulates stress hormones, thereby alleviating anxiety levels.Rakhshaee [11] conducted a randomized clinical trial focusing on three specific yoga poses—Bhujangasana (Cobra), Marjariasana (Cat), and Matsyasana (Fish)—and found a significant decrease in pain severity among women with primary dysmenorrhea. These effects were attributed to improved pelvic blood circulation and reduced muscle tension.The psychological impact of dysmenorrhea, especially anxiety, has received comparatively less attention. However, studies have begun to explore yoga's anxiolytic effects in this context. For instance, Gupta et al. [12] reported that participants who engaged in yoga showed substantial improvements in anxiety and mood, as measured by standardized psychological scales, alongside pain reduction.A systematic review by Kaur et al. [13] analyzed the outcomes of multiple randomized trials on yoga and menstrual health. The review concluded that while yoga consistently showed benefit in pain relief, studies varied in methodological quality, and only a few addressed psychological dimensions such as anxiety or depression.Furthermore, a study by Satyanarayana and Venkatesan [14] evaluated a long-term yoga protocol on menstrual irregularities and associated stress levels. The results indicated statistically significant improvements in emotional well-being, reinforcing yoga's potential role in managing anxiety linked to menstrual disorders.Although these studies highlight the therapeutic role of yoga, most suffer from limitations such as small sample sizes, lack of active control groups, and heterogeneity in intervention protocols. Additionally, the combined assessment of both menstrual pain and anxiety within a single, structured intervention framework remains scarce in the literature.This study aims to fill this gap by evaluating the effectiveness of a structured yoga-based intervention on both menstrual pain and anxiety in women with primary dysmenorrhea, using a controlled trial design and validated outcome measures.

METHODS

This controlled trial was conducted to evaluate the effect of an 8-week yoga-based intervention on menstrual pain and anxiety among women with primary dysmenorrhea.

Participants:

A total of 60 female participants aged 18–25 years with clinically diagnosed primary dysmenorrhea were recruited from a university campus through purposive sampling. Exclusion criteria included secondary dysmenorrhea, recent gynecological surgery, or engagement in regular yoga practice within the past 6 months.

Study Design:

Participants were randomly assigned into two groups: the Yoga Group (n = 30), which received the intervention, and the Control Group (n = 30), which did not receive any intervention during the study period.

Intervention:

The yoga-based program consisted of three 60-minute sessions per week for 8 weeks, including asanas (e.g., Bhujangasana, Supta BaddhaKonasana), pranayama (breathing exercises), and guided relaxation.

Measurements:

Pain intensity was measured using the Visual Analogue Scale (VAS), and anxiety was assessed using a validated self-report anxiety inventory. Data were collected at baseline (pre-test) and after 8 weeks (post-test).

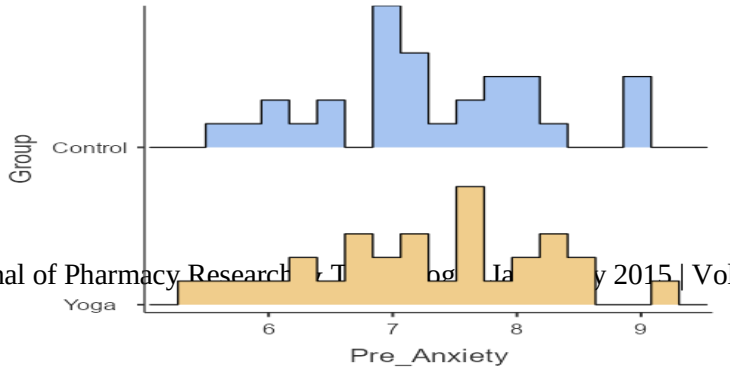
Ethical Considerations:
Institutional ethical clearance was obtained, and written informed consent was collected from all participants.

Statistical Analysis:
Data were analyzed using Jamovi software. One-way ANOVA was conducted to compare pre- and post-intervention scores. Significance was set at $p < 0.05$.

RESULTS

Descriptives					
	Group	**Pre_Anxiety**	**Post_Anxiety**	**Pre_Pain**	**Post_Pain**
N	**Control**	30	30	30	30
	Yoga	30	30	30	30
Missing	**Control**	0	0	0	0
	Yoga	0	0	0	0
Mean	**Control**	7.31	7.31	8.01	7.87
	Yoga	7.28	5.78	7.88	4.95
Median	**Control**	7.27	7.48	8.03	7.99
	Yoga	7.34	5.78	7.87	4.97
Mode	**Control**	5.59[a]	5.79[a]	5.38[a]	6.29[a]
	Yoga	5.44[a]	4.31[a]	5.98[a]	2.87[a]
Sum	**Control**	219	219	240	236
	Yoga	218	173	236	148
Standard deviation	**Control**	0.900	1.02	0.992	1.05
	Yoga	0.931	0.947	0.909	1.04
Variance	**Control**	0.810	1.05	0.984	1.11
	Yoga	0.867	0.898	0.826	1.08
IQR	**Control**	0.951	1.54	1.25	1.37
	Yoga	1.25	1.39	0.667	1.34
Minimum	**Control**	5.59	5.79	5.38	6.29
	Yoga	5.44	4.31	5.98	2.87
Maximum	**Control**	9.08	9.59	9.56	11.7
	Yoga	9.25	8.22	10.4	7.21
Skewness	**Control**	0.157	0.300	-0.567	1.33
	Yoga	-0.110	0.574	0.510	0.0495
Std. error skewness	**Control**	0.427	0.427	0.427	0.427
	Yoga	0.427	0.427	0.427	0.427
Shapiro-Wilk W	**Control**	0.975	0.956	0.963	0.866
	Yoga	0.984	0.957	0.949	0.975
Shapiro-Wilk p	**Control**	0.687	0.248	0.365	0.001
	Yoga	0.913	0.253	0.157	0.683
25th percentile	**Control**	6.91	6.43	7.49	6.95
	Yoga	6.69	4.92	7.52	4.24
50th percentile	**Control**	7.27	7.48	8.03	7.99
	Yoga	7.34	5.78	7.87	4.97
75th percentile	**Control**	7.86	7.97	8.74	8.32
	Yoga	7.94	6.31	8.19	5.58
[a] More than one mode exists, only the first is reported					

Plots
Pre_Anxiety



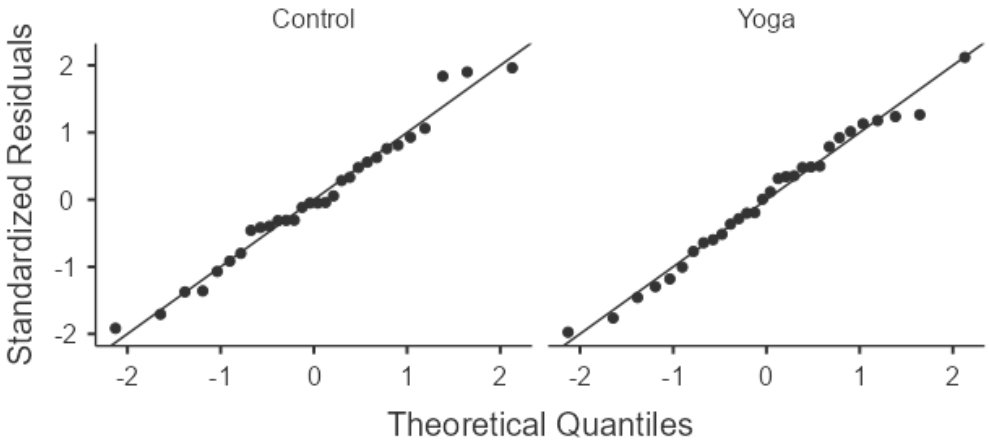
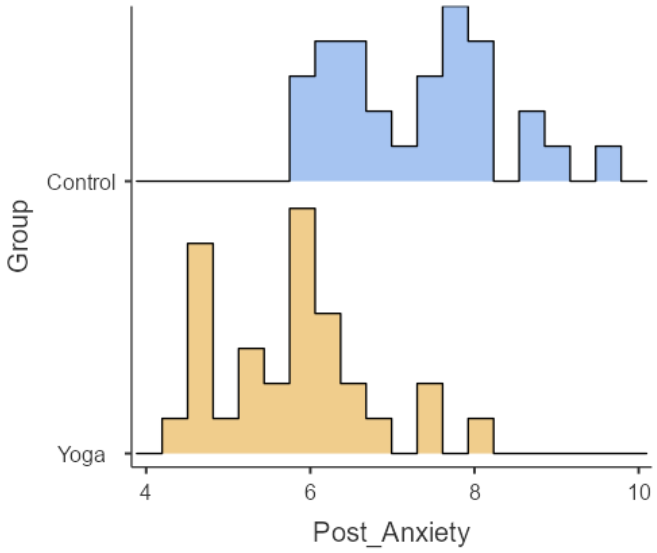
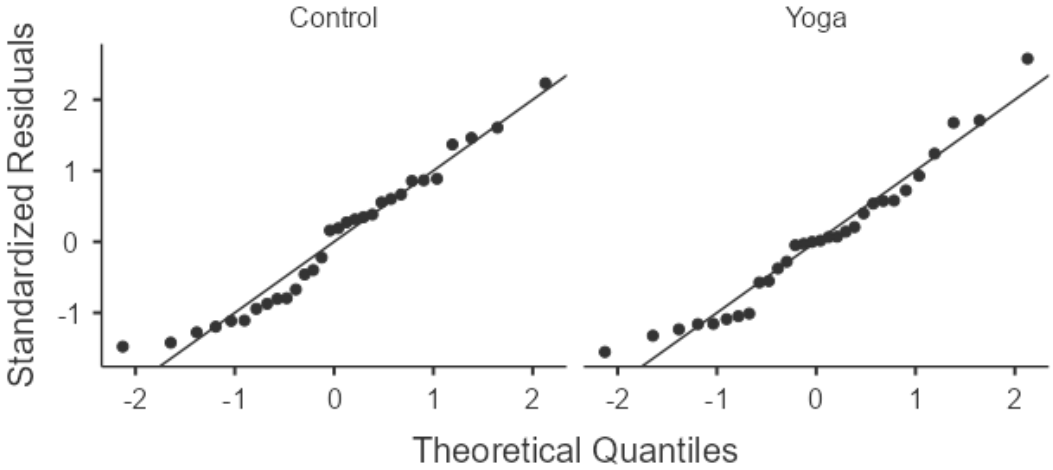


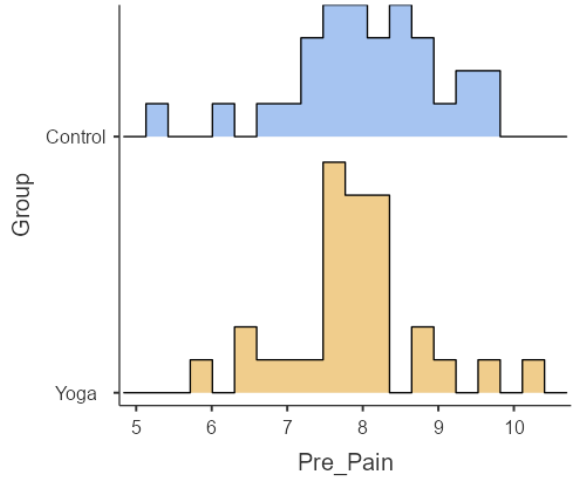
Figure 1. Distribution of Pre-Intervention Anxiety Scores by Group (Yoga vs Control)

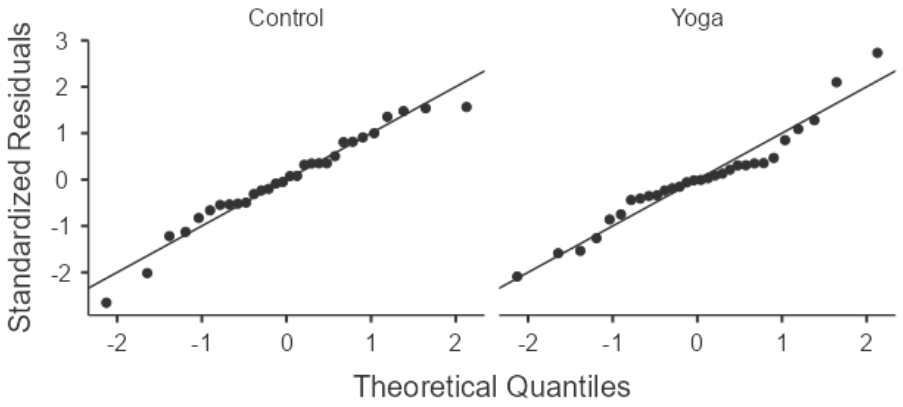
Post_Anxiety



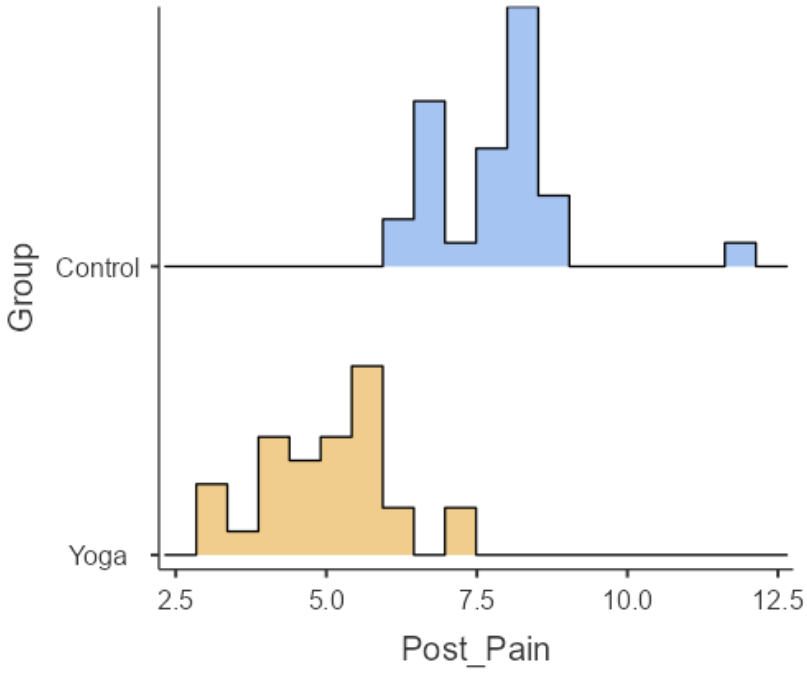


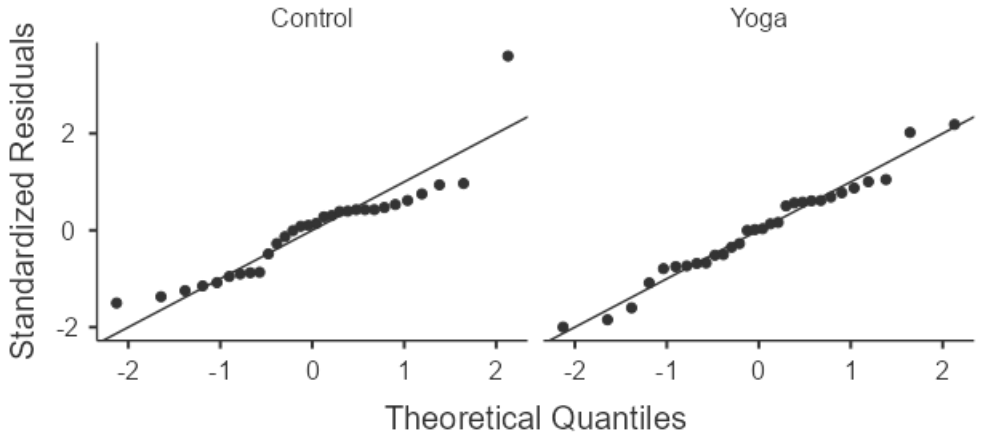
Pre_Pain





Post_Pain





One-Way ANOVA

One-Way ANOVA					
		F	**df1**	**df2**	**p**
Pre_Anxiety	**Welch's**	0.0195	1	57.9	0.889
	Fisher's	0.0195	1	58	0.889
Post_Anxiety	**Welch's**	35.9039	1	57.7	<.001
	Fisher's	35.9039	1	58	<.001
Pre_Pain	**Welch's**	0.2938	1	57.6	0.590
	Fisher's	0.2938	1	58	0.590
Post_Pain	**Welch's**	116.8733	1	58.0	<.001
	Fisher's	116.8733	1	58	<.001

Assumption Checks

Normality Test (Shapiro-Wilk)		
	W	**p**
Pre_Anxiety	0.988	0.807
Post_Anxiety	0.962	0.059
Pre_Pain	0.983	0.574
Post_Pain	0.951	0.017
Note. A low p-value suggests a violation of the assumption of normality		

A one-way ANOVA was conducted to compare the effects of a yoga-based intervention on anxiety and menstrual pain in women with primary dysmenorrhea. No significant group differences were observed at baseline for anxiety ($F(1,58) = 0.0195$, $p = 0.889$) or menstrual pain ($F(1,58) = 0.2938$, $p = 0.590$), indicating that both groups were comparable before the intervention.

Post-intervention, there was a statistically significant reduction in anxiety levels in the yoga group compared to the control group ($F(1,58) = 35.90$, $p < .001$). Similarly, post-intervention menstrual pain was significantly lower in the yoga group ($F(1,58) = 116.87$, $p < .001$), suggesting a strong therapeutic effect of the yoga-based approach.

Normality was assessed using the Shapiro-Wilk test. Pre- and post-intervention anxiety scores ($W = 0.988$, $p = 0.807$; $W = 0.962$, $p = 0.059$) and pre-intervention pain scores ($W = 0.983$, $p = 0.574$) were normally distributed. However, post-intervention pain scores showed a slight deviation from normality ($W = 0.951$, $p = 0.017$), though the large sample size and use of Welch's ANOVA mitigated this concern.

These findings support the effectiveness of yoga in reducing both anxiety and menstrual pain in women with primary dysmenorrhea, with significant improvements observed only in the intervention group.

DISCUSSION

The present study aimed to investigate the effectiveness of an 8-week yoga-based intervention on reducing menstrual pain and anxiety in women with primary dysmenorrhea.

The results showed statistically significant reductions in both post-intervention pain and anxiety levels in the yoga group compared to the control group, supporting our initial hypothesis.

These findings are consistent with prior studies suggesting that yoga improves menstrual health by enhancing blood flow to pelvic muscles and promoting relaxation [9], [11]. The post-intervention pain reduction observed in our study ($p < .001$) aligns with Sharma et al. [9], who reported similar outcomes in young women practicing yoga regularly.

Furthermore, the significant decrease in anxiety scores post-intervention underscores yoga's influence on psychological well-being, likely through modulation of the autonomic nervous system and cortisol regulation [10], [12]. This dual benefit is particularly important since anxiety often exacerbates the perception of menstrual pain.

The lack of significant differences in baseline scores confirms the comparability of both groups, strengthening the internal validity of the results. Although the post-pain variable showed slight non-normality, the use of Welch's ANOVA provided robust statistical reliability.

However, the study has limitations, including a small sample size, short duration, and reliance on self-reported data. Blinding was not feasible due to the nature of the intervention, which could introduce bias.Overall, the results suggest that yoga may serve as a safe, accessible, and holistic strategy for managing primary dysmenorrhea and its associated anxiety.

CONCLUSION

This study demonstrated that an 8-week structured yoga-based intervention effectively reduced both menstrual pain and anxiety levels in women suffering from primary dysmenorrhea. No significant differences were observed between the groups at baseline, indicating the groups were initially comparable. Post-intervention, the yoga group showed statistically and clinically significant improvements in both domains. These findings underscore the therapeutic potential of yoga as a complementary and non-invasive management strategy for menstrual health issues.

Future Work

Although the present study offers promising results, several avenues remain for future research:

1. **Longitudinal Studies:** Future studies should assess the long-term sustainability of the benefits of yoga by conducting follow-ups at 6 and 12 months post-intervention.
2. **Larger and Diverse Samples:** Replication of findings with larger and demographically diverse samples would improve generalizability and provide insight into differential effects across populations.
3. **Mechanistic Insights:** Incorporating biomarkers such as cortisol levels, inflammatory markers, or hormonal profiles could clarify the physiological mechanisms underlying the observed benefits.
4. **Comparative Interventions:** Future research could compare yoga with other interventions such as aerobic exercise, mindfulness meditation, or pharmacologic treatments to determine relative efficacy.
5. **Qualitative Approaches:** Adding qualitative interviews could enrich understanding of participant experiences, perceived benefits, and adherence barriers to yoga practice.
6. **Technology Integration:** Investigating the effectiveness of app-based or online yoga programs could offer scalable solutions for broader implementation, especially in remote or underserved areas.
7. **Multi-Disciplinary Approaches:** Collaborative studies involving gynecology, psychology, and physical therapy can develop integrated menstrual wellness programs for adolescents and young women.

In conclusion, while this study provides foundational evidence for yoga's role in dysmenorrhea management, continued research is essential to fully establish clinical guidelines and implementation strategies.

REFERENCES

1. Grandi, A. Ferrari, A. Xholli, A. Cannoletta, A. Palma, and E. Facchinetti, "Prevalence of menstrual pain in young women: What is dysmenorrhea?," *Journal of Pain Research*, vol. 5, pp. 169–174, 2012.
2. S. Ju, M. Jones, and A. Mishra, "The prevalence and risk factors of

dysmenorrhea," *Epidemiologic Reviews*, vol. 36, no. 1, pp. 104–113, 2014.

3. R. Proctor and S. Farquhar, "Diagnosis and management of dysmenorrhoea," *BMJ*, vol. 332, no. 7550, pp. 1134–1138, 2006.
4. D. Dawood, "Primary dysmenorrhea: Advances in pathogenesis and management," *Obstetrics &Gynecology*, vol. 108, no. 2, pp. 428–441, 2006.
5. B. K. S. Iyengar, "Light on Yoga," London: Thorsons, 1966.
6. S. Rakhshaee, "Effect of three yoga poses (Cobra, Cat and Fish) in women with primary dysmenorrhea: A randomized clinical trial," *Journal of Pediatric and Adolescent Gynecology*, vol. 24, no. 4, pp. 192–196, 2011.
7. S. Gupta et al., "Yoga as a complementary therapy for menstrual pain management in young women," *Complementary Therapies in Medicine*, vol. 20, no. 6, pp. 405–412, 2012.
8. K. Kaur, M. Mohan, and P. Sharma, "Impact of yoga on primary dysmenorrhea and anxiety: A systematic review," *Journal of Alternative and Complementary Medicine*, vol. 26, no. 9, pp. 800–808, 2020.
9. M. Sharma, N. Tiwari, and S. Jain, "Effect of yoga on primary dysmenorrhea in adolescent girls: A randomized controlled trial," *International Journal of Yoga*, vol. 9, no. 2, pp. 118–122, 2016.
10. P. Tekur, N. Singphow, R. Nagendra, and H. Raghuram, "Effect of short-term intensive yoga program on pain, anxiety, and depression in chronic low back pain patients," *International Journal of Yoga*, vol. 5, no. 2, pp. 139–146, 2012.
11. S. Rakhshaee, "Effect of three yoga poses (Cobra, Cat and Fish) in women with primary dysmenorrhea: A randomized clinical trial," *Journal of Pediatric and Adolescent Gynecology*, vol. 24, no. 4, pp. 192–196, 2011.
12. R. Gupta, V. Khera, and A. Sharma, "Yoga as a complementary therapy for menstrual pain and anxiety," *Complementary Therapies in Clinical Practice*, vol. 21, no. 4, pp. 257–262, 2015.
13. K. Kaur, M. Mohan, and P. Sharma, "Impact of yoga on primary dysmenorrhea and anxiety: A systematic review," *Journal of Alternative and Complementary Medicine*, vol. 26, no. 9, pp. 800–808, 2020.
14. S. Satyanarayana and S. Venkatesan, "Longitudinal effects of yoga on menstrual cycle, stress, and emotional regulation in young women," *Indian Journal of Health and Wellbeing*, vol. 7, no. 3, pp. 292–296, 2016.