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Yoga As An Effective Intervention For Primary Dysmenorrhea Among Young Adult Girls

Vandana Rathore
Research Scholar
Department of Yoga and Naturopathy School of Alternative Therapy
University of Technology, Vatika, Jaipur- 303905

Abstract: Primary dysmenorrhea, a prevalent condition among adolescent girls, causes significant discomfort and impacts quality of life. Traditional treatments like NSAIDs offer temporary relief but often lead to side effects and do not address the underlying causes. This study evaluates the effectiveness of yoga therapy as a holistic, non-pharmacological intervention for managing primary dysmenorrhea. Conducted in Jaipur, Rajasthan, with 270 participants, the study divided the participants into an experimental group, which received yoga training, and a control group. The intervention included specific yoga postures (asanas) and breathing exercises (pranayama), with pain intensity and quality of life assessed using validated scales before and after the intervention. The results demonstrated a significant reduction in pain intensity and improvements in physical, psychological, and educational factors in the experimental group, with a highly significant p-value of 0.001, while the control group showed no such improvements. The findings suggest that yoga offers a promising alternative to conventional treatments for primary dysmenorrhea, particularly in settings where access to healthcare is limited. These results underscore the potential of yoga as an effective, holistic approach to improving the well-being of adolescent girls suffering from dysmenorrhea.

Index Terms - Primary dysmenorrhea, yoga therapy, adolescent health, pain management, holistic intervention.

I. INTRODUCTION

Adolescence is a critical period of physical, emotional, and psychological development, during which young girls experience profound changes that influence their overall health and future well-being. Among the various challenges faced during this stage, primary dysmenorrhea stands out as a prevalent and often debilitating condition. Characterized by painful menstrual cramps in the absence of any underlying pathology, primary dysmenorrhea affects up to 90% of adolescent girls, significantly impacting their quality of life (Iacovides et al., 2015).

In many cases, dysmenorrhea leads to frequent absenteeism from school, diminished academic performance, and limited participation in social and extracurricular activities (Bernardi et al., 2017). Despite its widespread prevalence, the condition remains underdiagnosed and undertreated, particularly in rural areas where access to healthcare services is limited (Amoa et al., 2019). Traditional treatments, including NSAIDs, focus on symptom management but do not address the underlying causes of pain. Moreover, these medications are associated with side effects such as gastrointestinal issues, which can further complicate the lives of young girls (Proctor & Farquhar, 2006).

Given the limitations of conventional treatments, there is a growing interest in alternative therapies that can offer sustainable relief without adverse side effects. Yoga, an ancient practice rooted in holistic health, has gained attention for its potential benefits in managing various physical and psychological conditions (Riley & Park, 2015). This study explores the efficacy of yoga as a therapeutic intervention for primary

dysmenorrhea among adolescent girls, particularly those in rural settings where access to conventional medical care may be restricted.

II. METHODOLOGY

The study employed a **quasi-experimental design** to evaluate the effectiveness of yoga therapy on primary dysmenorrhea among young adult girls. The research was conducted in selected colleges in Jaipur, Rajasthan, involving a total of 270 participants, divided equally into an experimental group and a control group (135 participants each).

Research Approach

An evaluative approach was adopted to assess the impact of yoga therapy on the participants. This approach was selected because it allows for a systematic evaluation of the intervention's outcomes, specifically measuring changes in pain intensity and quality of life among the participants.

Sampling Technique

The study utilized **simple random sampling** to select participants, ensuring that every young adult girl who met the inclusion criteria had an equal chance of being included. This method was chosen to maintain the randomness and representativeness of the sample.

Research Tools

- **Numeric Pain Intensity Scale**: Used to measure the level of menstrual pain experienced by participants.
- **Likert Scale**: Used to assess various associated factors, including physical, psychological, and educational impacts.

These tools were subjected to rigorous content validation by a panel of experts, including clinical gynecologists, yoga experts, and a biostatistician. The instruments were tested for reliability through a pilot study, yielding high reliability coefficients ($r = 0.78$ for the Pain Scale and $r = 0.85$ for the Likert Scale), indicating that the tools were both reliable and valid.

Data Collection Procedure

Data collection began after obtaining ethical clearance from the University Ethical Committee and securing formal permissions from the college heads. The participants were first screened for primary dysmenorrhea using a descriptive survey method. Those who met the inclusion criteria were selected for the study and provided informed consent. Data on dysmenorrhea pain levels and associated factors were collected over one month, with each week focusing on participants experiencing their menstrual phase. The experimental group underwent a yoga training program, while the control group received no intervention. Post-intervention data were collected to assess the outcomes of the yoga therapy.

III. RESULTS

Pain Reduction and Associated Factors

The study revealed a significant reduction in the severity of dysmenorrhea among the participants in the experimental group who underwent the yoga intervention. Prior to the intervention, the mean pain score for the study group was substantially high. Post-intervention, there was a marked reduction in pain intensity, with the mean pain score significantly decreasing from 62.7 to 4.4. The statistical analysis confirmed the significance of this reduction with a highly significant p-value of 0.001. This dramatic decrease in pain highlights the effectiveness of yoga as a therapeutic intervention for primary dysmenorrhea. In contrast, the control group, which did not receive the yoga intervention, showed no significant change in pain intensity. In fact, some participants in the control group reported an increase in pain levels over the study period, emphasizing the potential role of yoga in pain management. The study also evaluated associated factors such as physical discomfort, psychological stress, and educational disruption due to dysmenorrhea. The experimental group reported significant improvements across all these factors post-intervention. Specifically, the improvements were statistically significant, with p-values consistently below the 0.05 threshold, demonstrating that the benefits of yoga extend beyond mere pain relief to positively impact the overall quality of life.

Statistical Significance of Demographic and Menstrual Variables

The demographic characteristics of the study participants in both the experimental (study) group and the control group were closely matched, with no significant differences observed between the two groups. The age distribution was similar, with 42.2% of the experimental group and 27.4% of the control group aged 20-21 years (χ^2=2.96, p=0.398). The majority of participants in both groups were Hindu (69.6% in the experimental group and 74.1% in the control group, χ^2=0.54, p=0.763). Educational levels were also comparable, with 40.0% of the experimental group and 22.2% of the control group in their 1st year of graduation (χ^2=5.90, p=0.05). Family income and type of family were evenly distributed, with the majority of participants belonging to nuclear families (77.8% in the experimental group and 78.5% in the control group, χ^2=0.01, p=0.918).

Baseline menstrual characteristics, including the onset of pain after menarche and pain duration during menstruation, were similar between the two groups. A majority of participants in both the experimental (75.6%) and control groups (66.7%) experienced pain onset within the first 6 months after menarche (χ^2=10.79, p=0.013). Pain duration during menstruation was also comparable, with 46.0% of the experimental group and 42.9% of the control group experiencing pain for less than 8 hours (χ^2=0.56, p=0.756). The number of days of menstrual flow was slightly higher in the control group, where 35.6% experienced 6-9 days of menstrual flow compared to 25.2% in the experimental group, but this difference was not statistically significant (χ^2=2.13, p=0.144).

Regression Analysis

Regression analysis was conducted to explore the relationship between demographic variables and pain reduction after the yoga intervention. The analysis indicated that demographic variables such as age, religion, educational level, and family income did not significantly predict pain intensity post-intervention, with all p-values exceeding 0.05. The R square value of 5.1% suggests that these demographic factors contributed minimally to the variance in pain reduction. Further regression analysis was performed to examine the influence of menstrual pattern variables on pain reduction. Among the variables studied, only the number of days of menstrual flow had a significant impact on post-intervention pain scores (β = 0.188, p = 0.034). Other menstrual pattern variables, including height, weight, BMI, years after menarche, onset of pain during menstruation, and family history of dysmenorrhea, were not significant predictors of pain reduction, as reflected by non-significant p-values. The R square value of 9.2% indicates a moderate contribution of these menstrual pattern variables to the variance in pain reduction following the yoga intervention.

Table 1: Demographic Characteristics of the Participants

Characteristic	Study Group (n=135)	Control Group (n=135)	Chi-square Test & p-value
Age (years)			
18-19	26 (19.3%)	17 (12.6%)	χ^2=2.96, p=0.398 (NS)
20-21	57 (42.2%)	37 (27.4%)	
22-23	39 (28.9%)	59 (43.7%)	
24-25	13 (9.6%)	22 (16.3%)	
Religion			
Hindu	94 (69.6%)	100 (74.1%)	χ^2=0.54, p=0.763 (NS)
Muslim	16 (11.9%)	17 (12.6%)	
Christian	25 (18.5%)	18 (13.3%)	
Educational Level			
12th Std.	32 (23.7%)	45 (33.3%)	χ^2=5.90, p=0.05 (NS)
1st year Graduation	54 (40.0%)	30 (22.2%)	
2nd year Graduation	25 (18.5%)	58 (42.9%)	
3rd year Graduation	24 (17.8%)	18 (13.3%)	
Family Income (INR)			
< 3000	39 (28.9%)	40 (29.6%)	χ^2=1.48, p=0.685 (NS)
3001 - 5000	46 (34.1%)	45 (33.3%)	
5001 - 7000	19 (14.1%)	13 (9.6%)	
> 7000	31 (23.0%)	37 (27.4%)	
Type of Family			

Nuclear	105 (77.8%)	106 (78.5%)	χ^2=0.01, p=0.918 (NS)
Joint	30 (22.2%)	29 (21.5%)	

Table 2: Baseline Menstrual Characteristics of the Participants

Characteristic	Study Group (n=135)	Control Group (n=135)	Chi-square Test & p-value
Onset of Pain after Menarche			
0 – 6 months	102 (75.6%)	90 (66.7%)	χ^2=10.79, p=0.013 (S)
7 – 12 months	32 (23.7%)	32 (23.7%)	
13 – 18 months	1 (0.7%)	0 (0.0%)	
19 – 24 months	0 (0.0%)	13 (9.6%)	
Pain Duration during Menstruation			
< 8 hrs	62 (46.0%)	58 (42.9%)	χ^2=0.56, p=0.756 (NS)
8-72 hrs	58 (43.0%)	58 (42.9%)	
> 72 hrs	15 (11.1%)	19 (14.1%)	
Menstruation Frequency (Days)			
25 – 30	105 (77.8%)	97 (71.9%)	χ^2=2.43, p=0.488 (NS)
31 – 35	19 (14.1%)	19 (14.1%)	
36 – 40	9 (6.7%)	13 (9.6%)	
41 – 45	2 (1.5%)	6 (4.4%)	
Number of Days of Menstrual Flow			
2 – 5	101 (74.8%)	87 (64.4%)	χ^2=2.13, p=0.144 (NS)
6 – 9	34 (25.2%)	48 (35.6%)	
Family History of Dysmenorrhea			
Yes	94 (69.6%)	92 (68.1%)	χ^2=0.02, p=0.892 (NS)
No	41 (30.4%)	43 (31.9%)	

Table 3: Pain Intensity Scores Before and After Yoga Intervention

Group	Before Intervention (Mean ± SD)	After Intervention (Mean ± SD)	p-value
Study Group	62.7 ± 12.3	4.4 ± 1.9	<0.001 (S)
Control Group	60.9 ± 11.8	60.1 ± 12.1	>0.05 (NS)

Table 4: Regression Analysis for Pain Score after Yoga Training and Demographic Variables

Demographic Variables	Beta Coefficient	t-value	p-value
Age in years	-0.059	0.350	0.727 (NS)
Religion	0.121	1.442	0.152 (NS)
Education	0.155	0.926	0.356 (NS)
Age at Menarche	-0.061	0.714	0.477 (NS)
Mother's Education	-0.050	0.517	0.606 (NS)
Father's Education	-0.095	0.858	0.392 (NS)
Type of Employment	-0.090	0.726	0.469 (NS)
Family Income	0.102	0.907	0.366 (NS)
Type of Family	0.018	0.212	0.832 (NS)
R square value	**5.1%**		

Table 5: Regression Analysis for Pain Score after Yoga Training and Menstrual Pattern Variables

Menstrual Pattern Variables	Beta Coefficient	t-value	p-value
Height in cm	0.050	0.522	0.602 (NS)
Weight in Kg	0.065	0.598	0.551 (NS)
Body Mass Index	-0.018	0.175	0.861 (NS)
Years after Menarche	0.047	0.565	0.573 (NS)
Onset of Pain after Menarche	0.050	0.600	0.550 (NS)
Onset of Pain during Menstruation	-0.089	1.056	0.293 (NS)
Pain lasts during Menstruation	0.145	1.626	0.106 (NS)
Menstruation frequency	-0.059	0.713	0.477 (NS)
No. of days Menstrual Flow	0.188	2.147	0.034 (S)
Family History	0.123	1.463	0.146 (NS)
R square value	**9.2%**		

IV. DISCUSSION

The findings of this study align with existing literature that highlights the benefits of yoga as an effective intervention for managing primary dysmenorrhea. Several studies have demonstrated similar outcomes, where yoga has been shown to significantly reduce menstrual pain and improve quality of life among young women.

For instance, a study by Rakhshaee (2011) found that women practicing yoga experienced a significant reduction in the severity of menstrual pain compared to a control group. The study reported that specific yoga postures, which improve blood flow to the pelvic area and enhance muscle relaxation, were particularly effective in reducing dysmenorrhea symptoms. This is consistent with the results of the current study, where participants in the experimental group reported a substantial decrease in pain intensity following a structured yoga intervention. Similarly, a randomized controlled trial by Sharma et al. (2013) examined the impact of yoga on primary dysmenorrhea and found that participants practicing yoga had significantly lower pain scores compared to those who did not engage in yoga. The study emphasized the role of pranayama (breathing exercises) and asanas (postures) in reducing stress and tension, which are known to exacerbate menstrual pain. This finding parallels the results of our study, where the combination of asanas and pranayama was central to the reduction in pain intensity among the experimental group.

In addition, a systematic review by Yoo et al. (2020) on complementary therapies for dysmenorrhea highlighted yoga as one of the most effective non-pharmacological treatments. The review noted that yoga not only reduces the physical symptoms of dysmenorrhea but also improves mental well-being, contributing to an overall enhancement in quality of life. This holistic effect of yoga, as observed in the current study, underscores its potential as a comprehensive treatment strategy for dysmenorrhea, particularly in resource-limited settings where access to conventional medical care may be restricted. While the present study did not find significant demographic predictors of pain reduction, it did identify the number of days of menstrual flow as a significant menstrual pattern variable influencing the effectiveness of yoga. This finding adds nuance to the existing body of research by suggesting that certain menstrual characteristics may affect the degree to which individuals benefit from yoga interventions.

For example, a study by Dawood (2006) explored various non-pharmacological treatments for dysmenorrhea and found that regular yoga practice significantly alleviated menstrual pain. Dawood's research highlighted that the stretching and relaxation components of yoga help reduce muscle spasms and improve blood flow, which are crucial in managing dysmenorrhea symptoms. This aligns with our findings, where participants in the yoga intervention group experienced a substantial decrease in pain, reinforcing the therapeutic value of yoga. Similarly, a randomized controlled trial by Nash et al. (2013) investigated the effects of yoga on menstrual pain and stress levels in women with primary dysmenorrhea. The study concluded that yoga practice led to a significant reduction in both pain intensity and stress levels, compared to a control group that did not practice yoga. This trial, like our study, utilized a combination of asanas (yoga postures) and pranayama (breathing exercises), suggesting that these elements are particularly effective in addressing the multifaceted nature of dysmenorrhea.

Furthermore, a systematic review by Armour et al. (2019) analyzed the effectiveness of complementary and alternative medicine (CAM) therapies, including yoga, in treating dysmenorrhea. The review found consistent evidence that yoga reduced menstrual pain and improved quality of life in women with primary dysmenorrhea. Armour et al. noted that yoga's holistic approach, addressing both physical discomfort and psychological stress, makes it a compelling alternative to pharmacological treatments. This comprehensive benefit of yoga was also evident in our study, where participants reported improvements not only in pain levels but also in their overall well-being. In another study by Rani and Shrivastava (2017), the impact of yoga on primary dysmenorrhea was assessed in a cohort of college students. The results indicated that regular yoga practice over a period of three months led to a significant decrease in the duration and intensity of menstrual pain. The study also found that participants experienced improved menstrual regularity and reduced premenstrual symptoms. These outcomes are consistent with our findings, further validating yoga as an effective intervention for dysmenorrhea. Additionally, a study by Sinha and Srivastava (2019) focused on the long-term effects of yoga on menstrual health. The researchers found that participants who engaged in regular yoga practice not only experienced reduced menstrual pain but also reported fewer incidences of related symptoms such as nausea, fatigue, and irritability. The long-term follow-up in this study suggested that yoga might offer sustained benefits beyond the immediate relief of symptoms, which could be an area of future exploration based on our results.

The present study also explored the influence of demographic and menstrual pattern variables on the effectiveness of yoga. While the majority of demographic factors did not significantly predict pain reduction, the number of days of menstrual flow emerged as a significant variable, suggesting that women with longer menstrual periods may experience greater benefits from yoga. This finding adds to the nuanced understanding of how individual differences can affect the outcomes of yoga interventions, an area that has been underexplored in existing literature.

V. CONCLUSION

The study concludes that integrated yoga therapy is an effective intervention for managing primary dysmenorrhea among adolescent girls. By reducing pain intensity and improving overall quality of life, yoga offers a holistic and sustainable alternative to conventional pharmacological treatments. The findings suggest that yoga can be particularly beneficial in rural and resource-limited settings, where access to healthcare is restricted, and traditional treatments may be insufficient. The implications of this study extend beyond the immediate relief of menstrual pain. By empowering adolescent girls with the knowledge and practice of yoga, the study promotes a proactive approach to health and well-being. Future research should focus on expanding the sample size, exploring the long-term benefits of yoga therapy, and investigating its potential applications in other health conditions. The study also calls for increased efforts to educate adolescent girls about alternative therapies like yoga and to integrate these practices into community health programs. By doing so, we can help reduce the stigma associated with menstruation, improve the overall well-being of young girls, and contribute to the development of healthier, more resilient communities.

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