

Effectiveness of Yoga Therapy In Relieving Symptoms of Dysmenorrhea Among Adolescence (16-18 Years) Girls Students of Selected Higher School of Saharanpur (UP)

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ABSTRACT

Introduction: Yoga is a holistic complementary therapy that combines physical postures, breathing exercises, and relaxation techniques to promote physical and psychological well-being. It may help in reducing menstrual pain by improving blood circulation, decreasing muscle tension, regulating stress responses, and enhancing relaxation. Yoga is a simple, cost-effective, and easily accessible intervention that can be practiced by adolescent girls without significant risk. Nurses play an important role in promoting menstrual health by providing education, correcting myths, and introducing evidence-based interventions for managing menstrual problems. **Objective:** To find out the effectiveness of yoga training programme on dysmenorrhea among adolescent girls by comparing Experimental and Control group scores. **Methodology:** This research design selected for this study was Pre-test Post-test control group design. The study was conducted in Gyankalash International School and KLG School of Saharanpur. The investigator selected 300 Adolescent girls (16-18 years) (Interventional-150 and control-150) with primary dysmenorrhea. Simple random sampling Opaque sealed envelope sampling technique was used. The sample in the experimental group received supervised yoga training for one week after the pre-test. They then continued self-practice for three consecutive menstrual cycles (approximately three months) with weekly reinforcement and monitoring by the investigator. The post-test was conducted after completion of the three menstrual cycles with the same tool and data were analysed. **Results:** The study found a highly significant difference in pain scores in the experimental group following the yoga training programme ($p < 0.001$), indicating a reduction in dysmenorrhea pain. In the control group, although the paired t-test was statistically significant ($p < 0.001$), the mean pain score increased slightly from 61.7% to 65.6% (mean difference = 3.9%). Comparison between the experimental and control groups using the independent t-test also showed a highly significant difference ($p < 0.001$), with a mean difference of 5.44. **Conclusion:** These findings demonstrate that the yoga training programme was effective in reducing primary dysmenorrhea pain among adolescent girls.

Keywords: Effectiveness, Adolescents, Dysmenorrhea, Yoga Therapy.

INTRODUCTION

Adolescence is a crucial transitional phase between childhood and adulthood characterized by rapid physical, physiological, psychological, and social changes.¹ The term adolescence is derived from the Latin word *adolescere*, meaning "to grow up," and represents a period of development during which individuals attain maturity and prepare for adult roles.² Adolescent girls constitute an important population group as their health influences not only their own well-being but also the health of future generations.¹ Menstruation is a significant physiological milestone during adolescence, indicating reproductive maturity; however, many girls experience menstrual problems, among which dysmenorrhea is one of the most common gynecological complaints.³ Primary dysmenorrhea is characterized by painful menstruation without any underlying pelvic pathology and is mainly associated with increased prostaglandin activity causing uterine contractions, abdominal cramps, backache, fatigue, and other discomforts.³⁻⁴ It affects the physical, emotional, social, and academic life of adolescent girls and is considered one of the major causes of absenteeism from school and reduced participation in daily activities.⁴ Although pharmacological methods are commonly used for symptom relief, increasing attention is being given to safe and non-pharmacological approaches.⁴

Yoga, as a holistic complementary therapy, helps in balancing the body and mind through physical postures, breathing techniques, and relaxation practices.⁵ It may reduce menstrual discomfort by improving circulation, decreasing stress, and promoting physical and psychological well-being.⁵⁻⁶ Therefore, the investigator felt the need to study the effectiveness of yogasanas in reducing dysmenorrhea among adolescent girls to provide evidence-based support for a safe, simple, and cost-effective approach in the management of menstrual pain.

NEED OF THE STUDY

Adolescence is a crucial transitional period between childhood and adulthood characterized by rapid biological, psychological, and social changes.¹ Among adolescent girls, menstruation is an important physiological milestone indicating reproductive maturity.³ Although menstruation is a normal process, many girls experience menstrual-related problems, among which dysmenorrhea is one of the most common gynecological complaints.³ Primary dysmenorrhea refers to painful menstruation occurring without any underlying pelvic pathology and is frequently associated with lower abdominal cramps, backache, fatigue, headache, nausea, and emotional disturbances.^{3,4} The condition is highly prevalent among adolescent girls and may significantly affect their physical comfort, academic performance, school attendance, participation in social activities, and overall quality of life.⁴ Many adolescent girls do not seek medical advice due to lack of awareness, cultural beliefs, social stigma, and misconceptions related to menstrual health.⁷ Although pharmacological interventions such as analgesics provide relief, their prolonged use may be associated with adverse effects; therefore, safe, economical, and non-pharmacological approaches are required for effective management of dysmenorrhea.⁴

Yoga is a holistic complementary therapy that combines physical postures, breathing exercises, and relaxation techniques to promote physical and psychological well-being.⁵ It may help in reducing menstrual pain by improving blood circulation, decreasing muscle tension, regulating stress responses, and enhancing relaxation.^{5,6} Yoga is a simple, cost-effective, and easily accessible intervention that can be practiced by adolescent girls without significant risk.⁵ Nurses play an important role in promoting menstrual health by providing education, correcting myths, and introducing evidence-based interventions for managing menstrual problems.⁸ However, limited studies are available regarding the effectiveness of yoga in reducing primary dysmenorrhea among adolescent girls, particularly in rural settings.⁹ During clinical and teaching experiences, the investigator observed that many adolescent girls experience menstrual pain, resulting in absenteeism and reduced participation in academic and clinical activities. Therefore, the investigator felt the need to conduct this study to assess the effectiveness of yoga on primary dysmenorrhea among adolescent girls and to provide evidence for incorporating yoga as a safe and supportive nursing intervention for menstrual pain management.

STATEMENT OF THE PROBLEM

A Study to Assess the Effectiveness of Yoga Therapy in Relieving Symptoms of Dysmenorrhea among 16-18 Years Girls Students of Selected Higher School, of Saharanpur (UP).

OBJECTIVES

1. To assess the pain level during menstruation before and after yoga training programme among adolescent girls for Experimental group and for Control group.
2. To assess the factors associated with dysmenorrhea before and after yoga training programme among adolescent girls for Experimental group and for Control group.
3. To find out the effectiveness of yoga training programme on dysmenorrhea among adolescent girls by comparing Experimental and Control group scores
4. To analyse the association between dysmenorrhea pain levels mean post test score and demographic variables and menstrual pattern variables among adolescent girls for Experimental group.
5. To analyse the association between associated factors of dysmenorrhea level mean post test score and demographic variables and menstrual pattern variables among adolescent girls for Experimental group.

HYPOTHESIS

H₁-There is a significant difference between before and after yoga training programme on Primary Dysmenorrhea among adolescent girls.

H₂-There is a significant association between the mean Post-Test dysmenorrhea score with selected demographic variables and menstrual pattern variables among adolescent girls.

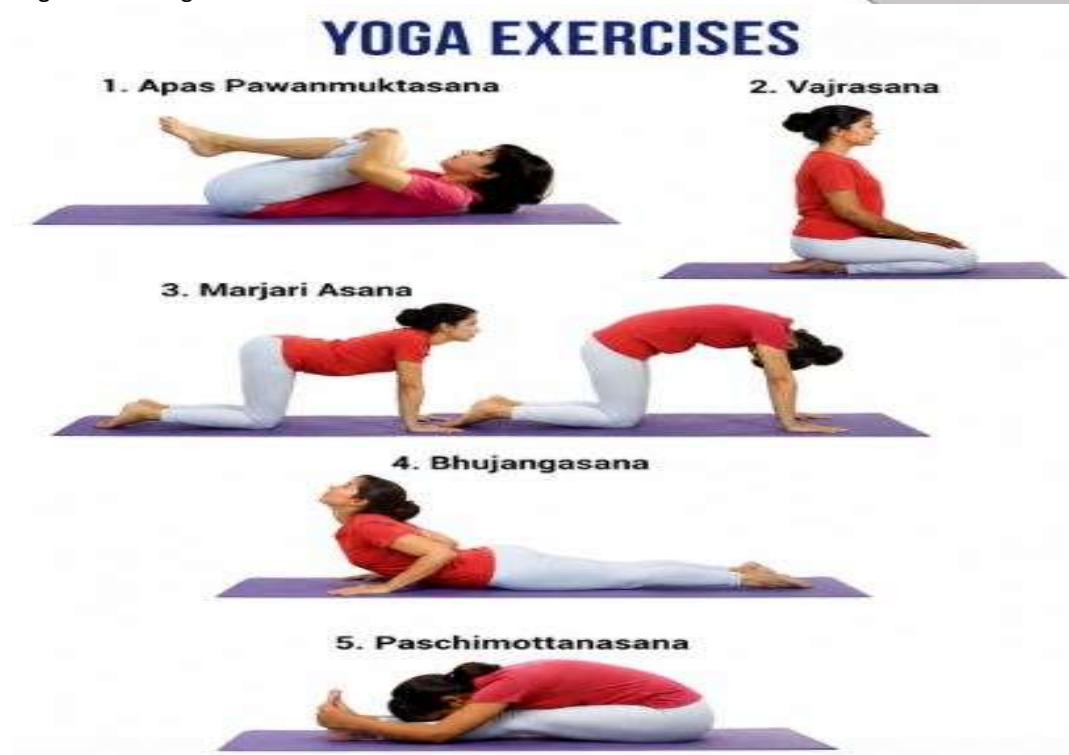
LIMITATIONS

1. The study was limited to adolescent girls who were studying at selected schools in Saharanpur.
2. This study was limited to girls who know English and Hindi.
3. This study was limited to girls who were willing to participate in yoga training programme.

PROJECTED OUTCOME

1. This study will help the adolescent girls to gain adequate knowledge on yoga that is one of the alternative therapies to treat primary dysmenorrhea.

2. At large, the society will be benefited by this study through decreased absenteeism for schools and jobs among adolescent girls.



METHODOLOGY

RESEARCH APPROACH

In this study an evaluative approach was found to be suitable to assess the effectiveness of yoga on primary dysmenorrhea among adolescent girls.

RESEARCH DESIGN

In the present study a quasi-experimental Non Equivalent control group Pretest-Posttest research design was used to assess the effectiveness of yoga on primary dysmenorrhea among adolescent girls.

SETTING OF THE STUDY

The selection of setting was done on the basis of the feasibility of conducting study and the availability of subjects. The present study was conducted at selected High school of Saharanpur Dist. Uttar Pradesh.

VARIABLES UNDER THE STUDY

➤ Independent Variable

In this study the independent variable is yoga training programme.

➤ Dependent Variable

In this study the dependent variables are dysmenorrhea pain and other associated factors like physiological, psychological and educational factors.

POPULATION

The target population of this study was adolescent girls those who were studying in selected schools at Saharanpur Dist., Uttar Pradesh.

SAMPLE

The sample of this study consisted of adolescent girls with primary dysmenorrhea who were in age group of 14 – 18 years studying in 9th to 12th standard in selected schools at Saharanpur Dist. Uttar Pradesh.

SAMPLE SIZE

The sample size was consisted of 300 adolescent girls with primary dysmenorrhea. In that 150 adolescent girls were in experimental group and 150 adolescent girls were in control group.

SAMPLING TECHNIQUE

In this study the samples were selected by Simple Random Sampling Technique. In simple random sampling, lottery method was followed i.e. Name of the students were written in chit of paper and picked it up.

CRITERIA FOR SAMPLE SELECTION:

INCLUSION CRITERIA:

- ✧ All adolescent girls, age between 14 – 18 years.
- ✧ Adolescent girls who were having primary dysmenorrhea.
- ✧ Adolescent girls who were having dysmenorrhea pain score moderate and above (4 & above).
- ✧ Adolescent girls who were available during data collection.
- ✧ Adolescent girls who were agreed not to use analgesics and oral contraceptives throughout the yoga training period for primary dysmenorrhea.

EXCLUSION CRITERIA:

- ✧ Adolescent girls who were not willing to participate in yoga training programme.
- ✧ Adolescent girls who were having irregular cycle.
- ✧ Adolescent girls who had surgery within last 6 months.
- ✧ Adolescent girls who were having congenital disorders like heart defects, muscular and bone defects.
- ✧ Adolescent girls who were taking medications and other form of treatments (like Homeo & Siddha) for primary dysmenorrhea.

DESCRIPTION OF THE INSTRUMENT

The investigator used self-administered questionnaire, to assess the baseline data, and standardized pain scale to assess the dysmenorrhea pain level and Likert scale to assess the associated factors of dysmenorrhea among adolescent girls. The average time taken to complete the questionnaire was 15 to 20 minutes. The tool consists of 3 parts:

Part 1 consists of 2 sections.

Section A: Consisted demographic variables like age, religion, education, age at menarche, mother's educational status, father's educational status, type of employment, family income and type of family.

Section B: Consisted menstrual pattern variables like height, weight, body mass index, years after menarche and onset of pain after menarche, onset of pain during menstruation, pain lasts during menstruation, menstruation frequency, number of days menstrual flow and family history of dysmenorrhea.

Part: 2

Numeric pain intensity scale to assess the dysmenorrhea pain level. Scale is having 0 -10 numbers to indicate pain

SCORE INTERPRETATION:

SL NO.	RANGE	LEVEL OF PAIN
1.	0	No Pain
2.	1-3	Mild Pain
3.	4-6	Moderate Pain
4.	7-9	Severe Pain
5.	10	Worst Pain

Part: 3

Likert scale to assess the other associated factors of primary dysmenorrhea. The scale consisted 3 factors like physical factors, psychological factors and educational factors.

SCORE INTERPRETATION:

SL NO.	RANGE	LEVEL OF PAIN
1.	0	Nil
2.	1-33.99	Mild
3.	34-66.99	Moderate
4.	67-100	Severe

TOOL VALIDITY

The instruments were given to 11 experts for content validity. The experts were 6 nursing experts, 2 clinical gynecologists, 2 yoga experts and 1 Biostatistician. The corrections and modifications suggested by the experts were incorporated into the instrument. Content Validity Ratio (CVR) was calculated. CVR is an indicator to test overall content validity. The value of CVR = 0.82 it indicates that tool is valid.

RELIABILITY

The final tool, Numeric pain intensity scale and Likert scale was tested for reliability. The tool was given to 10 adolescent girls for assessment. The reliability of the tool was established by testing the stability and internal

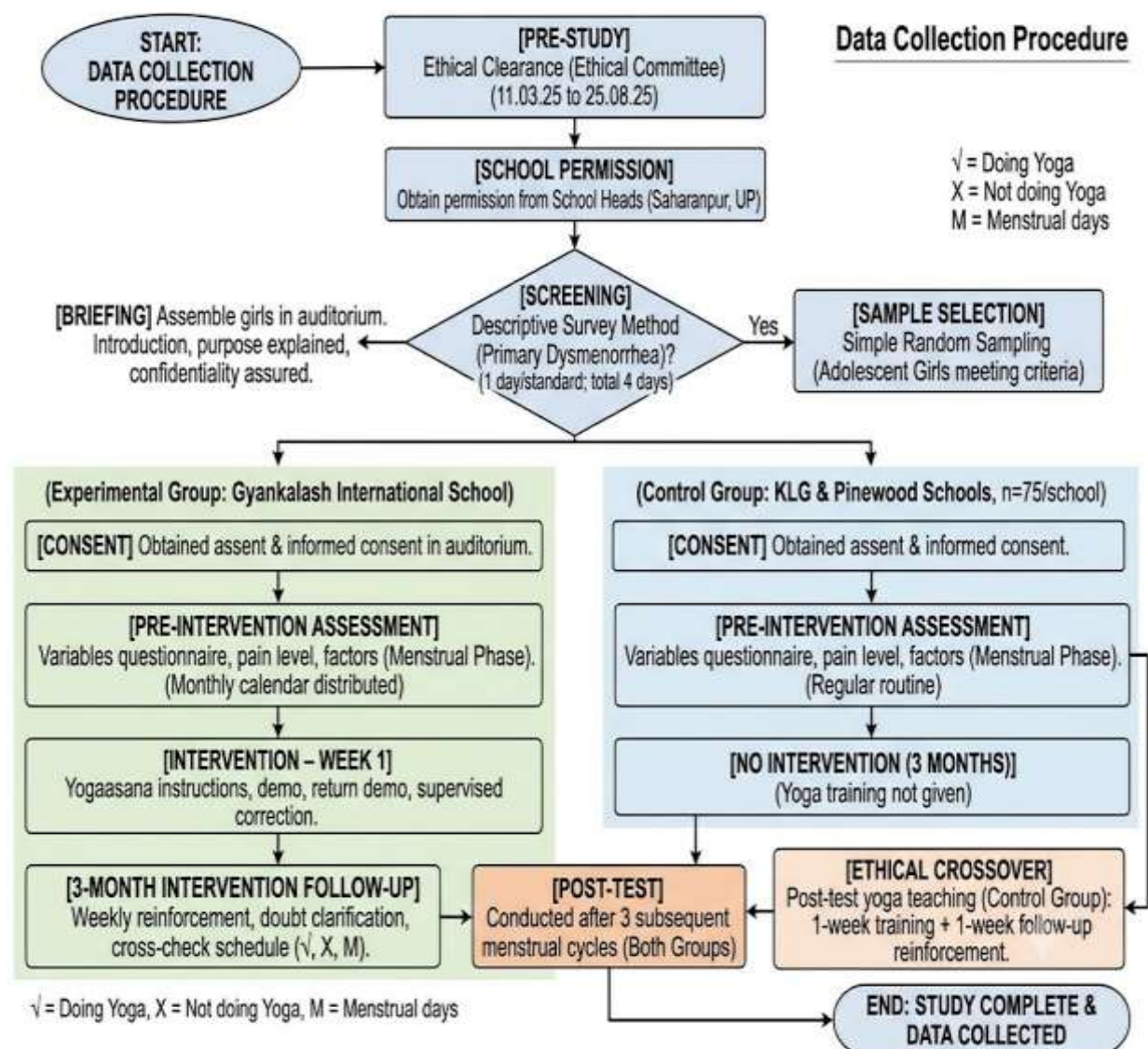
consistency. Stability was assessed by test and retest method. Internal consistency was assessed by using split half technique with raw score method, deviation method and spear man brown prophecy. The calculated 'r' value is 0.83 for Pain scale and 0.93 for Likert scale. It shows that tool is reliable.

PILOT STUDY

The pilot study was conducted from 23.01.25 to 24.02.25 in selected Higher Secondary School, Pilkhani, Sharanpur. The investigator obtained formal permission from the Management and Headmaster of the school. Then 30 adolescent girls who met the inclusion criteria were selected by simple random sampling method. In that samples were randomly allocated to experimental and control group. The subject selected for the pilot study possessed the same characteristics of the major study in order to maintain homogeneity.

After obtaining assent and informed consent, the tool was administered to all selected adolescent girls and yoga training programme was taught to experimental group and no intervention was given to control group. The adequate time was given to all study samples to clarify their doubts. After 73 completion of subsequent menstrual cycle, post test was conducted. Pilot study results analysed and the 'r' value is 0.89.

DATA COLLECTION PROCEDURE



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ANALYSIS AND INTERPRETATION:

Table 1- Distribution of Demographic Variables among Adolescent Girls in Study and Control Group

Demographic Variables	Study Group	Control Group	Chisquare Test &
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	No.	%	No.	%	
1.Age in years					$\chi^2=13.719$, D.F.=3, P=0.001***
a)14yrs	29	19.3	19	12.7	
b)15yrs	63	42.0	41	27.3	
c)16yrs	43	28.7	65	43.3	
d)17yrs	15	10.0	25	16.7	
2. Religion					$\chi^2=1.588$, D.F.=2, P=0.452(N.S)
a) Hindu	104	69.3	111	74.0	
	18	12.0	19	12.7	
b) Muslim	28	18.7	20	13.3	
c) Christian					
3.Education					$\chi^2=29.442$, D.F.=3, P=0.001***
a)9 th Std.	35	23.3	17	11.3	
b)10 th Std.	60	40.0	33	22.0	
c)11 th Std.	28	18.7	64	42.7	
d)12 th Std.	27	18.0	36	24.0	
4.Age at Menarche					$\chi^2=2.897$, D.F.=3, P=0.408(N.S)
a)11yrs	15	10.0	12	8.0	
b)12yrs	42	28.0	38	25.3	
c)13yrs	58	38.7	52	34.7	
d)14yrs	35	23.3	48	32.0	
5.Mother's Educational Status					$\chi^2=1.591$, D.F.=3, P=0.662(N.S)
a)Nonliterate	15	10.0	22	14.7	
b)Primaryschool	50	33.3	48	32.0	
c)Higher Secondary	60	40.0	58	38.7	
d)College education	25	16.7	22	14.7	
6.Father's Educational Status					$\chi^2=1.467$, D.F.=3, P=0.690(N.S)
a)Nonliterate	14	9.3	15	10.0	
b)Primary school	36	24.0	39	26.0	
c)Higher Secondary	59	39.3	64	42.7	
d)College education	41	27.3	32	21.3	
7.Type of Employment					$\chi^2=4.646$,
a)Daily wages	69	46.0	82	54.7	
b)Private employee	27	18.0	30	20.0	D.F.=3,
c)Govt.employee	46	30.7	30	20.0	P=0.200(N.S)
d)Professional	8	5.3	8	5.3	
8.Family Income					$\chi^2=1.942$, D.F.=3, P=0.585(N.S)
a)Rs.<3000	43	28.7	45	30.0	
b)Rs.3001-5000	52	34.7	51	34.0	
c)Rs.5001-7000	21	14.0	14	9.3	
d)Rs.>7000	34	22.7	40	26.7	
9. Type of Family					$\chi^2=0.019$, D.F.=1, P=0.890(N.S)
a) Nuclear	116	77.3	117	78.0	
	34	22.7	33	22.0	
b) Joint					

Table 1. Depicts that 42% in the study group and 27.3% in the control group were in the age group of 15 years. Considering religion 69.3% in the study group and 74% in the control group were belonging to Hindu. In education, 40% in the study group and 22% in the control group were studying in 10th standard. Regarding age at menarche, 38.7% in the study group and 34.7% in the control group were attained at the age of 13 years. Majority 40% of mothers in the study group and 38.7% of mothers in control group had higher secondary school education. 39.3%

fathers of study group and 42.7% fathers of control group had higher secondary school education. Regarding father's occupation, 46% in the study group and 54.7% in the control group were working as a daily wages. 34.7% in the study group and 43% in the control group had family income Rs.3001 – 5000/ month. Majority 77.3% in the study group and 78% in the control group belonged to nuclear family. This table showed significance of age and education between two groups at $p < 0.001$ level.

Table:2- Distribution of Menstrual Pattern Variables among Adolescent Girls in Study and Control Group

Demographic Variables	Study Group		Control Group		Chi square test And P value
	No.	%	No.	%	
1. Height in cm					$\chi^2 = 1.397$, D.F.=2, P=0.497(N.S)
a) 141–150	45	30.0	39	26.0	
b) 151–160	75	50.0	73	48.7	
c) 161–170	30	20.0	38	25.3	
2. Weight in Kg.					$\chi^2 = 6.144$, D.F.=2, P=0.046*
a) 36–45	57	38.0	77	51.3	
b) 46–55	77	51.3	64	42.7	
c) 56–65	16	10.7	9	6.0	
3.Body Mass Index					$\chi^2 = 0.532$, D.F.=2, P=0.766(N.S)
a) Underweight	68	45.3	66	44.0	
b) Normal weight.	76	50.7	80	53.3	
c) Overweight	6	4.0	4	2.7	
d) Obesity	0	0.0	0	0.0	
4. Years after Menarche					$\chi^2 = 5.939$, D.F.=3, P=0.115(N.S)
a) 1–2	79	52.7	69	46.0	
b) 3–4	66	44.0	66	44.0	
c) 5–6	5	3.3	15	10.0	
5.On set of Pain after Menarche					
a) 0–6months	113	75.3	100	66.7	$\chi^2 = 15.793$, D.F.=3, P=0.001***
b) 7–12months	36	24.0	36	24.0	
c) 13–18months	1	0.7	0	0.0	
d) 19–24months	0	0.0	14	9.3	

Table 2. Illustrates that 50% in the study group and 48.7% in the control group had the height of 151 -160cm. Majority of the students 51.3% in the study group and 42.7% in the control group weighed between 46 -55kg. Regarding body mass index, 50.7% in the study group and 53.3% in the control group had normal weight. None of the students had obesity. Considering years after menarche, 52.7% in the study group and 46% in the control group were in 1-2 years. Majority of the students in both group had onset of pain after menarche between 0-6 months. Regarding onset of menstrual pain, 49.3% in the study group had just before menses and 46% in the control group had pain with onset of menses. 42.7% in the both groups had menstrual pain for 8-72hours. Majority of the girls had menses once in 25-30 days. About 74.7% in the study group and 64.7% in the control group had 2-5 days of menstrual flow. Most of the girls 69.3% in the study group and 68% in the control group had family history of dysmenorrhea. This table showed significance of weight and onset of pain after menarche between two groups at $p < 0.01$ level respectively.

Table:3- Distribution of Level of Pain during Menstruation before and after Yoga Training programme among Adolescent Girls for Study Group

Level of Pain Score	Pre test	Post test
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	No.	%	No.	%
No Pain(0)	0	0.0	107	71.3
Mild Pain(1–3)	0	0.0	43	28.7
Moderate Pain(4–6)	107	71.3	0	0.0
Severe Pain(7–9)	38	25.3	0	0.0
Worst Possible Pain(10)	5	3.3	0	0.0
Total	150	100.0	150	100.0

The above table explains 71.3% of adolescent girls had moderate pain and 25.3% of them had severe pain during menstruation in pretest. Where as in posttest after yoga training programme 71.3% of girls had no pain and 28.7% had mild pain during menstruation. After the intervention none of the girls had severe or worst pain during menstruation or even moderate pain.

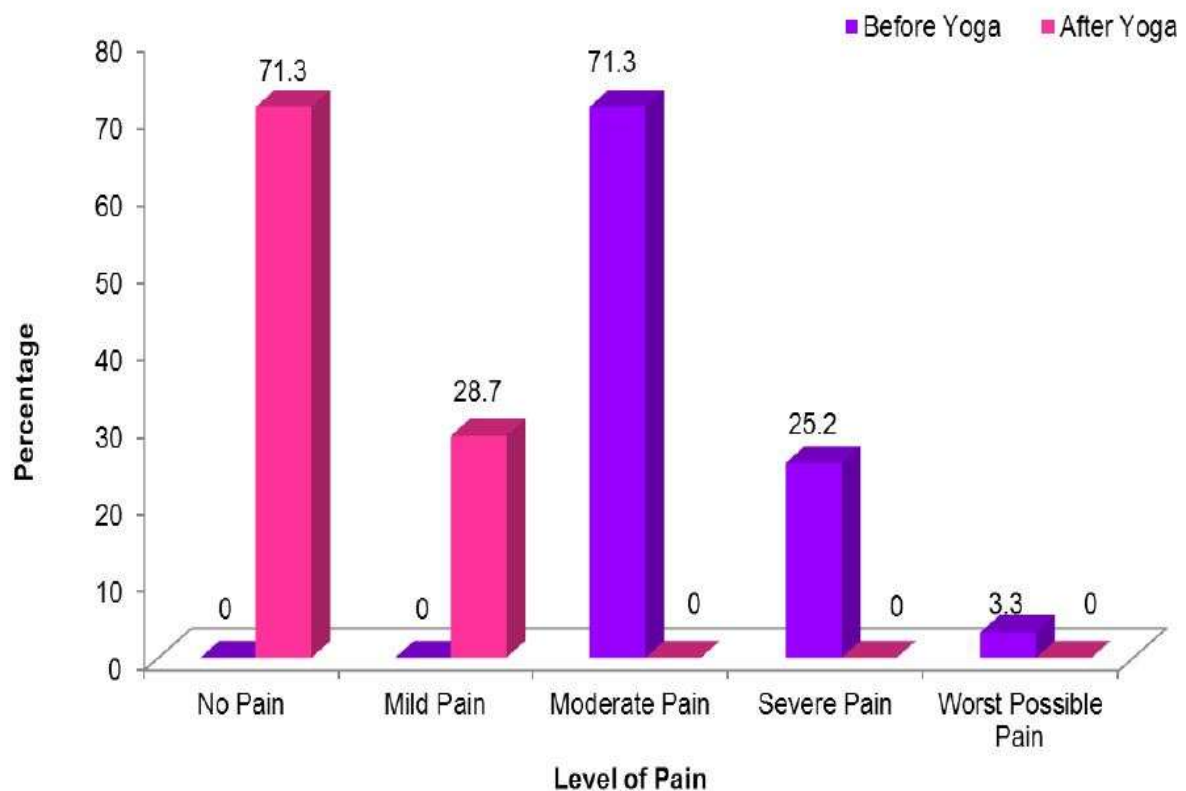


Fig 1 : Level of Pain during Menstruation before and after Yoga Training among Adolescent Girls for Study Group

Table:4 - Distribution of Level of Pain during Menstruation before and after Yoga Training programme among Adolescent Girls for control Group

Level of Pain Score	Pre test	Post test
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	No.	%	No.	%
No Pain(0)	0	0.0	0	0.0
Mild Pain(1–3)	0	0.0	9	6.0
Moderate Pain(4–6)	102	68.0	68	45.3
Severe Pain(7–9)	39	26.0	64	42.7
Worst Possible Pain(10)	9	6.0	9	6.0
Total	150	100.0	150	100.0

The above table projects 68% of adolescent girls had moderate pain and 26% of girls had severe pain in pretest, whereas 45.3% of girls had moderate pain, 42.7% of them had severe pain and 6% of girls had mild pain in posttest.

Table 5 – Mean and Standard Deviation for Pain Score before Yoga Training programme among Adolescent Girls for Study and Control Group

Pain Score before Yoga	Study Group	Control Group	Independent 't' test & P value
Mean	62.7%	61.7%	t=0.530, P=0.596 (N.S)
Standard Deviation	17.3%	17.5%	
Range:			
Minimum Score	4	4	
Maximum Score	10	10	

Note: N.S. - Not Significant

This table 5 shows that in pretest the mean percentage score of 62.7% with standard deviation 17.3% for study group and the mean score of 61.7% with standard deviation 17.5% for control group. The independent 't' test, obtained 't' value was lesser than table value hence statistically no significance between two groups in pretest.

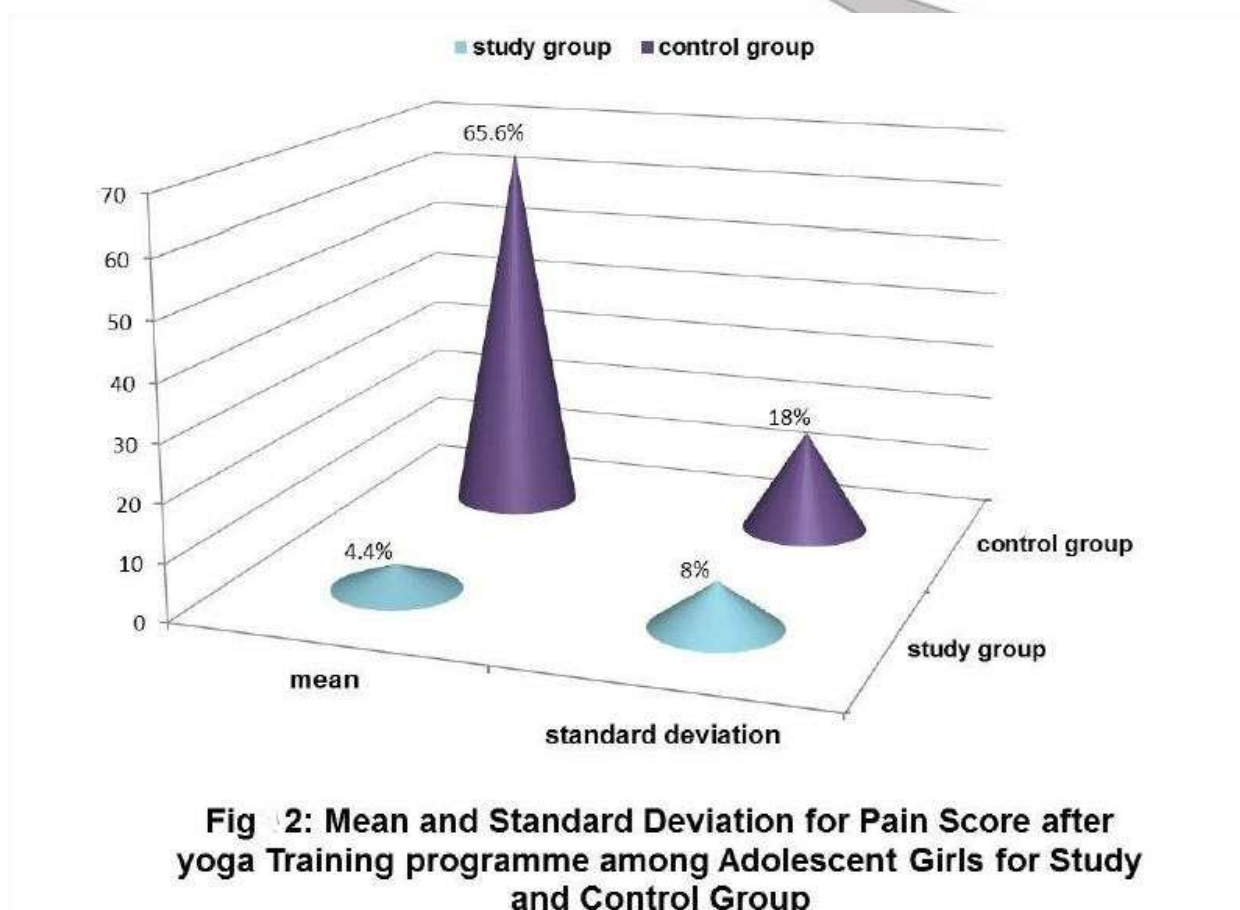


Fig 2: Mean and Standard Deviation for Pain Score after yoga Training programme among Adolescent Girls for Study and Control Group

Table 6 - Mean and Standard Deviation for Pain Score after Yoga Training programme among Adolescent Girls for Study and Control Group

Pain Score after Yoga	Study Group	Control Group	Independent 't' test & P value
Mean	4.4%	65.6%	t=38.125, P=0.001***
Standard Deviation	8.0%	18.0%	
Range: Minimum Score Maximum Score	0 3	2 10	

Note: * P < 0.001 Level of Significant**

Table 6 projects that in posttest the mean value of 4.4% with standard deviation 8.0% for study group and the mean value of 65.6% with standard deviation 18.0% for control group. The obtained 't' value 38.125 was greater than table value at $p < 0.001$ level. It showed that a significant difference between the two groups.

Table 7-Distribution of Associated Factors of Dysmenorrhea before Yoga Training programme among Adolescent Girls for Study Group

Dysmenorrhea factors	Associated factors of Dysmenorrhea before Yoga					
	Mild		Moderate		Severe	
	No.	%	No.	%	No.	%

Physical factors	46	30.7	97	64.7	7	4.7
Psychological factors	11	7.3	94	62.7	45	30.0
Educational factors	53	35.3	71	47.3	26	17.3
Overall	11	7.3	119	79.3	20	13.3

The above table 7 reveals that adolescent girls had 30.7% mild and 64.7% moderate level of physical factors of dysmenorrhea. Regarding psychological factors, 62.7% of adolescent girls had moderate level and 30% of them had severe level. Considering educational factors, 47.3% of adolescent girls had moderate level and 35.3% of them had mild level. In overall 79.3% of adolescent girls had moderate level and 13.3% of them had severe level of associated factors of dysmenorrhea before yoga training programme among adolescent girls in study group.

Table 8 - Distribution of Associated Factors of Dysmenorrhea after Yoga Training programme among Adolescent Girls for Study Group

Dysmenorrhea factors	Associated Factors of Dysmenorrhea after Yoga							
	Never		Mild		Moderate		Severe	
	No.	%	No.	%	No.	%	No.	%
Physical factors	118	78.7	32	21.3	0	0.0	0	0.0
Psychological factors	116	77.3	34	22.7	0	0.0	0	0.0
Educational factors	150	100.0	0	0.0	0	0.0	0	0.0
Overall	107	71.3	43	28.7	0	0.0	0	0.0

This table 8 explicates that the distribution of level of associated factors of dysmenorrhea after yoga training programme among adolescent girls for study group. It shows that 78.7% of adolescent girls had never and 21.3% of them had mild level of physical factors of dysmenorrhea. Regarding psychological factors, 77.3% of adolescent girls had never and 22.7% of them had mild level. Considering educational factors, 100% of adolescent girls had never after yoga training programme. In overall 71.3% of adolescent girls had never and 28.7% of them had mild level of associated factors of dysmenorrhea after yoga training programme among adolescent girls in study group.

Table 09 - Effectiveness of Yoga Training Program on pain among Adolescent Girls for Study Group

Statistics values	Pretest Mean score(%)	Posttest Mean score(%)	Mean difference score(%)	Paired 't' test P-value
Mean	62.7	4.4	58.3	t=53.588 P=0.001***
Standard Deviation	17.3	8.0	13.3	

The above table 9 explains that the effectiveness of yoga training program on pain reduction among adolescent girls for study group. The pain reduction scores mean value was 58.3 with standard deviation 13.3, which was statistically significant at P<0.001 level. It showed that the intervention was effective to reduce or to relieve dysmenorrhea.

Table 10 - Effectiveness of Yoga Training Program on pain among Adolescent Girls for Control Group

Statistics values	Pretest Mean score(%)	Posttest Mean score(%)	Mean difference score(%)	Paired 't' test P-value
Mean	61.7	65.6	-3.9	t=4.567 P=0.001***
Standard Deviation	17.5	18.0	10.5	

The above table 10 illustrates that the effectiveness of yoga training program on pain reduction among adolescent girls for control group. The pain reduction scores mean value was -3.9 with standard deviation 10.5, which was statistically significant at $P < 0.001$ level but mean difference showed minimal difference.

Table 11-Comparison of Effectiveness of Yoga Training Program on Pain between Study and Control Group among Adolescent Girls

Effective Score	Study Group Mean score(%)	Control Group Mean score(%)	Independent 't' test & P value
Mean	58.3	-3.9	t=44.858 P=0.001***
Standard Deviation	13.3	10.5	

This table 11 explicates that comparison of effectiveness of yoga training program on pain reduction between study and control group among adolescent girls. The obtained 't' value 44.858 was greater than table value at $p 0.001$ level. It showed that a significant difference between two groups.

Table 12 - Association between Pain Score before Yoga Training programme and Demographic Variables among Adolescent Girls for Study Group

among Adolescent Girls for Study Group							
Demographic variables	PainInPretest						Chi-square test and P-value
	Moderate		Severe		Worst		
	No.	%	No.	%	No.	%	
1.Ageinyears							$\chi^2=12.036$, D.F.=6, P=0.061(N.S)
a)14yrs	18	62.1	11	37.9	0	0.0	
b)15yrs	49	77.8	13	20.6	1	1.6	
c)16yrs	31	72.1	8	18.6	4	9.3	
d)17yrs	9	60.0	6	40.0	0	0.0	
2.Religion							$\chi^2=4.383$, D.F.=4, P=0.357(N.S)
a)Hindu	78	75.0	23	22.1	3	2.9	
b)Muslim	11	61.1	7	38.9	0	0.0	
c)Christian	18	64.3	8	28.6	2	7.1	
3.Education							$\chi^2=9.498$, D.F.=6, P=0.147(N.S)
a)9 th Std.	23	65.7	12	34.3	0	0.0	
b)10 th Std.	46	76.7	12	20.0	2	3.3	
c)11 th Std.	21	75.0	7	25.0	0	0.0	
d)12 th Std.	17	63.0	7	25.9	3	11.1	
4.Age at Menarche							$\chi^2=2.672$, D.F.=6,
a)11yrs	9	60.0	5	33.3	1	6.7	
b)12yrs	28	66.7	12	28.6	2	4.8	

c)13yrs	44	75.9	13	22.4	1	1.7	P=0.849(N.S)
d)14yrs	26	74.3	8	22.9	1	2.9	
5.Mother's Education							$\chi^2=3.201$, D.F.=6, P=0.783(N.S)
a)Nonliterate	8	53.3	6	40.0	1	6.7	
b)Primaryschool	37	74.0	12	24.0	1	2.0	
c)Higher Secondary	43	71.7	15	25.0	2	3.3	
d)College education	19	76.0	5	20.0	1	4.0	
6.Father's Education							$\chi^2=7.838$, D.F.=6, P=0.250(N.S)
a)Nonliterate	8	57.1	4	28.6	2	14.3	
b)Primaryschool	27	75.0	8	22.2	1	2.8	
c)Higher Secondary	40	67.8	18	30.5	1	1.7	
d)College education	32	78.0	8	19.5	1	2.4	
7.Type of Employment							$\chi^2=2.720$, D.F.=6, P=0.843(N.S)
a)Dailywages	47	68.1	19	27.5	3	4.3	
b)Privateemployee	19	70.4	8	29.6	0	0.0	
c)Govt.employee	35	76.1	9	19.6	2	4.3	
d)Professional	6	75.0	2	25.0	0	0.0	
8.Family Income							$\chi^2=8.421$, D.F.=6, P=0.209(N.S)
a)Rs.<3000	26	60.5	14	32.6	3	7.0	
b)Rs.3001-5000	39	75.0	13	25.0	0	0.0	
c)Rs.5001-7000	15	71.4	6	28.6	0	0.0	
d)Rs.>7000	27	79.4	5	14.7	2	5.9	
9.Type of Family							$\chi^2=0.963$, D.F.=2, P=0.618(N.S)
a)Nuclear	84	72.4	29	25.0	3	2.6	
b)Joint	23	67.6	9	26.5	2	5.9	

Table 12 explicates the association between pain score before yoga training programme and demographic variables among adolescent girls for study group. It showed that there was no significant association between pain score and demographic variables like age, religion, education, age at menarche, mother's education, father's education, type of employment, family income and type of family.

SUMMARY

Regarding demographic variables majority of 42% in the study group and 27.3% in the control group were at the age group of 15 years. Considering religion 69.3% in the study group and 74% in the control group were belongs to Hindu religion. In education 40% in the study group and 22% in the control group were studying in 10th standard. Regarding age at menarche, 38.7% in the study group and 34.7% in the control group were attained at the age of 13 years. Majority 40% of mothers in the study group and 38.7% of mothers in control group had higher secondary school education. 39.3% fathers of study group and 42.7% fathers of control group had higher secondary school education

Regarding father's occupation, 46% in the study group and 54.7% in the control group were working as a daily wages. 34.7% in the study group and 43% in the control group had family income Rs.3001 – 5000/ month. Majority 77.3% in the study group and 78% in the control group belonged to nuclear family.

About menstrual pattern variables, 50% in the study group and 48.7% in the control group had the height 151-160cm. Majority of the students 51.3% in the study group and 42.7% in the control group weighed between 46-55kg. Regarding body mass index, 50.7% in the study group and 53.3% in the control group had normal weight. None of the students had obesity. Considering years 155 after menarche, 52.7% in the study group and 46% in the control group were in 1-2 years. Majority of the students in both the groups had an onset of pain after menarche between 0-6 months.

Regarding onset of menstrual pain, 49.3% in the study group had just before menses and 46% in the control group had pain with onset of menses. 42.7% in both the groups had menstrual pain for 8-72hours. Majority of the girls had menses once in 25-30 days. About 74.7% in the study group and 64.7% in the control group had 2-5 days of menstrual flow. Most of the girls 69.3% in the study group and 68% in the control group had family history of dysmenorrhea.

CONCLUSION

The results of the study showed that selected yoga was effective in the management of primary dysmenorrhea among school girls. The study findings revealed a reduction in pain score and associated symptoms of dysmenorrhea after the yoga training programme in the study group. Yoga improves physical and mental well-being and may reduce symptoms such as nausea, headache, stress, and menstrual discomfort.^{5,6,9} It also promotes regular participation in daily activities and may help reduce school absenteeism associated with dysmenorrhea.^{4,9} From this study, the adolescents developed a positive attitude towards the management of primary dysmenorrhea, which enhanced their confidence in self-care. Therefore, the investigator concluded that educating adolescent girls about complementary therapies such as yoga can contribute to improved menstrual health and overall well-being.⁵

NURSING IMPLICATIONS

Nursing Practice

These study findings may create awareness among adolescent (14-18 years) girls regarding primary dysmenorrhea and its management. Nurses can provide health education regarding safe, evidence-based, non-pharmacological interventions such as yoga to promote menstrual health.^{5,8}

Nursing Education

Nursing education should prepare nurses to function effectively as health educators by equipping them with knowledge regarding complementary and alternative therapies for menstrual health management.⁸

Nursing Administration

Nursing administrators should encourage Continuous Nursing Education (CNE) programmes on complementary therapies including yoga and strengthen school health services for adolescent girls.⁸

Nursing Research

Further research should evaluate different yoga interventions, larger populations, and diverse settings to strengthen evidence regarding yoga for primary dysmenorrhea.⁹

LIMITATIONS

1. The investigator had no control on extraneous variables like diet habits, exam stress and absenteeism, etc.
2. Cultural belief restricted some participants to enroll in the study.
3. As parents are not having enough knowledge on alternative therapies, some of them did not give consent to participate in the study.
4. Study findings were limited generalization as it was conducted in selected schools.
5. Most of the schools did not give permission due to public exam, so schools were selected purposely.

RECOMMENDATIONS

- This study can also be replicated in different cultural groups, urban areas and larger samples in different settings.
- A similar study can be conducted as a video assisted teaching program with adequate follow up.
- A comparative study could be conducted to assess the effectiveness of conventional medicine and the yogasanas on dysmenorrhea.
- A similar study could be carried out for other menstrual problems like irregular cycle and excessive flow, etc.
- There are limited studies on effect of yoga on primary dysmenorrhea. So more studies could be replicated.
- In rural areas most of the schools did not appoint school health nurse. The government should appoint and urge all the private schools to appoint school health nurse. So that the young girls get guidance for their reproductive health problems.

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Author Contributions

Conception and design of the study: Sarvendra Pratap and Mrs. Anindita Tripathi.

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Accountability for all aspects of the work: Sarvendra Pratap.

Ethical Considerations

The study was conducted in accordance with ethical principles and the Declaration of Helsinki. Ethical approval was obtained from the appropriate institutional ethics committee before commencement of the study.

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Conflicts of Interest

The authors declare that there are no conflicts of interest.

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