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A STUDY TO ASSESS THE EFFECTIVENESS OF YOGA THERAPY IN DECREASING PAIN LEVEL DURING DYSMENORRHOEA AMONG ADOLESCENT GIRLS IN SELECTED SCHOOLS, BANGALORE.

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INTRODUCTION:

The term adolescent comes from a Latin word "Adalescere" which means "to grow up"[1]. Within this development phase physical, social and psychological issues are interwoven that create unique characteristic, behaviours and needs. Adolescence seems to be a chaotic and at the same time a vibrant period of human life. Like the budding flower, the adolescent girl needs the nurture of a caring environment at home, supported by a friendly, empathetic and sensitive health system to help her to bloom and mature in to a healthy womanhood. The advent of menstruation, that exclusive feature of female puberty, provides the greatest impetus toward full realization and acceptance of female sexuality. Menstruation is a positive evidence of womanhood and the potential for pregnancy and child bearing. Most girls are adequately prepared for the event and seeing it as the symbol of their passage from childhood to womanhood. Others find it distressing, frightening and difficult to accept.

According to Wolman, "adolescence is a transitional stage of development between childhood and adulthood". Inception of puberty declares the attainment of adolescence. Boys and Girls face it entirely different. Girls have their reproductive system changes , they become hairy, voice shrinks, lots of pimple on face and above all there is a onset of menstruation and it brings with it menstrual cramps which are known medically as dysmenorrhoea. One of the major physiological changes that take place in adolescent girls is onset of menarche which is usually associated with a number problems among which dysmenorrhoea are the most common. Menarche is the onset of menstruation and it is one of the most significant milestones in a woman's life[2].

Adolescent girls reveal in addition to nutritional and health problems, gynaecological disorders which may have a devastating effect on their future fertility and childbearing. Menstrual problems of adolescents occupy a special space in the spectrum of gynaecological disorders of all ages. This is because of the physical nature of the problems which are so unique, special and specific for the age group and also because of the associated psychological factors which are very important in the growth and psychological remodelling of someone in the transition between childhood and womanhood.

Menstruation is a periodic uterine bleeding that begins with the shedding of secretary endometrium approximately 14 days after ovulation. Molecular compounds called prostaglandins are released during menstruation, due to the destruction of the endometrial cells, and the resultant release of their contents. Release of prostaglandins and other

inflammatory mediators in the uterus cause the uterus to contract. These substances are thought to be a major factor in primary dysmenorrhea. When the uterine muscles contract, they constrict the blood vessels to the tissue of the endometrium, which, in turn, breaks down and dies. These uterine contractions continue as they squeeze the old, dead endometrial tissue through the cervix and out of the body through the vagina. These contractions, and the resulting temporary oxygen deprivation to nearby tissues, are responsible for the pain or "cramps" experienced during menstruation[3]. Dysmennorhoea or menstrual pain is the pain in the lower abdomen during menstruation. The pain sometimes radiates to the lower back or thigh area[4].

The term dysmenorrhoea is derived from the Greek word “dys” meaning difficult/painful/abnormal, “meno” meaning month, and “rrhoea” meaning flow. Dysmenorrhoea refers to the syndrome of painful menstruation. By definition, dysmenorrhoea is a painful period of menstrual cramping which may be accompanied by symptoms such as nausea, vomiting, diarrhoea, headache, weakness and fainting[5]. Dysmenorrhoea literally means painful menstruation. But a more realistic and practical definition includes causes of painful menstruation of sufficient magnitude so able to capacitate day to day activities[6].

Dysmenorrhoea is a gynaecological medical condition characterized by severe uterine pain during menstruation. While most women experience minor pain during menstruation, dysmenorrhoea is diagnosed when the pain is so severe as to limit normal activities or require medication. Dysmenorrhoea can feature different kinds of pain including sharp, throbbing, dull, nauseating, burning or shooting pain. Dysmenorrhoea may precede menstruation by several days or may accompany it, and it usually subsides as menstruation tapers off. Dysmenorrhoea may co-exist with excessively heavy blood loss known as menorrhagia[7]. Dysmenorrhoea is one of the common problems experienced by many adolescent girls. There are two types of dysmenorrhoea - primary and secondary dysmenorrhoea. Primary dysmenorrhoea is a periodic pain and cramping, that may radiate to the lower back and upper thighs. This is not caused by an underlying medical condition. It may lasts for 1-3 days of periods, when chemical messenger called prostaglandin peaks. Symptoms may include backache, leg pain, nausea, vomiting, diarrhoea, headache, and dizziness whereas secondary dysmenorrhoea is a cramps caused by medical problems[8].

The aetiology of primary dysmenorrhoea is not precisely understood, but most symptoms can be explained by the action of uterine prostaglandins, particularly PGF2-alfa. Elevated prostaglandin levels were found in the endometrial fluid of women with dysmenorrhoea and correlated well with the degree of pain. The increase in prostaglandins in the endometrium following the fall in progesterone in the late luteal phase results in increased myometrial tone and excessive uterine contraction[9]. The identified risk factors for dysmenorrhoea include teenage, nulliparity, heavy menstrual flow, smoking, upper socioeconomic status; attempts to lose weight, physical inactivity, disruption of social networks, depression and anxiety. Yoga, an ancient science, can help women cope with dysmenorrhoea and help develop the state of their body and mind. It can help alleviate pain that goes with menstruation. Yoga’s potential mental and physical health benefits are reductions in sympathetic nervous system tone, increases in vagal activity lowering inflammation; all of which could have favourable endocrine and immune consequences[10].

The word "yoga" comes from a Sanskrit root "yuj" which means union, or yoke, to join, and to direct and concentrate one's attention. Yoga is an ancient science and probably is the first known to mankind to maintain and promote health. As a system of treatment, it has gained worldwide popularity. Yoga experts around the world have always claimed that yoga can prevent and treat a number of health problems. Numerous scientific studies using the modern scientific techniques carried out in different parts of world have shown that many yogic practices have health promotive and curative abilities. Yoga can prevent and treat diseases by using the energies inside the body, improving the circulation and waste disposal thereby cleansing the cells. As a practice, yoga aims to harmonize the body & mind. The benefits of yoga apply to three aspects of physical health – prevention, cure and rehabilitation. Yoga treats the individual as a whole (holistic approach) and not just the symptoms. Therefore, yoga is just not a system of physical exercises but a psycho physiological system of therapy. Yoga is harmonizing the body with the mind and breath through the means of various breathing techniques, yoga postures (asanas) and meditation which helps in relieving pain. When yoga is practice for menstrual disorder, it improve the functioning of the endocrine glands, some of which are responsible for the regulating the menstruation. Yoga also promotes flexibility in the body so that the muscles become supple and do not cramp or get injured. When the body is stronger, it feel less pain as well. Yoga therapy for healthy menstrual cycle can also improve overall well-being[11]. The physical benefits of yoga are linked to the release of β-endorphins and the shift caused in neurotransmitter levels linked to emotions such as dopamine and serotonin. Yoga, tailored to chronic low back pain,

produced significant reductions in pain, physical disability, and depression[12]. Yoga, a time-tested natural technique is one of the rare side-effect free options available out there that can make your periods pain-free. Yoga strengthens the body physically and aids in alleviating pain caused due to menstrual cramps. It also calms the mind and empowers you to put up a stronger resistance against giving in to the pain. Yoga asanas effectively targets the affected area of the body to provide long- lasting and immediate relief from the menstrual pain such as the wide child's pose is one of the most effective yoga positions recommended in relieving women suffering from menstrual cramps which brings about the relaxation of the muscle. Asanas help in relieving congestion in these organs, especially uterus, which is one of the reason for dysmenorrhoea pain. This aspect of the yoga plays an important role for women wanting to find effective relief against painful menstrual cramps. This is very useful in an effective pain management system that allows the body to cope with any sensation of pain[13].

NEED FOR THE STUDY:

The World Health Organization identifies adolescence as the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to 19[14]. Adolescence is a transition period from childhood to adulthood and is characterised by a spurt in physical, endocrinal and mental growth with a change from complete dependence to relative independence. The period of adolescence for a girl is a period of physical and psychological preparation for safe motherhood. As the direct reproducers of future generations, the health of adolescent girls influences not only their health but also the health of future population. Around 21% of India's population comprises of adolescent girls[15]. The prevalence of dysmenorrhoea is estimated to be present in 25% of women and up to 90% of adolescents. No significant difference exists in the prevalence or incidence between races, though the most common causes of dysmenorrhoea differ by age. Although it is not life-threatening, dysmenorrhoea can be debilitating and psychologically taxing for many women. A study was conducted to determine the incidence of dysmenorrhoea among 1648 adolescent girls of Karnataka. The incidence of dysmenorrhoea was 87%. Of these, 46.69% had severe problem of perceived pain during menstruation[16]. A cross sectional survey was conducted in New Delhi to find the type and frequency of problem related to menstruation in adolescent girls and the effect of these problems, among 198 adolescent girls in the age group 13-19 years. About 35.9% of the study subjects were in the age group of 13-15 years followed by 15-17, 17-19 years respectively. Mean age of the study participants was 16.2 years. Dysmenorrhoea (67.2%) was the common problem and (63.1%) had one or the other symptom of premenstrual syndrome. Other related problems were present in 55.1% of the study subject. Daily routine of 60% girls was affected due to prolong bed rest, missed social activities/commitment, disturbed sleep, decrease appetite. Nearly 15% had to miss a class and 10% had to abstain from work. The study concluded that screen adolescent girls for menstruation related problems and provide them with counseling services and relevant information on possible treatment options[17].

Dysmenorrhea can disrupt personal life and is a significant public health problem associated with substantial economic loss related to work absences. Ten percent of women with the condition have severe pain that can be incapacitating. In the United States, the annual economic loss has been estimated at 600 million work hours and 2 billion dollars. In the Indian study conducted in a rural area in Maharashtra state, 92 per cent of the 650 adolescent clinically examined had evidence of one or more dysmenorrhea prevalence rate in many states like Gujarat 47.4 percent, Westbengal 35.9 percent and Bombay 41.7 percent[18] . Dysmenorrhoea is associated with a negative impact on social, academic and sports activities of many female adolescents. A study to determine the prevalence of dysmenorrhoea among the Hispanic adolescents in U.S states that, among participants 85% reported dysmenorrhoea. Of these 38% reported missing school due to dysmenorrhoea and 33% reported missing individual classes. Activities affected by dysmenorrhoea included class concentration (59%), sports (51%), class participation (50%) socialization (46%), home work (35%), test taking skills (36%) and grades (29%)[19]. A study was done on menstrual problems among girls at Sweden. The results showed that more than 50% of all menstruating girls experienced some discomfort. It has also been reported by a senior obstetrician that probably 5-10% of girls in their late teens suffer from severe spasmodic dysmenorrhoea interrupting their education and social life[20].

A study conducted to determine the prevalence of dysmenorrhoea, its associated factors and its effects on school activities among adolescent girls in a secondary school in a rural district of Selangor, Malaysia. The prevalence of dysmenorrhoea was 62.3%. It was significantly higher in the middle adolescence (15 to 17 years old) age group, girls with regular menstrual cycle and a positive family history. There was no significant association with mean age of

menarche and duration of menstruation. The number of school and class absences increased with increasing severity of dysmenorrhoea. The mean pain score was significantly higher in girls who reported to be unable to participate in sports and with poor concentration in class. Dysmenorrhoea among the adolescent girls was found to be common. It had significant negative impact in their school performance and activities. A study was conducted a study at Iran to evaluate the menstrual problem specially dysmenorrhoea and its severity in female medical students and its effect on their regular activities. Dysmenorrhoea was highly prevalent among female medical students; it is related to college/class absenteeism, limitations on social, academic, sports and daily activities. Maximum participants do not seek medical advice and self treat themselves with prostaglandin inhibitors like Ibuprofen.

An epidemiological study was conducted on prevalence of dysmenorrhoea in the middle and high schools, France. Out of 4,203 adolescents aged between 14 and 18 years, the prevalence of dysmenorrhoea was (902)21%. School absenteeism was high, 35%of the dysmenorrheic students reported missing classes on the first day of menses[21]. A cohort study was conducted to investigate the epidemiology of dysmenorrhoea in 823 women of menstrual age 18-51years, in Japan. Dysmenorrhoea of mean duration 1.75 days; range 1-5 days was reported in 95%, during the first month study period. Common associated symptoms included headache 10.77%, back pain 6.92%, and fatigue 5.38%.No participant with dysmenorrhoea visited a physician, while 51.5% of the women used self medication, and 7.7% used complementary/alternative medicine. The study conclude that dysmenorrhoea is common among women[22]. Several drugs were used to lessen the pain of primary dysmenorrhoea like non steroidal anti-inflammatory drugs (NSAIDs) such as aspirin, ibuprofen etc. and also acetaminophen may also help ease the pain. But these drugs may have significant side effects and risks. So, alternative treatments were considered to ease the menstrual cramps like yoga, exercise, dietary modification, etc. Of this yoga a simple technique in simply changing the position of the body is effective to help ease the menstrual cramps[23].

Yoga is the most renowned and most practiced form of mind and body therapy. The classical technique of yoga dates back more than 5,000 years. In ancient times, the desire for greater personal freedom, health, long life, and heightened self esteem gave birth to this system of physical and mental exercises. The word yoga means “Union” between mind and body, it brings them together in to a harmonious experiences. The whole system of yoga is built on four main structures i.e. exercise (asanas), breathing techniques (pranayama), meditation and relaxation postures. Asanas help to relax tone the muscles, massage the organs, regulate the body energy levels, calm the mind and reduce and eliminate stress and anxiety[24].

Yoga improves the well-being. Yoga teaches adolescent not to focus too much on the problem, rather it teaches them to learn to accept the inevitable changes in life. Yoga, being a physical exercise, promotes good blood circulation. As a result, menstrual cycle will not be a problem anymore, thus minimizing pain[25].

A study was conducted in which 60 medicos were made to do certain yogic exercises. Pre menstrual serum progesterone was taken. Yoga was continued for 3 months. Premenstrual serum progesterone was assayed again after yoga and 95% subjects reported 100% pain relief but their progesterone levels were still low. This result infers that yoga relieves pain of dysmenorrhoea, but no alteration in the progesterone levels. P = 0.0027 using the U test of Mann Whitney. It can be concluded that yoga can be safely used as an alternative therapy for pain relief in dysmenorrhoea and this action is not mediated through the hormones[26].

The above mentioned instances have motivated the researcher to select the topic. The prevalence of dysmenorrhoea among adolescent girls is high. As dysmenorrhoea causes different problem in the adolescent girls such as absenteeism, decrease social activities, disturbed sleep etc. The researcher felt the need to study the effect of yoga therapy during dysmenorrhoea among adolescent girls.

OBJECTIVES

1. To assess the pre test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.
2. To assess the post test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.

3. To compare the pre test and post test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.
4. To compare the post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group.
5. To associate the pre test level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables in both experimental and control group.

HYPOTHESIS:

- **H_1.**There is significant difference in the mean pre test and post test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.
- **H_2.**There is significant difference in the mean post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group.
- **H_3.**There is significant association between the pre test level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables in both experimental and control group.

CONCEPTUAL FRAMEWORK BASED ON HEALTH PROMOTION MODEL:.

The aim of present study is to assess effectiveness of yoga therapy on level of pain during dysmenorrhoea among adolescent girls in selected schools, Bangalore. In this study researcher adopted the modified conceptual framework based on Hall's core, care and cure model.

The Hall's core, care and cure model was developed in the late 1960"s by Lydia Hall and was designed from Roger Model. This model implies that patients achieve maximal potential through learning process. This model postulated that individual could be conceptualized in three separate domains: the person (core), the body (care) and the illness (cure).

Nursing functions is all three circles. They are interrelated and are influenced by each other. The three circles are as follow:

1. The Core
2. The Care
3. The Cure

The Core:

In this study the core refers to assess the level of pain during dysmenorrhoea among adolescent girls by using numeric pain rating scale and to assess the demographic variables and level of pain during dysmenorrhoea among adolescent girls in both experimental and control group. The demographic variables are age in year, standard of class, religion, age at menarche, type of family, parent's occupation, family monthly income in rupees and source of information on yoga.

The Care

In this study the care refers to the effectiveness of yoga therapy-wide child's pose on level of pain during dysmenorrhoea among adolescent girls. The investigator used numeric pain rating scale for assessing the level of pain during dysmenorrhoea among adolescent girls. The investigator identified the level of pain as no pain, mild, moderate and severe pain based on the study.

For the experimental group (30) the yoga therapy-wide child's pose was given to reduce the level of pain during dysmenorrhoea among adolescent girls. And for control group there was no therapy given.

The Cure

In this study it refers to the identified and the outcome intended. It help the investigator to keep focused on achieving the ultimate outcome and help the broader group of uses to cause the effort in receiving target needs i.e. the relieving in the level of pain during dysmenorrhoea among adolescent girls for the duration of 20minutes for 2 consecutive days.

In this present study outcome refers to the comparison of the pre test and post test level of pain scores during dysmenorrhoea among adolescent girls, is done with statistical analysis. In this study effectiveness of yoga therapy-wide child's pose reinforce the health of the samples.

METHODOLOGY:

RESEARCH APPROACH:

In view of the nature of the problem under study and to accomplish the objectives of the study, Quantitative approach was used to assess the effectiveness of yoga therapy on level of pain during dysmenorrhoea among adolescent girls.

RESEARCH DESIGN:

True experimental - Pre test and post test control group design.

POPULATION:

All the adolescent girls having dysmenorrhoea studying in Modern school, Ejipura, Holy Christ High School, Ejipura and Modern English High School, Anepalya, Bangalore. The study comprised of 92 adolescent girls who were having dysmenorrhoea.

SAMPLING:

Sampling technique:

Probability simple random sampling technique

Sample Size:

All adolescent girls who fulfil the inclusion criteria were selected as sample and sample size was 60.

DATA COLLECTION TECHNIQUE:

DEVELOPMENT OF THE TOOL:

The questionnaire was constructed with two parts and a total of 38 items.

Section A: Demographic variables which gives baseline information obtained from adolescent girls such as age in years, standard of class, religion, age at menarche, type of family, parents occupation, family monthly income in rupees and source of information on yoga.

Section B: Numeric Pain Rating Scale to assess the level of pain during dysmenorrhea among adolescent girls. The scale consisted of four level of rating the pain.

Score interpretation:

Score	Level of pain
0	No pain
1-3	Mild pain
4-6	Moderate pain
7-10	Severe pain

CONTENT VALIDITY

The prepared tool with the objectives was submitted to 5 nursing experts, 1 biostatistician expert and 1 to yoga expert. The tool got final shape after incorporation of the modification based on the opinions of the experts.

RELIABILITY:

Reliability of the tool was established through test retest method by using Karl Pearson's formula, r=.73 and the tool was found to be reliable.

PLAN FOR DATA ANALYSIS

Data was analyzed on the basis of objective and hypothesis by using descriptive and inferential statistics.

Descriptive statistics

1. Frequency and percentage distribution was used to analyze the demographic variables of adolescent girls in both experimental and control group.
2. Mean and standard deviation was used to analyze the pretest and posttest level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.
3. **Inferential statistics**

1. Wilcoxon's test was used to compare the pretest and posttest level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.
2. Mann-Whitney U test was used to compare the posttest mean level of pain during dysmenorrhoea among adolescent girls between the experimental and control group.
3. Chi-square test was used to associate the level of pain among adolescent girls with their selected demographic variables in both the experimental and control group.

RESULTS:

Section 1: Assessment of the demographic variables of the adolescent girls at selected schools in experimental and control group.

Table-1.1- Frequency and percentage distribution of adolescent girls at selected schools according to their demographic variables.

S.no	Demographic variables	Categories	Experimental		Control	
			No. (30)	%	No. (30)	%
1	Age in years	13-14 years	22	73.3	12	40.0
		15-16 years	8	26.7	18	60.0
		17-18 years	-	-	-	-
2	Standard of class	7^{th} std	10	33.3	4	13.3
		8^{th} std	4	13.3	4	13.3
		9^{th} std	8	26.7	9	30.0
		10^{th} std	8	26.7	13	43.3
3	Religion	Hindu	14	46.7	16	35.3
		Christians	7	23.3	6	20.0

		Muslim	9	30.0	8	26.7
		Others	-	-	-	-
4	Age at menarche	12 years	17	56.7	13	43.3
		13 years	13	43.3	17	56.7
5	Type of family	Nuclear family	24	80.0	21	70.0
		Joint family	6	20.0	9	30.0
6	Parents occupation	Unemployed	1	3.3	2	6.7
		Agriculture	-	-	-	-
		Govt. employee	2	6.7	2	6.7
		Pvt. employee	11	36.7	17	56.7
		Others	16	53.3	9	30.0
7	Family income per month	<5000	6	20.0	7	23.3
		5000-10000	18	60.0	16	53.3
		10001-15000	4	13.3	2	6.7
		>15000	2	6.7	5	16.7
8	Source of information on yoga	Health personnel	6	20.0	5	16.7
		Relatives	5	16.7	7	23.3
		Friends	16	53.3	13	43.3
		Elder sister	3	10.0	5	16.7

Table 1.1 shows the distribution of adolescent girls at selected schools according to their demographic variables in both the experimental and control group. In experimental group regarding age,22(73.3%) belong to 13-14years and 8(26.7%) belong to 15-16 years in experimental group. In control group 12(40%) belong to 13-14years and 18(60%) belong to 15-16 years.

With regard to standard of class in experimental group 10(33.3%) were in 7^{th} standard, 4(13.3%) were in 8^{th} standard, 8(26.7%) were in 9^{th} standard and 8(26.7%) were in 10^{th} standard. In control group 4(13.3%) were in 7^{th} standard, 4(13.3%) were in 8th standard, 9(30%) were in 9^{th} standard and 13(43.3%) were in 10^{th} standard.

With regard to religion in experimental group 14(46.7%) were hindu, 7(23.3%) were christians and 9(30%) were muslim. In control group 16(35.3%) were hindu, 6(20%) were christians and 8(26.7%) were muslim.

With regard to age at menarche in experimental group 17(56.7%) belong to 12 years and 13(43.3%) belong to 13 years. In control group 13(43.3%) belong to 12 years and 17(56.7%) belong to 13 years.

With regard to type of family in experimental group 24(80%) belong to nuclear family and 6(20%) belong to joint family. In control group 21(70%) belong to nuclear family and 9(30%) belong to joint family.

With regard to parents occupation in experimental group 1(3.3%) belong to unemployed, 2(6.7%) belong to government employee, 11(36.7%) belong to private employee and 16(53.3%) belong to others. In control group 2(6.7%) belong to unemployed, 2(6.7%) belong to government employee, 17(56.7%) belong to private employee and 9(30%) belong to others.

With regard to family monthly income in rupees in experimental group 6(20%) belong to <5000, 18(60%) belong to 5000-10000, 4(13. 3%) belong to 10001-15000 and 2(6.7%) belong to >15000. In control group 7(23.3%) belong to <5000, 16(53.3%) belong to 5000-10000, 2(6.7%) belong to 10001-15000 and 5(16.7%) belong to >15000.

With reference to source of information on yoga in experimental group 6(20%) were getting information from health personnel, 5(16.7%) were getting information from relatives, 16(53.3%) were getting information from friends and 3(10%) was getting information from elder sister. In control group 5(16.7%) were getting information from health

personnel,7(23.3%) were getting information relatives, 13(43.3%) were getting information from friends and 5(16.7%) was getting information from elder sister.

Section 2: Assessment of the pretest level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.

Table-2.1: Frequency and percentage distribution of adolescent girls according to the pre test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.

Sno	Level of pain	Pre test			
		Experimental		Control	
		No. (30)	%	No. (30)	%
1	No pain (0)	-	-	-	-
2	Mild pain (1-3)	-	-	-	-
3	Moderate pain (4-6)	13	43.3	14	46.7
4	Severe pain (7-10)	17	56.7	16	53.3
5	Over all	30	100	30	100

The table 2.1 shows the distribution of the pre test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group**.** In experimental group, 13(43.3%) had moderate pain and 17(56.7%) had severe pain. In control group 14(46.7%) had moderate pain and 16(53.3%) had severe pain.

Table -2.2: Mean, SD and range of pre test level of pain during dysmenorrhoea among adolescent girls

Sno	Groups	Max. score	Pre test pain				
			Range	Mean	SD	Mean %	% of Difference
1	Experimental	10	4-10	6.83	1.62	68.3	1%
2	Control	10	4-10	6.73	1.53	67.3	

The table 2.2 shows the Mean, SD and range of pre test level of pain during dysmenorrhoea among adolescent girls. In experimental group, out of maximum score 10, the mean was 6.83, SD 1.62 with range 4-10 and mean percentage 68.3. In control group out of maximum score 10, the mean was 6.73, SD 1.53 with range 4-10 and mean percentage was 67.3. The percentage of difference was 1%.

Section 3: Assessment of the posttest level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.

Table-3.1: Frequency and percentage distribution of adolescent girls according to the post test level of pain during dysmenorrhea among adolescent girls in both experimental and control group.

Sno	Level of pain	Post test			
		Experimental		Control	
		No. (30)	%	No. (30)	%
1	No pain (0)	-	-	-	-
2	Mild pain (1-3)	13	43.3	0	0
3	Moderate pain (4-6)	17	56.7	17	56.7
4	Severe pain (7-10)	0	0	13	43.3
5	Over all	30	100	30	100

The table 3.1 shows the distribution of the post test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group**.** In experimental group, 13(43.3%) had mild pain and 17(56.7%) had moderate pain. In control group 17(56.7%) had moderate pain and 13(43.3%) had severe pain.

Table -3.2: Mean, SD and range of post test level of pain during dysmenorrhoea among adolescent girls

Sno	Groups	Max. score	Post test pain				
			Range	Mean	SD	Mean%	% of Difference
1	Experimental	10	2-6	4.10	1.44	41.0	22.7
2	Control	10	4-9	6.37	1.06	63.7	

The table 3.2 shows the Mean, SD and range of post test level of pain during dysmenorrhoea among adolescent girls. In experimental group, out of maximum score 10, the mean was 4.10, SD 1.44 with range 2-6 and mean percentage 41.0. In control group out of maximum score 10, the mean was 6.37, SD 1.06 with range 4-9 and mean percentage 63.7. The percentage of difference was 22.7%.

Section 4: Within group comparison of pre and post test level of pain during dysmenorrhoea among adolescent girls in experimental and control group separately.

Table-4.1: Frequency and percentage distribution of adolescent girls according to pre and post test level of pain during dysmenorrhoea among adolescent girls in experimental group.

Sno	Level of pain	Experimental group			
		Pre test		Post test	
		No. (30)	%	No. (30)	%
1	No pain (0)	-	-	-	-
2	Mild pain (1-3)	-	-	13	43.3
3	Moderate pain (4-6)	13	43.3	17	56.7
4	Severe pain (7-10)	17	56.7	0	0
5	Over all	30	100	30	100

This table 4.1 shows the distribution of adolescent girls according to pre and post test level of pain during dysmenorrhoea among adolescent girls in experimental group. In the pre test score the adolescent girls had 13(43.3%) moderate pain and 17(56.7%) had severe pain. In the post test score adolescent girls had 13(43.3%) mild pain and 17(56.7%) had moderate pain.

Table -4.2: Mean, SD and range of pre and post test level of pain during dysmenorrhoea among adolescent girls in experimental group.

Sno	Level of pain	Max. score	Experimental group				% of reduction of pain
			Range	Mean	SD	Mean%	
1	Pre test	10	4-10	6.83	1.62	68.3	27.3%
2	Post test	10	2-6	4.10	1.44	41.0	

The table 4.2 shows the Mean, SD and range of pre and post test level of pain during dysmenorrhoea among adolescent girls. In pre test out of maximum score 10, the mean was 6.83, SD 1.62 with range 4-10 and mean percentage 68.3. In

post test out of maximum score 10, the mean was 4.10, SD 1.44 with range 2-6 and mean percentage was 41.0. The percentage of reduction of pain was 27.3%.

Table -4.3: Wilcoxon test analysis for the significance of pre and post test level of pain during dysmenorrhoea among adolescent girls in experimental group.

Sno	Variable	Max. Score	Mean difference	SD of difference	% of mean difference	Wilcoxon test Z-value	p-value
1	Level of pain	10	2.73	1.02	27.3	4.91*	p<.0.05

Note: *- denotes significant at 0.05 level (ie, p<0.05)

This table 4.3 shows the Wilcoxon test analysis for the significance of pre and post test level of pain during dysmenorrhoea among adolescent girls in experimental group. In experimental group out of maximum score 10, mean difference was 2.73 with SD of difference 1.02 and percentage of mean difference was 27.3. Wilcoxon test was carried out and found to significance at P<.0.05 level(4.91). It was evident that the yoga therapy-wide child's pose was effective in relieving the level of pain during dysmenorrhoea among adolescent girls in experimental group.

Table-4.4: Frequency and percentage distribution of adolescent girls according to pre and post test level of pain during dysmenorrhoea among adolescent girls in control group.

Sno	Level of pain	Control group			
		Pre test		Post test	
		No. (30)	%	No. (30)	%
1	No pain (0)	-	-	-	-
2	Mild pain (1-3)	-	-	0	0
3	Moderate pain (4-6)	14	46.7	17	56.7
4	Severe pain (7-10)	16	53.3	13	43.3
5	Over all	30	100	30	100

This table 4.4 shows the distribution of adolescent girls according to pre and post test level of pain during dysmenorrhoea among adolescent girls in control group. In the pre test score the adolescent girls had 14(46.7%) moderate pain and 16(53.3%) had severe pain. In the post test score adolescent girls had 17(56.7%) moderate pain and 13(43.3%) had severe pain.

Table-4.5: Mean, SD and range of pre and post test level of pain during dysmenorrhoea among adolescent girls in control group.

Sno	Level of pain	Max. score	Control group				% of reduction of pain
			Range	Mean	SD	Mean %	
1	Pre test	10	4-10	6.73	1.53	67.3	3.6%
2	Post test	10	4-9	6.37	1.06	63.7	

This table 4.5 shows the Mean, SD and range of pre and post test level of pain during dysmenorrhoea among adolescent girls in control group. In pre test out of maximum score 10, the mean was 6.73, SD 1.53 with range 4-10 and mean percentage was 67.3. In post test out of maximum score 10, the mean was 6.37, SD 1.06 with range 4-9 and mean percentage was 63.7. The percentage of reduction of pain was 3.6%.

Table -4.6: Wilcoxon test analysis for the significance of pre and post test level of pain during dysmenorrhoea among adolescent girls in control group.

Sno	Variable	Max. Score	Mean difference	SD of difference	% of mean difference	Wilcoxon test Z-value	p-value
1	Level of pain	10	0.36	0.13	3.6	1.393^{NS}	p>.0.05

Note: *- denotes significant at 0.05 level (ie, p>0.05)

This table 4.6 shows the Wilcoxon test analysis for the significance of pre and post test level of pain during dysmenorrhoea among adolescent girls in control group. In control group out of maximum score 10, mean difference was 0.36 with SD of difference 0.13 and percentage of mean difference was 3.6. Wilcoxon test was carried out and found to be non significance at P<.0.05 level(1.393^{NS}). It was evident that the level of pain during dysmenorrhoea among adolescent girls was not relieved in control group when no intervention was given.

Testing of hypothesis

H_0. There is no significant difference in the mean pre test and post test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.

H_1. There is significant difference in the mean pre test and post test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group.

The above table 4.3 and 4.6 shows the significance of pre and post test level of pain during dysmenorrhoea among adolescent girls in experimental group and not significant in control group. Hence, research hypothesis H_1 was accepted and null hypothesis was rejected.

Section 5: Assessing the effectiveness yoga therapy over control group among adolescent girls

Table -5.1: Mann –Whitney U test analysis for the significance of post test level of pain during dysmenorrhoea among adolescent girls in between experimental and control group

Sno	Groups	Max. score	Post test level of pain				Mann –Whitney U test Z-value	p-value
			Mean	SD	Mean rank	Sum of rank		
1	Experimental	10	4.10	1.44	18.57	557.0	5.418*	p<0.05
2	Control	10	6.37	1.06	42.63	1273.0		

Note: *- denotes significant at 0.05 level (ie, p<0.05).

This table 5.1 represents the statistical significance of post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group. In experimental group the post level of pain out of maximum score 10, the mean was 4.10, SD 1.44 with mean rank 18.57 and sum of rank was 557.0. In control group the post test level of pain out of maximum score 10, the mean was 6.37, SD 1.06 with mean rank 42.63 and mean sum of rank was 1273.0. The Mann-Whitney U test was carried out and it was found to be significant at p< 0.05 level (P=5.418).

Testing of hypothesis

H_0. There is no significant difference in the mean post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group.

H_2. There is significant difference in the mean post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group.

The table 5.1 represents the statistical significance of post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group. The Mann-Whitney U test was carried out and it was found to be significant at p< 0.05 level (P=5.418). Hence, research hypothesis H_2 was accepted and null hypothesis was rejected.

Section 6: Association between the pretest level of pain during dysmenorrhoea among adolescent girls with their demographic variables in both experimental and control group.

Table-6.1: Association between level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables in experimental group.

S.no	Demographic variables	Categories	Sample (30)		Experimental				χ^2- value	p-value
					≤median		>median			
			No.	%	No.	%	No.	%		
1	Age in years	13-14 years	22	73.3	15	75.0	7	70.0	0.85, df=1,NS	p>0.05
		15-16 years	8	26.7	5	25.0	3	30.0		
2	Standard of class	7th std	10	33.3	8	40.0	2	20.0	4.238, df=3,NS	p>0.05
		8th std	4	13.3	1	5.0	3	30.0		
		9th std	8	26.7	5	25.0	3	30.0		
		10th std	8	26.7	6	30.0	2	20.0		
3	Religion	Hindu	14	46.7	7	35.0	7	70.0	6.025, df=2,S	p<0.05
		Christians	7	23.3	7	35.0	0	0		
		Muslim	9	30.0	6	30.0	3	30.0		
4	Age at menarche	12 years	17	56.7	12	60.0	5	50.0	0.271, df=1,NS	p>0.05
		13 years	13	43.3	8	40.0	5	50.0		
5	Type of family	Nuclear	24	80.0	16	80.0	8	80.0	0, df=1,NS	p>0.05
		Joint	6	20.0	4	20.0	2	20.0		
6	Parents occupation	Unemployed	1	3.3	1	5.0	0	0	1.670, df=3,NS	p>0.05
		Govt. employee	2	6.7	2	10.0	0	0		
		Pvt. employee	11	36.7	7	35.0	4	40.0		
		Others	16	53.3	10	50.0	6	60.0		
7	Family income per month	<5000	6	20.0	4	20.0	2	20.0	1.000, df=2,NS	p>0.05
		5000-10000	18	60.0	13	65.0	5	50.0		
		10001-15000	4	13.3	2	10.0	2	20.0		
		>15000	2	6.7	1	5.0	1	10.0		
8	Source of information on yoga	Health personnel	6	20.0	5	25.0	1	10.0	2.381, df=2,NS	p>0.05
		Relatives	5	16.7	3	15.0	2	20.0		
		Friends	16	53.3	11	55.0	5	50.0		
		Elder sister	3	10.0	1	5.0	2	20.0		

Note: S-Significant at 5% level (i.e., p<0.05), NS-Not significant at 5% level (i.e., p>0.05)

Table-6.2: Association between pre test levels of pain during dysmenorrhoea among adolescent girls with their selected demographic variables in control group.

Sno	Demographic variables	Categories	Sample (30)		Control				χ^2- value	p-value
					≤median		>median			
			No.	%	No.	%	No.	%		
1	Age in years	13-14 years	12	40.0	11	50.0	0	0	3.937, df=1,S	p<0.05
		15-16 years	18	60.0	11	50.0	8	100		
2	Standard of class	7th std	4	13.3	3	13.6	1	12.5	2.058, df=3,NS	p>0.05
		8th std	4	13.3	3	13.6	1	12.5		
		9th std	9	30.0	8	36.4	1	12.5		
		10th std	13	43.3	8	36.4	5	62.5		

3	Religion	Hindu	16	35.3	13	59.1	3	37.5	3.047, $df_{=}2$,NS	p>0.05
		Christians	6	20.0	5	22.7	1	12.5		
		Muslim	8	26.7	4	18.2	4	50.0		
4	Age at menarche	12 years	13	43.3	10	45.5	3	37.5	0.151, $df_{=}1$,NS	p>0.05
		13 years	17	56.7	12	54.5	5	62.5		
5	Type of family	Nuclear	21	70.0	14	63.6	7	87.5	1.591, $df_{=}1$,NS	p>0.05
		Joint	9	30.0	8	36.4	1	12.5		
6	Parents occupation	Unemployed	2	6.7	1	4.5	1	12.5	2.293, $df_{=}3$,NS	p>0.05
		Govt. employee	2	6.7	1	4.5	1	12.5		
		Pvt. employee	17	56.7	12	54.5	5	62.5		
		Others	9	30.0	8	36.4	1	12.5		
7	Family income per month	<5000	7	23.3	6	27.3	1	12.5	2.350, $df_{=}2$,NS	p>0.05
		5000-10000	16	53.3	10	45.5	6	75.0		
		10001-15000	2	6.7	2	9.1	0	0		
		>15000	5	16.7	4	18.2	1	12.5		
8	Source of information on yoga	Health personnel	5	16.7	4	18.2	1	12.5	1.251, $df_{=}2$,NS	p>0.05
		Relatives	7	23.3	4	18.2	3	37.5		
		Friends	13	43.3	10	45.5	3	37.5		
		Elder sister	5	16.7	4	18.2	1	12.5		

Note: S-Significant at 5% level (ie., $p<0.05$), NS-Not significant at 5% level (i.e., $p>0.05$).

Table 6.1 and 6.2 reveals that the association of pretest level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables such as age in year, standard of class, religion, age at menarche, type of family, parents occupation, family monthly income in rupees and source of information on yoga in both experimental and control group were statistically non significant at $p<0.05$ except religion in experimental group and age in year in control group.

Testing of hypothesis

H_0. There is no significant association between the pre test level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables in both experimental and control group.

H_3. There is significant association between the pre test level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables in both experimental and control group

Table 6.1 and 6.2 reveals that the association of pretest level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables such as age in year, standard of class, religion, age at menarche, type of family, parents occupation, family monthly income in rupees and source of information on yoga in both experimental and control group were statistically non significant at $p<0.05$ except religion in experimental group and age in year in control group. Hence research hypothesis H_3 was accepted and null hypothesis was rejected

The main findings of the study

The findings of the study revealed that, in group 1 mean difference in pretest and posttest level of pain during dysmenorrhoea was 2.73, SD of difference was 1.02 and % of mean difference was 27.3. The Wilcoxon test Z-value for the level of pain during dysmenorrhoea was 4.91 which was significant at 0.05 level (i.e, $p<0.05$). This signifies that the level of pain during dysmenorrhoea was relieved. In group 2 mean difference in pretest and posttest level of pain during dysmenorrhoea was 0.36, SD of difference was 0.13 and % of mean difference was3.6. The Wilcoxon test Z-value for the level of pain during dysmenorrhoea was 1.393 which was not significant at 0.05 level (i.e, $p<0.05$).

In experimental group, the Wilcoxon test Z-value for the level of pain during dysmenorrhoea was 4.19, which denotes significance at 0.05 level. And in control group the Wilcoxon test Z-value for the level of pain during dysmenorrhoea was 1.393, which denotes non significance at 0.05 level. This means that the level of pain during dysmenorrhoea among adolescent girls was relieved after the administration of yoga therapy-wide child's pose. Since the mean difference in pretest and posttest score was high in the group 1 (experimental group), the intervention was found to be effective. Hence, the research hypothesis (H_1) stated that "There is significant difference in the mean pre test and post test level of pain during dysmenorrhoea among adolescent girls in both experimental and control group" was accepted and null hypothesis was rejected.

Mann Whitney U test was used to compare the post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group after the administration of the yoga therapy-wide child's pose, it was found to be significant at 0.05 level (i.e., $p<0.05$). Hence, the research hypothesis **(**H_2) stated that "There is significant difference in the mean post test level of pain during dysmenorrhoea among adolescent girls between experimental and control group" was accepted and null hypothesis was rejected.

The Chi-square test was used to find out the association between the level of pain and demographic variables of adolescent girls in both experimental and control group. It was found to be significant at 5% level (i.e., $p<0.05$) in both experimental and control group. Hence, the research hypothesis (H_3) states "There is significant association between the pre test level of pain during dysmenorrhoea among adolescent girls with their selected demographic variables in both experimental and control group" was rejected and null hypothesis was accepted.

CONCLUSION:

The practice of yoga has been demonstrated to significantly alleviate the symptoms of dysmenorrhea, offering a holistic and accessible approach to managing menstrual pain. Through its emphasis on physical postures, breath control, and relaxation techniques, yoga helps in reducing menstrual cramps, enhancing overall physical health, and improving emotional well-being. Studies have shown that regular yoga practice can lead to a decrease in the severity and duration of menstrual pain, as well as reduce the reliance on medication for pain management.

Furthermore, yoga's ability to reduce stress and promote relaxation can indirectly contribute to lessening the intensity of dysmenorrhea. The incorporation of specific asanas, pranayama, and meditation practices targets the pelvic region, improves blood flow, and releases muscle tension, thereby providing relief from menstrual discomfort. Additionally, yoga encourages a mindfull awareness of the body, which can empower individuals to better manage their menstrual health. Overall, the integration of yoga into the daily routine offers a natural, cost-effective, and holistic approach to reducing the impact of dysmenorrhea on individuals' lives, promoting a healthier and more balanced lifestyle. The growing body of evidence supporting yoga's benefits for menstrual health underscores its importance as a valuable tool for those seeking relief from dysmenorrhea.

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