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A Study to Assess the Effectiveness of Aerobic Exercise on Primary Dysmenorrhoea among Adolescent Girls at Selected College, Coimbatore

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Abstract: *After menarche many adolescent girls face problems of irregular menstruation, excessive bleeding, and dysmenorrhoea.Dysmenorrhoea is one of the common problem experienced by most of the adolescent girls.* ***Objective:*** *Assess the effectiveness of aerobic exercise on primary dysmenorrhoea among adolescent girls.* ***Samples and Methods:*** *This is a Pre experimental one group pretest posttest design. The sample size was 40 adolescent girls in PSG College of Nursing. Purposive sampling technique was used in this study. Pretest data were collected during menstruation for 5 days using menstrual symptoms assessment questionnaire. From 7th day of menstruation aerobic exercise was administered 40 minutes/day an alternative days up to 7 weeks for two consecutive menstrual cycles. Posttest I and posttest II data were collected during menstruation on two consecutive menstrual cycles for 5 days.* ***Results:*** *High statistical significant improvements were noted in the pre and post intervention on primary dysmenorrhoea among adolescent girls. After administration of 7 weeks of aerobic exercise reduces the degree of primary dysmenorrhoea among adolescent girls at p<o.o5 level of significance.* ***Conclusion:*** *Aerobic exercise as physical activity is significant in reducing the symptoms of primary dysmenorrhoea during menstruation among adolescent girls.*
Keywords - *Aerobic exercise, Adolescent girls, Primary dysmenorrhoea*

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I. Introduction

1.1 Introduction

The female reproductive system is indeed marvelous. Linda French (2007) mentioned that Menstruation is a basic female physiological process, capable of affecting the several other metabolisms within the body. Every month, one egg leaves one of the ovaries on its way to the uterus via fallopian tubes. The inner uterine wall known as the endometrium thickens and there is increased blood circulation in the entire reproductive system. Women may face several difficulties during their menstrual flow. In some women the effects are more aggressive than others. And the most worrisome thing is that the symptoms could recur month after month. The biological term for menstrual problems is dysmenorrhoea[1].

Tammy Boone (2014) mentioned that Primary dysmenorrhoea is caused by prostaglandin induced uterine contractions. Primary dysmenorrhoea tends to occur with the onset of ovulatory cycles and usually improves with time, coincides with the onset of menstrual bleeding, and frequently is associated with other prostaglandin-mediated symptoms such as nausea, vomiting, diarrhea, dizziness. The pain is sharp and crampy, and is located in the lower midline [2]. Robert and David (2004) stated that Primary dysmenorrhoea (PD) is one type of painful menstruation. Because of recent concerns about pharmacological therapy, several studies investigated the efficacy of numerous non pharmacological measures for the relief of primary dysmenorrhoea such as aerobic exercise [3].

1.2 Significance of the study

According to British medical authorities report that degree of dysmenorrhoea in the year of 2000, 80% of the world women have different degree of dysmenorrhoea. According to Med India journal in the year of 2008, pain

during menstruation or dysmenorrhoea occurs in 50% of menstrual women and about 10% are incapacitated for 1-3 day each month. In the 1st year after menarche 38% of girls develop dysmenorrhoea. In the second and the third year after menarche 20% experience pain related to menstruation, about 80% of women who developed dysmenorrhoea do so within 3 years of menarche.

Zondervan (2008) stated that Adolescent girls are more likely than older women to have primary dysmenorrhoea because the condition can get better with age. Secondary dysmenorrhoea tends to be less common in adolescents, as onset of causative conditions may not have occurred yet. Estimates suggest that around 25-50% of adult women and about 75% of adolescents experience pain with menstruation, and some 5-20% report severe pain that prevents them from carrying on with their usual activities [4].

Aganoff (2005) stated that adolescence is a period from childhood to adulthood. One of the major physiological changes that take place in adolescent girls is onset of menarche, which is associated with dysmenorrhoea, excessive bleeding and irregular menstruation of these dysmenorrhoea is one of the common problem experienced by many adolescent girls [5].

1.3 Aim of the study:

The study aimed to assess the effectiveness of aerobic exercise on primary dysmenorrhoea among adolescent girls.

1.4 Hypothesis:

There will be a significant difference in the mean pre-test and mean post-test degree of primary dysmenorrhoea among adolescent girls, after aerobic exercise at 0.05 level of significance.

II. Materials And Methods

2.1 Research Design:

Pre experimental one group pre-test post-test design was used to determine the effectiveness of aerobic exercise on primary dysmenorrhoea among adolescent girls.

2.2 Setting: This study was conducted in PSG College of Nursing, Peelamedu, Coimbatore.

2.3 Sample: A purposive sampling technique of 40 adolescent girls with primary dysmenorrhoea.

Samples were selected according to the following criteria:

1. Adolescent girls between 17 - 19 years of age
2. Adolescent girls who have regular menstrual cycle.
3. All adolescent girls who are having primary dysmenorrhoea and willing to participate in the study.

2.4 Tool

2.4.1 Section A: Demographic data.

Demographic data of adolescent girls includes the age, education, type of family, family income, family history of dysmenorrhoea.

2.4.2 Section B: Menstrual profile of girls with primary dysmenorrhoea.

The Menstrual profile of girls with primary dysmenorrhoea tool consists of 9 questions to know about menstrual history, which include age at menarche, duration of menstrual cycle, number of days of menstruation, characteristics of bleeding, nature of pain, onset of dysmenorrhoea, days of menstruation with severe pain, pattern of rest, dietary pattern.

2.4.3 Section C: Questionnaire for assessment of degree of primary dysmenorrhoea symptoms

The Questionnaire for assessment of degree of primary dysmenorrhoea symptoms consists of 27 questions to know the degree of primary dysmenorrhoea. Which includes effect of dysmenorrhoea on daily activities, academic performance and **physiological symptoms** consists of (Exhaust, lethargic, tired, Painful cramps in lower abdomen, Back ache, radiating pain to thighs and lower back, Nausea, Vomiting, Changes in bowel and bladder pattern, Fainting, Painful breast, abdominal bloating, Joint pain, Urinary frequency, Dizziness), and **Psychological symptoms** which consists of menstrual migraines, depression, irritability/easily agitated, Rapid mood changes, poor concentration, anxiety, insomnia, hypersomnia, over eating/food craving, Tension/nervousness and assess the severity of menstrual Pain by using numerical pain rating scale. No pain – 0, mild pain 1-3, moderate pain 4-7, severe pain 8-10. Based on the response it has been scored as No symptoms (1), Mild symptoms (2), Moderate symptoms (3), severe symptoms (4).

2.4.4 Section D: Management of dysmenorrhoea

This section consists of 6 questions regarding management of dysmenorrhoea which includes, consultation of doctor for dysmenorrhoea, any medications prescribed, self medications taken by students, measures taken to get relif from abdominal pain, exercise pattern, action taken for dysmenorrhoea during class hours.

Scoring and Interpretation

Scoring and interpretation only for Section-C, this section consists of 27 questions, the score prescribed for each questions was 4, total score was 108 it has been interpreted as following

- Score 1-27 No dysmenorrhoea
- Score 28-54 Mild dysmenorrhoea
- Score 55- 81 Moderate dysmenorrhoea
- Score 82- 108 Severe dysmenorrhoea

2.4.5 Section E: Steps of aerobic exercise:

Total duration of exercise 40 minutes, which includes the following exercises

- Warm up-10 min, (walking 4 min, stretching exercise 6 min - pectorals stretching, calf and hamstring stretching, triceps stretching, illiopsoas stretching all the muscles given 3 repetition)
- bicycling 10 min
- step-up-down 10 min
- Strengthening exercise 5 min (shoulder flexors, shoulder external rotator, shoulder abductors, knee flexor, shoulder internal rotator, knee extensor),
- Cool down 5 min

III. Methods

Permission to carry out the study was obtained from the principal and vice principal after explaining the aim of the study. The tool was developed on the basis of extensive review of literature, discussion with experts in the field of nursing and the investigator's professional experience. Split half method was used to test the reliability of the tool. The reliability of the tool was interpreted using the 'Karl Pearson correlation' method. It has established a reliability value of 'r' 0.73. A pilot study conducted on 10% of the total sample who were selected based on the inclusion criteria to evaluate the content and test the feasibility, objectivity, clarity, relevancy and applicability of the study tools.

Ethical considerations: The institutional human ethics committee (IHEC), PSG institute of medical science and research had reviewed the proposal and approved the study to conduct.

IV. Techniques Of Data Collection

Screening was done among adolescent girls studying II & III year B. Sc (N) at PSG College of Nursing, total number of students was 156 among that 63 students having the complaints of dysmenorrhoea during menstruation, in that 17 (26.98%) students were having irregular periods and 6 (9.52%) students were having poly cystic ovarian disease so they were excluded from the study, remaining 40 (63.49%) students who met the inclusion criteria were selected for the study. Pretest was done during menstruation up to 5 days by using menstrual symptoms assessment questionnaire and aerobic exercise was administered from the 7th day of menstruation in the Seminar Hall of PSG College of Nursing between 5 pm – 6 pm for 40 minutes/day an alternative days up to 7 weeks for two consecutive menstrual cycles. Posttest I and II was done during menstruation for 5 days for two consecutive menstrual cycles.

V. Results

.**Table (1):** Frequency and percentage distribution of adolescent girls according to their demographic data

n=40

S.No	Demographic Variables	Frequency (f)	Percentage (%)
1	**Age**		
	18 years	15	37.5%
	19 years	25	62.5%
2	**Education**		
	B. Sc (N) II yr	21	52.5%
	B. Sc (N) III yr	19	47.5%
3	**Type of family**		
	Nuclear family	37	92.5 %
	Joint family	3	7.5%
4	**Family income**		
	Below 10,000	7	17.5%
	11,000 – 30,000	21	52.5 %
	31,000 – 50,000	7	17.5 %
	Above 51,000	5	12.5%
5	**Family history of dysmenorrhoea**		
	Yes	13	32.5%
	No	27	67.5%

Table (1) reveals that among 40 participants, more than half of the students 25 (62.5%) were 19 years. More than half of the students 21 (52.5%) studying B. SC (N) II year, most of the students 37 (92.5%) belongs to nuclear family, more than half of the students 21 (52.5%) family income ranged between Rs. 11,000 - 30,000, nearly 27 (67.5 %) students did not have family history of dysmenorrhoea

Table (2): Frequency and percentage distribution of menstrual profile and management of primary dysmenorrhoea among adolescent girls. **n = 40**

S.no	Menstrual profile	Frequency (f)	Percentage (%)
1	**Age at menarche**		
	12-13 years	28	70 %
	14-15 years	12	30 %
2	**Duration of menstrual cycle**		
	15 – 20 days cycle	-	-
	21-28 days cycle	30	75 %
	29-35 days cycle	10	25 %
3	**Number of days of menstruation**		
	< 3 days	2	5 %
	3-4 days	25	62.5 %
	5-6 days	13	32.5 %
4	**Characteristics of bleeding**		
	Only blood	19	47.5 %
	Blood with clots	21	52.5 %
5	**Nature of pain**		
	Mild pain	8	20 %
	Moderate	6	15 %
	Severe	9	22.5 %
	Cramping pain	4	10 %
	Radiating pain to back and thigh	13	32.5 %
6	**Onset of dysmenorrhoea**		
	1st menarche onwards	11	27.5 %
	Within an year after menarche	7	17.5 %
	After 1 year	9	22.5 %
	After 2 or more years	13	32.5 %
7	**Day of menstruation with severe pain**		
	One day before onset of menstruation	4	10 %
	On the 1st day	27	67.5 %
	On the 2nd day	9	22.5 %
8	**Do you take adequate rest**		
	Yes	23	57.5 %
	No	17	42.5 %
9	**Do you skip meals**		
	Yes	8	20%
	No	32	80%
10	**Have you consulted doctor for dysmenorrhoea**		
	Yes	1	2.5 %
	No	39	97.5 %
11	**Have you been prescribed medications**		
	No	40	100%
12	**Have you take medicines without prescription**		
	No	40	100%
13	**Measures take to get relieve from abdominal pain**		
	Hot/cold application	3	7.5 %
	Massage	4	10 %
	Bed rest	21	52.5 %
	No measures	12	30 %
14	**Do you perform any exercise**		
	Yes	3	7.5 %
	No	37	92.5 %
15	**Action taken for dysmenorrhoea during class hours**		
	Inform class teacher and seek help	3	7.5 %
	Inform friends and get help	6	15 %
	Manage the situation by self	30	75 %
	Ask permission and going to hostel	1	2.5 %
	Other measures	-	-

Table (2) shows that among 40 students, majority of the students 28 (70 %) attained menarche at 12-13 years of age, majority of the students 30 (75 %) having 21-28 days duration of menstrual cycle, more than half of the

students 25 (62.5%) having 3-4 days of menstruation, more than half of the students 21 (52.5%) having periods with clots, less than half of the students 13 (32.5%) having radiating pain to back and thigh , less than half of the students 13 (32.5%) having dysmenorrhoea after 2 or more years of menarche, majority of the students 27 (67.5%) having pain on the 1st day of menstruation, more than half of the students 23 (57.5%) taken adequate rest, majority of the students 32 (80%) not skipping meals, majority of the students 39 (97.5%) did not consult the doctor, none of them 40(100%) prescribed any medications for dysmenorrhoea, none of them 40 (100%) took medicines without prescription, more than half of the students 21 (52.5%) take bed rest to relieve from pain, majority of the students 37 (92.5%) not performing any exercises, majority of the students 30 (75%) manage their situation by self.

Table (3): Pretest degree of primary dysmenorrhoea symptoms among adolescent girls

n=40

S. No	Dysmenorrhoea symptoms	No		Mild		Moderate		Severe	
		F	%	f	%	f	%	f	%
1.	**General characteristics**								
	Total duration of pain in hours	-	-	36	90	4	10	-	-
	Does dysmenorrhoea affect your daily activities	9	22.5	24	60	7	17.5	-	-
	Does dysmenorrhoea affect your college work or studies	11	27.5	25	62.5	4	10	-	-
2.	**Physiological symptoms**								
	Exhaust, lethargic, tired	4	10	30	75	6	15	-	-
	Painful cramps in lower abdomen	3	7.5	24	60	13	32.5	-	-
	Back ache	3	7.5	22	55	15	37.5	-	-
	Radiating pain to thighs and lower back	7	17.5	29	72.5	4	10	-	-
	Nausea	35	87.5	5	12.5	-	-	-	-
	Vomiting	36	90	4	10	-	-	-	-
	Changes in bowel and bladder pattern	37	92.5	3	7.5	-	-	-	-
	Fainting	34	85	6	15	-	-	-	-
	Painful breast	25	62.5	15	37.5	-	-	-	-
	Abdominal bloating	28	70	12	20	-	-	-	-
	Joint pain	18	45	20	50	2	5	-	-
	Urinary frequency	31	77.5	9	22.5	-	-	-	-
	Dizziness	26	65	13	32.5	1	2.5	-	-
3.	**Psychological symptoms**								
	Menstrual migraines	38	95	2	5	-	-	-	-
	Depression	27	67.5	12	30	1	2.5	-	-
	Irritability/easily agitated	18	45	20	50	2	5	-	-
	Rapid mood changes	23	57.5	16	40	1	2.5	-	-
	Poor concentration	12	30	26	65	2	5	-	-
	Anxiety	23	57.5	16	40	1	2.5		
	Insomnia	29	72.5	9	22.5	2	5	-	-
	Hypersomnia	36	90	4	10	-	-	-	-
	Over eating/food craving	38	95	2	5	-	-	-	-
	Tension/nervousness	12	30	27	67.5	1	2.5	-	-
4.	Menstrual pain intensity in numerical pain rating scale	-	-	23	57.5	17	42.5	-	-

Table (3) pretest reveals among 40 students, majority of the students 36 (90%) experienced 1-4 hours of pain during menstruation, more than half of the students 24 (60%) could not perform their daily activities, more than half of the students 25 (62.5%) could not perform in academics.

In physiological symptoms pretest reveals among 40 students, majority of the students 30 (75%) experienced exhaust, lethargy and tiredness, nearly 24 (60%) had painful cramps in lower abdomen, more than half of the students 22 (55%) had back ache, majority of the students 29 (72.5%) experienced radiating pain to thighs and lower back, majority of the students 35 (87.5%) , 36 (90%) do not have nausea and vomiting respectively, majority of the students 37 (92.5%) do not have changes in bowel and bladder pattern, most of the students 34 (85%), 25 (62.5%) do not have fainting and painful breast respectively, more than half of the students 28 (70%) not having abdominal bloating, half of the students 20 (50%) experienced joint pain, more than half of the students 31 (77.5%), 26 (65%) do not have frequency of urination and dizziness respectively.

In psychological symptoms pretest reveals among 40 students, most of the students 38 (95%), 27 (67.5%) do not have menstrual migraine and depression respectively, half of the students 20 (50%) experienced irritability/easily agitated, more than half of the students 23 (57.5%) do not have rapid mood changes, more than half of the students 26 (65%) had poor concentration, more than half of the students 23 (57.5%), 29 (72.5%) do not have anxiety and insomnia respectively, majority of the students 36 (90%), 38 (95%) do not have hypersomnia and food craving respectively, more than half of the students 27 (67.5%) experienced tension/nervousness.

Pain intensity by using numerical pain rating scale pretest reveals among 40 students, more than half of the students 23 (57.5%) experienced mild pain and less than half of the students 17 (42.5%) experienced moderate pain.

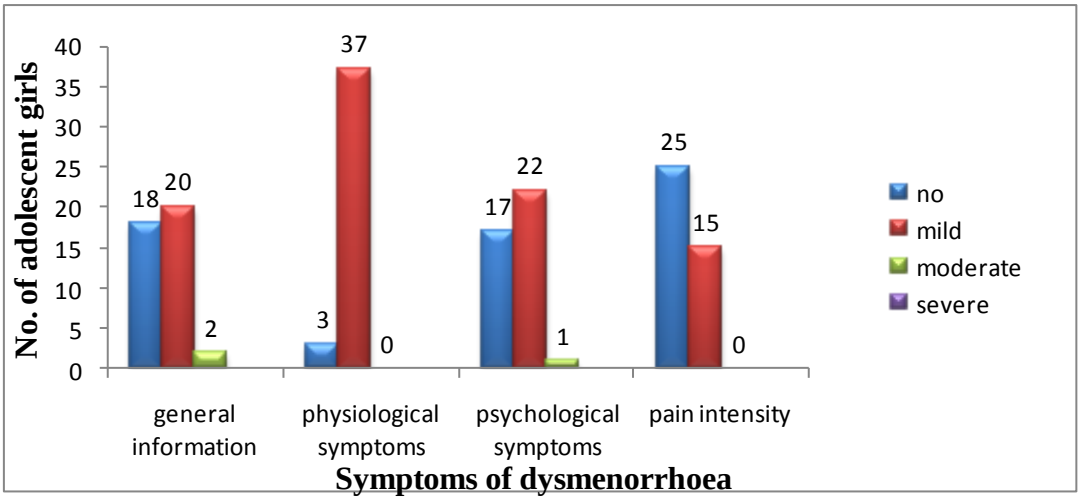

Figure (1): Bar diagram shows pretest degree of primary dysmenorrhoea symptoms among adolescent girls

Table (4): Comparison of Mean and Standard deviation of Degree of Primary Dysmenorrhoea Symptoms Between Pre Test, post test I and Post Test II Scores among Adolescent Girls Using Paired't' test

n = 40

S.No	Dysmenorrhoea symptoms	Pre test	Posttest I	Posttest II	Calculated 't' value			Tabulated value
		Mean ± SD	Mean ± SD	Mean ± SD	Pretest & posttest I	Pretest & posttest II	Posttest I & posttest II	
1	General characteristics	21.3±5.32	18.73±5.24	15.93±2.2	2.36*	6.43*	4.06*	1.69
2	Physiological symptoms	81.73±10.41	73.2±9.2	66.4±4.48	4.29*	8.2*	5.42*	1.69
3	Psychological symptoms	58.25±9.88	55.43±9.1	50.7±2.04	2.15*	4.63*	3.43*	1.69
4	Pain intensity by numerical pain rating scale	9.13±1.97	7.3±1.8	5.6±1.09	5.45*	9.46*	2.8*	1.69

Statistically Significant -*p<0.05

Table (4) shows that there was a gradual improvement in the mean score of daily activities and academics comparing to pretest mean score of 21.3 and it was gradually reduced to 18.73 in the post test I and 15.93 in the post test II. That there was a significant reduction in the physiological and psychological symptoms comparing to pretest mean score of 81.73, 58.25 and it was gradually reduced to 73.2, 55.43 in the posttest I respectively and 66.4, 50.7 in the posttest II respectively. Pain also gradually reduced as compared to pretest mean score of 9.13 and it was gradually reduced to 7.3 in the posttest I and 5.6 in the posttest II.

Table (5): Effectiveness of Aerobic Exercise on primary dysmenorrhoea symptoms among adolescent girls

n=40

S.no	Dysmenorrhoea symptoms	Pretest						Posttest I				Posttest II			
		No		Mild		Moderate		No		Mild		No		Mild	
		f	%	f	%	f	%	f	%	f	%	f	%	f	%
1	General characteristics	18	45	20	50	2	5	29	72.5	11	27.5	36	90	4	10
2	Physiological symptoms	3	7.5	37	92.5	-	-	27	67.5	13	32.5	36	90	4	10
3	Psychological symptoms	17	42.5	22	55	1	2.5	32	80	8	20	38	95	2	5
4	Pain intensity with numerical pain rating scale	25	62.5	15	37.5	-	-	33	82.5	7	17.5	39	97.5	1	2.5

Table (5) Posttest I reveals that among 40 students, more than half of the students 29 (72.5%) did not face difficulty in their daily activities, and posttest II majority of the students 36 (90%) did not face difficulty in their daily activities. There was a significant improvement in the physiological symptoms after aerobic exercise from

posttest I 27 (67.5%) to posttest II 36 (90%). and also there was a significant improvement in the psychological symptoms from posttest I 32 (80%) to posttest II 38 (95%) did not experienced the symptoms in the two consecutive menstrual cycles. Regarding to the pain, majority of the students 33 (82.5%) had no pain in the posttest I and 39 (97.5%) had no pain in the posttest II in the two consecutive menstrual cycles. Hence it was concluded that aerobic exercise was effective in reducing the primary dysmenorrhoea symptoms.

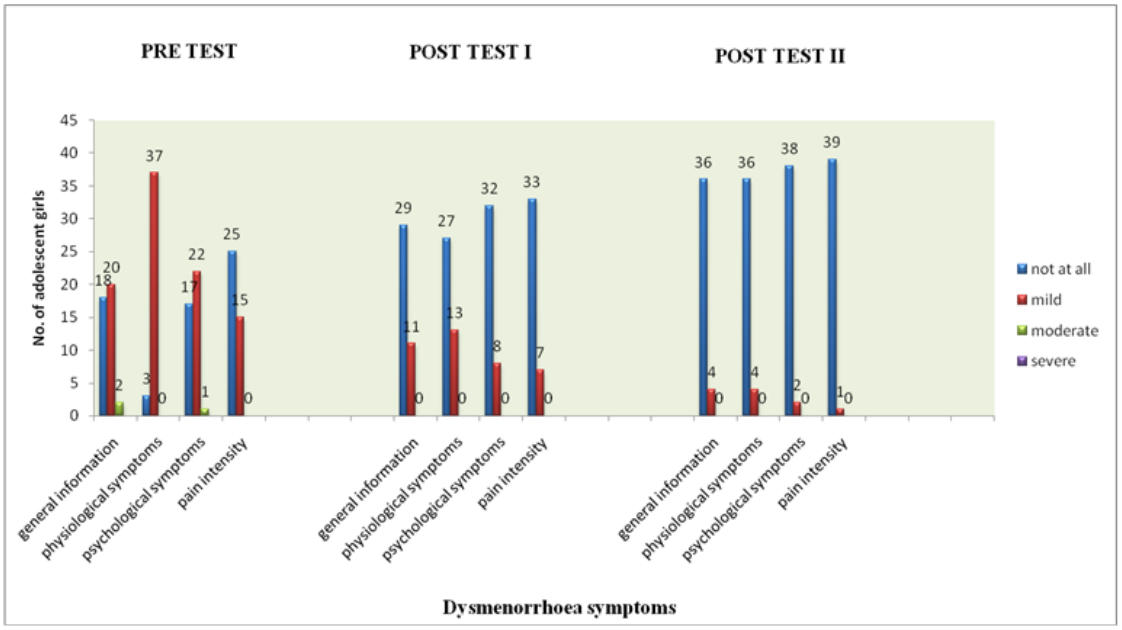

Figure (2): bar diagram shows Effectiveness of Aerobic Exercise on primary dysmenorrhoea symptoms among adolescent girls

VI. Discussion

Age of the adolescent girls experienced with dysmenorrhoea ranged from a minimum of 12 years to a maximum of 19 years. The present study shows that 15 students (37.5%) in the age group of 18 years, and 25 students (62.5%) in the age group of 19 years. 13 students (32.5%) were having the family history of dysmenorrhoea.

These findings are similar to a study performed by strinic et al (2003) on dysmenorrhoea among adolescent girls-characteristics and symptoms experienced during menstruation, which showed that among 233 adolescent girls the prevalence of dysmenorrhoea increased with age (39% of 12 years old and 72% in 17 years old), 60 adolescent girls (74.1 %) are having family history of dysmenorrhoea. More recent studies have reported similarly high prevalence rates of dysmenorrhoea (55-85%) among adolescent girls, various studies in India revealed that prevalence of dysmenorrhoea varies from 33% to 79.67% [6].

The present study shows that among 40 students, 28 students (70%) attained menarche at the age of 12-13 years and 12 students (30%) attained menarche at the age of 14-15 years. Most of the students 30 (75%) having 21-28 days duration of menstrual cycle. Most of the students 25 (62.5%) had 3-4 days of menstruation. Most of the students 27 (67.5%) experienced with dysmenorrhoea on 1st day of menstruation.

These finding are similar to a study performed by Khyrunnisa B (2012) which showed that among 233 adolescent girls, majority of the adolescent girls 146 (62.7%) attained menarche at the age of 12-13 years and in that most of the adolescent girls 125 (53.6%) are having a menstrual cycle of 21-28 days duration, most of the adolescent girls 135 (57.9%) are having a menstruation for 5-6 days in a month most of the adolescent girls 68 (46.6%) are having dysmenorrhoea from their first menstruation onwards, most of the adolescent girls 66 (45.2%) are having severe pain during their first day of menstruation**[7].**

Posttest I revealed that among 40 students, more than half of the students 29(72.5%) was not affected in their daily activities, and posttest II majority of the students 36(90%) was not affected in their daily activities. Posttest I more than half of the students 27 (67.5%) had no physiological symptoms, and posttest II majority of the students 36 (90%) had no physiological symptoms, Posttest I most of the students 32(80%) had no psychological symptoms, and posttest II majority of the students 38(95%) had no psychological symptoms, Posttest I most of the students 33 (82.5%) had no pain, posttest II majority of the students 39 (97.5%) had no pain.

These finding are similar to a study performed by Ebrahim koshenam et al (2014) A quasi experimental study was carried out on 30 female non-athletic volunteer between 18-25 years with primary dysmenorrhoea. The training program include 8 weeks of swimming training 3 days a week, each session lasting 45 minutes. The results of this study showed 8 weeks aerobic training significantly decreased psychological and physical symptoms in primary dysmenorrhoea [8].

VII. Conclusion

Dysmenorrhoea is a very common problem among adolescent girls and they experience a number of physical, and psychological symptoms associated with it. Adolescent girls, almost silently suffer the pain by dysmenorrhoea and the symptoms associated with it. Aerobic exercise is one of the effective, inexpensive and non-pharmacological measure to reduce the primary dysmenorrhoea symptoms among adolescent girls. The study concludes that aerobic exercise is a physical activity has effect in reducing the symptoms of primary dysmenorrhoea during menstruation among adolescent girls.

VIII. Recommendations

- The similar study can be conducted in large group of population
- The similar study could be conducted in school setting.
- A study can be conducted to assess the effectiveness of aerobic exercise in reducing primary dysmenorrhoea among adults age group of 22- 35 years.
- A comparative study can be conducted to assess the effectiveness of aerobic exercise and pelvic rocking exercise in reduction of primary dysmenorrhoea among adolescent girls.

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