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Effectiveness of Exercise in Menstruation Symptoms in Late Adolescents (17-20 Years of Age)

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ABSTRACT

Background: Menstruation is a sign of woman's fertility. It is a normal process that females go through as their bodies prepare themselves for potential pregnancy. About once a month, females who have gone through puberty will experience menstrual bleeding. This happens because if pregnancy does not occur, thickened lining of uterus is shed, and accompanied by bleeding. Besides the bleeding, other signs and symptoms of menstruation such as lower back pain, joint pain, abdominal pain, tiredness, mood changes are also occur during menstruation. Exercises are one of the ways to reduce the severity of this pain and symptoms. The present study aimed to determine the effect of 8 weeks of exercises which include aerobics, stretching and cardio exercises on the severity of menstruation symptoms.

Objective: Assess the effectiveness of exercise on menstruation symptoms in females.

Samples and Methods: This is a Pre-experimental one group pre test -post test design. The sample size was 40 students of age 17-20 years, from IBB College of Physiotherapy, Kota. Simple random sampling technique was used in this study. Students were non Athlete, the participants were randomly divided into 2 Experimental Group (1st exp gp n=20,2nd control Group, n=20). Group Ist perform daily exercise for 8 week as suggested and group B follow their daily routine without exercise. Pre test data were collected during menstruation for 5 days using menstrual symptoms assessment questionnaire. From 7th day of menstruation various type of exercise was administered 30 minutes/day regularly up to 8 weeks. Post test I and post test II data were collected during menstruation after 4 week and then after 8 week.

Results: High statistical significant improvements were noted in the pre and post intervention on menstruation symptoms .After administration of 8 weeks (30min/day) of exercise reduces the degree of symptoms among females at $p < 0.05$ level of significance.

Conclusion- The study concluded that exercise was effective in reduction of symptoms of menstruation.

Keywords- Stretching Exercise, Cardio Exercise, Aerobic Exercise, Menstruation

I-INTRODUCTION

Menstruation is a unique feature of a female menstruation cycle is defined as cyclic events that take place in a rhythmic fashion during the reproductive period of a women's life. Menstruation cycle starts from the age of 12-15 years, which make the onset of puberty. The commencement of menstruation cycle is called menarche. Permanent stoppage of menstrual bleeding is called menopause it occur at the age of 45-50 years. Duration of menstruation cycle is 28 days. A woman's menstrual cycle is divided into four phases:

- Menstrual phase
- Follicular phase
- Ovulation phase
- Luteal phase

After ovulation, if pregnancy does not occur, the thickened endometrium is shed. This desquamated endothelium is expelled out through vagina along with blood and tissue fluid. This process of shedding and exit of uterine lining along with blood and fluid is called menstrual bleeding. It last for about 4-5 days. It is called menstrual phase. Follicular phase start from the 5^{th} day of cycle and ends on ovulation. During this phase hypothalamus

give signals to pituitary and pituitary release FSH (follicular stimulating hormones). FSH stimulates ovaries to produce around 5 to 20 small sacs called follicles. Each follicle contains an immature egg. Follicle gradually grows into matured follicle by various stages. Matured follicle with mature ovum is called Graafian follicle. Follicle releases estrogens. Ovulation is the process by which the Graafian follicle is ruptured and discharged ovum into the abdominal cavity. This ovum latter enters the fallopian tube. Rising estrogens stimulate LH (Luteinizing hormone).which is the major cause of ovulation. After the follicle releases its egg, it changes into the corpus luteum. This structure releases hormones, mainly progesterone and some estrogens. The rise in hormones keeps uterine lining thick and ready for a fertilized egg to implant but if implant not occur menstruation phase repeat.

Uterine shedding and prostaglandins secreted by uterus during menstruation create pain during menstruation, hormones which are secreted during menstruation cycle create mood disturbance and irritation in females and because of mood change and physical pain female feels tired during menstruation cycle. NCBI journal shows that 84.1% females without any underlying pathology are reported menstrual pain, menstruation pain is not life threatening but it reduce the quality of life of a female. Specially for normal college and school going girls because it is the major cause of her absence in college and work place. Recommended treatment for this is hot pads, synthetic drugs, and rest but drugs especially in long-term prescriptions, has side effects such as nausea, gastric ulcers and kidney papillary necrosis. Hotpads creating burning over sensitive area. James Blumenthal, PhD, a clinical psychologist at Duke University says that "There's good epidemiological data to suggest that active people are less depressed than inactive people. And people who were active and stopped tend to be more depressed than those who maintain or initiate an exercise program," so the mood change during menstruation also give result towards exercise. Many experiments shows that exercise produce endorphin which give positivity to brain and give a feeling of wellbeing. It is also thought that the symptoms may be reduced during exercise as a result of increased metabolism, and blood flow to the uterus. Nizy John1, Rajitha SR2 says that pelvic exercise help to reduce menstruation pain in their journal published in International Journal of Medical and Health Research. so I choose many other exercise and try to find out that it works or not. Shahnaz Shahr-jerdy and associates also prove in their study that stretching exercises are helpful to reduce menstrual pain. Since many study shows effect of different type of exercise on menstruation pain. There is need of new research which work not only on pain but other symptoms too because these all are interconnected somewhere. The study used a special exercise protocol which is a mixture of aerobic, cardiac and stretching exercise and tries to find its effect on all basic symptoms of menstruation.

Since researches have shown contradictory results about the role of exercise therapy in treatment of primary dysmenorrhea, there is need for new research about this connection. It was believed that contracted ligamentous bands in the abdominal region were the causative factor for physical compression of nerve pathways and their irritation, so the proposed series of stretching exercise was considered very effective.

II. MATERIAL AND METHODOLOGY

This comparative study was carried out on 40 students of IBB College of physiotherapy, Kota Rajasthan India from August, 2019 to October, 2019. Study design was Pre- experimental one group pre test - a post test design sample criterion was random sampling. sample size is 40 student, because target population from which we randomly selected our sample are less than 100 .we take 40 subjects so that error should

be minimum .and we divided all the subjects into 2 groups ,in which n=20 in each group. 17-20 years normal young females with menstruation pain and Non Athletic were included in the study and female with History of any specific disease and Irregular menstrual cycles & any history of regular exercises 3days/week [daily average 30-45 min] were excluded from the study.

III PROCEDURE:

With the aim to find the effect of exercise on menstrual symptoms 40 subjects were taken randomly and, requested to kindly co-operate during research procedure, all participants were given information in written and verbally about the objectives and methods of implication . Student participation was voluntary after filling the written consent form, the subjects completed a demographic questionnaire that addressed: demographic data, age at first menstruation, amount of analgesic consumption during menstruation, assessment of pain intensity Of back pain, abdominal pain, pelvic pain by VAS, level of fatigue during menstruation. GROUP A: Experimental group [N=30] was given a questionnaire prior to the exercises protocol, which included Total 11 exercise. (Stretching exercises, aerobic and cardiac exercise). Subjects were requested to perform the exercise for 8 weeks (daily) furthermore, they were asked to avoid performing exercise during the menstrual cycle. The prescribed exercises were as follows:

1. In the first exercise, the subject were asked to stand ,and bend trunk forward from the hip joint and try to touch their feet, so that the shoulders and back were positioned on a straight line and the upper body was placed parallel to the floor ,duration of holding time was 10 sec , repetitions was 10 times.
2. In the second exercise, the subjects were requested to jogging at one place and repeat the exercise. The exercise was performed 50 times in 2 sets.
3. In the third exercise ,the subject were asked to sit , and try to hold their feet in long sitting hold the position for 10 sec, and repeat it 5 times in first week and increase 10 time from next week.
4. In the fourth exercise subject spread their legs and make a circle with both hand together clock and anticlock direction, 10 circle clock and 10 anti clock.
5. In the fifth exercise ask subject to lie down and ask him to lift their pelvis upwards. And hold abdominal contractions for 10 sec and relax. repeat it 10 times .
6. In this exercise ask subject to lie down and bend his trunk towards knees. Repeat it 20 time / session.
7. In seventh exercise ask subject to lie down and hold their both legs at 90 angle hold it there for 10 second and repeat it 10 time a session.
8. In this exercise ask subject to turn on side and she lift their side body with create pressure on hand and legs. Hold for 5 second and repeat 3 time each side.
9. Turn patient in prone and ask her to lift their hand and legs only tummy touch the plinth. Hold it for 5 sec and repeat 3 times.
10. Ask patient to do cat and camel position hold each position for 5 sec and repeat 10 times
11. Ask patient to sit in cross sitting hold their eyes and do meditation with deep breathing exercise for at least 5 min.

GROUP B: The participants (N=20]) would not participate in the exercise regimen described. All participants signed a consent form.

Statistical analysis- Statistical analysis was performed with chi-square test and fisher's exact test for both groups.

RESULT

We studied on 2 groups. One of them was control group & another one was intervention group. To examine the homogeneity of control and intervention groups in terms of age, marriage, history of treatment, type of treatment, effect of treatment, duration of bleeding, menstrual periods, Dysmenorrheal pain, diet,

menarche age and history of syndrome in first degree relatives (mother, sister) performed statistical tests that were homogeneous. The basic data of the both group is as under:

Sr.	Particulars	Unit	Control Group	Intervention Group
1	Number of Participant	Numbers	20	20
2	Average Age	Years	19	19
3	Average Menarche age	Years	13.5	14.4
4	Married	Numbers	0	0
5	Unmarried	Numbers	20	20
6	History of Treatment	Pills Used	3 Participants used Pain killers	4 Participants used Pain killers
7	Average Duration of bleeding	Days	4.4	4.4
8	Menstrual periods	Days	22-32	22-32
9	Dysmenorrheal pain (Average) Severe Moderate Mild No Pain		 0 17 3	 0 16 4
10	Diet		Normal	Normal

Result of Intervention:

The intensity of pain for both groups after 4 weeks & 8 weeks of intervention is stated in the table as follows:

Intensity of Pain	Menstrual Period		
	Before Intervention	4 Weeks after intervention	8 Weeks after Intervention
INTERVENTION			
Mild (1-3)	03 (15%)	06 (30%)	15 (75%)
Moderate (4-7)	17 (85%)	14 (70%)	05 (25%)
Severe (8-10)			
Total	20(100)	20(100)	20(100)
CONTROL			
Mild (1-3)	04 (20%)	02 (10%)	02 (10%)
Moderate (4-7)	16 (80%)	18 (90%)	18 (90%)
Severe (8-10)			
Total	20(100)	20(100)	20(100)
P	Chi Square Test: The chi-square statistic is 0.1732. The *p*-value is .677318. *Not* significant at $p < .05$. . Fisher's Exact Test: The Fisher exact test statistic value is 1. The result is *not* significant at $p < .05$.	Fisher's Exact Test: The Fisher exact test statistic value is 0.2351. The result is *not* significant at $p < .05$.	Fisher's Exact Test: The Fisher exact test statistic value is 0.0001. The result is significant at $p < .05$

Above table states that the severity of primary Dysmenorrhea in the intervention group at the end of 4 weeks of intervention was not significant ($P = 0.2351$). However, at the end of 8 weeks after intervention, it comes to at ($P = 0.0001$), which is significant.

The study states that performing a set of aerobic, cardiac and stretching exercise can reduce menstruation symptoms. Exercises are cheapest and safest treatment for menstruation pain. There is no after effect of exercise like pain reliever pills.

The regular exercises improve blood flow & reduce unwanted fats from the body. All this help in reducing primary Dysmenorrhea.

Therefore, we may recommend a compulsory exercise therapy for the girls students of middle & Secondary education i.e. students of class 6 to 12 as a preventive therapeutic approach to control Dysmenorrhea & other menstrual disorder.

DISCUSSION

Medical News Today states that Mostly women feel discomfort around the abdomen, lower back, and thighs at the time of menstruating in women. Doctors aren't sure why some women experience painful menstruation and others don't. But some factors that are associated with more intense pain include:

- Having a heavy blood flow
- Having first child

- Being under the age of 20, or just starting period
- Having an overproduction of or sensitivity to prostaglandins, a hormone that influences womb
- Growth in the womb, endometriosis (abnormal uterine tissue growth), and
- Use of birth control.

In 2010, a study published in the *Journal of Women's Health* found that stress could in fact lead to worse PMS symptoms. Women who said they felt stressed two weeks before starting their period were between two and four times more likely to report moderate to severe symptoms compared to women who reported no signs of stress. The researchers behind the study were unable to conclude why stress may affect period pain levels. However, they had a couple of theories including that stress may alter ovarian hormones or that the stress hormone cortisol may have a direct impact on PMS. Dr. Jamil Abdur-Rahman also states that lack of sleep can also result in period pain caused by stress.

All above studies states that menstrual pain is due to

i. Increased uterine muscle contraction, which is nerve-mediated by the sympathetic nervous system &
ii. Stress helps to increase the activity of the sympathetic nerves and may increase the contraction of the muscles of the uterus and increase the pain of the menstrual period.

A study of Mayo clinic states that exercise increases the overall health and sense of well-being, which puts more pep in the step every day. https://www.mayoclinic.org/healthy-lifestyle/stress-management / in-depth/exercise-and-stress/art-20044469
The study also states that exercise has some direct stress-busting benefits.

- **It pumps up endorphins.** Physical activity helps bump up the production of brain's feel-good neurotransmitters, called endorphins. Although this function is often referred to as a runner's high, a rousing game of tennis or a nature hike also can contribute to this same feeling.
- **It's meditation in motion.** After a fast-paced game of racquetball or several laps in the pool, often find fine.
- **It improves mood.** Regular exercise can increase self-confidence, it can relax and it can lower the symptoms associated with mild depression and anxiety. Exercise can also improve sleep, which is often disrupted by stress, depression and anxiety.

All of these exercise benefits can ease stress levels and give a sense of command over body and the life.

Findings from various studies indicate that exercise therapy and physical activity are related to decreasing Dysmenorrhea.

Exercise reduces levels of the body's **stress** hormones, such as adrenaline and cortisol. It also stimulates the production of endorphins, chemicals in the brain that are the body's natural painkillers and mood elevators.

Except above following researchers also found that exercise may reduce the severity & duration of pain in their studies:

1. Shavandi N, Taghian F, Soltani V. in "The effect of isometric exercise on primary dismenorrhea. Arak Med Univ J. 2010;13:71–7"
2. Chantler I, Mitchell D, Fuller A. Diclofenac."Potassium attenuates dysmenorrhea and restores exercise performance in women with primary dysmenorrhea. J Pain. 2009;10:191–200.] &
3. Mohammadi B, Azamian Jazi A, Fathollahi Shourabeh F. in "The effect of aerobic exercise training and detraining on some of the menstrual

disorders in non-athlete students in Lorestan universities. Horiz Med Sci. 2012;18:5–12"

4. Aganoff Aganoff and Boyle, also stated that the effect of aerobic training on menstrual cycle symptoms and women's psychological state, showed that regular aerobic exercise can increase relaxation in the mood and body.[Aerobic exercise, mood states and menstrual cycle symptoms. J Psychosom Res. 1994; 38:183–92.
5. Medical literature indicates that doing exercises is effective in women's other complaints about menstrual cycle, such as PMS (Steege JF, Blumenthal JA. The effects of aerobic exercise on premenstrual symptoms in middle aged women: a preliminary study. J psychosom res. 1993;37 :127–33. &. Ghanbari Z, Dehghan Manshavi F, Jafarabadi M. The effect of three months regular aerobic exercise on premenstrual syndrome. J Family Reprod Health. 2008;2:167–71.

However, following researchers state that there was no significant relationship between the pain of primary dysmenorrhea & exercise:

1. Blakey H, Chisholm C, Dear F, Harris B, Hartwell R, Daley AJ, Examined 540 students & reported that there was no relationship between exercise and primary dysmenorrhea [Is exercise associated with primary dysmenorrhoea in young women? BJOG. 2010; 117:222–4]
2. According to Sehati *et al*. study, there was no significant relationship between the distribution of dysmenorrhea between athletic and non-athlete groups
3. Davaneghi *et al*. also concluded that there was no relationship between the level of physical activity and the severity of dysmenorrhea,
4. Latthe et al. also showed that exercises could slightly reduce the risk of dysmenorrhea (Latthe P, Mignini L, Gray R, Hills R, Khan K. Factors predisposing women to chronic pelvic pain: systematic review. BMJ. 2006; 332:749–55).

This discrepancy between the above studies is likely to be due to differences in the type of exercise protocol and participants in the study.

CONCLUSION

Finally, we may say that the menstrual pain is probably due to increased uterine muscle contraction & Stress helps to increase the activity of the sympathetic nerves and may increase the contraction of the muscles of the uterus and increase the pain of the menstrual period. Exercise by reducing stress can reduce the activity of the sympathetic nervous system and as a result, the symptoms and symptoms of menstruation can be reduced

A further study may also be recommended to evaluate the participants' psychological variables and social stresses.

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5. Mohammadi B, Azamian Jazi A, Fathollahi Shourabeh F. The effect of aerobic exercise training and detraining on some of the menstrual disorders in non-athlete students in Lorestan universities. Horiz Med Sci. 2012;18:5–12. [Google Scholar]

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