

Effect of Different Exercise Techniques on Primary Dysmenorrhoea among Higher Secondary School Girls

Divya Khare¹, Pooja Jain²

¹Associate Professor, Department Of Physiotherapy, Ayushman College, Bhopal, Madhya Pradesh, India

²Research Scholar, Department Of Physiotherapy, Ayushman College, Bhopal, Madhya Pradesh, India

Abstract: *Aim: To Study the effectiveness of isometric exercises and various stretching techniques used as a treatment protocol for primary dysmenorrhoea. Methodology: Both groups; control (n=15) and experimental (n=15) performed set protocol from fourth day of menstrual cycle. Result: Significant findings were obtained. Conclusion: The research conducted and the results obtained suggested that isometric and stretching both exercises has a positive effect in the treatment of primary Dysmenorrhoea in adolescent school going girls.*

Keywords: Primary Dysmenorrhoea; School Girls; Exercise Techniques; Stretching Exercises; Isometric Exercises

1. Introduction

Primary dysmenorrhoea is one where there is no identifiable pelvic pathology.¹In other words Dysmenorrhoea means a painful menstruation. It is one of the most important causes of school absenteeism amongst adolescent girls, because it affects their academic performance, school and sports activities. Dysmenorrhoea is the most common gynaecological disorder among female adolescents, with a prevalence of 60% to 93%.²It is unusual for symptoms to start within first six months after menarche. Affected women experience sharp, intermittent spasm of pain usually concentrated in the suprapubic area. Pain may radiate to the back of the legs or the lower back. Systemic symptoms of nausea, vomiting, diarrhea, fatigue, mild fever and headache or light headedness are fairly common. Pain usually develops within hours of the start of the menstruation and peaks as the flow becomes heaviest during the first day or two of the cycle.³The consequences of dysmenorrhoea may involve an impaired quality of personal and social life with a high degree of associated mood disorders, sleep disturbance and limitations in performance of daily activities.⁴The developing awareness of primary dysmenorrhoea and the impact on the lives of menstruating women raises the question of how best to relieve the symptoms and distress. Despite the high occurrence and severity of primary dysmenorrhoea, many studies suggest that it is not managed efficiently.^{5,6,7,8}

Although the efficacy of conventional treatments for primary dysmenorrhoea is high, the failure rate is around 10-25%.⁹ and there are a number of associated adverse effects.^{10,11} Many young women are seeking complementary and alternative methods to manage their menstrual discomfort.¹²The risk factors for Dysmenorrhoea are; age <20 years, nulliparity, heavy menstrual flow, smoking, high/upper socioeconomic status; attempts to lose weight, disruption of social networks, depression and anxiety.¹³Although it appears that doing exercise can relieve the pain associated with Dysmenorrhoea, some observational studies in this area have provided controversial results. Some researchers have reported that exercise can improve Dysmenorrhoea, while

some others have found that regular physical activities can worsen the symptoms of Dysmenorrhoeal.^{14,15}Dusek performed a study on 67 athletic women and 96 non-athletic high school girls and found that the intensity of Dysmenorrhoea was significantly lower in the athletic group.¹⁶

2. Subjects and Methods

Physician diagnosed 40 primary Dysmenorrhoea cases were assessed, based on the inclusion and exclusion criteria 35 cases were found to be eligible to participate in the study from which 5 cases were withdrawn due to some reasons. These cases were randomly allocated into 2 groups as Group A – control Group and group B – experimental group.

Table 1: Procedure

| | Group – A | Group – B |
|-------------------------------|---------------------------------|---|
| | Controlled Group | Experimental Group |
| N | 15 | 15 |
| Age | 15-17year | 15-17year |
| Treatment Session Starts From | Fourth Day Of Menstrual Cycle | Fourth Day Of Menstrual Cycle |
| Treatment Session Ends On | Onset of Second Menstrual cycle | Onset of Second Menstrual cycle |
| Treatment Plan | No Exercise | Isometric Exercises And Stretching techniques |
| Duration Of Exercise | - | Thrice a Week (two times per day) |
| Repetition | - | 10 Repetition Each Exercise |
| Total Time Of Exercise | - | 30 Minutes Per Session |

Isometric Exercises: The experimental group students were required to perform isometric exercises since the third day of their menstrual cycle 3 days a week, two sessions a day and a daily average of 30-45 min, and 10 times per session for 3 weeks. The exercises in this study included 7 stages. The protocol of isometric exercises was

as follows: Sleeping in supine position, extending feet next to each other, pressing feet on each other, holding for 5 second, and relaxing; Sleeping in supine position, putting feet crossed and pressing them on each other, holding for 5s, and relaxing; Sleeping in supine position, bending knees and thighs, putting a pillow between two knees, pressing knees to each other, holding for 5s, and relaxing; Going back to the third position, putting hand below waist and pressing waist to the ground, holding for 5s, and relaxing; Sleeping in supine position, bending knees and thighs and trying to raise head and neck above the ground level, holding for 5s, and relaxing; Sleeping in supine position, bending knees and thighs and trying to move head and neck toward the right thigh, holding for 5s, and relaxing; Repeating stage 6 toward the left thigh; Taking one abdominal deep breath among above-mentioned movements (sleeping in supine position with bent knees and thighs and breathing through nose in a way that abdomen expands. One hand can also be placed on abdomen to ensure abdominal breath. Then, exhaling from mouth such a way that abdominal muscles stick to waist).

Stretching Techniques: The subject was asked to stand behind a chair, bend trunk forward from the hip joint 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 5 seconds; repetition was 10 times. Then, the subject was requested to stand 10-20 cm behind a chair, then raise 1 heel off the floor, then repeat the exercise with the other heel alternatively. The exercise was performed 10 times followed by The subject was asked to spread their feet shoulder width, place trunk and hands in forward stretching mode, then completely bend her knees and maintain a squatting position. Duration of this position was 5 seconds; the subject then raised her body and repeated the same movement 10 times after which The subject was asked to spread her feet wider than shoulder width. Then the subject was asked to bend and touch left ankle with her right hand while putting her left hand in a stretched position above her head, so that the head was in the middle and her head was turned and looked for her left hand. This exercise was repeated for the opposite foot with the same method. The exercise was repeated alternatively 10 times for each side of the body followed by The subject was asked to lie down in the supine position so that the shoulders, back, and feet were kept on the floor. In this position the knees was bent with the help of her hands and reached to her chin. The repetition frequency was 10 times and at last The subject was asked to stand against a wall and put her hands behind her head and elbows pointed forward in the direction of the eyes, then without bending the vertebral column, the abdominal muscle wall was contracted for 10 seconds. This exercise was repeated 10 times.

Participants were investigated in two menstrual cycles. In the first month or first cycle in which no experiment was performed, the intensity and duration of pain and were evaluated in exercise groups. Study questionnaire was completed and VAS was assessed in both groups after the first and second menstrual cycles. The control group was asked to complete the same questionnaires in the following 1 menstrual cycles. They were asked to avoid regular

physical exercise during this period. After completing the study projects, the stretching exercises that used the same procedures were taught to the control group in the hope of performing these exercises.

3. Results

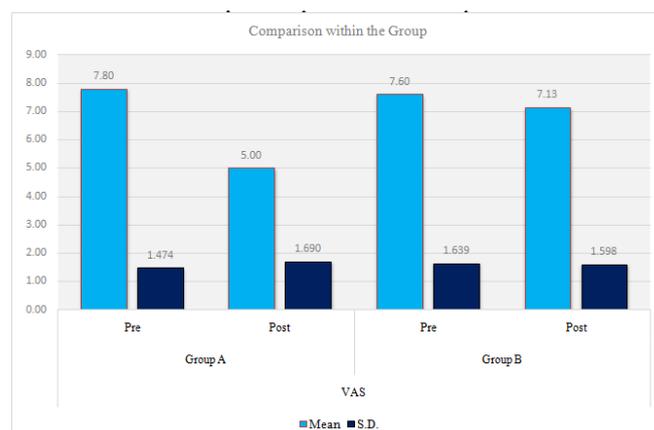
In this study, the mean and standard deviation for VAS score before the treatment in control group was 7.80 and ± 1.474 respectively and in experimental group was 7.60 and ± 1.639 respectively. The mean and standard deviation after the treatment in control group was 5.00 and ± 1.690 respectively and in experimental group was 7.13 and ± 1.598 respectively. The p value of both the group after comparing post treatment was <0.0014 . Which stands as a significant value. Data were entered into SPSS statistical software (v. 20) and analyzed using independent t-test. Overall results show that, there is significant improvement in pain (VAS) in both the treatment groups.

Table 2: Within Group comparison

| | VAS | | VAS | |
|---------------------|-------------|-------------|-------------|-------------|
| | Group A | | Group B | |
| | Pre | Post | Pre | Post |
| Mean | 7.80 | 5.00 | 7.60 | 7.13 |
| S.D. | ± 1.474 | ± 1.690 | ± 1.639 | ± 1.598 |
| Mean Difference | 2.80 | | 0.47 | |
| Paired T Test | 14.000 | | 2.824 | |
| P value | <0.001 | | <0.0135 | |
| Table Value at 0.05 | 2.15 | | 2.15 | |
| Result | Significant | | Significant | |

Analysis of VAS at Pre & post Treatment stage in both groups:

The mean before & after treatment in control group was 7.80 & 5.00 and standard deviation ± 1.474 & ± 1.690 respectively. The mean of group B in pre & post treatment was 7.60 and 7.13 and standard deviation after the treatment in group B was ± 1.639 and ± 1.598 respectively.



Graph No 1: Comparison between the both Groups

4. Discussion

In present study the age of girls was 15 to 17 years which is very similar to other studies like **Shahnaz Shahr-jerdy et.al(2012)** and **Gamit et al. (2014)**. According to the findings, the students in the experimental group were

found to have reduced levels of pain after receiving exercise training, the mean pain score were compared between before and after treatment, the students were found to have reduced mean scores from 7.60 to 7.13. Reduction in intensity of pain was found more significant in experimental group as compared to the control group, p value of pain intensity before the treatment between this two groups were $p < 0.7279$ and p value after the treatment between this two groups were $p < 0.0014$. Results of reduction in intensity of pain by stretching and isometric exercises were more similar to other studies as **Saleh et.al (2016)** which shows that performing exercise in various forms including stretching and core strengthening reduces pain intensity and duration of primary Dysmenorrhoea. The improvement in this study may be due to the increase in blood flow and metabolism of the uterus during exercise which may be effective in the reduction of Dysmenorrhoeal symptoms. Stress tends to enhance sympathetic activity and may increase menstrual pain by exacerbating uterine contraction. Exercise may decrease this sympathetic activity and relive the stress through release of endorphins, substances produced by the brain that raise the pain threshold, so reducing symptoms **Sandeep Kaur et.al. (2014)**.

The first objective of this study was to compare the mean score of pain intensity in experimental group and control group. Results indicated a significant difference between the two groups regarding intensity of pain after intervention ($p < 0.0014$). In this study we found that the intensity of pain decreased, which was measured by using VAS. After the exercise intervention, there was a significant difference in improvement in VAS score between Groups A and B ($p < 0.0014$). Decrease in the pain started after starting the exercise program and continued to decline in the next menstrual cycle. Similar findings concurred with the study of **Gamit et al. (2014)** who found 9 stretching exercises which are effective in reducing pain in young females with primary Dysmenorrhoea where experimental group(A) reduces VAS $p = 0.001$ and in control group(B) there was no significant improvement in VAS scores $p = 0.5$, There was a significant difference in improvement in VAS between Groups A and B with $p < 0.01$ post intervention. In present study after 1 month of exercise session students reported a relief in pain during their menses, the exercise intervention comprised sessions of home-based stretching and isometric exercises. The exercise program used was home based and therefore was convenient for every student. In this study, exercise intervention appeared to provide a significant improvement in health-related quality of life by reducing pain, this study showed significant improvements in every student ($p < 0.0014$).

Daley (2009) 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. It was suggested that increasing core stability improves the symptoms of dysmenorrhoea. Another study by **Noorbakhsh Mahvash, (2012)** examined the effect of 8 weeks physical activity on primary dysmenorrhoea of female students. The results of

this study indicated that participating in physical activity program is likely an approach to reduce the detrimental effect of primary dysmenorrhoeal symptoms in young females.

A similar study was performed by **Shahnaz Shahrjerdi (2010)** a semi-experimental study where 179 students aged 15-17 years and were non-athlete and volunteered for the study. This study showed that stretching exercises are effective in reduction, severity and duration of pain and also in reduction of using sedative tablets in girl students with primary Dysmenorrhoea. Present study shows that the p value of both the groups after comparing post treatment was < 0.0014 which stands as a significant value so, findings of different studies have shown that therapeutic exercise and physical activity were related with reduced incidence of Dysmenorrhoea.

5. Conclusion

There is evidence that isometric and stretching both exercises has a positive effect in the treatment of primary dysmenorrhoea in adolescent school going girls, although further randomized controlled trials may be need for a definitive conclusion. In addition to the many health benefits of exercise, because of its potential positive effect in reducing a number of other symptoms and complaints that are often associated with primary dysmenorrhoea, it can be recommended for all affected girls.

References

- [1] D.C.dutta's Textbook of Gynecology including contraception 6th ed.(2012)
- [2] SandeepKaur, Prabhnoorkaur, SarvananShanmugam, ManpreetKaur Kang (2014)To compare the effect of stretching and core strengthening exercises on Primary Dysmenorrhea in Young femalesIOSR-JDMS, 13(6): 22-32
- [3] Coco AS. Primary dysmenorrhea. American family physician. 1999 Aug;60(2):489-96.
- [4] Tu, Bettendorf & shay, dysmenorrhoea contemporary perspectives, pain clinical updates, 8, 15, 2007
- [5] Campbell MA, McGrath PJ. Use of medication by adolescents for the management of menstrual discomfort. Archives of pediatrics & adolescent medicine. 1997 Sep 1;151(9):905-13.
- [6] Campbell MA, McGrath PJ. Non-pharmacologic strategies used by adolescents for the management of menstrual discomfort. The Clinical journal of pain. 1999 Dec 1;15(4):313-20.
- [7] Han SH, Hur MH, Buckle J, Choi J, Lee MS. Effect of aromatherapy on symptoms of dysmenorrhea in college students: A randomized placebo-controlled clinical trial. Journal of Alternative & Complementary Medicine. 2006 Jul 1;12(6):535-41.
- [8] Lee LK, Chen PC, Lee KK, Kaur J. Menstruation among adolescent girls in Malaysia: a cross-sectional school survey. Singapore medical journal. 2006 Oct;47(10):869.
- [9] Chan WY. Prostaglandins and nonsteroidal antiinflammatory drugs in dysmenorrhea. Annual

- review of pharmacology and toxicology. 1983 Apr;23(1):131-49.
- [10] Hernández-Díaz S, García-Rodríguez LA. Epidemiologic assessment of the safety of conventional nonsteroidal anti-inflammatory drugs. *The American journal of medicine*. 2001 Feb 19;110(3):20-7.
- [11] Lefebvre G, Pinsonneault O, Antao V, Black A, Burnett M, Feldman K, Lea R, Robert M. Primary dysmenorrhea consensus guideline. *J Obstet Gynaecol Can*. 2005 Dec;27(12):1117-46.
- [12] Campbell MA, McGrath PJ. Non-pharmacologic strategies used by adolescents for the management of menstrual discomfort. *The Clinical journal of pain*. 1999 Dec 1;15(4):313-20.
- [13] French L. Dysmenorrhea. *American family physician*. 2005 Jan 15;71(2).
- [14] Speroff L, Fritz MA, editors. *Clinical gynecologic endocrinology and infertility*. lippincott Williams & wilkins; 2005.
- [15] Balbi C, Musone R, Menditto A, Di Prisco L, Cassese E, D'Ajello M, Ambrosio D, Cardone A. Influence of menstrual factors and dietary habits on menstrual pain in adolescence age. *European journal of obstetrics & gynecology and reproductive biology*. 2000 Aug 31;91(2):143-8.
- [16] Dusek T. Influence of high intensity training on menstrual cycle disorders in athletes. *Croat Med J* 2001; 42: 79-82.
- [17] Shahr-Jerdy, S., Hosseini, R.S. and Gh, M.E., 2012. Effects of stretching exercises on primary dysmenorrhea in adolescent girls. *Biomedical Human Kinetics*, 4, pp.127-132.
- [18] Gamit, K.S., Sheth, M.S. and Vyas, N.J., 2014. The effect of stretching exercise on primary dysmenorrhea in adult girls.
- [19] Saleh, H.S., El Hameid, A.A.A., Mowafy, H.E., Sherif, H.E. and Abdelsalam, W.A., 2016. Visual Inspection of the Cervix with (Acetic Acid or Lugols Iodine) for Cervical Cancer Screening. *Cervical Cancer: Open Access*.
- [20] SandeepKaur, Prabhnoorkaur, SarvananShanmugam, ManpreetKaur Kang, To compare the effect of stretching and core strengthening exercises on Primary Dysmenohrrea in Young females, Volume 13, Issue 6 Ver. V (Jun. 2014), PP 22-32
- [21] Gamit, K.S., Sheth, M.S. and Vyas, N.J., 2014. The effect of stretching exercise on primary dysmenorrhea in adult girls.
- [22] Daley AJ. the role of exercise in the treatment of menstrual disorders: The evidence. *Br J Gen Pract* 2009;59:241-2.
- [23] Mahvash, N., Eidy, A., Mehdi, K., Zahra, M.T., Mani, M. and Shahla, H., 2012. The effect of physical activity on primary dysmenorrhea of female university students. *World Applied Sciences Journal*, 17(10), pp.1246-1252.
- [24] Shahrjerdi, S. and Shaych Hosaini, R., 2010. The effect of 8 weeks stretching exercise on primary dysmenorrhea in 15-17 aged high school student girls in Arak. *Journal of Shahrekord University of Medical Sciences*, 11(4), pp.84-91.