

Efficacy Of Core Strengthening Exercises In Management Of Pain In Dysmenorrhea: A Review

Preeti*1, Prof (Dr) Vinay Jagga *2

*(Scholar, Department of Physiotherapy, BMU Rohtak, Haryana, India,)*1*

*(Research Supervisor, Department of Physiotherapy, BMU Rohtak, Haryana, India)*2*

p73.preeti@gmail.com

Abstract

Primary dysmenorrhea (PD) is defined as cramping pain that comes back every time you go through your period without any obvious pelvic disease. Women themselves, as well as pain researchers, may overlook or undertreat dysmenorrhea despite its high frequency, viewing it as a typical aspect of the monthly cycle. The objective of this research is to ascertain the correlation between core strengthening exercises and primary dysmenorrhea, as well as to find out how common primary dysmenorrhea is among young adults.

Keyword: *Dysmenorrhea, core strengthening, physical therapy, exercises, pain, mensuration*

Introduction

Pain is an unpleasant feeling that, depending on its degree, location, nature, and length, can have a detrimental impact on the person experiencing it.¹ A painful syndrome called primary dysmenorrhea arises during the menstrual flow phase of ovulatory cycles.² The beginning often occurs six to twelve months following menarche, at the same time as normal ovulatory cycles.²

The term dysmenorrhea refers to painful cramps that coincide with menstruation.³ The Greek terms "Dys" (difficult, painful, abnormal), "meno" (month), and "rrhea" (flow) are the sources of the phrase dysmenorrhea.³⁻⁴ In addition to degrading women's quality of life, dysmenorrhea is the leading cause of absenteeism, which costs money and reduces work hours.³ In menstruation, dysmenorrhea refers to recurrent, persistent pelvic pain. 70–91% of teenagers report having discomfort during their menstrual cycle.⁴ While mild discomfort is common during the menstrual cycle, intense pain is not.⁴ There has been discussion over the cause of primary dysmenorrhea.⁵ Primary dysmenorrhea typically manifests at or shortly after the establishment of ovulatory cycles, which occurs 6 to 12 months following menarche.⁵ Usually lasting between eight and seventy-two hours, the pain is linked to menstruation.⁵

Despite being quite common, dysmenorrhea is poorly managed and overlooked by medical professionals, researchers studying pain, and even women who may accept it as a typical aspect of the monthly cycle. Hence, dysmenorrhea has been classified as a public health issue due to its high frequency, the level of discomfort experienced by those who have it, and the decline in the quality of life experienced by female students.⁶ Any physical effort-requiring activity, especially one carried out to improve or maintain fitness, can be categorised as exercise.⁷ It has been claimed that one non-medical method of managing symptoms is through physical exercise.⁷ Exercise is often believed to lessen the severity and/or frequency of dysmenorrhoeal syndrome.⁷ The decrease in dysmenorrhea could be attributed to either an elevation in endorphin levels or the impact of hormonal fluctuations on the tissues of the uterine epithelium.⁷ Exercise seems to have non-specific analgesic benefits.⁷

Pathophysiology of dysmenorrhea

Based on pathophysiology, dysmenorrhea is typically divided into two categories: primary and secondary dysmenorrhea. Many theories have been proposed over time to assess the cause of primary dysmenorrhea.⁸ The development of primary dysmenorrhea is significantly influenced by the release of uterine prostaglandins, as demonstrated by experimental and clinical study.⁸ Prostaglandins are released during menstruation along with blood due to endometrial loss.⁸ Other enzymes that degrade cell membranes are released in conjunction with this.⁸ The production of prostaglandin causes tissue ischemia, endometrial disintegration, bleeding, and pain by stimulating myometrial contraction and constricting small endometrial blood vessels.⁹ Prostaglandins induce ischaemia and myometrial contractions. Prostaglandin levels in menstrual fluid are higher in women with more severe dysmenorrhea, and they are highest in the first two days of menstruation.¹⁰

Dysmenorrhea most commonly manifests as lower abdomen cramps, although other symptoms include headaches, backaches, nausea, and vertigo during the menstrual cycle.¹¹ While moderate symptoms are more prevalent and may indicate a typical menstrual experience, severe symptoms can interfere with day-to-day activities.¹¹ The gastrointestinal, endocrine, immunological, respiratory, and cardiovascular systems can all be negatively affected by untreated acute pain.¹ Illness, sadness, incapacity, rage, and exhaustion can all be brought on by persistent pain.¹

Aim and Objective: The primary goal of the study was to examine the effectiveness of core strengthening activities in managing pain in dysmenorrhea.

Material and method: A title and abstract search was performed using the Physiotherapy Evidence Database, Pub Med, Google Scholar, and the Cochrane database. A total of 13 studies were taken into consideration in order to examine the effectiveness of workouts in the treatment of pain in dysmenorrhea.

Core strengthening exercise as reciprocal therapy

While primary dysmenorrhea is not life-threatening and does not cause impairment, it can lower a woman's quality of life and, in extreme situations, cause incapacity and inefficiency, which manifests as missed work or school days.¹² One non-medical approach to alleviating symptoms has been recommended is physical exercises.⁴ Exercise reduces the symptoms of dysmenorrhea by releasing endorphins, or "feel good hormones."¹³ Any physical effort-requiring activity, especially one carried out to improve or maintain fitness, can be classified as exercise.⁴ Exercises aimed at strengthening the core muscles can be prescribed because primary dysmenorrhea has been linked to weak core muscles.¹³ These exercises enhance stability and posture by strengthening the rectus abdominus, internal and external obliques, pelvic floor muscles, and erector spine. They also release endorphins, which lessen the symptoms of dysmenorrhea.¹³

The method of maintaining functional stability around the lumbar spine through muscle control is called core strengthening.³ Core strengthening is a sort of training that isolates and strengthens the small intrinsic muscles surrounding the lumbar spine, allowing them to be conditioned for increased performance.⁷ It is possible to separate and strengthen the core muscle groups by strengthening the lumbar spine's surrounding musculature, which in turn enables improved performance.³ Exercises that strengthen the core are therefore necessary to assist

strengthen these muscles.³ Strong muscles are better equipped to withstand the daily stresses of normal biomechanics, even during the menstrual cycle, which puts the body under strain⁷

A search was done to find all the studies that were done to evaluate the impact of core strengthening exercises on dysmenorrhea between the year 2000 and September of 2023. These trials were listed in a number of databases, including Scopus, Google Scholar, and PubMed. "Core strengthening exercises," "menstrual pain," and "dysmenorrhea" were the chosen keywords. There were 125 publications found that included observational and comparative studies, systematic reviews, Cochrane reviews, clinical trials, and other types of reviews. Studies using "core strengthening" as the intervention and "dysmenorrhea" as the problem met the review selection criteria. Excluded from consideration were any studies that addressed menstrual issues other than dysmenorrhea or that did not use core strengthening as an intervention. A more thorough critical assessment of every paper was carried out, taking into account the appropriateness of the goal, the techniques employed, the level of detail and interpretation of the data acquired, and the conclusions' applicability to the study issue.

Correlation between Dysmenorrhea and Core Strengthening

Core strengthening exercises has been known as a beneficial intervention for managing pain in dysmenorrhea. Physical activity and exercise are regarded as safe and effective therapies for the management of dysmenorrhea.¹³ It is widely established that the dysmenorrhea pain threshold is raised by enhanced circulation, hormonal shifts, and the rise in endorphin levels brought on by different exercise regimens.¹³ Shreeya Dilip Berde et al. conducted a study to compare the effect of core strengthening and chair aerobic exercises in primary dysmenorrhea and found that core strengthening exercises are significantly effective than chair aerobics in reducing the quality of pain in females suffering from primary dysmenorrhea.³ In a study by Simran Sharma et al., the effectiveness of strengthening core muscles in women with dysmenorrhea was investigated. It was discovered that strengthening core muscles enhances the quality of life for these women while also reducing or eliminating discomfort.¹⁴

Shahrjerdi M et al. conducted a study on the impact of core stability exercises on 34 girls with moderate to severe primary dysmenorrhea. The results showed that these exercises were useful in reducing pain, its duration, and the number of painkillers consumed. These seem to be associated with the overall health benefits of physical activity, including the reduction of stress, the decrease of sympathetic irritation, and the increase of endorphins. The increase in steroid and endorphin hormones in blood circulation is, in fact, a systematic response to different forms of exercise, and this results in a notable rise in pain threshold.¹⁵ The effect of strengthening and stretching exercises for the core muscles on primary dysmenorrhea in adolescent girls was compared on 100 female students, according to a study by Shreya Patel and Shweta Rakholiya. For the girls with primary dysmenorrhea, there was a considerable decrease in pain intensity and a notable increase in both groups' quality of life and muscle strength. For girls with primary dysmenorrhea, however, strengthening was more effective than stretching in terms of pain reduction, improvement in muscle strength, and quality of life.¹⁶

A drop in academic performance, a decrease in physical and social activities, and illness absence are often linked to dysmenorrhea in teenagers. Most girls do not seek medical attention for dysmenorrhea because they believe it to be a normal part of the menstrual cycle, despite the condition's severity and frequency.¹⁷ According to a study by Shahnaz Shahrjerdi et al., which examined the effects of core stability exercises on primary dysmenorrhea in

females, they found that the experimental group significantly reduced pain intensity ($P=0.008$), pain duration ($P=0.021$), and the number of painkillers consumed ($P=0.018$) in comparison to the control group. These findings suggest that core stability exercises may be useful in lowering these factors.¹³ A study on stretching or core strengthening exercises for managing primary dysmenorrhea was carried out on 150 female patients with primary dysmenorrhea by Saleh HS, Mowafy HE, et al. A computer-generated randomization list was used to allocate individuals at random to two exercise groups and one control group. For eight weeks, two times a day for ten minutes, four days a week, at home, the interference groups were required to engage in either active stretching or core strengthening exercises. There were no significant differences in the post-test readings between the two intervention groups, but there was a substantial reduction in the intensity and duration of pain in the exercise groups ($P<0.001$) when compared to the control group. They came to the conclusion that doing exercises that involve active stretching or core strengthening would be a simple, non-pharmacological way to manage primary dysmenorrhea.⁷

In a comparative study of thirty female college students with primary dysmenorrhea who were 16 years of age or older, Aiyegbusi AI, Adeagbo CA, et al. examined the effects of core strengthening and stretching exercises on systemic and quality-of-life symptoms. They discovered that there were no statistically significant ($P > 0.05$) differences in the frequency and severity of symptoms between the two groups. In contrast to the stretching group, there were notable ($P < 0.05$) variations between the pre- and postintervention values of the systemic and quality of life symptoms in the core strengthening group. The study's findings indicated that while both types of exercise were successful in considerably lowering pain, core strengthening exercises seemed to have a greater impact on controlling the systemic and quality of life symptoms related to Parkinson's disease.¹⁸ This could be attributed to the simple fact that weak lumbar spine muscles make the spine unable to withstand functional load, which causes pain in the lower back, thighs, and abdomen. The small intrinsic muscles surrounding the lumbar spine can be developed and trained for maximal effectiveness through core strengthening exercises. This will enable the muscles to withstand the daily demands of regular biomechanics, even during the stressful menstrual cycle.

Neha Kulkarni and Shubhangi Patil conducted a study to determine the impact of core strengthening and stretching exercises on pain and quality of life in 27 unmarried girls with primary dysmenorrhea, ages 18 to 25. The results showed that all outcome measures improved significantly ($p<0.05$) in both groups, with patients with primary dysmenorrhea showing significantly more improvement in the group that received combined strengthening and stretching exercises. Ultimately, they concluded that while both stretching and strengthening exercises are effective in reducing pain and enhancing quality of life in females with primary dysmenorrhea, their combination was more beneficial than stretching exercises alone.¹⁹ Exercise causes the production of endorphin, a hormone that reduces pain, which helps to explain the pain relief. A further potential mechanism could be that the activities enhance local metabolism and increase blood flow to the pelvis. Exercise may therefore aid in preventing prostaglandin accumulation, which may be the source of pain, diminished blood flow, and uterine contractions.

Menstruation discomfort affects 84.8% of women in Serbia²⁰, 88.0% of women in Australia²¹, 80.0% of women in Saudi Arabia²², 76.7% of women in Ethiopia²³, 89.1% of women in Malaysia²⁴, 64.9% of women in Poland²⁵, 76.5% of women in Spain²⁶, and 84.1% of women in Italy²⁷, according to previous studies. In order to compare the effects of stretching and core strengthening exercises on primary dysmenorrhea in young females, a study

involving 105 girls aged 19 to 25 years was conducted by Sandeep Kaur, Prabhnoor Kaur, et al. The study's findings indicated that pain intensity was significantly reduced in both experimental groups, namely Gp1 ($p=.0001$) and Gp2 ($p=.0001$) with NPRS and PDQ in Gp 1 ($p=.0001$) and in Gp 2 ($p=.0001$) following post readings of 4 weeks (p1) and of 8 weeks (p2). However, the control group's results were not statistically significant. According to the study's findings, progesterone is not a mediator of the pain-relieving effects of physical stretching and core strengthening as alternative therapies for dysmenorrhea. Since we are addressing a functional issue rather than a disease state, we are able to concentrate on a comprehensive strategy.²⁸

Ronika Agarwal and Rushda Ahmed studied 60 young sedantary females to determine the impact of stretching versus core strengthening workouts on primary dysmenorrhea. The study's findings demonstrated a substantial decrease in both groups' NRS ($p<0.0001$), Menstrual Distress Questionnaire ($p<0.0001$), Number of Painkiller Tablets ($p<0.0001$), Core Muscle Strength ($p<0.0001$), and Sit and Reach Test scores ($p<0.001$). According to the study, girls with primary dysmenorrhea who engage in stretching and core strengthening exercises can lessen their pain, menstrual symptoms, and the number of tablets they take during their period. Consequently, it might be used as a successful therapeutic approach for females experiencing primary dysmenorrhea.²⁹ This may also be explained by the fact that exercise enhances trunk, abdominal, and pelvic muscle flexibility, which lowers sympathetic activity and promotes relaxation. This also lessens back pain and other aches and pains.

Study authors Hayam Fathey A. Eittah and Eman Seif S. Ashour looked at how stretching and core strengthening exercises compared to applying heat to relieve primary dysmenorrhea pain in young women, including those who were between the ages of 18 and 25. Compared to applying heat (Group A), stretching and core strengthening exercises (Group B) were more successful in reducing dysmenorrhea pain. Applying heat, stretching, and engaging in core strengthening activities can lessen the severity of dysmenorrhea pain in groups A and B compared to group C, which is the control group. Applying heat was not as beneficial as stretching and core strengthening activities in alleviating dysmenorrhea pain. Young female girls should get health education about the value of applying heat and engaging in physical activity to treat primary dysmenorrhea pain.³⁰ 30 female girls with primary dysmenorrhea participated in a study conducted by Koohestani, Z., Koushkie Jahromi et al. to find out how core stability exercises affected the physical fitness of core muscles and the severity of dysmenorrhea in teenage girls. The findings indicated that core muscle exercises decreased dysmenorrhea symptoms ($p=0.001$), increased abdominal muscle endurance ($p=0.001$), and increased flexibility ($p=0.04$) in the exercise group. Core muscle exercises did not significantly alter balance ($p>0.05$), and the changes in dysmenorrhea were negatively correlated with changes in physical fitness ($r=0.55$, $p=0.002$). The severity of dysmenorrhea can be lessened by core muscle activities, which may also raise core muscle fitness indices.³¹ Exercise has the potential to alleviate dysmenorrheal symptoms by increasing blood flow and metabolism in the uterus. Stress can worsen menstrual pain by intensifying uterine contraction, which increases sympathetic activity. Exercise can counteract this by lowering sympathetic activity and relieving stress by releasing endorphins, which are brain chemicals that raise the pain threshold.

In order to determine the impact of Bosu Pilates on primary dysmenorrhea in adolescent girls, Mayuri T. Got agar and Poovishnu Devi studied 25 females between the ages of 18 and 30. Based on the analysis of the data, it was found that exercises such as stretching and core strengthening on a bosu ball significantly reduced the pain status

of the primary dysmenorrhea adolescent girls as measured by the Wong Baker scale ($p < 0.0001$). The study's findings indicate that exercises like these are effective in reducing the pain associated with primary dysmenorrhea in adolescent girls.³² Overall, the majority of included studies demonstrated that exercise therapy significantly reduces the pain and discomfort in females.

Result: A data search of about 13 free full publications revealed that activities are crucial for helping girls and women with dysmenorrhea manage their pain. Another low-cost, side-effect-free method for reducing the symptomatology of this health issue is core strengthening exercises.

Conclusion

Based on available data, core strengthening therapy is a non-invasive, low-cost alternative treatment option tailored to females suffering from primary dysmenorrhea. Regular physical activity is a safe and effective strategy to reduce Parkinson's disease symptoms. Consistent practice will yield long-term benefits that will further minimise these symptoms and improve the individual's overall health. Exercise appears to be the greatest training method for dysmenorrhea symptoms. Another important aspect of this PD therapy is that it has no adverse physiological effects. There has been evidence to support the use of core strengthening exercises as a beneficial treatment for primary dysmenorrhea, with regard to pain intensity reduction. Exercises that strengthen the core decrease the severity of discomfort in persons with primary dysmenorrhea.

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