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Efficacy of Core Stability and Kegel Exercise for the Management of Dysmenorrhea

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DECLARATION

This work has not previously been accepted in substance for any degree and isn't concurrently submitted in candidature for any degree. This dissertation is being submitted in partial fulfillment of the requirements for the degree of B.Sc. in Physiotherapy.

I confirm that if anything is identified in my work that I have done plagiarism or any form of cheating that will directly awarded me fail and I am subject to disciplinary actions of authority. I confirm that the electronic copy is identical to the bound copy of the thesis.

In case of dissemination the finding of this project for future publication, research supervisor will highly concern, it will be duly acknowledged as graduate thesis and consent will take from the physiotherapy department of Saic College of Medical Science and Technology (SCMST).

Signature: **Date:**

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List of Acronyms

BMI-	Body Mass Index
BMRC-	Bangladesh Medical Research Council
DIS-	Dysmenorrhea Interference Scale
ERB-	Ethical Review Board
FIM-	Functional Independence Measurement
HADS-	Hospital Anxiety and Depression Scale
JUST-	Jashore University of Science and Technology
MSQ-	Menstrual Symptom Questionnaire
NPRS-	Numeric Pain Rating Scale
NSAID-	Non-Steroidal Anti-Inflammatory Drug
PCOS-	Polycystic Ovary Syndrome
PT-	Physiotherapy
QOL-	Quality of Life
VAS-	Visual Analogue Scale
WHO-	World Health Organization
WHOQOL-	World Health Organization Quality of Life
WSRT-	Wilcoxon Signed-Rank Test

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ABSTRACT

Background: Dysmenorrhea is a common gynecological condition among young women, leading to physical discomfort, psychological distress, and interference with daily functioning. Pharmacological treatments such as NSAIDs are often associated with side effects, highlighting the need for safe, effective, and non-invasive alternatives. Physiotherapy-based interventions, particularly core stability and Kegel exercises, have shown promise in reducing menstrual pain and improving quality of life.

Objective: To evaluate the efficacy of core stability and Kegel exercise in reducing pain intensity, anxiety, depression, and daily life interference among women with primary dysmenorrhea.

Methods: A quasi-experimental study was conducted among 20 female participants aged 18–30 years with primary dysmenorrhea. Interventions included a structured four-week program of core stability and Kegel exercises. Pain was assessed using the Visual Analogue Scale (VAS), psychological well-being using the Hospital Anxiety and Depression Scale (HADS-A and HADS-D), and functional interference using the Dysmenorrhea Interference Scale (DIS). Data were analyzed using the Wilcoxon Signed Rank Test.

Results: The Wilcoxon test evidenced the reductions on pain and psychological distress after intervention. VAS scores were significantly decreased ($Z = -4.010$, $p < 0.001$). HADS-A score was significantly reduced ($Z = 2.810$, $p = 0.005$), and HADS-D score also showed a decrease ($Z = -2.714$, $p = 0.007$). Improvement in day-to-day functioning was similarly well demonstrated by the DIS scores. These findings demonstrate that the hybrid exercise program successfully reduced menstrual pain and improved

Conclusion: Core stability and Kegel exercises are effective, safe, and cost-efficient interventions for managing dysmenorrhea. They not only reduce pain but also improve mental health and functional activity, making them suitable for integration into physiotherapy practice and community health programs targeting young women.

Keywords: *Dysmenorrhea, Core Stability Exercise, Kegel Exercise, Pain, Anxiety, Depression, Physiotherapy*

CHAPTER – I INTRODUCTION

1.1 Background

Uterine cramping during menstruation, known as dysmenorrhea, is a common cause of menstrual irregularity and pelvic pain. Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage, by the International Association for the Study of Pain. Specifically, CPP is defined as intermittent or constant pelvic pain occurring for at least 6 months (Bernardi et al. 2017, p. 1).

Dysmenorrhea, according to 2020 World Health Organization cases of menstrual pain was 1,769,425 (90 %) in women with 10-16% experiencing severe dysmenorrhoea. The worldwide prevalence of dysmenorrhea is very high at ≥50% from the women in the world (Herawati et al. 2021, p. 55).

Dysmenorrhea is divided into two general types: primary and secondary. Primary dysmenorrhea is characterized by intense crampy pain in the lower abdomen which always appears immediately before or at the onset of menstruation, without apparent pelvic disease. This pain usually begins during the teenage years, typically within 6 to 24 months after the onset of menstruation (menarche). The headache follows a typical and predictable pattern, tending to begin soon before or upon the onset of the menstrual cycle. The headache persists for 8 to 72 hours, being most intense during the first two days of menstruation, and may extend into the thighs and lower back. Along with the abdominal cramping, the patient may complain of other symptoms such as diarrhea, nausea, vomiting, fatigue, and a general sense of discomfort. These symptoms have substantial effects on functioning and quality of life (Iacovides et al. 2015, p. 762).

Secondary dysmenorrhea likewise possesses the same endometrial pain symptoms during menstruation as primary dysmenorrhea but with secondary pelvic pathologies. These include endometriosis, uterine fibroids, adenomyosis, or congenital malformations of the reproductive organs. (Kho et al. 2020, p. 268). It may develop at any point, typically within two years following menarche, and depending on the

specific underlying cause, it can be accompanied by additional gynecological symptoms, such as heavy menstrual bleeding (menorrhagia) or bleeding between periods (intermenstrual bleeding) (Iacovides et al. 2015, p. 762).

Non-steroidal anti-inflammatory drugs (NSAIDs) are used as the initial treatment of choice for the control of dysmenorrhea. Since their introduction in 1969, NSAIDs have had a significant influence on the control of menstrual pain. Their availability as over-the-counter medications offered women an easy solution for relieving menstrual cramps (Barcikowska et al. 2020, p. 1191).

Yet, even though NSAIDs are highly effective, their use will sometimes produce side effects, especially on the gastrointestinal system, such as stomach upset or even ulcers. If taken over a long period of time, the medications can also affect the heart, liver, or kidneys. Similarly, oral contraceptives, which are primarily given to alleviate menstrual symptoms, can increase the potential for bleeding, cause weight gain, and increase the risk of the formation of blood clots in veins (Xiang et al. 2025, p.1540557).

A study of 560 female students of three Indian medical colleges reported that 87% of the patients with dysmenorrhea had received treatment proactively. Of these, 73% used analgesic drugs and 58% received physiotherapy in the form of heat therapy. While NSAIDs and oral contraceptives are the most widely used medications in the management of dysmenorrhea, they too have side effects such as nausea, breast tenderness, irregular menstrual bleeding, and even disturbance of hearing or vision. Moreover, for 20 to 25% of women, menstrual pain is not adequately relieved by NSAIDs alone. This has raised the prominence of the growing importance of determining safe and effective non-pharmacological treatment to reduce the symptoms of primary dysmenorrhea (Kannanv et al. 2014, p. 13).

Dysmenorrhoea induced losses truly need an efficient and effective solve apart from taking analgesic drug. Exercise is the single remedy for dysmenorrhoea. With physical exertion, pain, stress and prostaglandins will be reduced so that quality of life improves. Physical activity is a therapy that also has low levels of risk, or even no risk, of an adverse effect (Geneen et al. 2017, p. 1077).

A single session of core muscle exercise decreased the intensity and number of pain in primary dysmenorrhea. Core stability exercise is a useful exercise concept for the treatment of disease. From the Core stabilization exercise works and mobilizes the muscles around the abdominal, lumbar and pelvic areas. Due to the fact that lumbo-pelvic stability training may have a role and effect in lumbosacral structure (Gopal et al. 2024, p. 252).

The core stability-training exercises result in proper activation and contraction of the neural drive and the response throughout the core musculature. Therefore, it is going to be logical again that strengthening the core stability muscle will improve the pelvic circulation/metabolism, which leads to the relief of primary dysmenorrhea. The effect of core stability exercise program was evaluated for symptoms of primary dysmenorrhea and the finding indicated a significant alleviation in the primary dysmenorrhea symptoms (Shahrjerdi et al. 2019, p. 113).

Kegel exercises can decrease the length and intensity of primary dysmenorrhea pain, Therefore, Kegel exercise may be beneficial in managing primary dysmenorrhea and the improvement of the quality of life of these patients (Karimi et al. 2021, p. 299). Kegel exercises had a very good effect on reducing the dysmenorrhea pain intensity among the female students with primary dysmenorrhea (Mohamed et al. 2024, p.735).

The role of physiotherapy education and intervention in school and college-aged girls, emphasizing early intervention to manage dysmenorrhea. Early application of exercise-based therapies not only manages symptoms but also prevents long-term complications and improves daily functioning. These exercises are simple, low-cost, and can be performed without specialized equipment making them highly accessible, especially in low-resource settings (Mohamed et al. 2022, p. 129).

1.2 Rational:

Dysmenorrhoea still remains a significant health problem which has far-reaching effects on physical, psychological and social aspects in many menstruating women. Although several pharmacological therapies (NSAIDs, hormonal contraceptives) are available, they have significant side effects as well as being less accessible and poorly complied within resource-poor settings including Bangladesh where menstrual pain is an under-reported condition due to various sociocultural constraints. Physiotherapy provides a promising non-invasive and cost-effective alternative in the form of exercise programmes. The stability exercise and Kegel exercise both have been separately shown to decrease menstrual pain by increasing muscle tone, promoting pelvic blood flow, and supporting the function of pelvic organ. However, limited clinical evidence has described the cumulative effect of these exercises. Physiotherapy interventions, including structured exercises are inexpensive, non-invasive and safe and therefore provide attractive potential for the community, school and health Areas. Should the combined core stability and Kegel exercises demonstrate to be effective, then integrating such combined regime into exercise prescription may pave the way for standardized physiotherapy protocols in the management of dysmenorrhea. In contrast to drug options, these exercises get better but with no danger of side effects. Previous research has indicated that both core stability and Kegel exercises can lead to pain reduction as well as quality-of-life improvement among women with menstrual disorders. But when these two workouts are combined, very little is known about what unfolds. The evidence from this study may contribute positively to guide physiotherapy practice.

1.3 Research Question

Is core stability and Kegel exercise effective for patients with dysmenorrhoea?

1.4 Aim of the study:

The aim of the study was to investigate the effectiveness of core stability and Kegel exercise in alleviating symptoms in patients suffering from dysmenorrhoea.

1.4 Objective of the study

1.4.1: General objective:

- To evaluate the efficacy of a combined core stability and kegel exercise program in managing primary dysmenorrhea among women.

1.4.2: Specific objective:

- To identify socio-demographic factors (such as age, BMI, physical activity level, menstrual cycle characteristics) that may influence the outcomes of the intervention.
- To assess the level of pain intensity during menstruation before and after the exercise intervention.
- To examine improvements in functional activity and participation in daily tasks during menstruation after completing the exercise program.
- To evaluate changes in mental well-being among participants following the intervention.

1.5 Research Hypothesis

Null hypothesis (Ho):

Core stability and Kegel exercise is not effective among patients with dysmenorrhea.

$$\mu 1 - \mu 2 = 0 \text{ or } \mu 1 \neq \mu 2$$

Alternative hypothesis (Ha):

Core stability and Kegel exercise is effective among patients with dysmenorrhea.

$$\mu 1 - \mu 2 \neq 0 \text{ or } \mu 1 \neq \mu 1$$

Here,

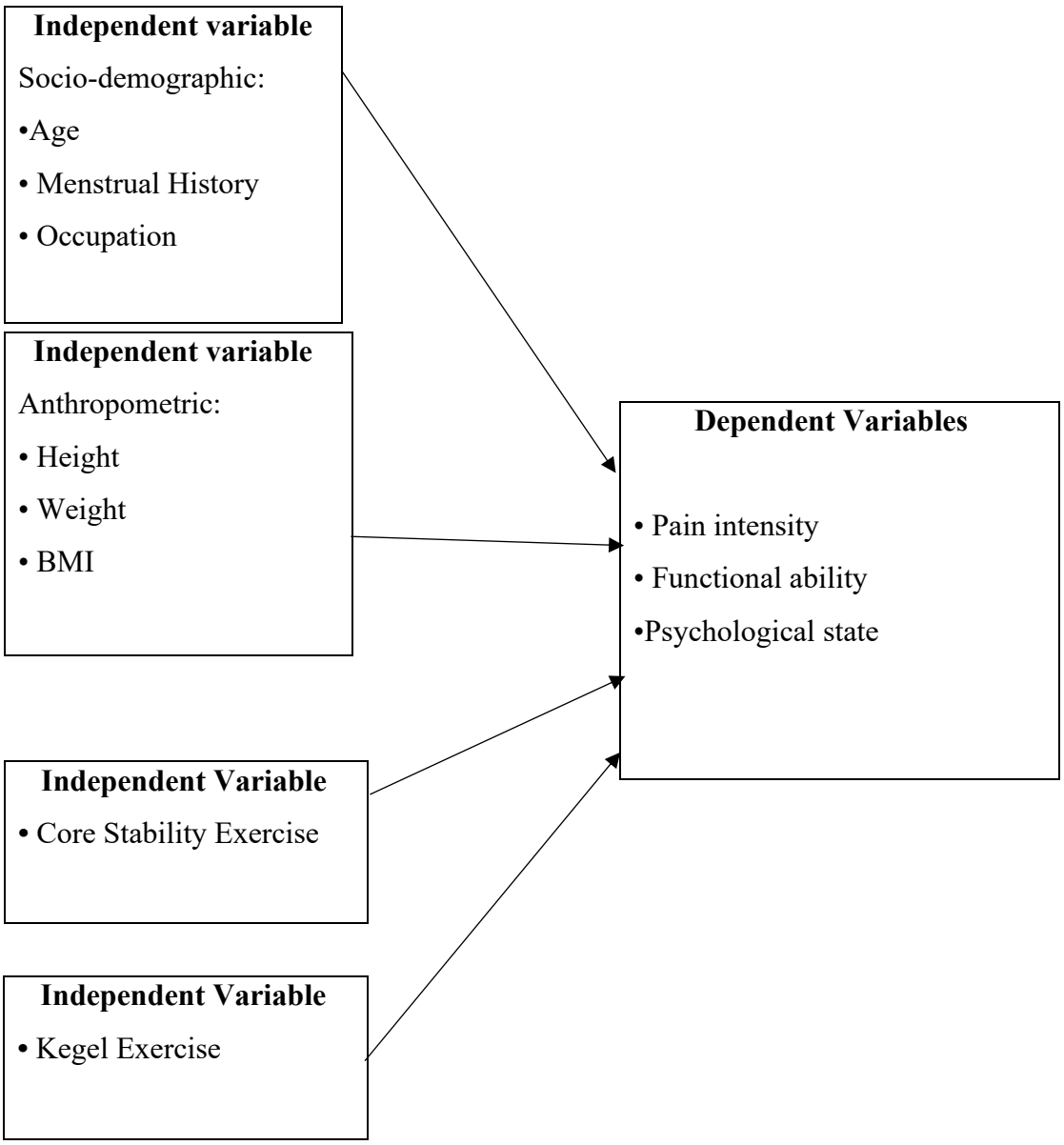
Ho = Null hypothesis

Ha = Alternative hypothesis

μ_1 = Mean score in the initial assessment (pre-intervention)

μ_2 = Mean score in the final assessment (post-intervention)

1.6 Conceptual Framework:



1.7 Operational Definition

Dysmenorrhea:

Dysmenorrhea In medical terms, painful menstrual periods are called dysmenorrhea, which means cramps and pain in the lower abdomen or pelvis. The symptoms can be accompanied by nausea, fatigue, and headache.

Core Stability Exercises:

Core stability exercise refers to the systematic strengthening of the muscles surrounding the trunk, abdomen, pelvis, and hips, which together provide the foundation for controlled body movement and spinal stability. Operationally, in this study, core stability exercise will involve a structured set of movements such as planks, side planks, bridging, abdominal hollowing, bird-dog, and pelvic tilts, designed to activate the deep core muscles including the transverse abdominis, multifidus, obliques, and pelvic floor muscles.

Kegel Exercise:

Kegel exercise, which is also referred to as pelvic floor muscle training (PFMT), has been operationally defined in this study as voluntary contracting and relaxing of the muscles of the pelvic floor with the aim of improving their strength and endurance in supporting the organs which are composed by uterus, bladder as well as bowel.

CHAPTER – II LITERATURE REVIEW

2.1 Anatomy and Physiology of the Female Reproductive System

The reproductive system of the female consists of primary organs such as the uterus, ovaries, and vagina, which play key roles in the menstrual cycle and fertility. The uterus is the key organ involved in dysmenorrhea, in which hormonal fluctuation causes uterine muscular contractions that can lead to pain. The cyclic rise and fall of estrogen and progesterone regulate endometrial growth and shedding. If hormonal balance is disrupted or prostaglandins increase excessively, the uterus contracts more forcefully and leads to pain (Barcikowska et al. 2020, p. 1191).

Progesterone, in particular, regulates prostaglandin production, and hormone withdrawal during the luteal phase provokes uterine contractions that help expel the endometrial lining. Under normal conditions, this physiological reaction is hyper stimulated during dysmenorrhea (Elbandrawy & Elhakk, 2021, p. 10).

2.2 Pathophysiology and Classification of Dysmenorrhea

Dysmenorrhea is primarily of two kinds, primary (functional) and secondary (associated with pelvic pathology). Primary dysmenorrhea is painful menstruation without anatomical abnormalities and typically starts in adolescence. It is linked with high levels of prostaglandins, which lead to vigorous uterine contractions and reduced blood flow, resulting in ischemic pain. Women with dysmenorrhea exhibit increased pain sensitivity, possibly due to central sensitization, which may predispose them to chronic pain conditions in later life (Iacovides et al. 2015, p. 762).

Primary dysmenorrhea is without visible pelvic pathology and is typically caused by high levels of prostaglandins, leading to intense myometrial contractions and uterine ischemia. It affects about 45.3% of menstruating women and can be worsened by factors such as early menarche, longer menstrual duration, and high BMI. Overproduction of prostaglandins tends to be highest during the first two days of

menstruation, which explains the duration and severity of symptoms (Bayraktar et al. 2020).

Secondary dysmenorrhea symptoms may occur immediately following menarche or may occur later in life. Alteration in or increase of pelvic pain, abnormal uterine bleeding, vaginal discharge and dyspareunia. These symptoms are more representative of secondary dysmenorrhea (McKenna et al. 2021, p. 164).

2.3 Impact of Dysmenorrhea on Quality of Life and Daily Function

Primary dysmenorrhea seriously disrupts daily activity, most prominently among students and employed women. Menstrual pain leads to absenteeism from school and work responsibilities and often disrupts physical and social activity. Studies have established that the condition is culturally normalized, rendering its effective management challenging. Further, the majority of affected individuals stated they avoid consulting doctors and resort to self-management strategies that could be risky or untested (Armour et al. 2019, p. e0220103).

Dysmenorrhea severely impairs quality of life by disrupting mood, sleep, concentration, and physical function. The menstrual cycle of pain causes repeated school and job absences and disrupts mental health. Dysmenorrheic women have disrupted sleep and compromised daytime function even during the non-menstruating phases due to heightened pain sensitivity. This chronic effect is associated with poorer performance in school and work environments, necessitating availability and effective forms of treatment (Iacovides et al. 2015, p. 762).

2.4 Role of Physiotherapy in Women's Health Conditions

Physiotherapy has many non-pharmacological interventions such as heat therapy, TENS, stretching, yoga, and strengthening, which have all been effective in the management of dysmenorrhea. (Kannan and Claydon, 2014, p. 13) reported high rates of pain relief with yoga and TENS, whereas acupuncture and acupressure yielded inconsistent results. Physiotherapy can manage uterine contractions, promote

circulatory blood flow, and reduce pain without drug side effects and is therefore an integral component of dysmenorrhea management.

Physiotherapy, including selected exercises, has increasingly become a very important role in the management of primary dysmenorrhea. It offers non-medicinal modalities that are affordable and free from side effects. Aerobic exercise, core stability, and stretching have been reported to be researched for alleviation of pain and moderation of hormonal reaction. These are especially useful in patients where pharmacological intervention is contraindicated or ineffective (Flynn and Warren, 2014, p. 45).

2.5 Efficacy of Exercise-Based Interventions in Dysmenorrhea

Exercise interventions, including strength training and aerobic exercise, have been consistently shown to decrease the severity of pain in women with dysmenorrhea. A meta-analysis also showed that exercise protocols more than 30 minutes long, which is applied at least three times per week and continued for 8 weeks, caused a pain reduction according to VAS. These benefits may be the result of increased blood supply, hormonal modulation and release of endorphins which together help to modulate pain (Xiang et al. 2025, p. 1540557).

Application of this study may, thereby, decrease drug treatment in favor of physiotherapy intervention. That means there will be fewer side effects, and patients won't have to spend as much on Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), birth control pills and other drugs. Electrotherapy modalities and exercise represent an effective and diverse range of interventions that have demonstrated benefit if used in an individualized manner that could support patients to reduce the severity of side-effects, improve quality of life and patient-reported outcome measures, such as upper limb function outcomes amongst breast cancer survivors (Sharma et al. 2023, p. 16).

Several interventions involving exercise have shown significant effectiveness in reducing menstrual pain. Aerobic exercise, including cycling and walking, reduced pain intensity and improved menstrual symptoms significantly in several clinical trials. For instance, eight weeks of aerobic training led to statistically significant reductions in the

severity of pain and improved overall menstrual experience in university students (Dehnavi et al. 2018, p. 3).

The widely known EIA present in literature is based on the central mechanism for pain modulation, and hormonal interaction could be another mean to obtain a reduction of pain in PD. The complicated work of a pain reliever Dond through Exercise training as well as the interaction off all these and hormonal factors for Pain modification in PD would not be simply Picture the features of different cycle shouting. Therefore, based on the kind of exercise in different phases of the cycle, the review for this article will address all possible neural and hormonal mechanisms evidences implicated in analgesia effect as a result of PD after exercise training (Jaleel et al. 2022, p. 15).

Evidence has been shown through research that there is increasing evidence to suggest that home-based exercise may help in reduced menstrual cramp, muscle strengthening in the lower back and abdomen, stress reduction, mood improved and other related symptoms. Exercise in the modern era is a normal part of living for the majority of women. Exercise and physical activity is widely known to be a stress-altering technique and symptoms related to stress. Exercise affects the release of endorphins (the brain's natural painkillers) and alters the secretion of hormone production, preventing prostaglandin from release and reducing endometrial proliferation and shunting the blood flow away from uterus (Abedel and Mohamed, 2017, p. 241).

Similarly, both isometric exercise and aerobic exercise experienced reductions in the severity of pain, increased levels of progesterone, and improved symptom scores, with aerobic exercise marginally superior in outcome (Elbandrawy & Elhakk, 2021, p. 10).

2.6 Core Stability Exercises:

Core stability exercises reinforce the abdominal, lumbar, pelvic, and hip muscles. The exercises stabilize the pelvis and spine and enhance neuromuscular control and posture. The improvement in pelvic alignment and reduction of uterine ligament tension might be the mechanism behind their therapeutic effectiveness in dysmenorrhea. Core exercises also enhance blood flow and pain modulation through mechanical and neurochemical mechanisms (Bayraktar et al. 2020).

Core stability exercises contract the abdominal, pelvic, and lumbar muscles, leading to better postural alignment and increased muscle tone. The exercises can reduce uterine pressure and decrease menstrual cramping. In a study found that those who had engaged in a program of core stability and relaxation exercises had less pain, lower levels of stress, and better posture. The mechanism is likely one that involves both musculoskeletal and hormonal responses acting together to produce analgesia (Sinha et al. 2020).

In an unmarried female patient with primary dysmenorrhea, a case report presented the successful results of core stability exercise and relaxation. The patient underwent a 5-week course involving 20 sessions of 30-minute duration, and had statistically significant relief based on the VAS scale (7/10 before versus 3/10 after first set) and WaLIDD score. This research has shown that core exercise and Mitchell relaxation technique is helpful in controlling the severity and duration of dysmenorrhoea. The results give strength to the inclusion of the combination intervention in the non-pharmacological management of primary dysmenorrhea for a better quality of life and physical function (Gopal et al. 2024, p. 252).

Core Stability Core strengthening is based on isolated muscles group training which in doing so will strengthen the small intrinsic lumbar musculature around the spine and offer support to the low back. Once they are strong, they can resist even normal biomechanical forces-again the stress of menstrual cramps a woman endures during her cycle (Saleh et al. 2016, p. 2167).

Core strengthening of abdominal muscles as an adjunct to pharmacotherapy for treatment of Primary Dysmenorrhea is a modality which effectively brings down the pain significantly and when given over a long duration, reduces occurrence of pain phenomenally along with toning up of the abdominal muscles, improvement in body posture and also birth better Quality Of Life (Sharma et al. 2022, p. 4204).

2.7 Kegel Exercises:

Kegel exercises, or pelvic floor muscle training, seek to tighten the pelvic floor muscles that keep the uterus, bladder, and bowel in position. For dysmenorrhea, the exercises

improve blood flow to the pelvic region, tighten the muscles, and reduce uterine muscle cramps. Kegel exercises reduced the severity of pain in females with primary dysmenorrhea significantly, and the women also noted quality of life and emotional status to improve. Strengthening the pelvic floor muscles also assists in uterine support and hormonal control, which can be the cause of Kegel exercises providing relief from the pain during menstruation. Being a non-invasive and available technique, Kegel exercises are especially beneficial for young women looking for natural dysmenorrhea pain relief (Hassan et al. 2022, p. 64).

A quasi-experimental clinical trial in adolescent girls showed significant benefit of Kegel's exercise in terms of the severity of dysmenorrheal pain as compared to "control" group. Pain level was changed from moderate to mild in 53.3% of participants who underwent Kegel exercise after intervention. There was some statistical relief of pain $p = 0.005$ showing pelvic floor muscle training as a noninvasive and cost-effective alternative for menstrual relieve. The study also pointed out that Kegel exercises improve blood circulation and muscle toning, which could relieve uterine spasms of dysmenorrhea (Lestari & Putri, 2025, p. 316).

Adolescent girls who performed Kegel exercises had less pain and a better emotional state (Mohamed et al. 2024). Pelvic floor exercises on a regular basis reduced the severity and duration of menstrual pain (Karimi et al. 2021, p. 299).

2.8 Comparative Research on Core vs. Kegel vs. Combined Approach

Comparative research finds both Kegel and core stability to be effective at reducing menstrual pain, with some evidence that a combined approach is even more effective. (Gopal et al. 2024, p. 252) describe a case where a combination of core exercises and relaxation reduced pain scores over 5 weeks significantly. Similarly, (Mohamed et al. 2024, p. 735) found that Kegel exercises alone led to meaningful pain intensity and quality of life enhancement in female students. These findings stress that both modalities are beneficial and may be individualized or combined according to patient.

Core and Kegel exercises have both shown independent efficacy in providing relief for dysmenorrhea, but when combined, they can produce a synergistic effect. Core

exercises stabilize pelvic and trunk stability, and Kegel exercises stabilize the pelvic floor muscles. The two combined may be more effective in enhancing pelvic circulation, uterine positioning, and reducing pain perception than either of the two alone. More clinical trials need to be done comparing and evaluating their combined efficacy directly in primary dysmenorrhea treatment (Hassan et al. 2022, p. 64 ; Flynn and Warren, 2014, p. 45).

CHAPTER – III METHODOLOGY

3.1 Study Design

It was a quasi-experimental study which offered an intervention during the experiment. This design lacked a control group of this experimental group. The research design for this study was experimental under quantitative approach. This was a pre-post design looking at the same group of patients in one state. Data were recorded pre (pre-test score) and post 4-week of physiotherapy treatment.

3.2 Study Area

The study was conducted at the Physiotherapy Department of Saic College of Medical Science and Technology. located in Mirpur 14, Dhaka, Bangladesh.

3.3 Study period

The data has been collected from June 2024 to July 2025

3.4 Study Population

Participants will include female aged 18-30 years diagnosed with primary dysmenorrhoea. Participants must report moderate to severe menstrual pain and be willing to participate in an exercise-based intervention.

3.5 Study population

A The study population were the female aged 18 - 30 years diagnosed with primary dysmenorrhea at Saic College of Medical Science and Technology.

3.6 Sample size:

A total of 20 participant were included in the study, selected based on inclusion and exclusion criteria.

3.7 Eligibility criteria:

3.7.1 Inclusion Criteria

- Females aged between 18 and 30 years
- Regular menstrual cycles (21–35 days)
- Diagnosed with primary dysmenorrhoea
- Moderate to severe pain based on Visual Analogue Scale (VAS ≥ 4)
- Willing to participate in the full intervention protocol

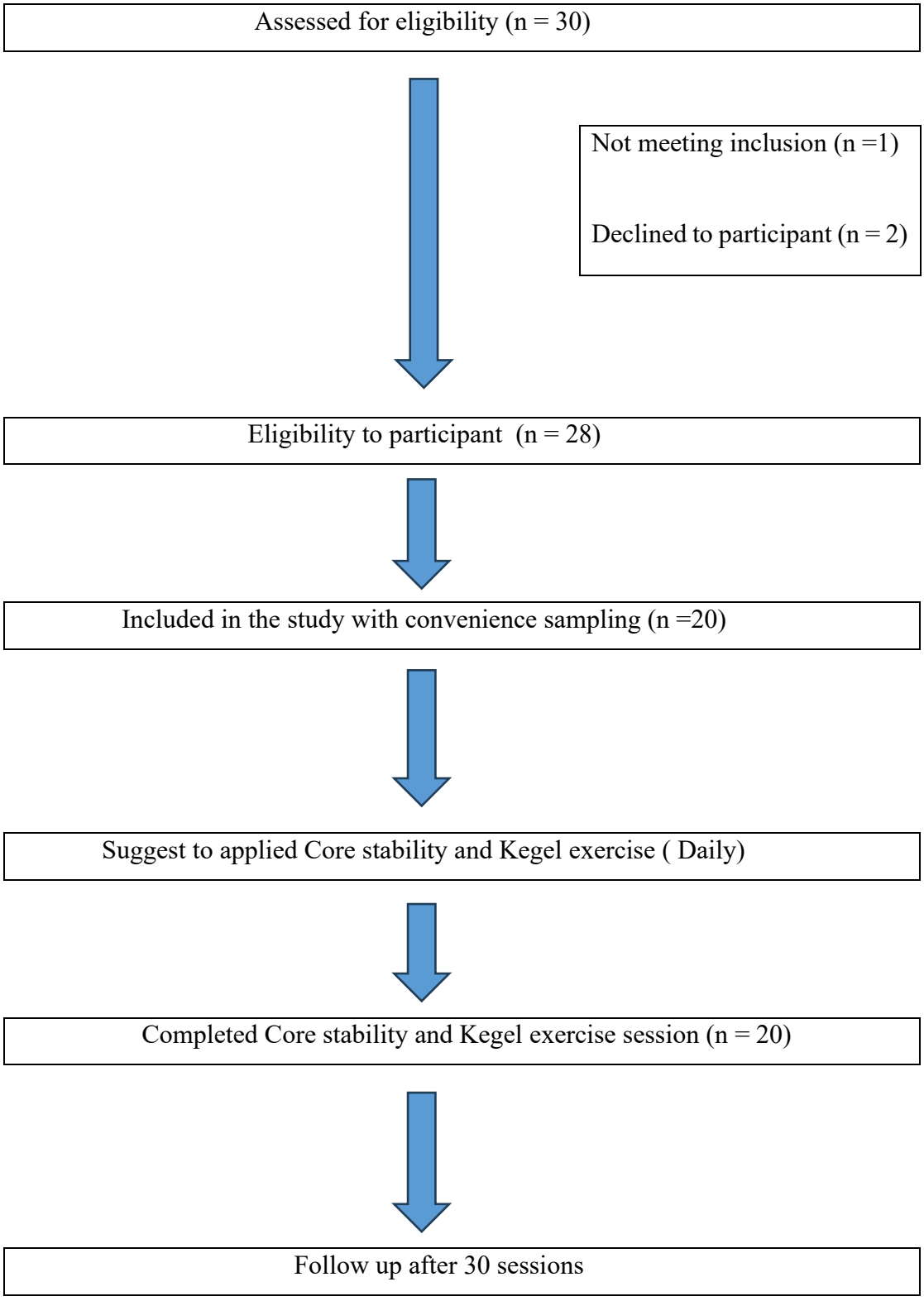
3.7.2 Exclusion Criteria

- Secondary dysmenorrhoea or pelvic pathology (e.g., endometriosis, fibroids)
- Current use of hormonal therapy or analgesics that affect results
- Pregnancy or recent postpartum period
- Any musculoskeletal or neurological disorder affecting exercise performance

3.8 Sampling techniques

I use a convenience sampling techniques to select sample unit for this study

3.9 Flow Chart of Phages of Pre-test and Post-test design



3.10 Method of data collection:

3.10.1 Techniques of data collection:

- Face to face interview and assessment of patient.
- Review patient records.

3.10.2 Data collection instrument:

Questionnaire:

The researcher developed a structured self-made questionnaire with the guidance and approval of the supervisor, adhering to standard rules of question construction. The instrument included socio-demographic information (e.g., name, age, education status, being married; job title and address…. etc) to capture background variables. In this protocol, two standard questionnaires will be used as well: The Dysmenorrhea Interference Scale (DIS) to measure the impact of symptoms on the functional performance and The Anxiety and Depression Scale (HADS) to measure psychological health in conditions of anxiety and depression. The conceived questionnaire was applied pre-test, pos- test and follow up stage to assess the efficacy of core stability and Kegel exercise therapy in treatment of dysmenorrhea.

3.10.3 Measurement Tool

Hospital Anxiety and Depression Scale (HADS)

The HADS is a self-completed questionnaire, which has been shown to be effective for identifying anxiety and depression in patients with physical health problems (Zigmond & Snaith, 1983). It is widely used because it avoids reliance on physical symptoms of illness (such as fatigue or insomnia) and focuses instead on emotional and psychological indicators.

(Hospital Anxiety and Depression Scale (HADS)

Subscale	Score Range	Interpretation
Anxiety (HADS-A)	0 - 7	Normal (no clinical anxiety)
	8 - 10	Borderline (mild anxiety, possible clinical case)
	11 - 21	Abnormal (clinically significant anxiety)
Depression (HADS-D)	0 - 7	Normal (no clinical depression)
	8 - 10	Borderline (mild depression, possible clinical case)
	11 - 21	Abnormal (clinically significant depression)

3.1 Data collection procedure:

Baseline Assessment (Pre-Test):

After enrollment, participants completed a sociodemographic questionnaire (age, academic year, menstrual history, exercise habits). Standardized tools were then applied: the DIS scale to assess functional status, and the HADS scale to measure psychological status. Baseline pain intensity and dysmenorrhea symptoms were also recorded.

Intervention Phase:

Participants were taught core stability and Kegel exercises through demonstrations, with written and visual instructions for home practice. The program ran for 4 weeks, with weekly follow-ups via calls or messages to ensure adherence.

Post-Intervention Assessment (Post-Test):

Following the intervention, the FIM and HADS scales were administered again, with updates made to sociodemographic and symptom data where required. Variations in functional status, anxiety, depression, and menstrual pain were then documented for comparison.

Data recording and Confidentiality:

All data will be coded to maintain confidentiality. Collected data will be stored securely in both digital and hard-copy formats, accessible only to the research team.

3.12 Intervention Protocol

Participants will undergo a 4-week structured exercise program including:

Core Stability Exercises (15–20 minutes/day):

- Pelvic tilt
- Bridging

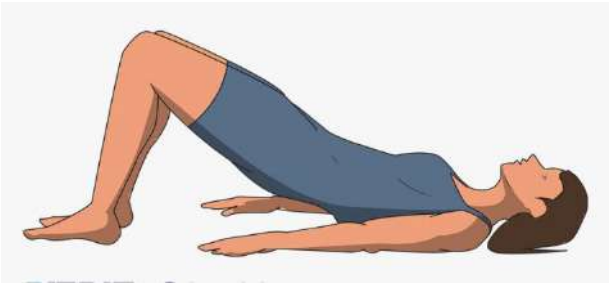
Kegel Exercises (10-15 minutes/day)

1. Pelvic Tilt Exercise

- **Starting Position:** Supine, knees bend, feet flat on the floor.
- **Procedure:** Contract abdominal muscles, press the lower back against the floor to tilt the pelvis backward, then relax.
- **Duration:** Hold 5-10 seconds; do 10-15 repetitions per set, 3 sets daily.

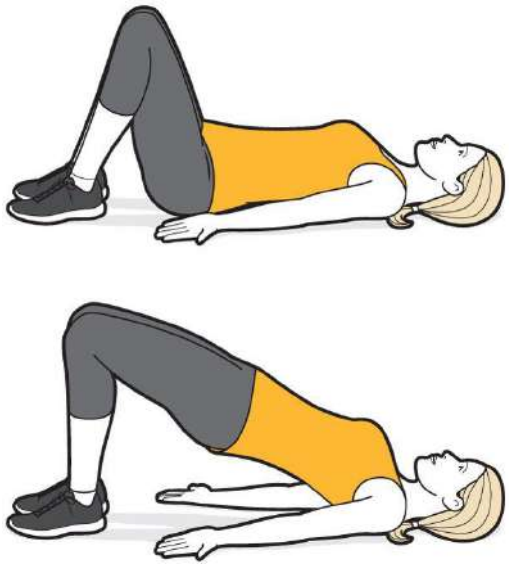
2. Bridging Exercise

- **Starting Position:** Supine, knees bend, feet flat on the floor, arms resting by the sides.
- **Procedure:** Lift pelvis so body forms straight line from knees to shoulders; hold and lower.
- **Duration:** Hold 5-10 seconds; do 10-15 repetitions per set, 3 sets daily.



3. Kegel Exercise

- **Starting Position:** Sitting, standing, or lying down comfortably.
- **Procedure:** Contract pelvic floor muscles (as if trying to stop urination midstream), hold the contraction, then relax.
- **Duration:** Hold 5-10 seconds; do 10-15 repetitions per set, 3 sets daily.



Treatment protocol:

Treatment name	Perform	Duration	Total Sessions
1. Pelvic Tilt Exercise	3 sets daily	Hold 5-10 sec; 10-15 repetitions per set	4weeks (daily practice)
2. Bridging Exercise	3 sets daily	Hold 5-10 sec; 10-15 repetitions per set	4 weeks (daily practice)
3. Kegel Exercise	3 sets daily	Hold 5-10 sec; 10-15 repetitions per set	4 weeks (daily practice)

3.13 Management of data

3.13.1 Data analysis

The data collected was organized and coded, analyzed with SPSS version 25 (Microsoft Excel). The sociodemographic data were descriptively completed, and a paired t-test compared the pre-and post-treatment scores of FIM, HADS, and pain intensity.

3.13.2 Significant level

P value <0.05 Was considered as a significant finding in health service studies. A p-value of … 0.05 is considered as a significant result.

3.13.3 Ethical Consideration

The study was reviewed and approved by the Ethical Review Board (ERB) of SAIC, College of Medical Science and Technology (SCMST). The investigation was conducted in compliance with the principles of the Bangladesh Medical Research Council (BMRC) and World Health Organization (WHO). Participants were informed about the aims, and purpose of the research prior to data collection and only participants who gave verbal consent participated in the study. The participants were informed that they could discontinue the study without any consequences. During the study, participant's identity including names, addresses and personal news were anonymous to researcher.

3.13.4 Informed consent

All participants provided written informed consent prior to questionnaire completion when applicable. This research proposal was reviewed and approved by the Ethical Review Board (ERB) of SAIC College of Medical Science and Technology (SCMST).

The research complied with the guidelines of Bangladesh Medical Research Council (BMRC) and World Health Organization (WHO). The subjects were SAIC College students who met the eligibility criteria. The purpose and significance of the study were introduced to all subjects before the participants entered in our study, and only those who provided verbal informed consent were involved. A simple physical examination took place, and the subjects were informed that they had the right to withdraw at any time without penalty. Anonymity of all particulars and addresses were assured at all times during the study.

CHAPTER – IV RESULTS

Twenty cases of Dysmenorrhea patients from Saic College of Medical Science and Technology were selected as study sample. The research A study on the core stability and Kegel exercise to treat dysmenorrhea. The findings of this cross-sectional study have been presented in various bar and pie charts and tables.

4.1 Sociodemographic Characteristics:

Table No. 1: Age of the participants

Age category in years	Frequency (N)	Percentage (%)
15–20	3	15%
21–25	13	65%
26–30	4	20%
Total	20	100%
Mean ± SD	23.40 ± 2.60	

Age distribution of the 20 participants recruited for this study showed majority (65%) were within the age range of 21–25 years, followed by those in the age group of 26–30 years (20.0%), and least number was from those between age group of 15–20 years old (15%). The average age of the subjects was 23.40 years, with an SD of ±2.60 suggesting a rather homogeneous sample clustered to early adulthood.This suggests that most of the study population comprised young adult women in their early twenties, an age range that is typically associated with the peak prevalence of primary dysmenorrhea.

4.1.2 Marital Status of Participants:

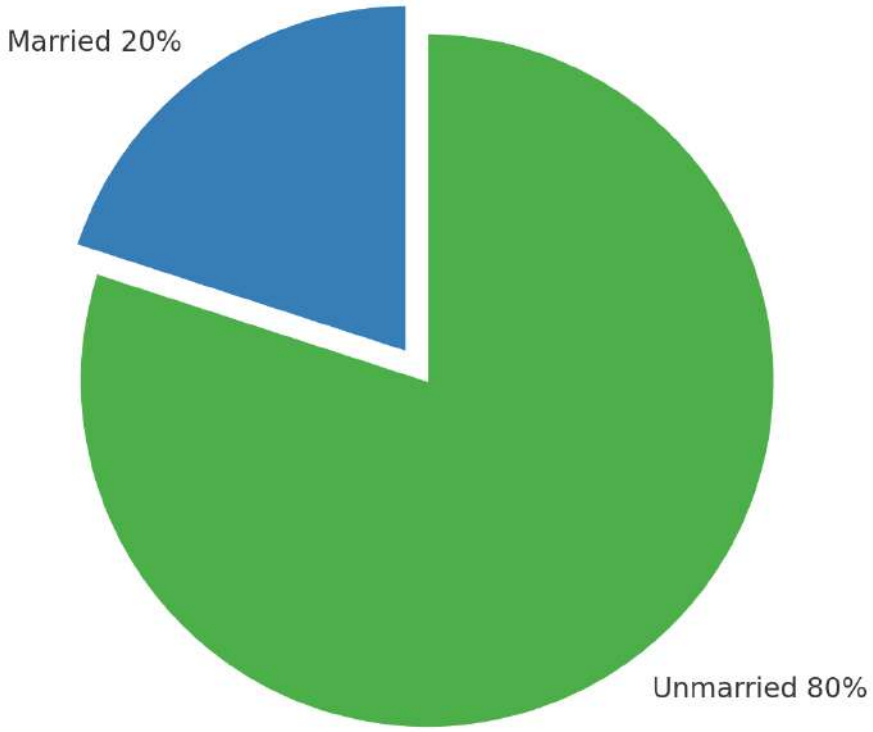


Figure No. 1: Marital Status of Participants

In the present study, the marital status of the participants was assessed. The findings revealed that the majority, 80% of participants, were unmarried, while only 20% were married. This distribution indicates that the sample population was predominantly unmarried, which may reflect the age group and demographic characteristics of the participants.

4.1.3 BMI (Body mass index) of participant

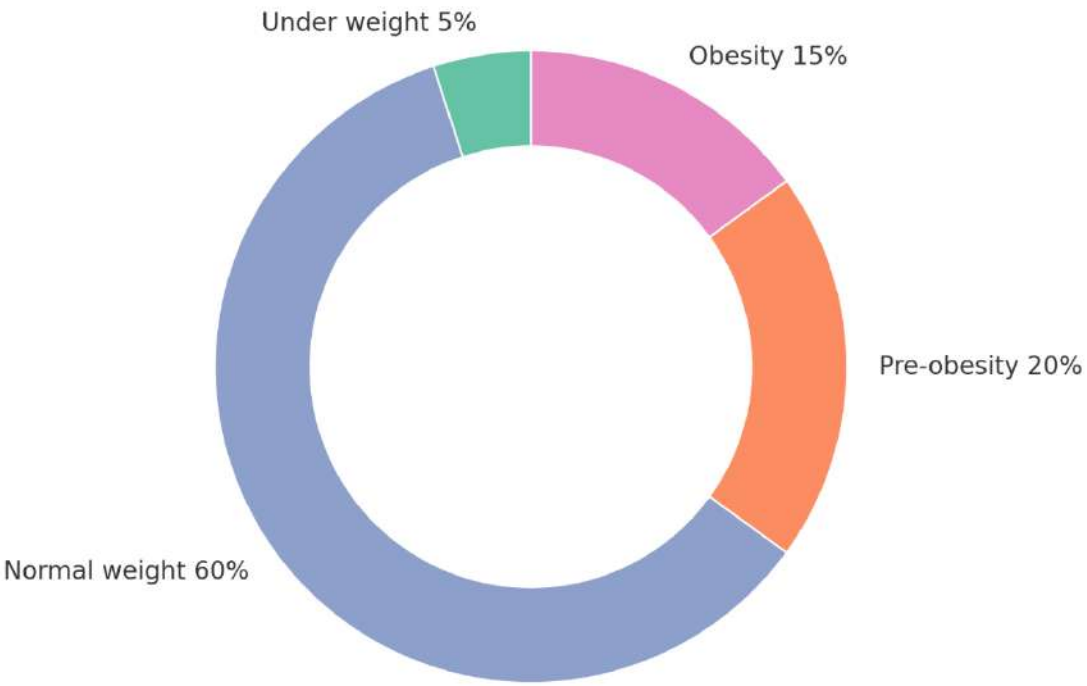
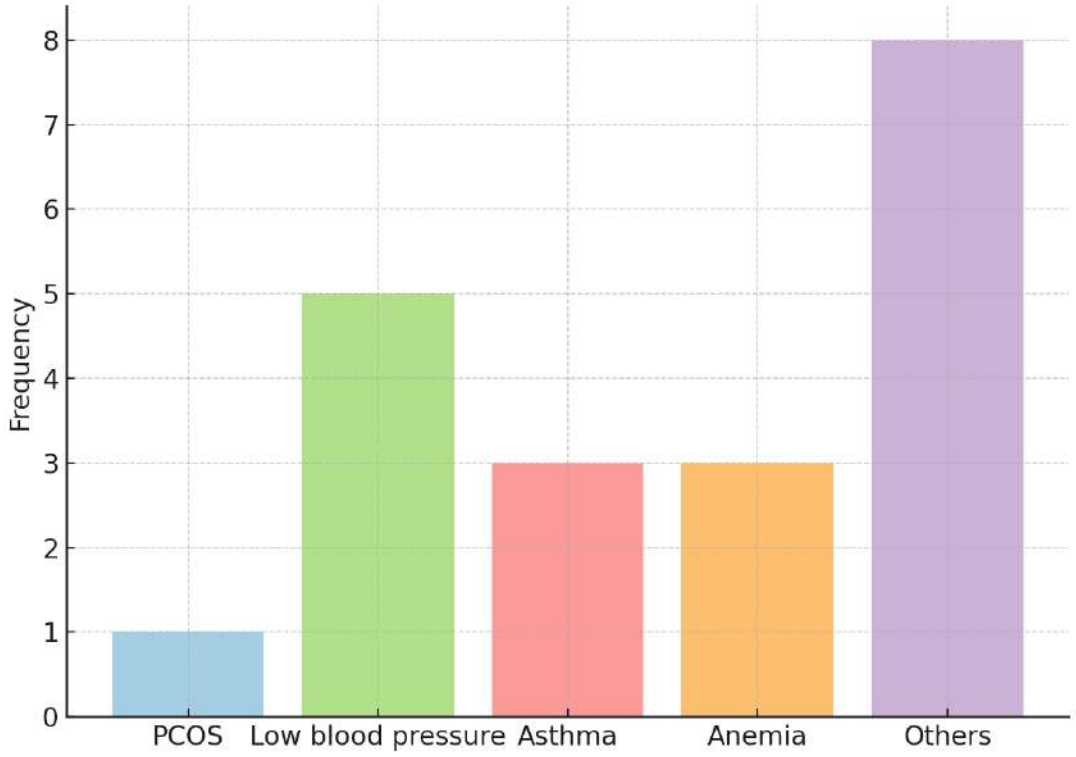


Figure: BMI of the participants

The BMI distribution of the participants revealed that the majority, 60%, fell within the normal weight category. A further 20% were classified as pre-obese, while 15% were in the obese category. Only 5% of participants were found to be underweight.

4.1.4 Co-morbidities of the participants:



In the 20-participant study, comorbidity prevalence was assessed. The findings indicated that the most common comorbidity was Others, reported by 8 participants (40% of the sample). Low blood pressure was present in 5 participants (25%), while asthma and anemia were each observed in 3 participants (15%). Polycystic ovary syndrome (PCOS) was the least frequent comorbidity, reported by 1 participant (5%). This distribution reflects the presence of varied health issues among the participants, highlighting that general health conditions may contribute to individual differences in overall functional status and response to interventions.

4.2 Visual Analogue Scale

Table No. 2: Impact on VAS (Visual Analogue Scale) scores before and after intervention.

Subjects of Experimental Group	VAS (pre)	VAS (post)
P-1	7	3
P-2	9	4
P-3	9	4
P-4	7	2
P-5	8	3
P-6	7	3
P-7	7	4
P-8	8	4
P-9	8	3
P-10	8	3
P-11	8	3
P-12	6	2
P-13	8	3
P-14	8	5
P-15	7	3
P-16	7	2
P-17	9	4
P-18	8	2
P-19	7	3
P-20	7	2
Mean ± SD	**7.65 ± 0.81**	**3.10 ± 0.85**

The outcomes indicate a remarkable improvement in pain reduction as measured by the Visual Analogue Scale (VAS) following the intervention. Mean VAS decreased significantly from 7.65 ± 0.81 (pre-test) to 3.10 ± 0.85 (post-test), reflecting a substantial reduction in perceived pain intensity. Out of 20 participants, the majority demonstrated favorable changes, with most showing a clinically meaningful decrease in VAS scores. The results suggest that the applied intervention was effective in reducing pain severity.

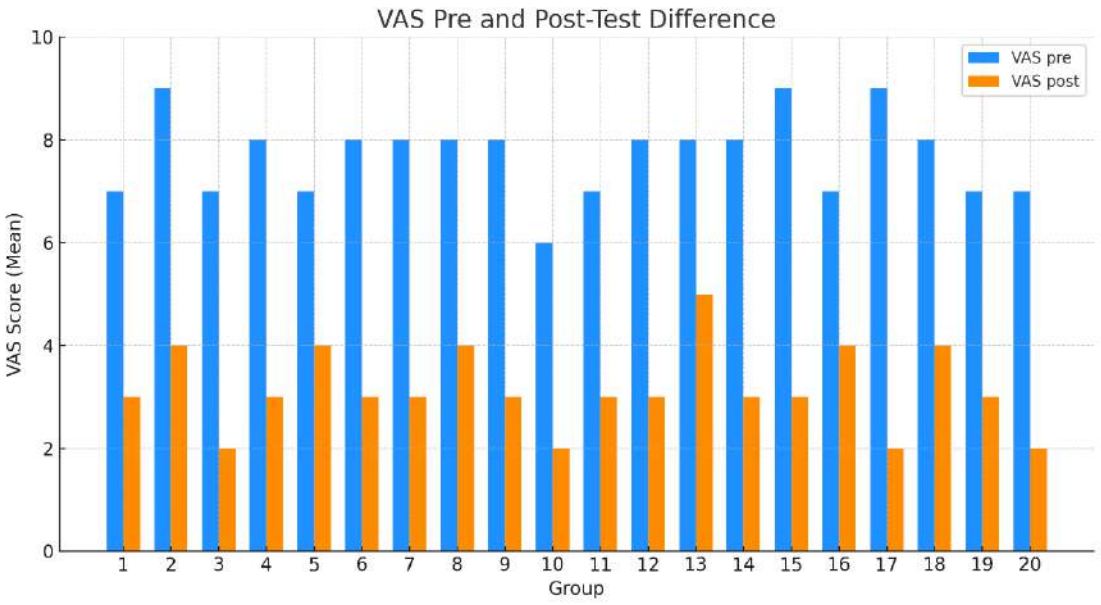


Table no 3: Impact on VAS scores before and after treatment.

Posttest - Pretest VAS scores	N	Mean Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P-Value
Negative Ranks	**20**	**10.50**	**210.00**	**-4.010**	**<0.001**
Positive Ranks	**0**	**.00**	**.00**		
Ties	**0**				
Total	**20**				

The Wilcoxon Signed Rank Test indicated consistent improvements in Visual Analogue Scale (VAS) scores following the intervention. Negative ranks demonstrated that all 20 subjects had reduced VAS scores post-intervention, while no subjects showed improvement in the opposite direction, and no ties were observed. The test statistic (Z) was -4.010, and the p-value of < 0.001 reflected a statistically significant difference in pain intensity before and after the intervention. The results suggest that the applied intervention was effective in significantly reducing pain levels, supporting its clinical utility in pain management and rehabilitation.

Table No.4: impact on HADS (Hospital Anxiety and Depression Scale) anxiety scores before and after intervention.

Subjects of Experimental Group	HADS Anxiety (pre)	HADS Anxiety (post)
P-1	5	5
P-2	6	5
P-3	7	6
P-4	4	4
P-5	7	7
P-6	6	6
P-7	8	8
P-8	7	7
P-9	9	8
P-10	8	8
P-11	8	7
P-12	6	5
P-13	7	5
P-14	8	8
P-15	6	6
P-16	5	5
P-17	8	8
P-18	8	7
P-19	6	4
P-20	7	6
Mean ± SD	**6.80± 1.28**	**6.25 ± 1.37**

The mean HADS-A score decreased from 6.80 ± 1.28 at pre-test to 6.25 ± 1.37 at post-test, reflecting a favorable change in anxiety symptoms among participants. Although the decrease appears modest, the shift suggests that the intervention had a positive influence. Importantly, all 20 participants were included in the analysis, with scores ranging from 4 to 9 at baseline and 4 to 8 after the intervention, representing individual variability in response.

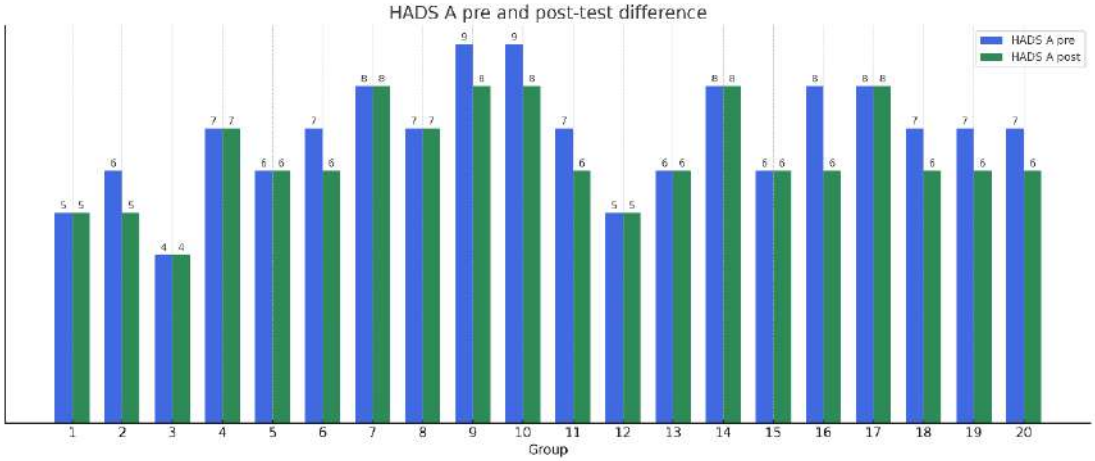


Table no 5: Impact on HADS (Hospital Anxiety and Depression Scale) anxiety score before and after treatment.

Posttest-Pretest HADS Anxiety scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P-Value
Negative Ranks	9	5.00	45.00	Z = -2.810	0.005
Positive Ranks	0	.00	.00		
Ties	11				
Total	20				

The Wilcoxon Signed Rank Test indicated overall improvements in Hospital Anxiety and Depression Scale Anxiety (HADS A) scores following the intervention. Negative ranks demonstrated that 9 subjects had their HADS A scores reduced, while no participant showed an increase, with 11 ties representing consistent pre-to-post stability. The test statistic (Z) was -2.810, and the p-value of 0.005 reflected a statistically significant difference in HADS A scores. The results suggest that the intervention was effective in reducing anxiety levels, although the presence of ties highlights variability in individual responses.

Table no 6: Impact on HADS (Hospital Anxiety and Depression Scale) depression score before and after intervention.

Subjects of Experimental Group	HADS Depression (pre)	HADS Depression (post)
P-1	5	6
P-2	6	5
P-3	7	7
P-4	4	4
P-5	7	6
P-6	6	6
P-7	8	8
P-8	7	7
P-9	9	8
P-10	8	8
P-11	8	8
P-12	6	6
P-13	7	6
P-14	8	8
P-15	6	7
P-16	5	5
P-17	8	8
P-18	8	7
P-19	6	6
P-20	7	7
Mean ± SD	**6.65± 1.18**	**6.20± 1.36**

The outcomes indicate a favorable reduction in depression levels as measured by the Hospital Anxiety and Depression Scale – Depression (HADS D) post-intervention. The mean HADS D score decreased from 6.65 ± 1.18 at pre-test to 6.20 ± 1.36 at post-test, reflecting an overall positive change. The minimum and maximum scores (4.00 to 8.00) remained within the same range, yet the slight reduction in the mean suggests improvement in depressive symptoms for several participants. All 20 individuals were included in the analysis, representing consistency in data collection and demonstrating that the intervention contributed to modest but meaningful improvements in depression outcomes.

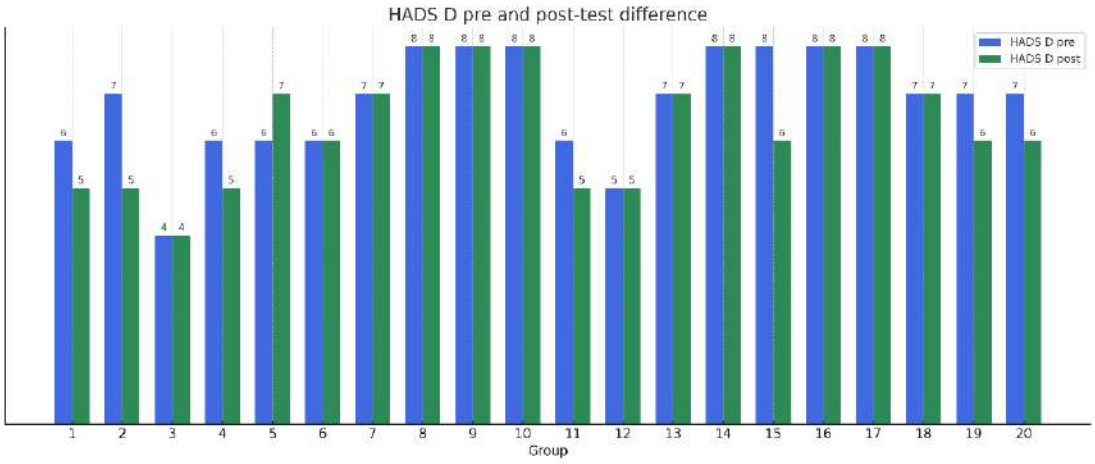


Table no 7: Impact on HADS (Hospital Anxiety and Depression Scale) depression score before and after treatment.

Pre test- Post test HADS depression scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P-Value
Negative Ranks	8	4.50	36.00	-2.714	0.007
Positive Ranks	0	.00	.00		
Ties	12				
Total	20				

The Wilcoxon Signed Rank Test was utilized to compare the pre- and post-test depression scores (HADS D). The analysis revealed 8 negative ranks, meaning that 8 subjects decreased their depression score after the intervention. 0 of the ranks were positive, indicating that no participant reported an increase in depression; and 12 ties represented scores that remained unvaried from pre- to post-test. The test statistic was (Z) -2.714, with a P-value at 0.007,> indicating that there were a significant decrease in depression level following the intervention. Although the fact that 12 items have a presence of ties points to different responding by subjects, there is evidence that the intervention successfully reduced depressive symptomatology in a fraction of responders.

Table no 8: Impact on DIS (Dysmenorrhea Interference Scale) score before and after intervention.

Subjects of Experimental Group	DIS (pre)	DIS (post)
P-1	40	39
P-2	42	42
P-3	21	20
P-4	35	35
P-5	40	40
P-6	46	45
P-7	32	31
P-8	39	39
P-9	45	44
P-10	41	40
P-11	50	48
P-12	20	20
P-13	48	48
P-14	45	43
P-15	58	56
P-16	45	43
P-17	60	59
P-18	42	40
P-19	21	21
P-20	40	39
Mean ± SD	**40.50± 10.79**	**39.60± 10.49**

The outcomes indicate a minimal change in Dysmenorrhea Symptom Interference (DSI) scores following the intervention. The mean DSI score decreased slightly from 40.50 ± 10.79 at pre-test to 39.60 ± 10.45 at post-test, reflecting a small reduction in interference of dysmenorrhea symptoms on daily activities. While the overall difference is limited, this suggests that participants experienced a modest improvement, though variability in responses was observed across individuals.

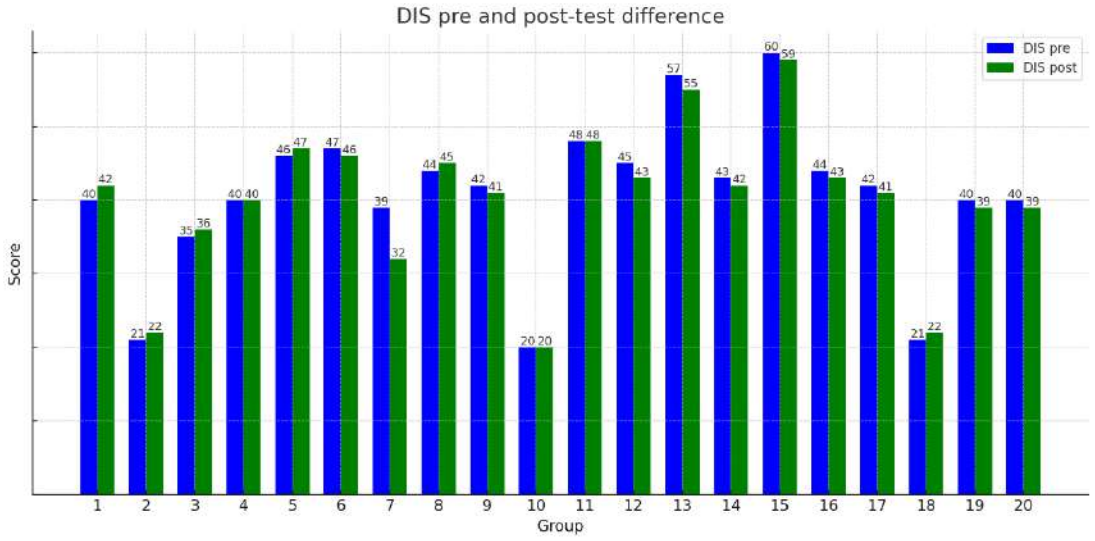


Table no 9: Impact on DIS (Dysmenorrhea Interference Scale) score before and after treatment.

Pre test-Post test DIS scores	N	Means Rank	Sum of Ranks	Wilcoxon signed rank test based on Z rank	P-Value
Negative Ranks	13	7.00	91.00	-3.286	0.001
Positive Ranks	0	.00	.00		
Ties	7				
Total	20				

Wilcoxon Singed-Rank Test demonstrated that there was a reduction in DIS scores after intervention with statistical significance. Of 20 participants, 13 had lower scores, 0 had higher scores and for 7 there was no change. Test statistic (Z) was -3.286 with p-value 0.001 (<0.05), indicating that there was a significant difference between the pre- and post-test scores. These findings imply that the intervention could help to decrease interference and associated distress of dysmenorrhea symptoms in daily life, but not for all included participants.

CHAPTER: V DISCUSSION & LIMITATIONS

This research was conducted to compare the effects of core stability and Kegel exercises on dysmenorrhea. An experimental and quasi-experimental design was used with a sample of 20 participants who participated in four weeks of supervised intervention. Results were assessed with well-validated instruments: Visual Analogue Scale (VAS) for pain, Hospital Anxiety and Depression Scale – Anxiety (HADS-A) and Depression (HADS-D) for psychological outcome variables, as well as Daily Interference Scale (DIS) to assess functional disruption. The findings showed significant reductions in pain, anxiety, and depression scores; and better daily activities indicating that core stability and Kegel exercises can be considered as useful non-pharmacological interventions for the treatment of dysmenorrhea.

The most striking of the findings in this study was that pain severity for all the 20 subjects reduced at post-test. No ranks in the Wilcoxon Signed Rank Test were negative; indicating no subjects aggravated pain and test statistic ($Z = -4.010$, $p < 0.001$) proved significant relief of an extremely high degree. This highly indicates that core stability and Kegel exercise have a significant effect on reducing menstrual pain. Findings are in line with previous studies. (Shahrjerdi et al. 2019, p.113) showed that after an 8-week core stability program there was a reduction in the severity and duration of pain in women with primary dysmenorrhea.

Similarly, (Mohamed et al. 2024, p.735) also found that Kegel exercise had significant positive effects for the reduction of dysmenorrhea symptoms and improvement of the quality of life in female students. Moreover, a meta-analysis of the (Lorzadeh et al. 2024) (29 trials) showed that organized exercise programs significantly reduced the pain with a WMD of −2.62 for the VAS (p-value < 0.001).

The underlying mechanism for these improvements can be explained physiologically. Exercise enhances pelvic blood flow, thereby reducing ischemia of the uterine tissue, which is associated with pain during menstruation. Core stability exercises improve trunk and lumbopelvic muscle activation, while Kegel exercises strengthen the pelvic floor muscles, both of which contribute to better neuromuscular control and reduced

uterine muscle spasm. Together, these effects help in decreasing prostaglandin-induced myometrial contractions, the underlying cause of pain in dysmenorrhoea.

The current study, also showed a significant decrease in BeAn scores after the intervention ($Z = –2.810$, $p = 0.005$). Nine participants reported improvement, while 11 remained stable, with no cases of worsening anxiety. This outcome highlights the psychological benefits of physical exercise in women experiencing dysmenorrhea.

These results are supported by the findings of (Lorzadeh et al. 2024), who reported that core strengthening and aerobic exercise programs not only reduced pain but also alleviated menstrual-related psychological distress, including anxiety and sleep disturbance. Similarly, (Bi et al. 2023, p.1175) observed that structured preoperative exercise and coping strategies reduced postoperative anxiety, highlighting the broader psychological role of exercise interventions.

The mechanism may be attributed to the release of endorphins during exercise, which serve as natural mood enhancers and reduce stress levels. Additionally, by lowering the intensity of menstrual pain, the intervention indirectly reduces anticipatory anxiety related to the onset of menstruation. Improvements in physical capacity and body confidence may also contribute to reduced anxiety levels.

Depression levels also improved significantly in this study, with 8 participants reporting reduced scores after the intervention ($Z = –2.714$, $p = 0.007$). Although 12 participants reported stable scores, no worsening was observed, indicating that the intervention positively influenced mood and emotional well-being.

These results are in agreement with (Hasaan et al. 2022, p.119), who found that pelvic floor strengthening exercises significantly improved pain outcomes and reduced depressive symptoms associated with menstrual distress. Likewise, (Barbalho-Moulim et al. 2011) showed that structured exercise rehabilitation programs enhanced mood and reduced depressive symptoms in women suffering from pelvic pain.

The association between pain and depression is firmly established. The psychological stress is a cause of irritability and low mood associated with dysmenorrhea. By reducing the burden of pain, exercise indirectly alleviates depressive symptoms. Furthermore, the act of engaging in structured physical activity fosters a sense of self-efficacy, which helps counteract negative mood states and promotes psychological resilience.

The study further documented improvements in daily functioning, as indicated by reduced DIS scores following intervention ($Z = –3.451$, $p = 0.001$). Participants reported being better able to manage household, academic, and social activities during menstruation.

This finding is consistent with Hasaan et al. (2022, p.119), who observed that Kegel exercises significantly improved daily performance and reduced interference caused by dysmenorrhea. Similarly, Shahrjerdi et al. (2019) demonstrated that core stability training enhanced functional capacity by improving lumbopelvic stability and neuromuscular coordination.

Although the improvements in DIS were less pronounced than in VAS, this may be attributed to the relatively short duration (four weeks) of the intervention. Functional improvements often require sustained exercise practice over longer periods to achieve more substantial benefits. Nonetheless, the positive change suggests that exercise interventions can enhance quality of life by reducing activity limitations.

Overall, the results of this study are consistent with existing research emphasizing the value of non-pharmacological approaches in managing dysmenorrhea. While earlier studies evaluated core stability or pelvic floor exercises individually, the current research demonstrated the benefit of a combined approach, highlighting the synergistic impact on both physical and psychological outcomes. The findings add to the growing evidence base that structured exercise programs should be incorporated into standard dysmenorrhea management protocols as cost-effective and sustainable strategies.

In light of these findings, several important implications emerge. From a clinical perspective, incorporating core stability and Kegel exercises into routine physiotherapy and women's health programs could provide a safe, accessible, and cost-effective adjunct to pharmacological treatment. This approach may be particularly valuable for women who prefer to avoid long-term medication use due to side effects or contraindications. Non-clinically, these exercises can be promoted in educational institutions, workplaces, and community health initiatives as preventive and self-management strategies for young women and adult populations alike. Such interventions could reduce absenteeism from school and work, thereby contributing to improved academic performance, productivity, and overall quality of life.

Despite the favorable findings, there are several limitations in this study. The generalizability of the findings is limited to some extent by the rather small number of subjects (n = 20). Also, the brief duration of intervention (4 weeks) might have tempered effectiveness in terms of functional and psychologic changes as long-term compliance with exercise is associated with more pronounced benefits. A further limitation is the lack of a control condition, meaning that we cannot be absolutely sure that any group-level change is purely due to intervention rather than because the treatment provided or natural variation in this population showed placebo-like effects across both lifestyle and menstrual symptoms. Furthermore, the use of self-report instruments like the VAS, HADS, and DIS cannot avoid subjective interpretation and response bias despite been standardized and broadly validated.

These limitations could be the topic of further inquiries by recruiting larger, more diversified samples from both different age groups and cultural milieus, matched with clinical populations. Randomized controlled trials of longer duration may enhance causal inference and provide stronger evidence for the long-term sustainability of exercise interventions. Additionally, the comparison of core stability and Kegel exercise individually versus in combination would help to clarify whether synergistic benefits exist, or if one modality is more influential than the other. The inclusion of objective physiological measures, such as electromyography for pelvic floor activity or Doppler imaging for uterine blood flow, could also provide valuable mechanistic insights into how these exercises exert their effects.

On a broader theoretical level, the findings contribute to the biopsychosocial model of health, demonstrating how physical interventions can influence not only biological mechanisms (e.g., uterine blood flow, prostaglandin activity) but also psychological states (e.g., anxiety, depression) and social functioning. This underscores the interconnectedness of physical and mental health in women's reproductive well-being and highlights the importance of multidisciplinary approaches in gynecological care.

In conclusion, the study reinforces the potential of exercise-based interventions as effective, low-cost, and holistic strategies for managing dysmenorrhea. By reducing pain, alleviating psychological distress, and enhancing daily functioning, core stability and Kegel exercises can empower women with greater control over their health. While more work is needed to tailor protocols in order to optimise them and ensure long-term

effectiveness, introducing such non-pharmacological approaches into standard of care seem convincing for the aim of improving both clinical outcomes and women's quality of life overall.

Limitations of the Study:

1. **Small Sample Size:** Only 20 participants, limiting generalizability.
2. **No Control Group:** It can be hard to credit improvements just to the exercises.
3. **Single Centre:** Participants from a single institution and age group validity.

Strengths of the Study:

1. Standardized tools (VAS, HADS-A, HADS-D, DIS) ensured validity and reliability.
2. Both physical and psychological outcomes were evaluated for a holistic view.
3. The combined use of core stability and Kegel exercises offered an innovative approach.
4. The intervention was simple, safe, and cost-effective for clinical and community use.
5. Relevant research.

CHAPTER: VI CONCLUSION & RECOMMENDATION

6.1 Conclusion:

The purpose of this study was to evaluate the effect of core stability and Kegel exercises on dysmenorrhea. The results revealed the significant reduction of VAS pain intensity (VAS) and improvements in psychological outcomes such as reduction of anxiety (HADS-A) and depression (HADS-D) after 4 weeks of a structured exercise program. Functional interference in daily activities (DIS) was also improved, suggesting better ability to manage routine and academic tasks during menstruation. Participants may have experienced better psychological well-being because the program not only reduced pain but also enhanced self-efficacy, providing them with structured techniques to tregain the control and reduce the distress during the menstrual cycle. By contrast, the functional improvements observed in DIS were moderate compared to pain reduction. This may indicate that short-term interventions may not fully capture long-term improvements in overall functional health and endurance. For stronger functional recovery, longer-duration programs or exercises, such as aerobic activity, posture training, or relaxation techniques, may be required.

Overall, this study provides promising preliminary evidence that core stability and Kegel exercises are effective non-pharmacological strategies for reducing pain and improving psychological well-being among women with dysmenorrhea. The magnitude of change in functional outcomes was modest, but the pain and psychological benefits were significant, indicating the clinical importance of early exercise based interventions. These results highlight the need to structured physiotherapy programs into menstrual health management and encourage future studies with longer duration, larger samples, and combination exercise strategies to maximize benefits.

6.2 Recommendations:

1. **Expand to Multiple Centers:** Future research should be carried out across a variety of settings, such as universities, hospitals, and community health centers. Involving multiple institutions would strengthen the generalizability of the findings and ensure that the benefits of core stability and Kegel exercises apply to diverse populations of women with dysmenorrhea.

2. **Include Long-Term Follow-Up:** It is important for future studies to track participants beyond the initial intervention period. Monitoring the long-term effects of these exercises on pain recurrence, daily functioning, and psychological well-being would help determine whether the improvements observed in this study are sustained over time.

3. **Larger Randomized Controlled Trials:** To provide stronger and more reliable evidence, future research should involve larger sample sizes within randomized controlled trial (RCT) designs. This would increase statistical power and allow for more confident conclusions about the true effectiveness of the intervention.

4. **Compare with Other Interventions:** Future investigations should not only test core stability and Kegel exercises but also compare them with other available treatments, both pharmacological and non-pharmacological. Such comparisons could clarify whether these exercises are best used alone or as part of a combined management strategy.

5. **Integration into Health Programs:** Given the high prevalence of dysmenorrhea among young women, especially students, physiotherapy-based exercise routines should be incorporated into school, college, and community health programs. Doing so would improve awareness, accessibility, and adoption of safe, cost-effective methods for managing menstrual pain.

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APPENDIX: A

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref : *Date : .....*

SCMST-BPT/IRB/12-06/25 – 24/01

To
Mst.Mim
4th Year Student of B.Sc. in Physiotherapy
Session: 2019-20, Reg No: 8823
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Subject: Approval of the thesis proposal " **Efficacy of Core Stability and Kegel Exercise for the management of Dysmenorrhoea -** " by ethics committee.

Dear Mst.Mim
Congratulations.
The Institutional Review Board (IRB) of SCMST has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Research proposal.
2	Structured Questionnaire (English & Bangla version)
3	Information sheet & consent form.

The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 09.00 AM on 4th September 2024 at SCMST.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring during the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,
04.09.25.
Dr. Abul Kasem Mohammad Ehamul Haque
Principal, SCMST &Chairman, Institutional Review Board (IRB)
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

APPENDIX: B

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref : *Date : .....*

To
The Principal,
Saic College of Medical Science and Technology
Saic Tower, M-1/6
Mirpur-14, Dhaka-1216.

Subject: **Prayer for permission to collect data from SAIC College of Medical Science and Technology, to conduct a research project.**

Sir,

With due respect and humble submission to state that I am a student of B.Sc. in Physiotherapy at Saic College of Medical Science and Technology (SCMST). As a part of our course curriculum, we have to conduct a research project for the partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. My research title is **"Efficacy of Core Stability and Kegel Exercise for the Management of Dysmenorrhea"** This is a type of quasi experimental study under the supervisor Dr. MD. Feroz Kabir sir, Assistant Professor and Chairman, Department of Physiotherapy and Rehabilitation Jashore University of Science and Technology (JUST).I have chosen SAIC College of Medical Science and Technology, Saic Tower, M-1/6 Mirpur-14, Dhaka-1216, to collect data from the female students with dysmenorrhea.

So, I, therefore, pray and hope that you would be kind enough to give permission for data collection that will help me to complete my study.

10. 10. 24.
Yours Faithfully
Mst. Mim
B.Sc. in Physiotherapy (4th Year)
Session: 2019-2020
SCMST, Mirpur-14, Dhaka-1216, Bangladesh.

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

APPENDIX: C

Questionnaire Bangla and English

সম্মতি পত্র

আমি মোছাঃ মিম, সাইক কলেজ অব মেডিকেল সায়েন্স এন্ড টেকনোলজির বিএসসি ইন ফিজিওথেরাপি চতুর্থ বর্ষের শিক্ষার্থী। আমার গবেষণার জন্য একটি সমীক্ষা পরিচালনা করছি। গবেষণার শিরোনাম: " ইফিক্যাসি অফ কোর স্ট্যাবিলিটি অ্যান্ড কেগেল এক্সারসাইজ ফর দ্য ম্যানেজমেন্ট অফ ডিসমেনোরিয়া"এই গবেষণার উদ্দেশ্য হল প্রজনন বয়সী নারীদের মধ্যে মাসিকের ব্যথা কমানোর জন্য কোর স্ট্যাবিলিটি ও কেগেল ব্যায়ামের কার্যকারিতা নির্ণয় করা। এই গবেষণায় আপনার অংশগ্রহণ স্বেচ্ছাসেবী এবং আপনি যে কোন সময় এটি থেকে সরে আসতে পারবেন।আপনাকে নিশ্চিত করছি যে আপনার প্রদত্ত সকল তথ্য সম্পূর্ণ গোপন রাখা হবে এবং রিপোর্টে কোনো ব্যক্তিগত নাম প্রকাশ করা হবে না।সাইক কলেজ অব মেডিকেল সায়েন্স অ্যান্ড টেকনোলজি (SCMST) এই গবেষণার অনুমতি দিয়েছে ,আপনার অংশগ্রহণ সম্পূর্ণ স্বেচ্ছাসেবী এবং আপনি যেকোনো সময় অংশগ্রহণ প্রত্যাহার করতে পারেন।

যদি আপনার কোনো প্রশ্ন থাকে, আপনি আমার গবেষণা তত্ত্বাবধায়ক ডা. মোঃ ফিরোজ কবির, সহকারী অধ্যাপক ও চেয়ারম্যান, ফিজিওথেরাপি ও পুনর্বাসন বিভাগ, যশোর বিজ্ঞান ও প্রযুক্তি বিশ্ববিদ্যালয় (JUST)-এর সাথে যোগাযোগ করতে পারেন।

হ্যাঁ [ ] না [ ]

অংশগ্রহণকারীর স্বাক্ষর: ..... তারিখ: .....

সাক্ষীর স্বাক্ষর: ..... তারিখ: .....

ফিজিওথেরাপিস্টের স্বাক্ষর: ..... তারিখ: .....

গবেষকের স্বাক্ষর: ..... তারিখ: .....

টাইটেল: ইফিক্যাসি অফ কোর স্ট্যাবিলিটি অ্যান্ড কিগেল এক্সারসাইজ ফর দ্য ম্যানেজমেন্ট অফ ডিসমেনোরিয়া

পর্ব ১ অংশগ্রহণকারী তথ্য:

ক্রমিক নং	রোগীর তথ্য	উত্তর
১	অংশগ্রহণকারী আইডি	
২	নাম (ঐচ্ছিক)	
৩	বয়স	
৪	বৈবাহিক অবস্থা	□ বিবাহিত □ অবিবাহিত
৫	পেশা	
৬	শিক্ষাগত যোগ্যতা	
৭	ঠিকানা	
৮	ফোন নম্বর (ঐচ্ছিক)	

পর্ব ২: শারীরিক পরিমাপ

সঠিক উত্তরে টিক (✓) চিহ্ন দিন

ক্রমিক	প্রশ্ন	উত্তর
১	উচ্চতা:	_____
২	ওজন:	_____কেজি
৩	বিএমআই :	_____
৪	সহ-রোগসমূহ :	☐ ০. রক্তশূন্যতা ☐ ১. নিম্ন রক্তচাপ ☐ ২. হাঁপানি ☐ ৩. পিসিওএস ☐ ৪. অন্যান্য: _____

পর্ব ৩: ক্লিনিক্যাল ও মাসিক সংক্রান্ত তথ্য:

ক্রমিক নং	প্রশ্ন	**উত্তর দেওয়ার ঘর (টিক দিন)**
১	আপনার মাসিক কি নিয়মিত হয়?	☐ হ্যাঁ ☐ না
২	আপনার প্রথম মাসিক হওয়ার বয়স কত ছিল?	_____ বছর
৩	আপনি কি মাসিকের সময় ব্যথা অনুভব করেন?	☐ হ্যাঁ ☐ না
৪	ব্যথার ধরন কেমন হয়?	☐ মৃদু ☐ মাঝারি ☐ তীব্র
৫	ব্যথা কমানোর জন্য আপনি কোন ওষুধ খান?	☐ হ্যাঁ ☐ না
৬	আপনি কি ব্যথা কমাতে ব্যায়াম করে থাকেন?	☐ হ্যাঁ ☐ না
৭	আপনি কোর স্টেবিলিটি ব্যায়াম সম্পর্কে জানেন কি?	☐ হ্যাঁ ☐ না
৮	আপনি কেগেল ব্যায়াম সম্পর্কে জানেন কি?	☐ হ্যাঁ ☐ না
৯	পূর্বে কখনও কোর/কেগেল ব্যায়াম করেছেন কি?	☐ হ্যাঁ ☐ না

পর্ব ৪: মাসিকের ব্যথা সংক্রান্ত উপসর্গ:

প্রশ্ন	**Pre-Test (✓)**	**Post-Test (✓)**
১। মাসিকের সময় তলপেটে ব্যথা হয়	☐ হ্যাঁ ☐ না	☐ হ্যাঁ ☐ না
২। ব্যথার কারণে দৈনন্দিন কাজ ব্যাহত হয়	☐ হ্যাঁ ☐ না	☐ হ্যাঁ ☐ না

৩। ব্যথা ছাড়া মাথাব্যথা বা বমি বমি ভাব হয় কি?	□ হ্যাঁ □ না	□ হ্যাঁ □ না
৪। ব্যথা কতদিন স্থায়ী হয় (দিন):	_____ দিন	_____ দিন
৫। মাসিক চলাকালে মানসিক অস্থিরতা বা বিষণ্নতা থাকে	□ হ্যাঁ □ না	□ হ্যাঁ □ না

পর্ব ৫: ব্যথার মাত্রা মূল্যায়ন (VAS Scale):

দয়া করে ব্যথার মাত্রা প্রকাশ করতে নিচের সংখ্যার মধ্যে টিক (✓) দিন।
০ = কোনো ব্যথা নেই, ১০ = সবচেয়ে তীব্র ব্যথা।

পর্যায়	**মূল্যায়ন পয়েন্ট**	**ব্যথার মাত্রা**
প্রি-টেস্ট	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	
পোস্ট-টেস্ট	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	

পর্ব ৬: ডিসমেনোরিয়া প্রভাব মূল্যায়ন স্কেল(DIS স্কেল ভিত্তিক)

DSI মোট স্কোর (০–৮০)	তীব্রতার ব্যাখ্যা
০ – ২০	সামান্য / কোনো ব্যাঘাত নেই
২১ – ৪০	হালকা থেকে মাঝারি ব্যাঘাত
৪১ – ৬০	মাঝারি থেকে গুরুতর ব্যাঘাত
৬১ – ৮০	গুরুতর ব্যাঘাত দৈনন্দিন জীবনে

প্রশ্নাবলী

০ = একেবারেই ব্যাহত করে না

১–৩ = হালকা

৪–৬ = মাঝারি

৭–১০ = তীব্র

ক্রম	প্রশ্ন	উত্তর (প্রি-টেস্ট)	পোস্ট-টেস্ট
১	মাসিক চলাকালে বিশ্ববিদ্যালয়ে উপস্থিতি কতটুকু ব্যাহত হয়?		
২	মাসিক চলাকালে পড়াশোনা বা কাজে মনোযোগ কতটুকু ব্যাহত হয়?		
৩	মাসিক চলাকালে শারীরিক কাজ (হাঁটা, ব্যায়াম, গৃহস্থালির কাজ) কতটুকু ব্যাহত হয়?		
৪	মাসিক চলাকালে সামাজিক কাজ বা অন্যদের সাথে যোগাযোগ কতটুকু ব্যাহত হয়?		
৫	মাসিক চলাকালে ঘুম ও বিশ্রাম কতটুকু ব্যাহত হয়?		

৬	মাসিক চলাকালে মানসিক অবস্থা ও মেজাজ কতটুকু ব্যাহত হয়?		
৭	মাসিক চলাকালে ব্যক্তিগত কাজ (টয়লেট, গোসল, পোশাক, খাওয়া) কতটুকু ব্যাহত হয়?		
৮	মাসিক চলাকালে সামগ্রিক দৈনন্দিন জীবনযাপন কতটুকু ব্যাহত হয়?		

DIS স্কোর তুলনা :

ধাপ	DIS স্কোর
প্রি-টেস্ট	
পোস্ট-টেস্ট	

পর্ব ৭: মানসিক অবস্থা (HADS স্কেল ভিত্তিক)

০ = একদম নয়
১ = মাঝে মাঝে
২ = বেশিরভাগ সময়
৩ = প্রায় সব সময়

উদ্বেগ উপ-স্কেল :

প্রশ্ন	উত্তর(প্রি-টেস্ট)	পোস্ট-টেস্ট
১. আমি অস্থির বোধ করি		
২. আমার মনে হয় ভয়ানক কিছু ঘটতে যাচ্ছে		
৩. মনে দুশ্চিন্তা বারবার আসে		
৪. আমি আরামে বসতে পারি এবং শান্ত থাকতে পারি		
৫.আমি ভেতরে ভেতরে অস্বস্তিকর ভয় বা দুশ্চিন্তার অনুভূতি পাই, যেন পেটে কাঁপুনি হচ্ছে।		
৬. “আমি শান্তভাবে থাকতে পারি না		
৭. হঠাৎ আমি খুব ভয় পাই		

বিষণ্নতা উপ-স্কেল:

প্রশ্ন	উত্তর(প্রি-টেস্ট)	পোস্ট-টেস্ট
৮. আমি এখনও সেই জিনিসগুলো উপভোগ করি, যেগুলো আগে উপভোগ করতাম		
৯. আমি হাসতে পারি এবং ঘটনার মজার দিকগুলো উপলব্ধি করতে পারি		
১০. আমি আনন্দিত বোধ করি		
১১. আমার মনে হয় আমি ধীর হয়ে গেছি		
১২. আমি আমার চেহারা বা নিজের পরিচর্যায় আগ্রহ হারিয়েছি		
১৩. আমি আগ্রহ ও আনন্দের সাথে ভবিষ্যতের জিনিসগুলোর জন্য অপেক্ষা করি		
১৪. আমি বই, টিভি বা রেডিও অনুষ্ঠান উপভোগ করতে পারি		

HADS স্কোর তুলনা:

ধাপ	HADS-A স্কোর	HADS-B স্কোর
প্রি-টেস্ট		
পোস্ট-টেস্ট		

পর্ব ৮: ব্যায়ামের প্রভাব (শুধু Post-Test অংশে প্রযোজ্য)

ক্র.	প্রশ্ন	Post-Test (✓)
১।	ব্যথার তীব্রতায় কি পরিবর্তন এসেছে?	☐ হ্যাঁ ☐ না
২।	আপনি কোর স্ট্যাবিলিটি ব্যায়ামে উপকার পেয়েছেন কি?	☐ হ্যাঁ ☐ না
৩।	আপনি কেগেল ব্যায়ামে উপকার পেয়েছেন কি?	☐ হ্যাঁ ☐ না
৪।	উভয় ব্যায়াম একত্রে করলে কি ভালো ফল পেয়েছেন?	☐ হ্যাঁ ☐ না
৫।	ব্যায়ামের ফলে দৈনন্দিন কার্যক্ষমতা উন্নত হয়েছে কি?	☐ হ্যাঁ ☐ না

Informed consent

Title: **Efficacy of Core Stability and Kegel Exercise for the Management of Dysmenorrhea**

Thanks in advance for being a part of my study. My name is Mst Mim. I am a student of Saic College of Medical Science and Technology (SCMST). As a part of my academic course requirement, I need to conduct a research work. The aim of my research topic is to find out the **Efficacy of Core Stability and Kegel Exercise for the Management of Dysmenorrhea**. This will be a quasi experimental type of study. I assure you that all data will be kept confidential. In report information will be presented in the form of group. No name will be mentioned. For your information Saic College of Medical Science and Technology (SCMST) has permitted me to do the research. Your co-operation in answering a few questions will be highly appreciated.

If you have any queries about the study? ou may contact with my supervisor Dr. Md. Feroz Kabir, Assistant Professor and Chairman, Department of Physiotherapy and Rehabilitation, Jashore University of Science and Technology (JUST).

Do you have any question before I start?

So, may I have your consent to proceed with the interview?

Yes ☐ No ☐

Signature of the Participant and date _____

Signature of the Interviewer and date _____

Witness signature and date _____

Date of interview:

Address of participant:

Research Title: Efficacy of Core Stability and Kegel Exercises for the Management of Dysmenorrhea

Part 1: Participant Information

Serial No.	Patient Information	Response
1	Participant ID	
2	Name (Optional).	
3	Age	
4	Marital Status	☐ Married ☐ Unmarried
5	Occupation	
6	Educational Qualification	
7	Address.	
8	Phone Number (Optional)	

Part 2: Physical Measurement

No.	Question	Answer
1	Height	_____
2	Weight	_____ kg
3	BMI	_____
4	Co-morbidities	☐ 0. Anemia ☐ 1. Low blood pressure ☐ 2. Asthma ☐ 3. PCOS ☐ 4.Others: _____

Part 3: Clinical and Menstrual History

Serial No.	Question	Response Box (Tick)
1	Is your menstrual cycle regular?	☐ Yes ☐ No
2	At what age did you have your first menstruation?	_____ years
3	Do you experience pain during menstruation?	☐ Yes ☐ No
4	How would you describe the type of pain?	☐ Mild ☐ Moderate ☐ Severe
5	Do you take any medication to relieve the pain?	☐ Yes ☐ No
6	Do you do any exercises to reduce the pain?	☐ Yes ☐ No
7	Are you aware of core stability exercises?	☐ Yes ☐ No
8	Are you aware of Kegel exercises?	☐ Yes ☐ No
9	Have you ever done core or Kegel exercises before?	☐ Yes ☐ No

Part 4: Symptoms Related to Menstrual Pain

Question No.	Question	Pre-Test (✓)	Post-Test (✓)
1	Do you feel lower abdominal pain during menstruation?	☐ Yes ☐ No	☐ Yes ☐ No
2	Does the pain interfere with daily activities?	☐ Yes ☐ No	☐ Yes ☐ No
3	Apart from pain, do you feel headache or nausea?	☐ Yes ☐ No	☐ Yes ☐ No
4	How many days does the pain last? (Days)	_____ days	_____ days
5	Do you experience mental restlessness or depression during menstruation?	☐ Yes ☐ No	☐ Yes ☐ No

Part 5: Pain Intensity Assessment (VAS Scale)

Instruction: Please tick (✓) the number that best represents your menstrual pain intensity.

0 = No pain, 10 = Worst imaginable pain.

Phase	VAS Score	Level of pain
Pre test	0 1 2 3 4 5 6 7 8 9 10	
Post test	0 1 2 3 4 5 6 7 8 9 10	

Part 6: Dysmenorrhea Interference Assessment (DSI)

DSI Total Score (0–80)	Interpretation of Severity
0 – 20	Minimal / No interference in daily life.
21 – 40	Mild to Moderate interference.
41 – 60	Moderate to Severe interference.
61 – 80	Severe interference in daily life.

DIS Scoring Question (Pre-test & Post-test)

No.	Question	Pre-test	Post-test
1	During menstruation, how much does pain interfere with attending school regularly?		
2	During your period, how much does the pain make it hard for you to focus on studying or doing tasks?		
3	How much does menstrual pain interfere with your physical activities		
4	How much does menstrual pain interfere with your social activities or interaction with others?		
5	How much does menstrual pain interfere with your sleep and rest?		
6	How much does menstrual pain interfere with your mood and emotional well-being?		
7	How much does menstrual pain interfere with your personal care		
8	Overall, during your period, how much does the pain affect your daily life and activities?		

Comparing DIS score:

Phase	DIS Score
Pre test	
Post test	

Part 7: Mental Status (Based on HADS Scale)

Score Range	Interpretation
0–7	Normal (no clinical anxiety/depression)
8–10	Borderline abnormal (possible case)
11–21	Abnormal (probable case, clinically significant)

Please read each question carefully and select the option (0–3)

0 = Not at all
1 = Occasionally
2 = A lot of the time
3 = Most of the time

Anxiety Subscale:

Question	Pre test	Post test
1. I feel tense		
2. I get a sort of frightened feeling as if something awful is about to happen		
3.Worrying thoughts go through my mind		
4.I can sit comfortably and feel relaxed		
5.I get sort of frightened feeling like 'butterflies' in the stomach		
6.I feel restless as if I have to be on the move		
7.I get sudden feelings of panic		

Depression Subscale:

Question	Pre test	Post test
8. I still enjoy the things I used to enjoy		
9. I can laugh and see the funny side of things		
10. I feel cheerful		
11. I feel as if I am slowed down		
12. I have lost interest in my appearance		
13. I look forward with enjoyment to things		
14. I can enjoy a good book, TV, radio, or film		

Comparing HADS score:

Phase	HADS A Score	HADS D Score
Pre test		
Post test		

Part 8: Effect of Exercise (Applicable only for Post-Test)

Serial No.	Question	Post-Test (✓)
1	Has there been any change in the intensity of your pain?	☐ Yes ☐ No
2	Have you benefited from core stability exercises?	☐ Yes ☐ No
3	Have you benefited from Kegel exercises?	☐ Yes ☐ No
4	Have you achieved better results by doing both exercises together?	☐ Yes ☐ No
5	Has your daily functional ability improved due to the exercises?	☐ Yes ☐ No

APPENDIX: D

Patient Instruction Leaflet for Home Exercise:

APPENDIX: E

Gantt Chart

Activities/ Months	Jun 24	Jul 24	Aug 24	Sep 24	Oct 24	Nov 24	Dec 24	Jan 25	Feb 25	Mar 25	Apr 25	May 25	Jun 25	Jul 25
Proposal Presentation														
Introduction														
Literature Review														
Methodology														
Data Collection														
Data Analysis														
Result														
1st progress Presentation														
Discussion														
Conclusion and Recommendation														
2nd progress Presentation														
Communication with supervisor														
Final Submission														