ISSN: 2347-6567

International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

IJAMSCR |Vol.14 | Issue 2| Jan - Mar – 2026

www.ijamscr.com

DOI :https://doi.org/10.61096/ijamscr.v14.iss2.2026.702-714

A Comparative Study on the Effectiveness of Myofascial Release with Aerobic Exercise Vs Kinesiotaping with Aerobic Exercise in Premenstrual Syndrome

Nasreen Shaikh[1*], Dr. D. Arnold Nikhilesh[2]

[1]MPT 2 Year student Garden City University Bangalore.
[2]Assistant professor, Garden City University Bangalore.

*Corresponding Author: Nasreen Shaikh

Email id: nasreenshaikh2029@gmail.com

Published on: 27.04.2026

Published by: Futuristic Publications

Abstract: Background: Premenstrual syndrome (PMS) is triggered by hormonal events ensuring after ovulation. kinesio taping is an elastic cotton strip and is used with the intent of treating pain. Myofascial release is a form of manual therapy that involves the application of low load and long duration stretch.

Design: Two group experimental study designed with pre-test and post-test.

Methods: Myofascial release (Group A) and Kinesio taping (Group B) with 10 women in each group

Outcome measure: Visual analogue scale (VAS) is a subjective measure of pain and worst pain imaginable, during the visit.

Results: Statistical analysis done by using paired‘t’ test and unpaired ‘t’ test showed that there was significant improvement in subjects who received kinesio taping.

Conclusion: 20 subjects were included in the study and were randomly divided into two groups. The group A was treated with myofascial release with aerobic exercise and group B was treated with kinesio taping with aerobic exercise. From the result, it can conclude that significant difference in reduction of pain and in both groups but when comparing the mean value it is found out that group treated with kinesio taping shows better changes in pain with premenstrual syndrome.

Keywords: Premenstrual syndrome, womens health, kinesiotaping, myofascial release.

1. INTRODUCTION

Premenstrual syndrome (PMS) is triggered by hormonal events ensuring after ovulation. The symptoms can begin in the early, mid, or late luteal phase and are not associated with defined concentration of any specific gonadal or non-gonadal hormone.

The anatomy of uterus consists of following three layer. The inner layer called endometrium it is the most active layer and respond to cyclic ovarian hormone changes the endometrium is highly specialized and is essential to menstrual and reproductive function. The middle volume of endometrium makes most of the uterine volume and is muscular consist of smooth muscle cell the outer layer of uterus, the serosa or perimetrium is a thin layer of tissue made of epithelial cells that develop the uterus.

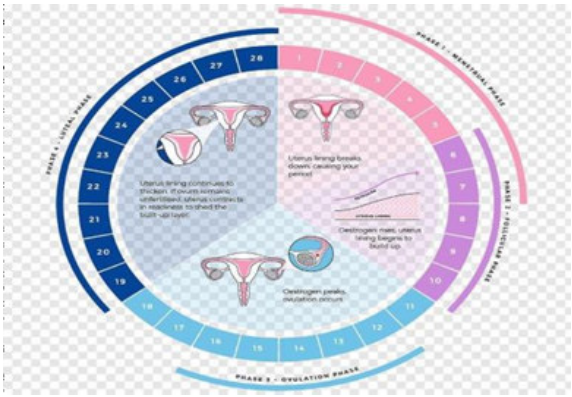


Figure 1: *A typical 28 days of menstrual cycle*

The uterus is a pear shaped origin in the female pelvis between the urinary bladder anteriorly and the rectum posteriorly the average dimensions are approximately 8cm long across and 4cm thick with an average volume between 80-200ml.The uterus is divided in to three parts: the fundus, body and the cervix. The uterus can also exhibit normal variations in size shape based on reproductive stage and exposure to ovarian steroid hormones. Pain usually occurs right before menstruation starts as the level of prostaglandin increases in the lining of uterus. On the first day of the menstrual period the levels are high.as menstruation continues and the lining of uterus is shed, her level is decreased. Pain is usually at the level decreases the prostaglandin decreases. Uterine contractility is mediated largely by hormone mechanisms. Estrogen, prostaglandins and oxytoxin produce contraction and progesterone causes relaxation. Concentration of these hormones and the relationship that vary at different times of the menstrual cycle and parturition.

In normal menstruation, the menstrual blood is predominantly arterial with 25% of the blood is being of various origin. It contains tissue debris prostaglandins and large amount fibronylosin from endometrial tissue. The fibrinolysin clots so that menstrual blood does not normally contains clots unless the flow is excessive. The usual duration of the menstrual flow is 3-5 days, but flow as short as 1 day and as long as 8 days occur in normal women. The amount of blood loss may range from slight spotting from 800ml, is loss more than 80ml is abnormal obviously. The abnormality of menstruation includes premenstrual syndrome. The several menstrual cramps that are common in young women quiet often disappear after first pregnancy. The signs and symptoms of premenstrual syndrome include pain concentrated in the lower abdomen, pelvis, thighs, lower back Sore breasts, headache, dizziness, fainting, fatigue, hypersensitivity to light. The examination for menstrual pain includes pelvic examination, ultrasound exam and laparoscopy.

Several interventions for the management of menstrual pain have been described including surgery, analgesic drugs, acupressure, cryotherapy, transcutaneous electrical stimulation (TENS), active stretching exercises, abdominal massage (Wanda2006). Elastic therapeutic tape also called kinesiology tap, kinesiology therapeutic tape, kinesio tape or kt, is an elastic cotton strip with acrylic adhesive is used with the intent of treating painand disability from athletic injuries and variety of other physical disorders. Myofascial release is a form of manual therapy that involves the application of low load, long duration stretch to the myofascial complex, intended to restore optimal length, decrease pain and improve function.

1.1. Objectives of the study

- To find out the effectiveness of myofascial release with aerobic exercise on pain among patients with premenstrual syndrome.
- To find out the effectiveness of kinesio taping with aerobic exercise on pain among patients with premenstrual syndrome.
- To find out the effectiveness of kinesio taping with aerobic exercise on depression among patients with premenstrual syndrome.
- To compare the effectiveness of myofascial release and kinesio taping with aerobic exercise on depression among patients with premenstrual syndrome.

1.2. Operational definitions

Premenstrual Syndrome most women of reproductive age have some physical discomfort or dysphoria in the weeks before menstruation. Symptoms are often mild, but can be severe enough to substantially affect daily activities.

1.3. Myofascial Release Therapy

Myofascial release is a form of manual therapy that involves the application of low load, long duration stretch to the myofascial complex, intended to restore optimal length, decrease pain and improve function.

1.4. Kinesio Taping

Elastic therapeutic tape also called kinesiology tape, kinesiology therapeutic tape, k tape is an elastic cotton strip with an acrylic adhesive that is used with the intent of treating pain and disability from athletic injuries and variety of other physical disorder.

1.5. Aerobic Exercise

Aerobic exercise (also known as cardio) physical exercise of low to high intensity that depends on to aerobic energy generating process.

1.6. Visual Analogue Scale

Visual analogue scale is one of the basic pain measurement tools which consists of 100 cm horizontal line with two end points labeled respectively. One end is labeled as no pain and other is labeled as severe pain.

1.7. Depression Scale

The beck depression scale is a 21-item, self-related scale that evaluates key symptoms of depression including mood, crying, irritability, social withdrawal

2. METHODOLOGY

The study was approved by the Institutional Review Board of Garden City University and physiocare, Banglore, and informed consent was obtained from all participants. It was a comparative study conducted in the outpatient department to evaluate the effectiveness of Myofascial Release (MFR) and Kinesio Taping (KT), each combined with aerobic exercise, in managing pain and depression among women with premenstrual syndrome (PMS). Twenty female subjects aged between 18 and 35 years with regular menstrual cycles were selected according to inclusion and exclusion criteria and randomly assigned into two equal groups. Group A received Myofascial Release with aerobic exercises, while Group B received Kinesio Taping with the same aerobic protocol. The intervention was carried out for two weeks prior to menstruation across two consecutive cycles. Aerobic sessions lasted 45 minutes per day and included a 10-minute warm-up, 20 minutes of moderate-intensity aerobic activity such as jogging and step-ups, 5 minutes of strengthening exercises, and 5 minutes of cool-down stretching. Kinesio taping was applied in a seated position using three “I” shaped strips around the umbilical and lumbar regions, whereas the myofascial release technique targeted the psoas and latissimus dorsi muscles for 90–120 seconds twice a week. Pre- and post-intervention assessments were performed using the Visual Analogue Scale (VAS) for pain and Beck Depression Inventory (BDI) for depression. Data collection was done before and after the treatment period under uniform conditions for both groups. The collected data were analyzed using paired‘t’ tests to find within-group significance and unpaired ‘t’ tests to compare between groups, with $p < 0.05$ considered statistically significant. The study ensured ethical compliance, standardization of procedures, and supervision by qualified physiotherapists throughout the intervention period.

Study setting

The study was conducted in the Garden City University and physiocare, Bangalore.

Selection of subject

20 subjects were randomly selected who fulfilled the inclusion and exclusion criteria were divided into two groups, group A and group B.

- Group A- Myofascial release with aerobic exercise
- Group B- Kinesio taping with aerobic exercise

Variables

Dependent variables

- Pain
- Depression

Independent variables

- Myofascial release along with Aerobic exercises
- Kinesio taping along with Aerobic exercises

Measurement tool

Variable	Tool
Pain	VAS
Depression	Beck depression inventor

Study design

Pre and post experimental study

Duration

2 weeks prior to the menstruation

Inclusion criteria

- Women presenting menstrual pain grade above 4 according to the visual analogue scale.
- Regular menstrual cycles (cycles typically range from21-35 days)
- Nulliparous
- Do not use any contraceptive device or take oral contraceptive pills.

Exclusion criteria

- Women with mild pain (grade2-3) according to the visual analogue scale.
- Women with irregular or infrequent menstrual cycles (outside typical range of cycles 21-35days)
- Women using an intrauterine contraceptive device or taking oral contraceptive pills
- Women to which it has undergone a surgical procedure for treatment
- Provide skin lesion in the abdominal wall or lumbar region
- Use or abuse of drugs or alcohol

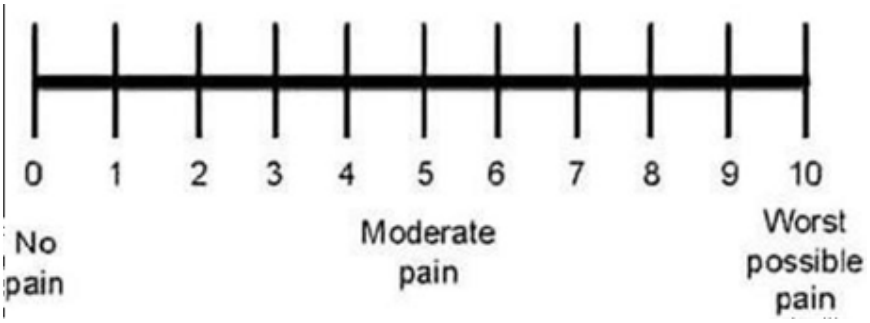
Procedure

20 premenstrual patients are selected for the study and divided into two group A and B.

Group A treated with myofascial release along with aerobic exercise and Group B treated with kinesio taping along with aerobic exercise. The treatment was given for a period of 2 weeks. Before and after completion of treatment interventions, pain was evaluated by visual analogue scale, and depression was evaluated by beck depression inventory. Before collecting data, all the subjects were explained about the purpose of the study. The investigator had given a detailed orientation about the test procedure of visual analog scale to measure the pain. The consent and full co-operation of each participant was sought after completing explanation of the condition and demonstration of the procedures involved in the study.

Test administration

Pain assessment by visual analogue scale [VAS] – The visual analogue scale is a subjective measure of pain. It consists of a 10cm line with two end point representing no pain and worst pain imaginable. During the visit, patients are asked to rate their pain by placing a mark on the line corresponding to their current level of pain.



Materials used

- Bicycle
- Staircase
- Kinesiology tape

Treatment procedure

Aerobic exercises up to 4 week lasting 45 minutes Aerobic exercises program:

Warm up - 10 min

Walking - 4 min

Stretching - 6 min

Pectoralis stretching

Calf and hamstring stretching Triceps stretching

Iliopsoas stretching

All the muscles given 3 repetitions

Exercises 1

Jogging: 10 min

Jogging on ground or trampoline until the patient is sweating lightly.

Duration; 2 weeks before menstruation

Figure 2: *Jogging*

Exercise 2

4step up – down: 10 min

The patient was made to climb the stair step up and down for 10 minutes. It provide weight bearing.

Duration: 2 week before menstruation

Number of session: 2 session per day

Figure 3: *Step up*

Figure 4: *Step down*

Strengthening exercises: 5 min

Shoulder flexor – shoulder external rotator

Shoulder abductors –

Shoulder internal rotator –

Knee flexor

Knee extensor all the muscles given 3 repetitions

Cool down; 5 min

Group A- Kinesio-taping:

Duration; 2 week prior to menstruation

Number of session; 1 session per day

Procedure: Patient is made to sit on a table. Here taking 3 I shaped

Kinesio-tape of 20 cm of length

1st tape is applying 5 cm below the level of the naval 2nd tape perpendicular to the navel on the 1st tape

3rd tape on the back of the patient at the level of L3 vertebrae

Figure 5: *Kinesio taping*

Group B: Myofascial release technique:

Procedure:

The technique of direct relaxation of fascia of both psoas muscles and latissimus dorsi muscles to the participant in the myofascial relaxation group, since the end of the last cycle, 90-120 seconds. It will be applied by the physiotherapist twice a week.

Figure 6: *Myofascial release*

Collection of data

The selection 20 premenstrual syndrome patient were divided into two groups. Group A and Group B.

- Group A – Myofascial release along with aerobic exercise.
- Group B- Kinesio taping along with aerobic exercise.

Before and after the treatment intervention, pain was evaluated by visual analogue scale and recorded.

Table 1: *The table shows mean value, mean difference, standard deviation, and paired 't' value between pre-test and post-test scores of pain among group A*

Measurement	Mean	Mean difference	Standard deviation	Paired 't' value
Pre-test	**7.7**	**1.8**	**0.63**	**9.03**
Post-test	**5.9**			

**0.005 level of significance*

In group A for pain the calculated paired't' value is 9.03 and the't' table value is 3.250 at

0.005 level. Since the calculated't' value is more than't' table value, there is significant different in pain following myofascial release along with aerobic exercise among patient with premenstrual syndrome.

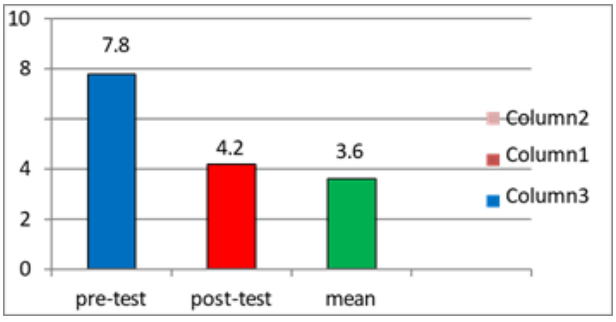


Figure 3: *Graphical representation of pre and posttest mean values of pain among group A*

Table 2: *The table shows mean value, mean difference, standard deviation, and paired 't' value between pre-test and post-test scores of pain among group B*

Measurement	Mean	Mean difference	Standard deviation	Paired 't' value
Pre-test	**7.8**	**3.6**	**1.17**	**9.723**
Post-test	**4.2**			

**0.005 level of significant*

In group B for pain the calculated paired‘t’ value is 9.723 and the‘t’ table value is 3.250 at 0.005 level. Since the calculated‘t’ value is more than ‘t’ table value, there is significant difference in pain following kinesio taping along with aerobic exercise among patients with premenstrual syndrome.

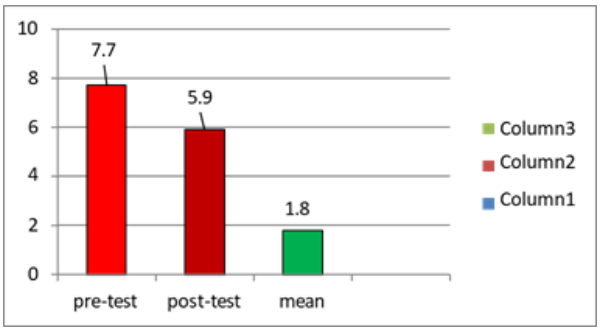


Figure 4: *Graphical representation of pre and posttest mean values of pain among Group B*

Table 3: *The table shows mean value, mean difference, standard deviation, and unpaired‘t’ values of pain between Group A and Group B*

Groups	Mean	Mean difference	Standard deviation	Unpaired ‘t’ test
Group A	**3.8**	**1.8**	**0.94**	**4.27**
Group B	**1.8**			

**0.005 level of significance*

In group A and B for pain calculated unpaired‘t’ value is 4.27 and‘t’ value is 2.845 at

0.005 level. Since the calculated‘t’ is more than ‘t’ table value, there is significant difference between myofascial release and kinesio taping along with aerobic exercise among patients with premenstrual syndrome.

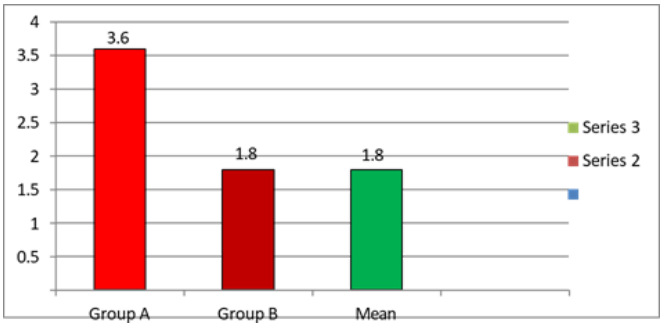


Figure 5: *Graphical representation of unpaired‘t’ value of pain between group A and Group B*

Table 4: *The table shows mean value, mean difference, standard deviation, and paired‘t’ value between pre-test and post test scores of depression among group A*

Measurement	Mean	Mean difference	Standard deviation	Paired ‘t’ value
Pre-test	**178**	**38**	**1.65**	**7.27**
Post-test	**140**			

**0.005 level of significance.*

In group A for depression the calculated paired‘t’ value is 7.27 and the‘t’ table value is 3.250 At 0.005 level. Since the calculated‘t’ value is more than‘t’ table value, there is significant different in depression following myofascial release along with aerobic exercise among patient with premenstrual syndrome.

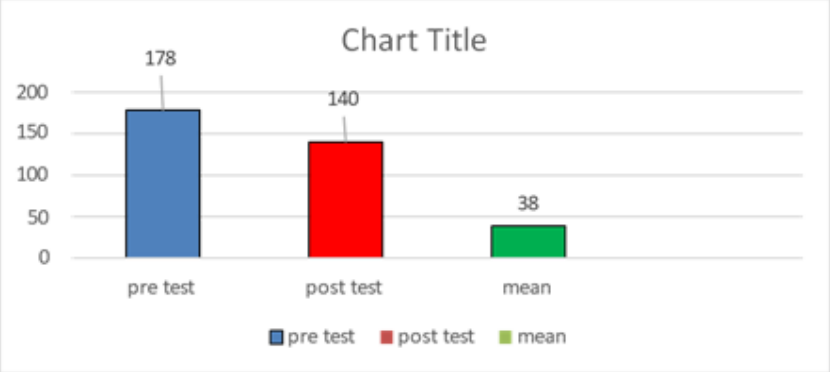


Figure: *Graphical representation of pre and post-test mean values of depression among Group A.*

Table 5: *The table shows mean value, mean difference, standard deviation, and paired 't' value between pre-test and post-test scores of depression among group B*

Measurement	Mean	Mean difference	Standard deviation	Paired 't' value
Pre-test	**177**	**46**	**1.39**	**11.82**
Post-test	**131**			

0.005 level of significance.

In group B for depression the calculated paired't' value is 11.82 and the't' table value is 3.250 at 0.005 level. Since the calculated't' value is more than 't' table value, there is significant difference in depression following kinesio taping along with aerobic exercise among patients with premenstrual syndrome

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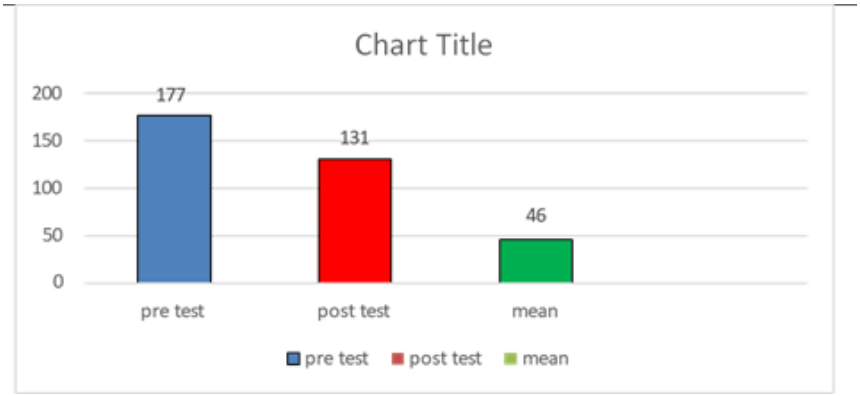

Figure: *Graphical representation of pre and post-test mean values of depression among Group B*

Table 6: *The table shows mean value, mean difference, standard deviation, and unpaired't' values of depression between Group A and Group B*

Groups	Mean	Mean difference	Standard deviation	Unpaired 't' test
Group A	**38**	**8**	**0.43**	**3.052**
Group B	**46**			

**0.005 level of significance.*

In group A and B for mild depression calculated unpaired't' value is 3.052 and't' value is 2.845 at 0.005 level. Since the calculated't' is more than 't' table value, there is significant difference between myofascial release and kinesio taping along with aerobic exercise among patients with premenstrual syndrome.

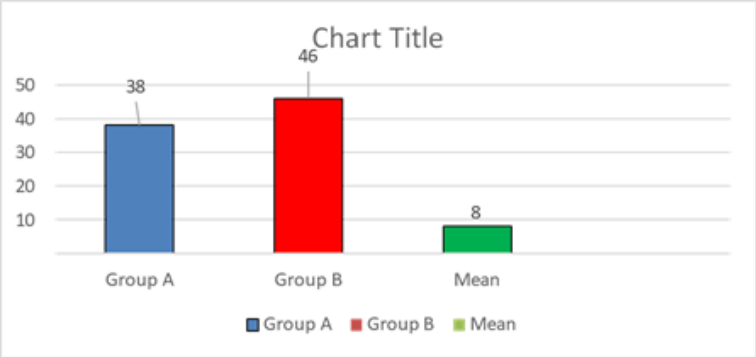

Figure: *Graphical representation of unpaired‘t’ value of depression betweenGroup A and Group B.*

3. RESULTS

20 clinically diagnosed premenstrual syndrome patients were divided into two groups

Group A was treated with myofascial release and aerobic exercise. Group B was treated with kinesio taping and aerobic exercise.

3.1. Analysis of dependent variable pain in group A:

In group A for pain the calculated paired‘t’ value is 9.723 and the‘t’ table value is 3.250 at 0.005 level. Since the calculated‘t’ value is more than‘t’ table value, it shows that there is significant difference in pain following myofascial release in patient with premenstrual syndrome.

3.2. Analysis of dependent variable pain in group B:

In group B for pain the calculated paired‘t’ value is 9.03 and the‘t’ table value is 3.250 at 0.005 level. Since the calculated‘t’ value is more than‘t’ table value, it shows that there is significant difference in pain following kinesio taping in patient with premenstrual syndrome.

3.3. Dependent variable pain between group A and group B:

In group A and B for pain calculated unpaired‘t’ value is 4.27 and‘t’ table value is 2.878 at 0.005 level. Since the calculated unpaired‘t’ value is more than ‘t’ table value, it shows that there is significant difference between myofascial release and kinesio taping along with aerobic exercise patients with premenstrual syndrome.

When comparing the mean value of group A and group B of pain, group B subjects treated with kinesio taping along with aerobic exercise shows more difference than group a subjects.

3.4. Analysis of dependent variable depression in group A:

In group A for depression the calculated paired‘t’ value is 7.27 and the‘t’ table value is 3.250 at 0.005 level. Since the calculated‘t’ value is more than‘t’ table value, there is significant difference in depression following myofascial release in patient with premenstrual syndrome.

3.5. Analysis of dependent variable depression in group B:

In group B for depression the calculated paired‘t’ value is 11.82 and the‘t’ table value is 3.250 at 0.005 level. Since the calculated‘t’ value is more than‘t’ table value, it shows that there is significant difference in depression following kinesio taping in patient with premenstrual syndrome.

3.6. Dependent variable depression between group A and group B:

In group A and B for depression calculated unpaired‘t’ value is 3.052 and‘t’ table value is 2.845 at 0.005 level. Since the calculated unpaired‘t’ value is more than‘t’ table value, there is significant difference between myofascial release and kinesio taping along with aerobic exercise patients with premenstrual syndrome.

When comparing the mean value of group A and group B of depression, group B subjects treated with kinesio taping along with aerobic exercise shows more difference than group a subjects.

4. DISCUSSION

The study is aimed on find out the effectiveness of myofascial release and kinesio taping with aerobic exercise on Premenstrual syndrome. The results of present study have shown that kinesio taping have significantly reduce the pain than the myofascial release among women.

The significant reduction in pain among the MFR group may be attributed to the release of fascial restrictions, improvement in circulation, and neuromuscular relaxation, which enhance tissue mobility and decrease

nociceptive input. These outcomes are consistent with the studies of Barnes (2010) and Schleip (2012), who stated that myofascial release normalizes fascial tension and reduces pain through mechanical and neurophysiological mechanisms. The improved pain relief also reflects modulation of the autonomic nervous system, promoting parasympathetic dominance and emotional relaxation.

Kinesio Taping also demonstrated beneficial effects, particularly in reducing perceived pain and improving functional comfort during the premenstrual phase. The possible mechanism involves cutaneous stimulation and facilitation of lymphatic drainage, improving circulation, and reducing muscle tension. These results align with the findings of Aytar et al. (2011) and Shakeri et al. (2016), who reported that KT decreases muscle fatigue and pain perception by enhancing proprioceptive feedback and reducing local inflammation.

Chacil et al., (2015) she conducted a study to find the effectiveness of kinesio taping in 34 unmarried women subjected with regular menstrual cycle underwent taping a total of 6 times twice a week for three weeks starting from 14 days before menstruation and continuing until its send. Degrees of menstruation syndrome were measured before the application of tapping. And she concluded kinesio taping reduce the intensity of pain in PMS patient.

Aerobic exercise release of endorphin by the brain, which can raise the threshold. The increase in the uterine blood flow and metabolism in aerobic activities can be effective against premenstrual syndrome. The aerobic exercise took pain faster waste and prostaglandins in the womb help reduce the pain. Exercise may act as a distraction from intrusive thoughts and promote positive thoughts, decreasing short-term depression.

Albert (2017) this study aimed to assess the effects of single and multiple massage treatment on pressure-pain threshold at myofascial trigger point in people with myofascial pain syndrome. They concluded that single and multiple release increase pressure pain threshold.

5. CONCLUSION

A study was conducted to compare the effectiveness of myofascial release and kinesio taping with aerobic exercise on premenstrual syndrome. 20 subjects were included in the study and were randomly divided into two groups. The group A was treated with myofascial release with aerobic exercise and group B was treated with kinesio taping with aerobic exercise.

From the result, it can conclude that significant difference in reduction of pain and in both groups but when comparing the mean value, it is found out that group treated with kinesio taping shows better changes in pain with premenstrual syndrome.

6. LIMITATIONS

- Small size of the group
- Short duration of study
- Follow up exercise were not directly supervised by therapist.

7. SUGGESTIONS

- Similar study can be carried out for larger sample size.
- Study can be contacted for other age group individuals.
- Study duration can be increased.

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