

## ORIGINAL ARTICLE

# COMPARE THE EFFECTIVENESS OF KINESIO-TAPING WITH CORE STRENGTHENING EXERCISES FOR PAIN MANAGEMENT OF DYSMENORRHEA IN FEMALE STUDENTS

## ABSTRACT

## BACKGROUND AND AIM

Dysmenorrhea is the most common gynecological problem in women, associated with painful menstruation, diarrhea, headache, low back pain, lower abdominal pain, nausea, fatigue, vertigo, etc. The current study is designed to compare the effectiveness of Kinesio-taping and core strengthening exercises in the pain management of dysmenorrhea.

## METHODOLOGY

The current study was Randomized Controlled Trial with Probability, random sampling technique carried out at Bahria University Medical and Dental College Karachi from January to June 2021. Total 40 female students between 18-35 years with diagnosed dysmenorrhea and VAS Score  $4 \geq$  were randomly selected. Two groups A and B were separately treated with Kinesio-taping and core strengthening exercises respectively. The intensity and duration of pain are evaluated in both groups. The study questionnaire was completed and VAS was assessed in both groups after the first, second, and third menstrual cycles.

## RESULTS

The result of second Menstrual cycle Post Treatment VAS in group A revealed 16 (80%) with moderate pain and 2 (10%) with severe pain, whereas in group B there were 10 (50%) with mild pain and 10 (50%) with moderate pain with significant P-value of 0.002. Third Menstrual cycle Post Treatment VAS in group A was present in 16 (80%) with moderate pain and 3 (15%) with severe pain, whereas in group B there were 5 (25%) with no pain, 14 (70%) with mild pain and 1 (5%) with moderate pain with significant P-value of 0.000.

## CONCLUSION

There was a significant effect found in participants with Core strengthening exercises for managing dysmenorrhea.

## KEYWORDS

Strengthening Exercise, Kinesiotaping, Dysmenorrhea, Pain, Physical Therapy, Gynecological problem, Menstrual cycle.

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## INTRODUCTION

Dysmenorrhea is the most common gynecological problem. The term Dysmenorrhea comes from a Greek word that means painful menstruation and difficult cyclic flow. A Women experience menstrual cycles approximately 450 times in her reproductive life that equals to 7 years of the bleeding period and if she experiences menstrual pain and cramps during the cycle for two to three days in each cycle that equals more than 3 years of menstrual pain and cramps in her lifetime <sup>1</sup>. The prevalence of dysmenorrhea showed a large number of females suffer from this condition approximately 50 to 95 percent during their reproductive life <sup>2</sup>. In which mild symptoms reported in previous studies is 75% to 85% <sup>3</sup>. Although one of the studies reported as there is a lack of attendance of females during their menstruation cycle at least once from colleges and universities at the rate of 51%. While a female who is absent in every menstrual cycle from their regular studies at 8% <sup>4</sup>. According to previous research, abdominal pain and cramps are caused by the increasing production of a hormone known as prostaglandins which result in increased contractility and vasoconstriction of arteries of myometrium <sup>5</sup>. However, women with dysmenorrhea have increased levels of prostaglandin hormones, especially in the first two days of their cycle in comparison to non-dysmenorrhea women <sup>6</sup>. It mainly consists of two types including primary dysmenorrhea and secondary dysmenorrhea <sup>7</sup>. Primary dysmenorrhea is the painful menstrual cycle with the absence of pelvic pathological disease, it can be present with the following symptoms; diarrhea, headache, backache at the lower side, abdominal pain in the lower side, nausea, fatigue, vertigo, etc. <sup>8</sup>. While Secondary dysmenorrhea presents with a painful menstrual cycle with the presence of pathological disease of the pelvic, for example, pelvic inflammatory disease, endometriosis, fibroids, ovarian cyst, adenomyosis, uterine polyps, cervical stenosis, pelvic adhesions. The most common cause of secondary dysmenorrhea is endometriosis according to ACOG (American college of obstetricians and gynecologist) 2/3 of women with cramps who are insensitive to treatment are the possibility of diagnose with endometriosis <sup>9</sup>. During labor, there is a possibility of destruction of sensory nerve endings which can reduce the prevalence of dysmenorrhea infertile women <sup>10</sup>. Furthermore, the reduction in the prevalence of dysmenorrhea is also related to increasing age <sup>11</sup>. Various methods are introduced according to different researches for the pain management of dysmenorrhea like NSAID (Non-steroidal anti-inflammatory drugs) <sup>12</sup>. These painkillers can reduce the pain of menstruation by causing the variations in prostaglandin hormone level, but some adverse effects can because due to the use of these drugs like the tenderness of the breast, bleeding during the intermenstrual period, reduce hear-

ing and vision, etc. <sup>13</sup>. Additionally, pain is also reduced through a nonpharmacological approach like herbal treatment <sup>14</sup> acupuncture treatment <sup>15</sup> psychotherapy for cognitive symptoms, yoga, physical therapy, including heating pads, TENS (transcutaneous electrical nerve stimulations), stretching exercises, strengthening exercises, kinesio-taping <sup>16</sup>. Kinesiotaping is an elastic and a stretchable therapeutic tape that provides the shear force to the skin with consistency. It can stretch up to 140% of its original length before application to the skin as compared to other athletic tapes. Because of its unique fabric characteristics of water-resistant and air permeability, it can be used for many days <sup>17</sup>. According to different researches, pain during menstruation can also reduce by Kinesio-taping <sup>18</sup>. Core strengthening exercises improve stability and strengthens the muscle of back, abdomen, pelvis by using your trunk without support. Dysmenorrhea in females may be due to the instability of lumbar stabilizers because the muscles of the lumbar spine are designed naturally to bear the weight of our body so weak in this region can cause pain in the abdomen, thighs, and back <sup>19</sup>.

During menstruation, the above mentioned areas of the female are affected. Strong muscles of the lumbar spine can bear the biomechanical changes of daily life and maintain stability during menstruation as well <sup>20</sup>. In our study, we compare the treatment effects of Kinesio-taping and core strengthening exercises in the management of dysmenorrhea in female students that will helpful for the physical therapist to give effective treatment in the future.

## MATERIAL AND METHODS

This is a Randomized Controlled Trial with a Probability, random sampling technique was done from January to June 2021 at Bahria University Medical And Dental College, Karachi after approval of institutional review board of Bahria University letter reference no: FRC-BUMDC42/2020. The sample size of 40 participants was calculated from openepi.com online software by taking statistical conditions of 95% confidence interval and a 5 % margin of error. There were two groups in this study, with equal sample of 20 each. Group A is treated with specializing and experience physical therapist from the Kinesio-taping method to reduce the pain of dysmenorrhea throughout the study period and Group B participants performed 4 cores strengthening exercises for 4 days a week for 10 mins and continue the same treatment till (8 weeks) exercises are performed before cycles. Participants were observed for three months treatment is performed in two consecutive months and all were investigated in three menstrual cycles. The intensity and duration of pain were evaluated in both groups with the help of VAS score used world widely, which was self-design questionnaire and VAS scale (one

pre-treatment VAS score and two post-treatment VAS scores after a first and second menstrual period).

#### Inclusion Criteria

Females with diagnosed dysmenorrhea between age group 18-35 years and their VAS Score is  $4 \geq$  are included in this study and participants with a history of pelvic inflammatory disease, endometriosis, any pathology, compulsory use of special drugs, Having symptoms such as (tingling, itching, discharge), Irregular menstruation cycle, use of painkillers during the study period will be strictly restricted in this study.

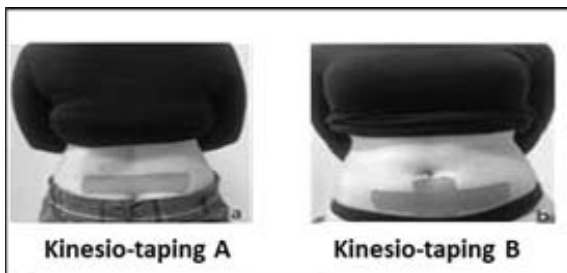
#### Exclusion Criteria

Females who will not agree to participate in this study due to any domestic or ethical issues will be the limitations of the study.

This research is done to increase the awareness of physical therapy treatment for the management of pain in dysmenorrhea. We will compare the effectiveness of both treatment criteria's in the pain management of dysmenorrhea. Protocols of both treatments will be done in both groups throughout the study period are as follows:

#### GROUP A (Kinesiotaping)

Elastic Kinesio-tape of (K-Active) brand used for this group, cut the tape 5cm wide of blue color from a roll. Placement of two strips on the skin over the pubic joint under the belly area. The first strip application was horizontally placed (from the anterior superior iliac spine to the other) Second strip placement was vertical over the previous strip which was placed before this horizontally, creating a cross figure (equally distant from both sides of the spine) on the lumbar region the third strip was placed (superior iliac spine on the above side of lumbar region) To attain full stretching of Kinesio-tape a technique was applied by a qualified physical therapist. The tape was applied for three days (two estimated days before the menstrual period and the first day of the cycle).



#### GROUP B (Core Strengthening Exercises)

The participants of group B treatment were done by the qualified physical therapist with core strengthening exercises four days a week for 10 minutes (8 weeks) exercises will be applied before cycles in each month. Exercises that were done by the qualified physical therapist were as follows.

#### Plank

The participants were advised to lie prone and put the weight of their body on elbows and toes and lift themselves upward and hold this position for five seconds with five repetitions.

#### Pelvic Bridging

The physical therapist advised participants to lie in the supine position and flexed their knees and then lift her pelvis up till the comfort level and hold this position for five seconds with ten repetitions.

#### Curl Up

The participants were advised to lie in a supine position with little knee flexed clasp her both hands behind the head and towards the move her body for five seconds with ten repetitions. As shown in picture 3.

#### Cat and Camel

The participants were advised to take a deep breath in from the nose with making a hump (like a cat) back and then breathe out from the mouth with making a curve in the spine (like a camel) for five seconds with ten repetitions. The intensity and duration of pain were evaluated by using VAS after the first, second, and third menstrual cycles. VAS scale is a tool used to evaluate the perception of the pain of an individual rating from 0 (no pain) to 10 (worse pain). The severity of pain is also evaluated by self-administered questionnaire.

#### Statistical Analysis

Statistical analysis was done by using SPSS version 23.0. Data was summarized using frequencies for categorical variables and means  $\pm$  standard deviation (SD) for quantitative variables. Bar charts were made for all cervical movements. For significance between both groups independent sample t test was applied. Categorical variables were analyzed by using Chi-square test. A P-value of  $<0.05$  was considered to be statistically significant.

## RESULTS

A total of 40 participants were recruited in this study. These participants were divided into two equal groups in which Group A treated with Kinesiotaping and Group B was given Core Strengthening Exercises. The mean age of participants in Group A was  $27.10 \pm 5.5$  and in Group B was  $28.2 \pm 4.5$ . When asked about the menstrual cycle period mean time in group A was  $5.95 \pm 1.9$  days and in group, B was  $5.60 \pm 1.6$  days. Menstrual cycle duration was classified into three categories, there were 7 (35%) participants observed in 21 days or less in group A and 10 (50%) in group B respectively with a non-significant P-value of 0.605. Symptoms experienced were found backache in 9 (45%), cramps 5 (25%) in group A whereas in group B backache was found in 13 (65%) and cramps were seen in 4 (20%) participants. When feeling during

menstruation question was asked option depressed were seen in 10 (50%) in group A and 11 (55%) in group B as shown in Table 1.

**Table-1: Effects of kinesiotaping and core strengthening exercises on menstruation symptoms in different ages of women.**

Parameters	Group A Kinesiotaping (n=20)	Group E Core Strengthening Exercises(n=20)	P-value
Age (years) How many days does Menstrual cycle stay?	27.10±5.5	28.2±4.5	0.495
	5.95±1.9	5.60±1.6	0.543
<b>Menstruation cycle duration</b>			
21 days or less	7	10	0.605
	35.00%	50.0%	
23 to 34 days	7	6	
	35.0%	30.0%	
35 or greater days	6	4	
	30.00%	20.00%	
<b>Have you experienced following?</b>			
Cranps	5 250%	4 20.0%	0.564
Bazkache	9	13	
Headache	450%	65.0% 2	
	150%	10.0%	
Tiredness	3	1	
	15.0%	5.0%	
<b>Do you feel during menstruation the following?</b>			
Depressed	10	11	0.924
	50.0%	55.0%	
Agitated	5	5	
	25.0%	25.0%	
Irritated	5	4	
	25.0%	20.0%	

First Menstrual cycle Pre Treatment VAS in group A was seen in 10 (50%) participants with moderate pain, 6 (30%) with severe pain, and 4 (20%) with very severe pain in group A whereas in group B there were 12 (60%) participants with moderate pain and 5 (25%) with severe pain with non-significant P-value of 0.254. Second Menstrual Cycle Post Treatment VAS in group A was seen in 16 (80%) participants with moderate pain and 2 (10%) with severe pain, whereas in group B there were 10 (50%) participants with mild pain and 10 (50%) with moderate pain with significant P-value of 0.002. Third Menstrual cycle Post Treatment VAS in group A was presented in 16 (80%) participants with moderate pain and 3 (15%) with severe pain, whereas in group B there were 5 (25%) participants with no pain, 14 (70%) with mild pain and 1 (5%) with moderate pain with significant P-value of 0.000 as shown in Table 2.

**Table-2: Effects of kinesiotaping and core strengthening exercises on visual analog scale.**

Fist Menstral cycle Pre treatment VAS	Group A kinesiotaping (n=20)	Group B Core strengthening Exercises <n=20)	P-value
2-5 Mild	0	2	0.254
	0.0%	10.0%	
4-5 Moderate	10	12	
	50.0%	60.0%	
6 Severe	6	5	
	30.0%	25.0%	
7-8 Severe	4	1	
	20.0%	5.0%	
<b>Second Menstruation cycle Post treatment VAS (First Follow-up)</b>			
2-3 Mild	0	10	0.002
	0.0%	50.0%	
4-5 Moderate	10	10	
	80.0%	50.0%	
6 Severe	2	0	
	10.0%	0.0%	
7-8 Severe	2	0	
	10.0%	0.0%	
<b>Third Menstruation cycle Post treatment VAS (First Follow-up)</b>			
0-1 No Pain	0	5	0.002
	0.0%	25.0%	
2-3 Mild	1	14	
	5.0%	70.0%	
6 Moderate	16	1	
	80.0%	5.0%	
7-8 Severe	3	0	
	15.0%	0.0%	

**DISCUSSION**

Dysmenorrhea is a common gynecological problem among young women during the reproductive age is defined as painful menstruation without any pelvic pathology<sup>21</sup>. Any obnoxious sensation in the body during this period is referred to as pain. The intensity of the pain depends upon the perception of an individual<sup>22</sup>. All females experience different feelings during this period like some are depressed, agitated, irritated while others are uncomfortable during menstrual cycle days. Some female completely leaves physical activity and become immobile and confined to bed while other remain mobile and physically active with the support of pharmacological measures: painkillers, muscle relaxants. Numerous studies were done to describe the role of nonpharmacological and physical therapy treatment to avoid the use of medications to alleviate pain during the menstrual cycle.<sup>23-24</sup>.

The current investigation was conducted to see the beneficial effects of physical therapy treatments in the management of pain caused by dysmenorrhea and which treatment protocol has more beneficial effects either Kinesio-taping or core strengthening exercises. In our study, treated female students reported a reduction of pain threshold within the study period by physical therapy treatment. Previ-

ous studies documented that pain and symptoms; reduce after the aerobic workout of 12 weeks<sup>25</sup>. Another study done on high school girls reported that the non-exercise group is more susceptible to dysmenorrhea as compared to girls involved in physical and sports activities<sup>26</sup>.

In the present study Group B, females have a more significant effect of treatment with core strengthening exercises as compare to Group A females who were treated with Kinesio-taping. Lots of authors approved by their researches about the effects of exercises in the management of dysmenorrhea. Previous investigations revealed that stretching exercises were helpful to reduce the duration and intensity of pain<sup>25, 26</sup>. Increase in blood circulation and uterus metabolism during exercises may be the cause of pain reduction and symptoms of dysmenorrhea. Stress can increase menstrual pain by increase the contraction of the uterus and sympathetic activity, through exercise sympathetic activity suppress which results in the reduction of stress. According to one of research proved that stretching exercises are very effective in the compression and irritation of nerves due to contraction of abdominal ligaments. Symptoms of dysmenorrhea can be relieved by core strengthening exercises as proved one of research<sup>27-29</sup> So based on previous evidence studies, it is proved that exercises play a key role in pain management of dysmenorrhea, According this study, it is proved that core strengthening exercises are more effective than Kinesio-taping in the management of dysmenorrhea in young female students.

### CONCLUSION

Core strengthening exercises was found to be more significant in the management of dysmenorrhea in comparison to the application of the Kinesio-taping technique. These exercises can be used safely for relieving the pain of dysmenorrhea in young females.

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