A study to find out the effect of Pilates exercise on low back pain due to primarydysmenorrhea: A Randomised controlled trial

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Abstract

Background: Primary dysmenorrhea is a common problem among the young females. It affects daily routine activities and quality of life. It is characterized by lower abdominal pain which may irradiate to thighs and lower back. Pain appears the day before or during the first menstrual cycle day. Low back pain is the most common symptom among females with primary dysmenorrhea. Pilates is a series of exercises based on progressive movement the body is able to perform. It helps in prevent injuries and provide pain relief. This is why the study is planned to know the effect of Pilates on low back pain due to primary dysmenorrhea.

Aim: To know the effect of Pilates exercise on low back pain in female with primary dysmenorrhea.

Methodology: This is an experimental study on young females with age group of 18-25 years studying in school of physiotherapy, RKU. 40 subjects were selected conveniently as per criteria include co-operative individual and having low back pain during menstruation. Females having child and having any pelvic or gynecological diseases and being treated with any physical therapy or under drug were excluded. All subjects were submitted to a protocol of 7 Pilates ground exercise aimed at the lower back region. Pain intensity was evaluated by numerical pain rating scale.

Result: The result of paired t test and unpaired t test suggests that Pilates have significant effect on low back pain during menstruation. The pain is decrease due to the phenomenon called exercise- induced analgesia that is during treatment with Pilates, these patients may have increased their pain threshold due to the adjustment of endogenous pain control mechanisms. The body would start to secrete more neurotransmitters, such as norepinephrine, serotonin, encephalin and dopamine, which would act to inhibit and control pain.

Conclusion: Result of this study indicates that Pilates as physical activity has significant effect on low back pain due to primary dysmenorrhea. Thus, Pilates reduce low back pain during menstruation in females with primary dysmenorrhea.

Keywords: *Pilates exercises, primary dysmenorrhea, low back pain*

Introduction

Primary dysmenorrhea is the more common type of dysmenorrhea which is due to the production of prostaglandins. These are natural substances made by cells in the inner lining of the uterus and other parts of the body. [(1)] The prostaglandins made in the uterus make the uterine muscles contract and help the uterus to shed the lining that has built up during the menstrual cycle. If excessive prostaglandins are produced, the girl may have excessive uterine contraction accompanied with pain or dysmenorrhea with her menstrual cycle. Prostaglandins can also cause headache, nausea, vomiting and diarrhea. Hormonal and endocrine theory, uterine contractions, uterine bleeding, cervical obstruction and psychological factors are also involved in the pathophysiology of primary dysmenorrhea. [(2)]

In a study done on dysmenorrhea in different settings the prevalence of dysmenorrhea in adolescent girls was 54% which was also same as reported by other Indian and Western Countries. A dysmenorrhea incidence of 33.5% among adolescent girls in India was reported by Nag George and Bhaduri found dysmenorrhea to be a common problem in India with prevalence of 87.87%.

The dysmenorrhea can be treated medically, surgically or by conservative methods. Medical treatment for dysmenorrhea includes Non-steroidal anti-inflammatory (NSAIDs) or Oral contraceptive pills (OCPs) both reduces the symptoms by reducing myometrium activity.[(3-5)]

Pilates exercises belong to a group of Body-Mind Exercises, where the focus is on controlled movement, posture, and breathing pattern. Pilates improves mental and physical well- being, increase flexibility, and strengthens muscles through controlled movements done as mat exercises to tone and strengthen the body. The method combines principles of exercises from the Eastern cultures and the Western cultures.[4] Pilates developed comprehensive method of stretching and strengthening exercises both of them together aim to create a strong and limber body as well as a strong will of mind that can control the body. This is true for the Pilates Method, which may be said to have key principles. These principles are centering, concentration, control, precision and breathing. [(6-7)]

Pilates is the fastest growing exercise regimen in the U.S. and Canada. Pilates is also beneficial to the post-natal women. Rudolf .H Moos (1968) developed the Menstrual Distress Questionnaire (MDQ). This questionnaire is composed of seven factors that Moos found to be stable and recurrent (pain, concentration, behavioral change, autonomic imbalance, water retention, negative effect, arousal), as well as a control factor composed of menopausal symptomatology. [(8-10)]

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METHODOLOGY

- **Study design:** Interventional study
- **Study setting:** School of physiotherapy, RKU
- **Sampling technique:** Convenient
- **Study population:** Females with primary dysmenorrhea
- **Study sample:** 40 females (6 months) (some subject were included in the study but as they continue with other physiotherapy treatment. so, that's why they are excluded in this study)

INCLUSION CRITERIA

- Co-operative individual
- Females with age of 18-25 years
- Females having with low back pain due to primary dysmenorrhea.

EXCLUSION CRITERIA

- Married women having child, gynecological disease and pelvic disease
- Smoking
- Being under drug or physical therapy treatment

MATERIAL USED

- Pen
- Paper
- Assessment form
- NPRS

PROCEDURE

The subjects for the study were selected as per inclusive and exclusive criteria. were informed about the purpose of the study and also explained about the procedure of the study and we took the consent form from the subjects. Then, they qutified their low back pain during menstruation through the numerical pain rating scale (NPRS). There are two groups, the one is experimental group which is having a 20 female students, and the other one is control group which is also having a 20 female students. Frequency was thrice in week, there is a session of 30 minutes contain 5 repetitions of each exercises. Participants were oriented to wear comfortable clothes to prevent compressing and/or impairing circulation, in addition to avoid watches or bracelets to prevent skin injuries. Participants were re-evaluated at treatment completion by the same initial evaluation criteria, to compare pre and post-treatment data.

Treatment group:

In treatment group we give 7 Pilates exercises. Exercises given are as below (this protocol is taken from reference no. 15)

Table 1: Pilates exercises Program

Exercise	progression
Hip mobility exercise	Thrice in A Week, session OF 30 Minutes contains 5 repetition
Chest lifts	
Pelvic curl	
Leg floats	
Single leg stretch	
Double leg stretch	
Plank	

Bridging

Pelvic

Double leg stretch

Singly leg stretch

Chest lifts

Plank

Leg Floats

RESULT

In this study total 40 females were assessed. They were further divided into two groups. One experimental group in that Pilates exercise given and second group is control group.

Statistical Software: IBM SPSS Statistics 21

Statistical Test: Paired Sample T Test and unpaired sample T Test

PAIRED SAMPLE T TEST:

Paired sample t test between pre data and post data of experimental group suggest that data is significant. Paired sample t test between pre and post data of control group suggest that data is significant.

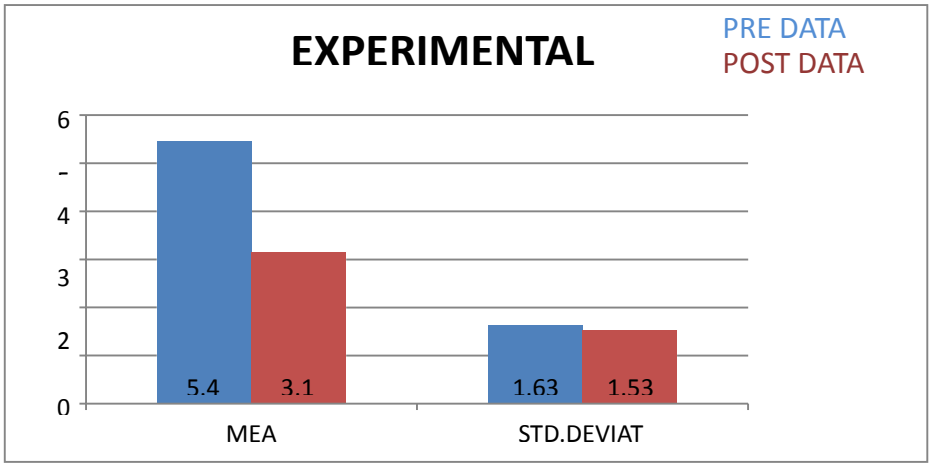
UNPAIRED SAMPLE T TEST:

Unpaired sample t test of post data of experimental group and post data of control group has showed t value=2.846, which suggest that data is significant.

PAIRED SAMPLE T TEST:

Table no 5.1 Paired sample t test between pre data and post data of experimental group suggest that data is significant.

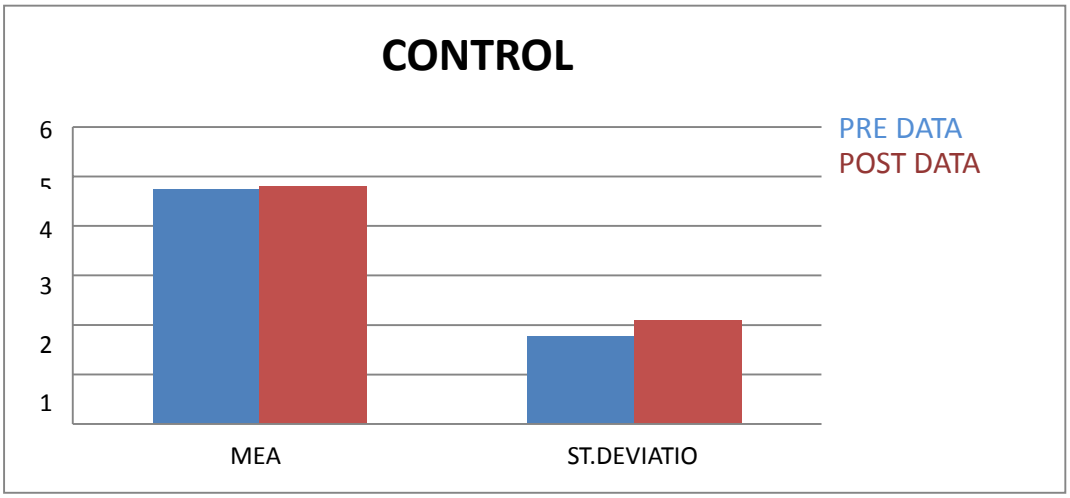
	NO	MEAN	STD.DEVIATION	T VALUE
PRE DATA	20	5.45	1.635	9.516
POST DATA	20	3.15	1.531	9.516



Graph No:5.1 Paired sample t test between pre data and post data of experimental group

Table no 5.2 Paired sample T test between pre and post data of control group suggest that data is significant.

	NO	MEAN	STD.DEVIATION	T VALUE
PRE DATA	20	4.75	1.773	-0.328
POST DATA	20	4.8	2.093	-0.328



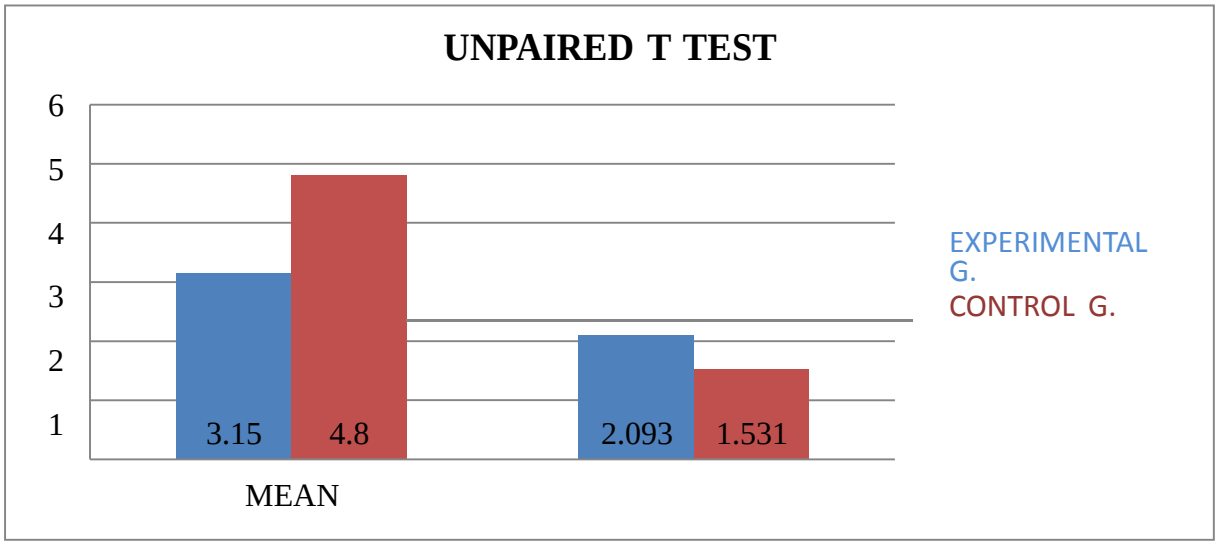
Graph No:5.2 Paired sample t test between pre data and post data of control group

UNPAIRED SAMPLE T TEST

Table no 5.3 Unpaired sample t test of post data of experimental group and post data of control group has showed t value=2.846, which suggest that data is significant.

	NO	MEAN	STD.DEVIATION	T TEST
EXPERIMENTAL GROUP	20	3.15	2.093	2.486
CONTROL GROUP	20	4.8	1.531	2.486

Graph No:5.3 shows Unpaired sample t test of post data of experimental group and post data of control group



DISCUSSION

The purpose of the study was to find out of the effectiveness of Pilates exercise for the primary dysmenorrhea in female students to improve in pain intensity. The study was carried out with two groups. Group A(n=20) was Pilates exercise and group B(n=20) was the control group total 40 subjects were taken in this study. there was one outcome measure taken in this study. (i)numerical pain rating scale.

The present study showed that the intragroup comparison of all the outcome was done using the statistic test paired t-test. which has shown statistical significance difference. However, the control group did not show any improvement after four weeks of study.

So, here the present study showed that group A is more effective compared to the group on the base of that shows decrease pain intensity.

So, here the null hypothesis was rejected and the experimental hypothesis was accepted.

A different study with Pilates has shown that during six months there has been considerable ơlow back pain patients' improvement; most part of this analgesia was obtained with just one month of program

The use of pain evaluation tool in this study (NPRS) helped determining the similarity of data obtained in each phase, increasing the reliability of results. The pain evaluation tool of this research has shown significant pain intensity decrease reported by participants of Pilates. There has been decrease because exercises increase blood flow, correct muscle and postural unbalances and recover body and mind vitality, thus contributing to pain decrease[13.]

Most study results are similar to those obtained in our study with Pilates, which would improve pelvic blood flow, decreasing muscle stresses, providing the stretching of all involved structures with consequent pain relief [14,15].

This phenomenon is called exercise-induced analgesia, that is, during the treatment with Pilates, these patients may have increased their pain threshold due to the adjustment of endogenous pain control mechanisms. The body would start to secrete more neurotransmitters, such as norepinephrine, serotonin, encephalin and dopamine, which would act to inhibit and control pain[16].

Results of this study confirm other findings already reported by the literature which state that Pilates physical exercises may be used as a treatment to decrease low back pain.

CONCLUSION

This study concluded that Pilates as physical activity has significant effect on low back pain due to primary dysmenorrhea. Thus, Pilates improve low back pain during menstruation infemales with primary dysmenorrhea.

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