



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2021; 7(12): 381-387
www.allresearchjournal.com
Received: 28-09-2021
Accepted: 13-11-2021

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Effect of exercise program and homeopathic remedy as an adjunct in treatment of knee osteoarthritis: A pilot study

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Abstract

Background: Osteoarthritis as a heterogeneous group of conditions that leads to joint signs and symptoms which are associated with detective integrity of particular cartilage. Pain, knee stiffness, knee movement limitations, crepitus, tenderness, occasional effusion and variable degrees of local inflammation are the clinical characteristics of knee Osteoarthritis. Physiotherapy demonstrates that exercise can reduce pain and improve functions. Homeopathy is one of the oldest traditional European medical systems. Homeopathic remedies have shown effective according to the clinical experience.

Aim: To study the effect of exercise program and Homeopathic remedy as an adjunct in treatment of knee Osteoarthritis.

Method: A total of 10 patients having grade 2 knee osteoarthritis and knee pain for more than 3 months were selected. They were assessed for pain, knee range of motion (flexion and extension), insomnia and activities of daily living. They were divided in two groups: control group and experimental group. Control group consisted of 5 patients who were given only physiotherapy exercises whereas experimental group patients were given physiotherapy exercises with homeopathic treatment. 10 days later pain, knee range of motion, insomnia and activities of daily living were assessed. Both the pre and post values were compared.

Result: The result shows that Homeopathic medicine in addition to Physiotherapy has better effects as compared to Physiotherapy treatment. There was a significant reduction in pain, insomnia and increase in activities of daily living in experimental group.

Conclusion: According to this trial, a multi-disciplinary approach has more effect on OA knee.

Keywords: Osteoarthritis, knee osteoarthritis, pain, insomnia, knee range of motion, activities of daily living, homeopathic remedies

1. Introduction

American College of Rheumatology defines "Osteoarthritis as a heterogeneous group of conditions that leads to joint signs and symptoms which are associated with detective integrity of particular cartilage, in addition to related changes in the underlying bone at the joint margins" [1]. It has a multifactorial aetiology and affects around 60% of individuals aged over 50 years. According to Nilza *et al.*, Osteoarthritis affects 9% of men and 18% of women over 65 years old and is responsible for high level of absenteeism and retirement due to disability [2].

Pain, knee stiffness, knee movement limitations, crepitus, tenderness, occasional effusion and variable degrees of local inflammation are the clinical characteristics of knee Osteoarthritis [3]. Ability of sitting on chair, standing, walking and stair climbing is greatly affected in knee OA patients [2]. Due to Quadriceps dysfunction and impaired proprioception above symptoms are caused [4].

Non-steroidal anti-inflammatory drugs (NSAIDs) are one of the most commonly used groups of drugs. They are used for pain relief in knee Osteoarthritis. They are a diverse group of compounds that poses analgesic, anti-pyretic and anti-inflammatory effects [6]. The prevalence of drug use was 96.4% (males 96%, females 96.7%). The use of these drugs was significantly associated with a greater number of GI symptoms and prescription for GI drugs [7]. Sam Harirforoosh *et al.*, in his article discussed the GI toxicity of NSAIDs and assessed their renal and cardiovascular adverse effects in more detail [6]. The major cause of increasing the disease burden is non adherence to the treatment due to various factors like increased pill

load, previous medication effectiveness and fear of addiction or adverse reactions. Besides the risks associated with pharmacological conservative care which include gastrointestinal bleeding, renal failure and myocardial infarction [5].

The American College of Rheumatology and the European League against Rheumatism recommended Physiotherapy for Osteoarthritis as a non pharmacological intervention. Physiotherapy interventions for patients with knee Osteoarthritis demonstrates that exercise can reduce pain and improve functions. By following a programme of daily exercises, functional improvement in knee osteoarthritis can be achieved [2]. Exercise therapy for knee OA improves joint range of motion, muscle and tendon lengthening, strength and endurance and decrease pain and loading on the symptomatic compartment of knee joint [8]. According to recommendations of American College of Rheumatology on hip and knee OA treatment published in 2012, non pharmacological treatments of knee OA include aerobic and strength exercise, hydrotherapy and weight loss [9].

Homeopathy is one of the oldest traditional European medical systems founded by the German physician Samuel Hahnemann (1755-1843) in 1796. It is based on 'the principle of similars' already described in ancient Greek sources of medicine. According to the 'like cures like' principle of healing, dilute substances that cause symptoms in the healthy individuals can be used to treat patients with similar symptoms. A homeopathic remedy is made by a process of dilution and succession. Homeopathic remedies can be prescribed individually, but patients are often treated with typical remedies that have shown effective according to the clinical experience, irrespective of the individuality of a given patient [10].

As OA knee can be treated with multidirectional approach this study aims in combination therapy of physiotherapy and homeopathic remedies.

2. Materials and Methodology

A total of 10 patients from Dr. D. Y. Patil Physiotherapy College OPD having grade 2 Knee Osteoarthritis (according

to Kellgren-Lawrence scale) of both genders, with age criteria 35-60 years participated in this study. Knee pain for more than 3 months was included in selection criteria. Exclusion criteria included inflammatory knee disorder, history of knee trauma and previous knee surgery. This study was approved by Dr. D. Y. Patil university ethics committee and obtained and informed consent.

The participants those who were to participate were screened according to Kellgren-Lawrence scale (Appendix 1) and 10 patients with Knee Osteoarthritis were identified. An informed consent was taken from each participant and an explanation of the study was given.

All the patients were assessed for pain, knee range of motion, insomnia and activities of daily living and was noted as pre-treatment assessment. The assessment was done in the following ways:

- The intensity of knee pain was evaluated using visual analogue scale (VAS). The pain level was rated by each patient from 0 to 10 cm, where 0 represented 'no pain' and 10 represented 'unbearable pain'.
- Knee range of motion was assessed with universal Goniometer.
- Insomnia scale was taken to assess the sleep cycle of the patients.
- WOMAC scale was used to assess the functional activities of daily living.

Experimental Group: Physiotherapy exercise program + Homeopathic medicine

Control Group: Physiotherapy exercise program

The exercise protocol for 10 days included stretching and strengthening exercises. Following exercises were given:

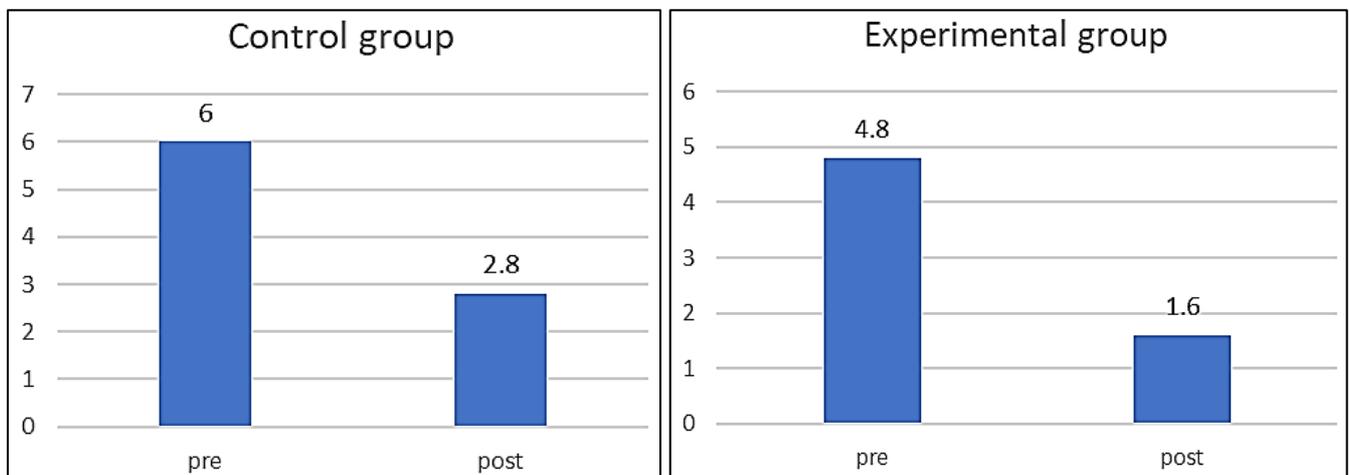
Straight Leg Raise	10 repetitions 3 times a day
Dynamic Quadriceps	10 repetitions 3 times a day
Hip abduction in side lying	10 repetitions 3 times a day
Quadriceps stretching	30 seconds hold 4 times
Hamstrings stretching	30 seconds hold 4 times

10 days later patients were again assessed in the similar manner. The findings were noted as post treatment assessment.

3. Statistics

Table I: Scores of Pain scale of Control and Experimental Group

Group	Mean value Pre	Mean value Post	Mean difference	P value	SD value
Control Group	6	2.8	3.2	0.003	1.095
Experimental group	4.8	1.6	3.2	0.003	1.095



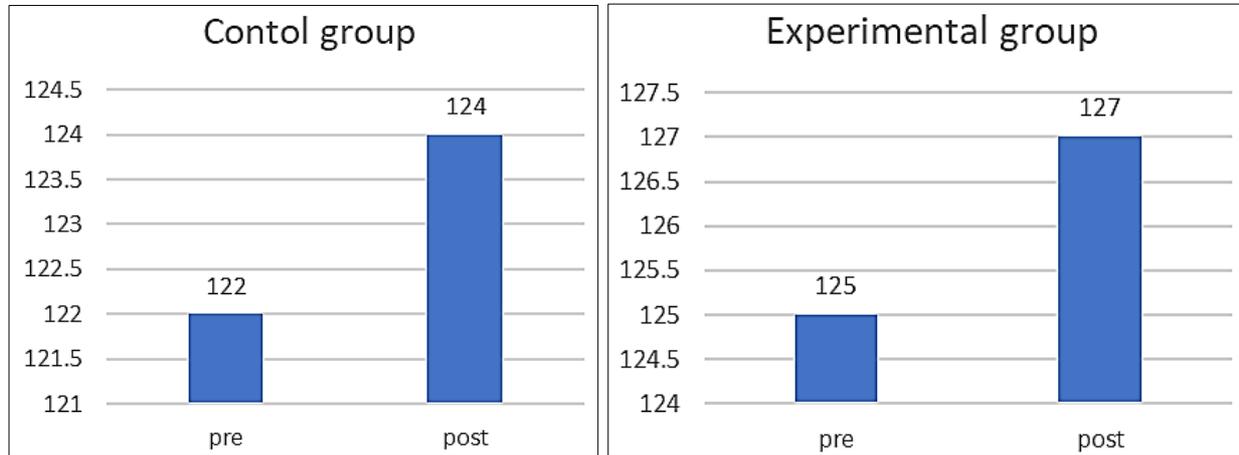
Graph I, II: Shows the mean values of Pain scale of Control and Experimental Group

Interpretation: Paired t test was used for statistical analysis when the pre and post score of pain scale in control group was seen. It was initially 6 and after the treatment it was 2.8.

Paired t test was used for statistical analysis when the pre and post score of pain scale in experimental group were seen. It was initially 4.8 and after the treatment it was 1.6.

Table II: Scores of Knee Flexion range in Control and Experimental Group

Group	Mean value Pre	Mean value Post	Mean difference
Control group	122	124	2
Experimental group	125	127	2



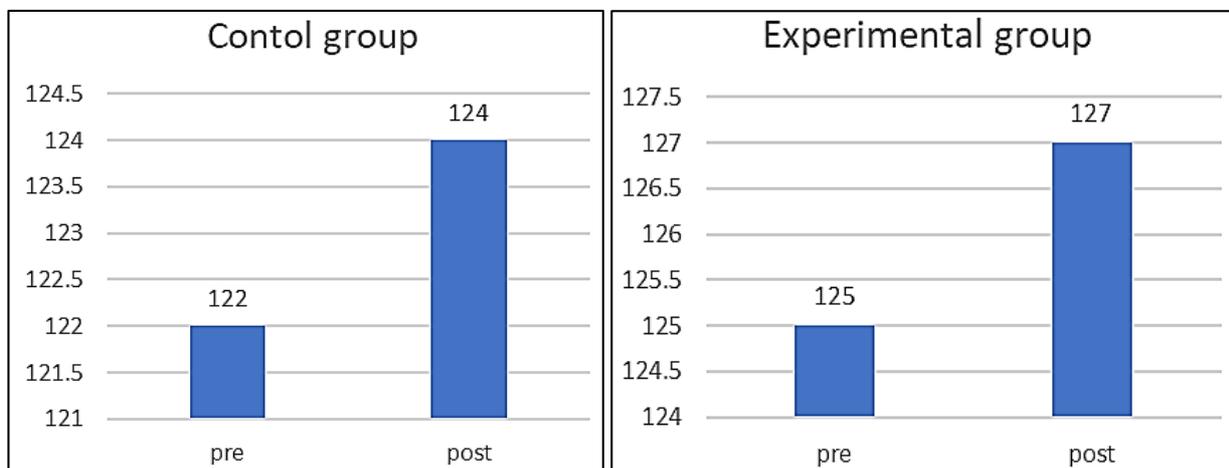
Graph III and IV: Shows the mean values of Knee Flexion range of Control group

Interpretation: Pre and post scores of knee flexion of control group are 122 and 124 respectively.

Pre and post scores of knee flexion in experimental group are 125 and 127 respectively.

Table III: Scores of Knee extension range in Control and Experimental Group

Group	Mean value Pre	Mean value Post	Men difference
Control group	122	124	2
Experimental group	125	127	2



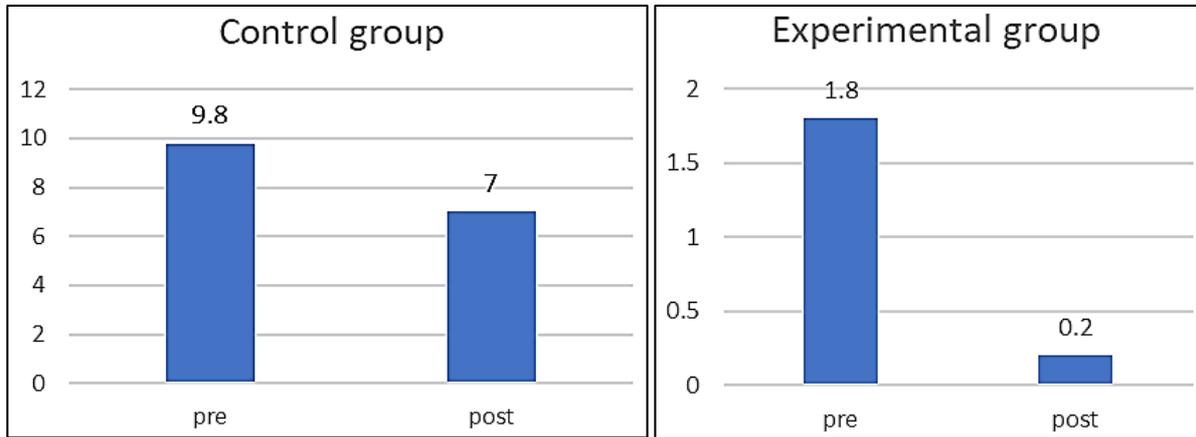
Graph V and VI: Shows the mean values of Knee Extension range in Control and Experimental Group

Interpretation: Pre and post scores of knee extension range of control group are 122 and 124 respectively.

Pre and post scores of knee extension range of experimental group are 125 and 127 respectively.

Table IV: Scores of Insomnia scale in Control group

Group	Mean value Pre	Mean value Post	Mean difference	P value	SD value
Control group	9.8	7	2.8	0.115	3.114
Experimental group	1.8	0.2	6	0.035	1.14



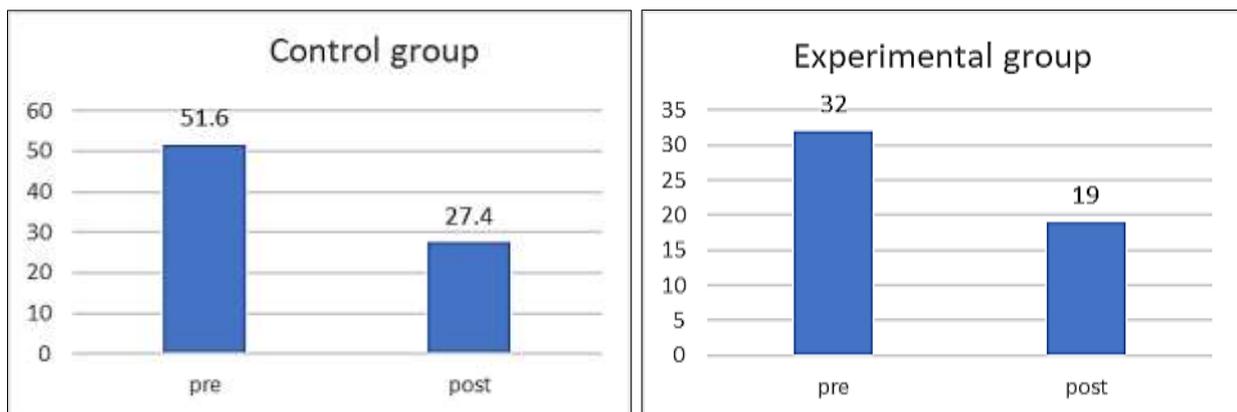
Graph VII and VIII: Shows the mean values of Insomnia scale in Control group

Interpretation: Paired t test was used for statistical analysis when the pre and post scores of insomnia scale in control group were seen. It was initially 9.8 and after treatment it was 7.

Paired t test was used for statistical analysis when the pre and post scores of insomnia scale in experimental group were seen. It was initially 1.8 and after the treatment it was 0.2.

Table V: Scores of WOMAC scale in Control and Experimental Group

Group	Mean value Pre	Mean value Post	Mean difference	P value	SD value
Control group	51.6	27.4	24.2	0.066	21.58
Experimental group	32	19	13	0.006	5.339



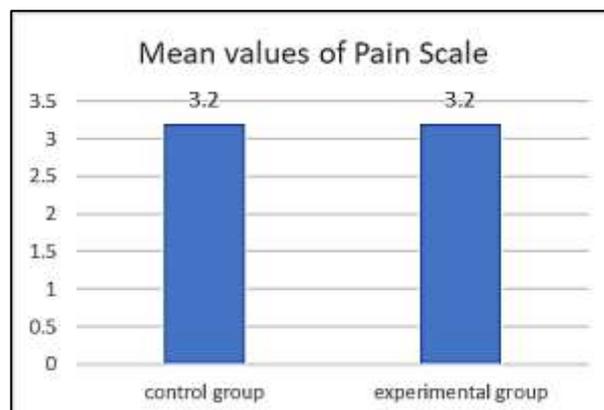
Graph IX and X: Shows the mean values of WOMAC scale in Control and Experimental Group

Interpretation: Paired t test was used for statistical analysis when the pre and post score of WOMAC scale in control group were seen. It was initially 51.6 and after treatment it was 27.4.

Paired t test was used for statistical analysis when the pre and post score of WOMAC scale in experimental group were seen. It was initially 32 and after treatment it was 19.

Table VI: Scores of Pain scale in Control group v/s scores of Pain scale in Experimental group

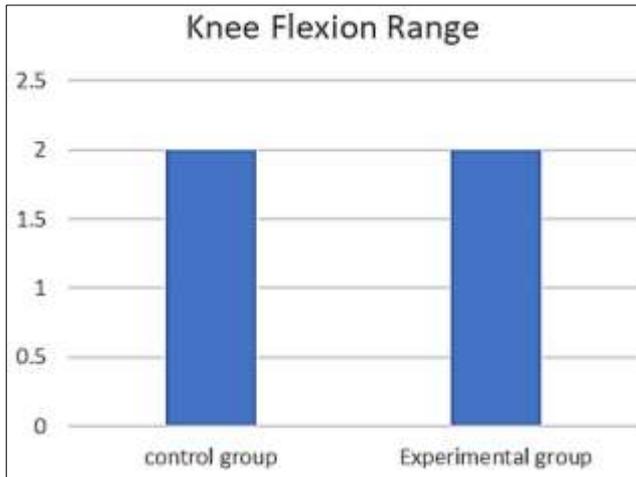
Group	Mean values	Mean difference	SD values	P value
Control group	3.2	0	0.4472	1.000
Experimental group	3.2		0.4472	



Graph XI: Mean values of Pain scale in Control group v/s mean values of Pain scale in Experimental group

Table VII: Scores of Knee Flexion range in Control group v/s scores of Knee Flexion range in Experimental group

Group	Mean values	Mean difference	SD values
Control group	2	0	1.253
Experimental group	2		1.527

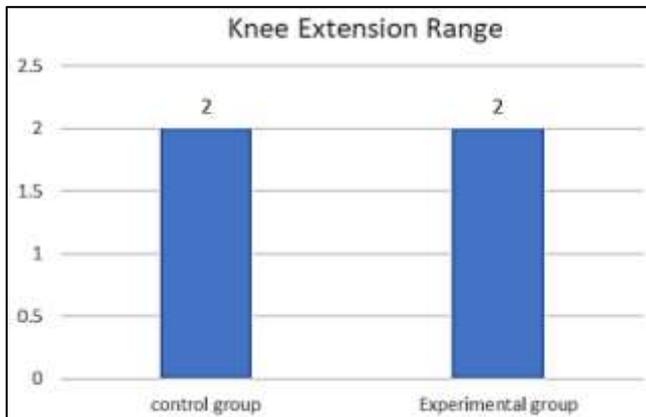


Graph XII: Mean values of Knee Flexion range in Control group v/s mean values of Knee Flexion range in Experimental group

Interpretation: Mean value of control group was 2 and mean value of experimental group was 2.

Table VIII: Scores of Knee Extension range in Control group v/s scores of Knee Extension range in Experimental group

Group	Mean values	Mean difference	SD values
Control group	2	0	0.400
Experimental group	2		1.527

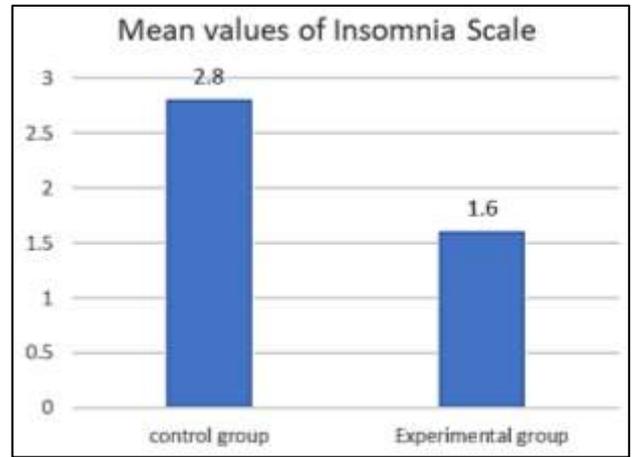


Graph XIII: Mean values of Knee Extension range in Control group v/s mean values of Knee Extension range in Experimental group

Interpretation: Mean value of control group was 2 and mean value of experimental group was 2.

Table IX: Scores of Insomnia scale in Control group v/s scores of Insomnia scale in Experimental group

Group	Mean values	Mean difference	SD values	P value
Control group	2.8	1.2	3.114	0.442
Experimental group	1.6		1.14	

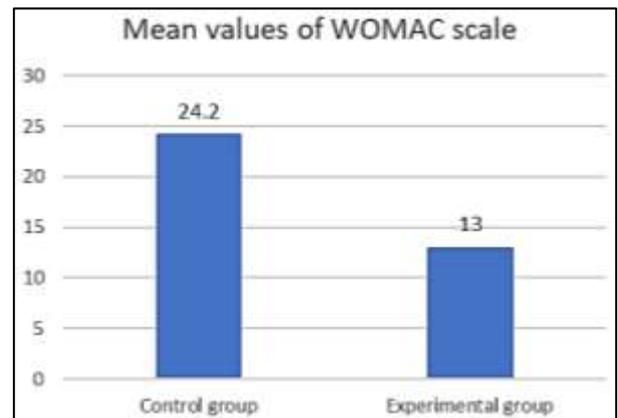


Graph XIV: Mean values of Insomnia scale in Control group v/s mean values of Insomnia scale in Experimental group

Interpretation: Unpaired t test was used for the statistical analysis. When the scores of insomnia scale of control group v/s experimental group was compared it was 2.8 and 1.6 respectively. The p value was 0.442.

Table X: Scores of WOMAC scale in Control group v/s scores of WOMAC scale in Experimental group

Group	Mean values	Mean difference	SD values	P value
Control group	24.2	11.2	21.58	0.293
Experimental group	13		5.339	



Graph XV: Mean values of WOMAC scale in Control group v/s mean values of WOMAC scale in Experimental group

Interpretation: Unpaired t test was used for the statistical analysis. When the scores of WOMAC scale of control group v/s experimental group was compared it was 24.2 and 13 respectively. The p value was 0.293.

4. Results

- There was a significant reduction in pain in both the groups.
- There was no significant difference in knee flexion range in both the groups.
- There was no significant change in knee extension range in any of the groups
- There was no difference in sleep of control group but was significant increase in sleep of experimental group.

- There was no significant improvement in activity in control group but was seen significant increase in activities in experimental group.

5. Discussion

So the present study proves the effect of exercises in addition to Homeopathic medicine is more than only exercises in Knee Osteoarthritis patients. The effect was compared based on pain scale, knee range of motion, insomnia scale and WOMAC scale.

According to this study, pain was reduced in both the groups significantly (p=0.003) as seen in Table 4. A study done by FF Motiwala concluded that Homeopathic medicines are potential enough to improve the ADLs of patients by reducing pain and stiffness [5].

As there was no change in range of motion of knee, the difference was statistically insignificant.

In this study, there was a statistical significant reduction in insomnia in experimental group (p=0.035). A study done by David Francis Naude in 2010 concludes that Homeopathic treatment of primary insomnia was effective, compared to placebo [14].

On WOMAC scale there was a significant change in both the groups but was statistically significant in experimental group (p=0.006). Jay Nilesh Shah *et al* concluded from their study that the major presentation including pain, stiffness, restricted movement, tenderness, etc., when assessed for their improvement with Homeopathic medicines, either with Rhus toxicodendrone alone or along with any some complementary medications, showed promising results [11]. A study shows that rhus tox promotes dedifferentiation of chondrocytes by increasing the mRNA expression of COX-2. It also suppresses the biosynthesis of prostaglandins E2, which are responsible for inflammatory response, this resulting in anti-inflammation of the joint [19].

Other study done by Kalpana Bansal *et al* showed that the Calcarea flourica (Homeopathic medicine) tablets can be used as safe and cost-effective remineralizing agent [12].

A systemic review done by M Koley concludes there is clear evidence that Homeopathic complexes play a considerable role in treatment of OA [15].

Morris M *et al.*, concludes that Homeopathic complex, together with Physiotherapy, can significantly improve symptoms associated with CLBP due to OA [16].

Thus the results were in favour of exercises plus Homeopathic medicines.

Appendix 1

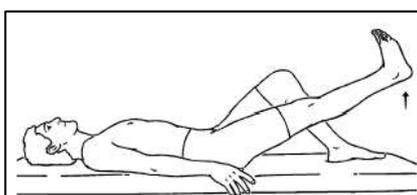
Kellgren-Lawrence Scale

Grade I: normal

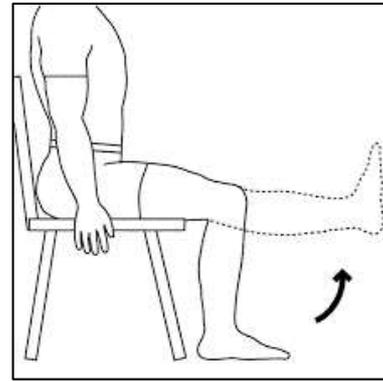
Grade II: uncertain joint space, possible osteophytes

Grade III: significant reduction in joint space, moderate sclerosis, moderate osteophytes, possible cysts, possible deformity

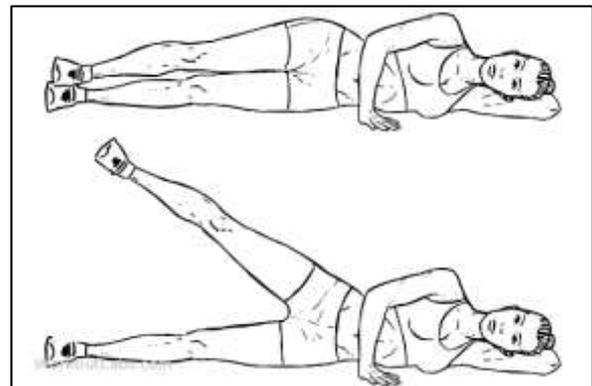
Grade IV: total reduction in joint space, sever sclerosis, great osteophytes, certain deformity



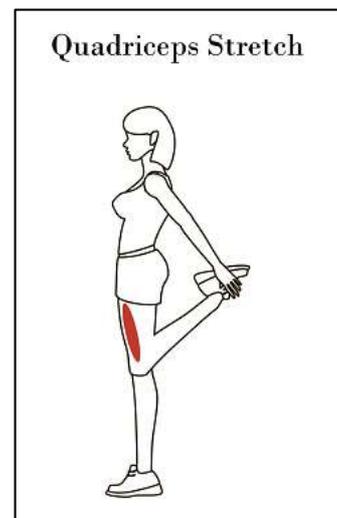
Straight leg raise



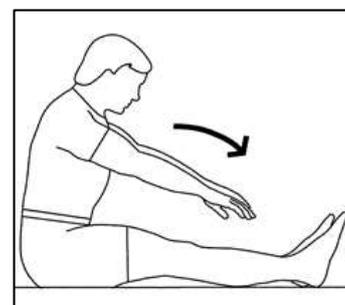
Dynamic Quadriceps



Hip abduction in side lying



Quadriceps Stretch



Hamstring stretch

6. Conclusion

From this study, we can conclude that Homeopathic medicine in addition to Physiotherapy has better effects as compared to Physiotherapy treatment. According to this

trial, a multi-disciplinary approach has more effect on OA knee.

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