



Effect of pilates vs conventional physiotherapy exercises in osteoarthritis of knee

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Abstract

Aim: To find out the effect of pilates vs conventional physiotherapy exercises in osteoarthritis of knee.

Method: This experimental study was carried out using Numerical Pain Rating Scale (NPRS) and WOMAC scale amongst osteoarthritis of knee in hospitals across Maharashtra state, India. A total of 30 samples aged between 50-65 years were included in the study. There were 2 groups the first was pilates group and second was conventional physiotherapy exercises group. The protocol was of three weeks which consisted four sessions per week.

Results: When pilates and conventional PT exercises were compared results showed that there is significant improvement in physical functioning on WOMAC scale than pain on NPRS. On WOMAC scale 3 components were calculated separately (i.e pain, stiffness, physical function) pre and post intervention. Out of which physical function component scoring was improved significantly as compared to pain and stiffness. Hence we can say that Pilates are more helpful in improving physical functioning of the participants.

Conclusion: From the study we can conclude that patients with OA knee can achieve significant benefits using Pilates exercises. They have been found efficacious for the improvement of knee functions.

Keywords: osteoarthritis of knee, pilates, elderly, WOMAC scale, conventional physiotherapy exercises

Introduction

Osteoarthritis is the most common form of arthritis in the knee. It is a degenerative, "wear-and-tear" type of arthritis that occurs most often in people 50 years of age and older, but may occur in younger people, too. In osteoarthritis, the cartilage in the knee joint gradually wears away which becomes frayed and rough, and the protective space between the bones decreases. This can result in bone rubbing on bone, and produce painful bone spurs. Osteoarthritis develops slowly and the pain it causes worsens over time [1]. Osteoarthritis (OA) is divided into four stages. Stage 0 is assigned to a normal, healthy knee. The highest stage, 3, is assigned to severe OA.

Pilates is a mind-body intervention that focuses on strength, core stability, flexibility, muscle control, posture and breathing. It provides joint protection by helping to develop the local stabilizer muscles that create precise motions, thus protecting the joint surfaces, along with the global muscles that are responsible for shock absorption, force distribution and joint motion.

It also provides awareness of joint alignment within movement promotes joint health while minimizing the destructive forces that weight bearing can subject joints to [2]. The whole purpose of the exercise is to strengthen those muscles of the core, which, when they are sufficiently developed, allow us to make properly controlled movements of the limbs. This limits the risk of injury, both in everyday life and in more active leisure pursuits. As the muscles

become more balanced and controlled, posture improves. Rounded shoulders straighten, spines lengthen and have curves in the right places, necks become longer and heads that are pushed forward, in front of the chest, gradually pull back to be more in line with the body. This results in less general achiness and joint discomfort, and can reduce the incidence of headaches.

In Physiotherapy, for treating Osteoarthritis exercises, braces etc. are given. In Pilates along with exercises, there is core strengthening. Once the muscles are controlled and balanced it helps to improve posture. There is lack of information available on effect of pilates vs conventional physiotherapy exercises in osteoarthritis of knee. The same study was performed in foreign population but there is less research available yet on pilates and osteoarthritis of knee in Indian population hence the need arises to find out whether conventional exercises or pilates are beneficial for patients with diagnosed OA knees.

Materials and Methodology

Study Design : Experimental
Sample Population : Males and females with OA knee.
Sample Size : 30

Inclusion criteria

1. males and females of age group 50-65 years
2. known case of OA knee
3. willing to participate in the study.

Exclusion criteria

1. Total knee replacement
2. Any history of fracture of hip, knee, ankle
3. Recent incidence of knee injuries
4. Cognition impaired
5. Not willing to participate
6. Undiagnosed knee pain

Materials Required : Pen
Paper
Document sheet

Outcome Measure : WOMAC questionnaire
Numerical Pain Rating Scale

Procedure

The synopsis was submitted to the institute and was approved by the Institutional Ethical Committee at Tilak Maharashtra Vidyapeeth Pune.

It was an experimental study in which 30 sample size constituted of OA knee aged between 50-65 years. The participants were selected according to the inclusion criteria. Need for the study was explained. The respondents were made clear that the identity of the participants will not be disclosed and the information gathered would be used for research purpose A consent form was given to each participant. WOMAC questionnaire was administered to the study subjects pre and post treatment. Numerical Rating Scale was taken pre and post treatment. The protocol was of 3 weeks. 4 sessions were taken each week.

There were 2 groups the first was pilates group and second was conventional physiotherapy exercises group.

Pilates Group included the following exercises

1. **Supine Position:** quadriceps activation, hamstrings activation.
2. **Crook Lying:** bridging and lift one leg.

Conventional physiotherapy exercises group includes the following exercises

1. Static quadriceps.
2. VMO strengthening.
3. Hip abductor strengthening.

Results

Table 1: Age wise distribution of samples

Age	Distribution of Samples
50-53	7(23.33)
54-57	8(26.66)
58-61	9(30)
62-65	6(20)

Table 2: Effect of pre and post pilates intervention on WOMAC scale

Pilates	Mean	Standard deviation(SD)	P value
Pre	46.59	5.41	<0.0001
Post	31.38	4.08	

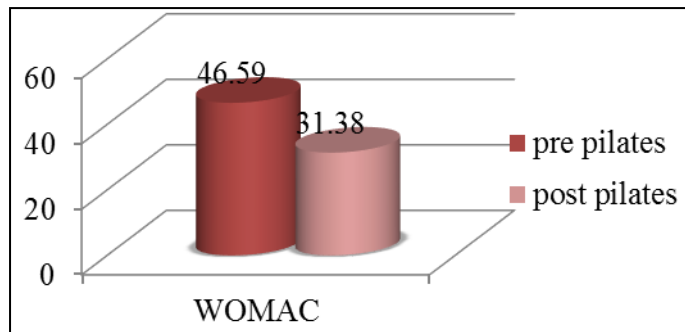


Fig 1

Table 3: Effect of pre and post pilates intervention on Numerical Rating Scale

Pilates	Mean	Standard deviation(SD)	P value
Pre	6.66	0.72	<0.0001
Post	3.93	0.88	

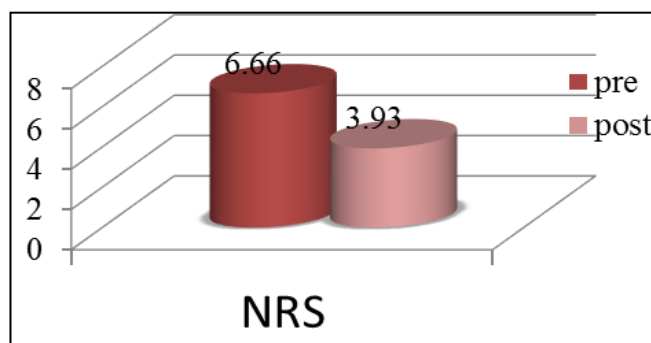


Fig 2

Table 4: Effect of pre and post conventional Physiotherapy exercises on WOMAC scale

Conv. PT exercises	Mean	Standard deviation(SD)	P value
Pre	54.71	5.79	<0.0001
Post	36.52	4.59	

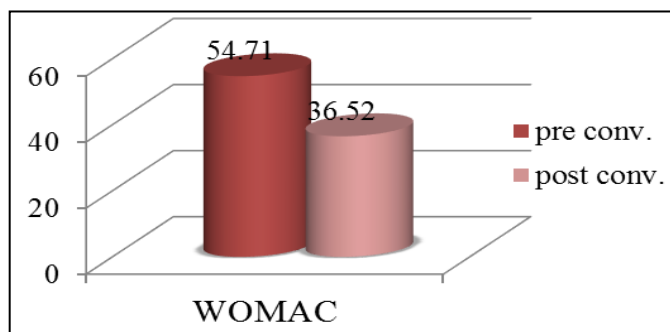


Fig 3

Table 5: Effect of pre and post conventional Physiotherapy exercises with intervention on Numerical Pain Rating Scale

Conv. PT exercises	Mean	Standard deviation(SD)	P value
Pre	7.26	0.70	<0.0001
Post	4.4	0.73	

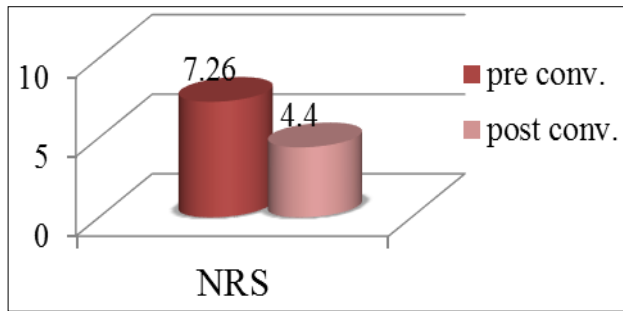


Fig 4

Table 6: Comparison of pre pilates intervention and pre conventional PT exercises intervention on WOMAC scale

WOMAC	Mean	Standard deviation(SD)	P value
Pilates pre	46.59	5.41	0.0005
Conv. pre	54.71	5.79	

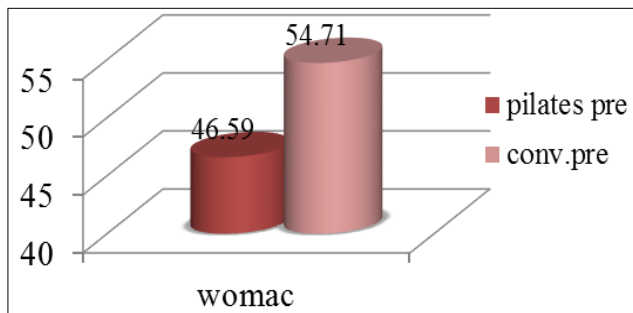


Fig 5

Table 7: Comparison of pre pilates and pre conventional PT exercises with intervention on Numerical Rating Scale

NRS	Mean	Standard deviation(SD)	P value
Pilates pre	6.66	0.72	0.0290
Conv. pre	7.26	0.70	

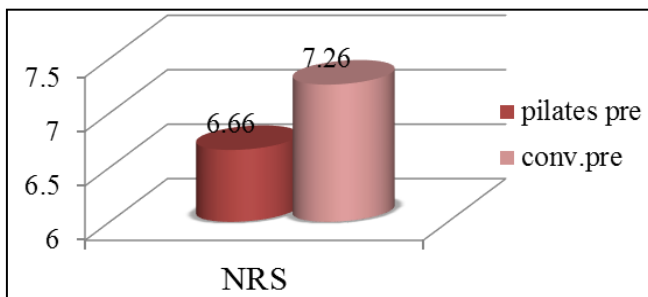


Fig 6

Table 8: Comparison of post pilates and post conventional PT exercises with intervention on WOMAC scale

WOMAC	Mean	Standard deviation (SD)	P value
Pilates post	31.38	4.08	0.0031
Conv. post	36.52	4.599	

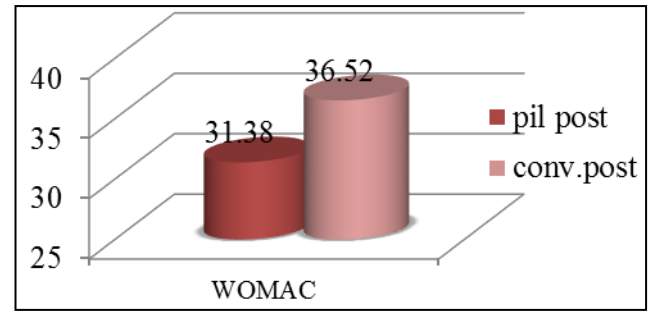


Fig 7

Table 9: Comparison of post pilates and post conventional PT exercises with intervention on Numerical Pain Rating scale

NPRS	Mean	Standard deviation (SD)	P value
Pilates post	3.93	0.88	0.0276
Conv. post	4.4	0.73	

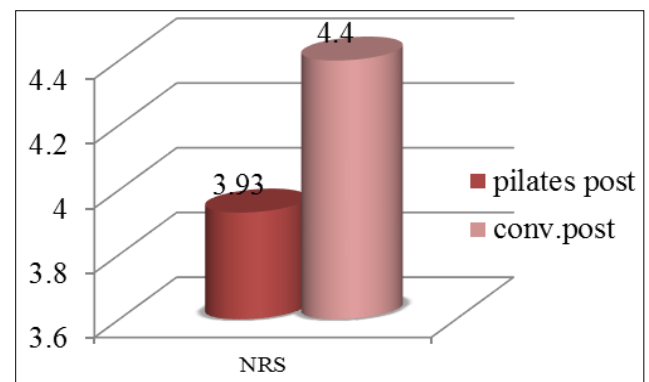


Fig 8

Discussion

The present study was aimed to find out the effect of pilates vs conventional physiotherapy exercises in Osteoarthritis of knee. Two outcome measures were used WOMAC scale and Numerical Pain Rating Scale. In the present study, sample size was 30. 76.66% had bilateral knee pain while 23.33% had unilateral knee pain. 23.33% belonged to 50-53 years of age group, 26.66% belonged to 54-57 years of age group, 30% belonged to 58-61 years of age group while 20% belonged to 62-65 years of age group. Maximum of the participants were in the age group of 58-61 i.e 30%. Both the genders were included in the study out of which 40% of the samples were males and 60% were females. This shows that females (18) were more affected with osteoarthritis of knee than males [6], this supports the findings of Ronen Debi *et al.* [3], Zhang Y *et al.* [4], and Sharon L. Hame *et al.* [5] who reported that women have a higher prevalence of osteoarthritis of knee in advanced stages as compared to men which could be due to menopause which leads to osteoporosis. In the current study, the protocol was of 4 weeks and 3 sessions were taken each week. Mean value of pre pilates intervention is 46.59 and post pilates intervention is 31.38 on WOMAC scale of which P value was

<0.0001 which is extremely significant. This supports the findings of E. Yakut *et al.* [7] who reported that Pilates exercises are an effective and a clinically practicable approach for patients with osteoarthritis of knee and it may be more effective when applied in group exercises. In this study while evaluating the Mean value of pre pilates is 6.66 and post pilates is 3.93 with the intervention on Numerical Pain Rating Scale of which P value was <0.0001 which is considered extremely significant. Mean value of pre conv. exercise protocol is 54.71 and post conv. exercise protocol is 36.52 with the intervention on WOMAC scale of which P value was <0.0001. Mean value of pre conv. exercises is 7.26 and post conv. exercise protocol is 4.4 with the intervention on Numerical Pain Rating Scale for which P value was <0.0001.

In the current study, Mean value of pre pilates exercises is 46.59 and pre conv. PT exercises is 54.71 with the intervention on WOMAC scale of which P value was 0.0005 which is significant. Mean value of pre pilates exercises is 6.66 and pre conv. PT exercises is 7.26 with the intervention on Numerical Pain Rating Scale of which P value is 0.0290 which is considered not significant this proves that pain is not a significant factor for an intervention. When pilates and conventional PT exercises were compared results showed that there is significant improvement in physical functioning on WOMAC scale than pain on NPRS. This supports the findings done by Mazloun V *et al.* [9] who reported that pilates training was more effective than conventional exercises to improve pain and disability in osteoarthritis of knee. Hence we can say that Pilates are more helpful in improving physical functioning of the participants.

Mean difference of post pilates and conv. PT exercises for pain intensity was calculated as 0.1333. Most of the included studies (Vahid mazloun *et al.*, 2017, Erfani mehdi *et al.*, 2011, Rajinder Kaur *et al.*, 2016) [10] showed the effectiveness of Pilates intervention. Unpaired t-test was used to analyze the data to compare the effect of post pilates intervention and post conv. PT exercises protocol with WOMAC scale. The P value of which was 0.0031, considered very significant and post NPRS, the P value was 0.0276 which is not significant. This suggests there is no significant pain reduction after intervention.

Conclusion

1. From the above study we can conclude that patients with OA knee can achieve significant benefits using Pilates exercises.
2. They have been found efficacious for the improvement of knee functions.

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