

ORIGINAL ARTICLE

EFFECTIVENESS OF CLINICALLY SUPERVISED EXERCISE PROGRAM AS COMPARED TO HOME BASED EXERCISE PROGRAM ON PAIN AND DISABILITY IN KNEE OSTEOARTHRITIS

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ABSTRACT

The Objectives of this study was to compare the effectiveness of clinically supervised exercise program with home based exercise program on pain and disability in knee osteoarthritis. Individuals with pain full knee were enrolled from the OPD of IPM & R, Dow University of Health Sciences (DUHS), Karachi. Then patients were indiscriminately assigned to both groups with age and gender alike. Numeric pain rating scale was used for assessment of pain and Lequesne Index for functional capacity, at initial and final session of intervention. Study method was conversed with patients and transcribed permission of the subjects was signed. Design of Study is quasi experimental design and the Study setting: Study has conducted at Institute of Physical therapy Medicine & Rehabilitation, Dow University of Health Sciences, Karachi.

Sample size: I have taken 30 subjects per groups. Interventions: Both groups performed same amount of exercise (25 minutes for four consecutive days about 4 weeks. Experimental group performed these exercise in clinical areas in front of physiotherapist while control group perform these exercises at home. However control group has visited once in a week only. Result for evaluation of data SPSS 20 version was used. Mean standard deviation age weight quantitative variables were calculated. Clinically supervised exercise group shows better results compared with control group with P- value of 0.001.

Keywords: knee, osteoarthritis, isotonic exercises, isometric exercises, home based exercise program.

1. INTRODUCTION

Osteoarthritis is characterized by a deterioration of articular cartilage by way of extra bone development on margins of joint ^[1]. Painful knee joint and restrictions in activities of daily living are key aspects in patients with osteoarthritis. Osteoarthritis is a primary cause of disability, essentially in aged population. OA is solely having the greatest substantial effect from the rheumatic diseases producing agony and physical disability. Osteoarthritis especially effects knee joint, it hardly effects other joint of body ^[2, 3].

Previously, osteoarthritis was considered as pathology that primarily affects joint margins. These days,

osteoarthritis is characterized as pathology that encircles all intra articular structures such as, infrapatellar fat pad, articular cartilage and synovial lining ^[4, 5]. After the diagnosis of OA, the symptoms and the impairment can be worse, persist similar, or hardly improved ^[6]. The factors which are involved for the knee osteoarthritis are Age, Sex, Obesity, recurring squatting activities, decrease bone mineral mass, muscle weakness and absenteeism of exercises ^[7]. Aging is another leading risk factor of knee OA. Knee OA approximately arises 10% in males and to some extent 13% in females over the phase of 60 years. Knee OA values are 27million US individuals with the annual occurrence of 240/100000 persons ^[8]. Populace in Asia would

successfully in the direction of twofold in approaching two decades from 6.8% to 16.4% in 2040, so the probability of knee arthritis remains twofold^[9,10]. Incidence of OA knee in Indian rural is 13.7% and urban 6.0%, population of rural 25% and 28% of urban Pakistan residents has OA^[11]. Management of OA comprises of medicine (NSAID, analgesics), Exercises and invasive intrusion. Non-pharmacological involvement (physical therapy), is a prime management suggested by gathering evidence which were printed in last two decades^[12,13].

Individuals suffering as of knee osteoarthritis come across with functional deficiencies some of them are non- receptive to any treatment which leads to disability. Whole managing patients for OA of knee, use of physical therapy have been promoted^[14].

Exercises especially isometric training is helpful in recovering functional volume and reduces pain. The incapability of doing day-to-day activities associated with knee OA which have an association with reduced power of quadriceps femoris muscle^[15, 16]. Muscular power is enhanced at almost similar ratio by both isometric and isotonic exercises regimes. Subsequently, the greatest effective, categories and combinations of trainings and remedies are unclear^[17].

Reviewing of literature demonstrated that, reduction in pain and enhanced functional abilities by reinforcement of some muscles and muscle groups by diverse physiotherapy intervention have some advantageous effects. Intended for this purpose, individual have to call physiotherapy clinic on day-to-day basis or may be minimum thrice a week. However, the similar advantage can attain through appropriate exercise regime deprived of usage of somewhat expensive modality and patients could perform those exercises at home. To deliver finest patient care at a nominal price, there is a requirement of appropriate, suitably planned home based exercise package that is harmless, effective, and easy intended for patients to do at home without hassling their everyday routine and dismissing travel cost to health center. The outcomes of study will propose, it is meant for patients to make appointment with therapist

at clinic regularly or they could attain the anticipated goal at home with lesser visits to clinic^[18, 19]. By reviewing the published literature, proposed that there is a prerequisite for cost effective but yet clinically efficient exercise therapy regime which highpoints the worth of, whether patients required everyday appointments to a physiotherapist or they could gain comparable advantage from a suitable made home based exercise regime. On the way to highlight, the efficacy of home based exercise, this study has formulated which determines the usefulness of clinically supervised exercises in comparison with prescribed home exercises in easing pain and disability in individuals with knee Osteoarthritis.

2. METHOD

Quasi experimental study was designed to check the effectiveness of clinically supervised exercise program as compared to home based exercise program on pain and disability in knee osteoarthritis at Institute of Physical Medicine and Rehabilitation, Dow University of Health Sciences (IPM&R, DUHS) Karachi, Pakistan. Inclusion Criterion of this study is the subject of interest both male and female age between 38-60 years, correctly diagnosed as Osteoarthritis (Scientific criteria for determination by Altman, affectability = 89% and specificity = 88%)³⁴. Individuals with moderate functional limitation as predicted by Lequesne Index for OA³⁵. Whereas the exclusion criteria is Accidental cases, Cardiovascular system disorder, Cancerous joint, Central Nervous System disorder, Skin Allergies.

2.1. Study Duration

Treatment period is 4 weeks number of sittings is 20. Every sitting was of 30 minutes five times each week. Group 1 comprises of those patients who were dealt with at center, clinically managed activities were done and assessed on their underlying and on conclusive sitting. Group 2 comprises of patients who did practices at home, they were assessed on their initial & final session of the review.

2.2. Ethical Review Board

Research was approved on 9th September IRB of DUHS with reference letter no. IRB-

581/DUHS/approval/2015/117.

2.3. Size of Sample

A repeated measures design with 1 amongst component and 1 inside variable has 2 groups with subjects each for a sum of 8 subjects with 99% power of the Test and 99% confidence interval with mean and standard deviation.

2.4. Sampling Technique

Nonprobability purposive sampling was used.

2.5. Procedure

This research work was allowed by BASR of DUHS. Subjects were recognized from the outpatient department of IPM&R, DUHS Karachi. These patients were selected using pain questioners to meet the incorporation criteria. Subjects were recruited after taken Informed consent. All patients were randomly allocated to both groups. History, clinical examination and relevant analyses, for example, information for age, gender, stature, weight, both knees involvement, past surgery. Both groups comprise of 30 patients. The review was blind and evaluator was unchanged within the review. After baseline valuations and randomization, intervention 1 participants underwent clinically administered exercises and intervention 2 subjects did prescribed exercises at home.

Activities don't contain any kind of machine with the exception of sandbags to be utilized as weights for strengthen training work out. Exercises included isometric quads, VMO reinforcing, sit-ups, strengthening hip flexor, hamstring and calf muscles. Each of these activities would be executed effortlessly at home also.

Statistical software SPSS version 20 was use for analysis of data. The study variables include, participant's age and gender were ascertained through mean and standard deviation. Association between either study groups was assessed using Wilcoxon signed rank test, and to comprehend the baseline and last session values were evaluated through Man Whitney test.

3. RESULT AND DISCUSSION

Since no drop-outs during the study were observed, data from all 60 participants were gathered and analyzed. 30 participants were distributed into each of the two groups, namely the 'Clinically Supervised Exercises-Group A' and 'Home Based Exercises-Group B'. The data from the two groups were further stratified on the basis of age and gender. The mean age in the group A was 51.46 ± 4.36 whereas in group 2 it was 54.73 ± 4.50 , as shown in the table 1:

Table 1.

Study Groups	Number of participants (N)	Mean age	Standard deviation
Group A (Clinically Supervised Exercises)	30	51.46	4.368
Group B (Home Based Exercises)	30	54.73	4.502

In Group A there were 13 (43.3%) males and 17 (56.7%) females, whereas in Group B there were

14 (46.7%) males and 16 (53.3%) females, as shown in the Table 2:

Table 2

Study Groups	Male	Female
Group A (Clinically Supervised Exercises)	13 (43.3%)	17 (56.7%)
Group B (Home Based Exercises)	14 (46.7%)	16 (53.3%)

Table 3

Pre and Post Intervention Scores of both Groups	Shapiro-Wilk test	
	Statistic	P-value
Pre-Intervention Scores	0.890	<0.001
Post-Intervention Scores	0.880	<0.001

Shapiro- Wilk test was applied to test the normality of the data. The P-value turned out to be less than the level of significance (0.05), as shown in the table 3, therefore it was concluded that the data did not follow normal distribution and therefore non-parametric tests were applied. Mann-Whitney U test was applied to assess the difference between the pre

and post-intervention scores of both groups (Intergroup analysis) whereas Wilcoxon signed rank test was applied to assess the pre and post-intervention mean (NPRS) scores (Intragroup analysis) of the study participants as shown in the subsequent tables.

Table 4.

Pre and Post Intervention Scores of both Groups	Mean $\pm$ SD	Min – Max
Pre-Intervention Scores	6.31 $\pm$ 0.91	3-7
Post-Intervention Scores	2.85 $\pm$ 0.88	1-6

Table 4 shows the Pre and Post Intervention Scores of both Groups combined. It reveals that the mean pre intervention scores for both the groups were

6.31 $\pm$ 0.91 whereas after the interventions had been administered these scores went down to 2.85 $\pm$ 0.88.

Table 5.

Pre and Post Intervention Scores	Group A	Group B	P-Value of Mann-Whitney U test
Pre-Intervention Scores	6.20 ± 0.96	6.40 ± 0.89	0.372
Post-Intervention Scores	2.41 ± 0.72	3.30 ± 0.79	<0.001

As shown in the table 5, mean NPRS scores of the Group A and Group B were 6.20 ± 0.96 and 6.40 ± 0.89 respectively which were not statistically significant (P-value 0.372), however after administering the treatment, the mean scores decreased to 2.41 ± 0.72 and 3.30 ± 0.79 for Group

A and Group B respectively. The difference between the mean scores of the two groups was found to be statistically significant as the P-value of Mann-Whitney U test turned out to be less than the level of significance 0.005

Table 6.

Intervention	Pre		Post		P- Value of Wilcoxon Signed Rank test
	Mean ±SD	Min-Max	Mean ± SD	Min-Max.	
Group A	6.20 ± 0.96	4-8	2.41 ± 0.72	1-4	<0.001

The difference between the Pre and Post intervention mean scores was found to be statistically significant for both group A and group B, however the post intervention mean

score for group A (2.41 ± 0.72) were less than that of group B (3.30 ± 0.79) as shown in the tables 6 and 7.

Table 7.

Intervention	Pre	Post	P- Value of
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The difference between the Pre and Post intervention mean scores was found to be statistically significant for both group A and group B, however the post

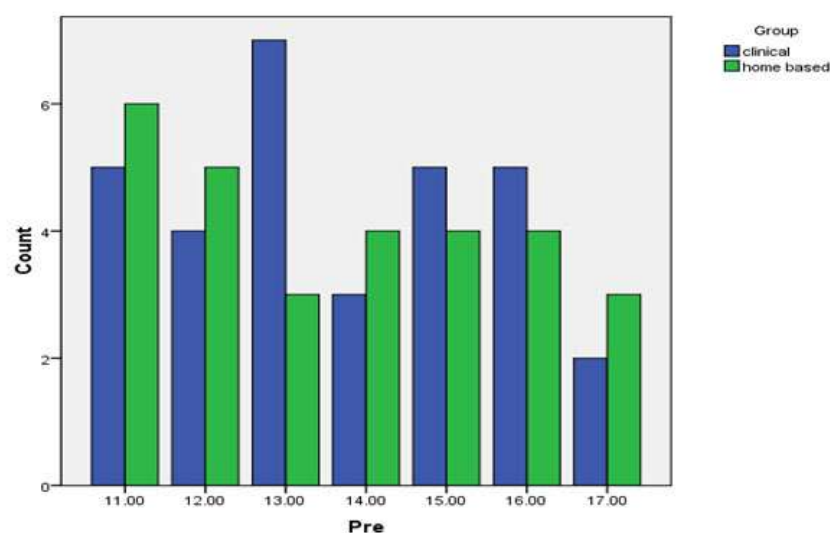
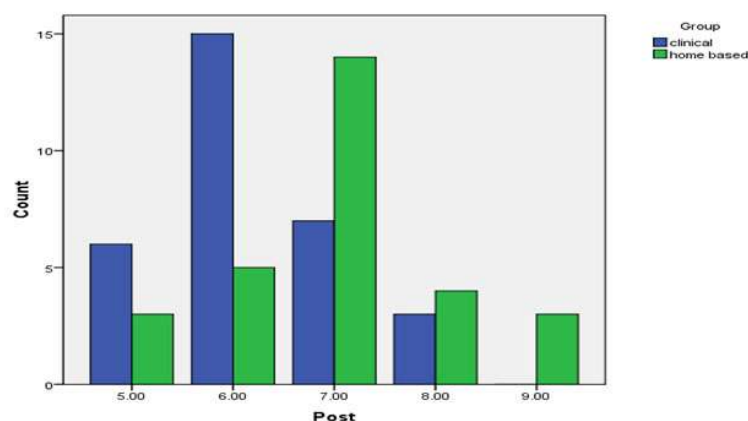
intervention mean score for group A (2.41 ± 0.72) were less than that of group B (3.30 ± 0.79) as shown in the tables 6 and 7.

Table 7.

	Mean $\pm$ SD	Min-Max	Mean $\pm$ SD	Min-Max.	Wilcoxon Signed Rank test
Group B	6.40 $\pm$ 0.89	4-8	3.30 $\pm$ 0.79	2-5	<0.001

Figure 1 and 2 depict the mean pre and post intervention scores of the study participants of both groups on the 'Lequesne index of severity for osteoarthritis of knee'. The pre intervention scores indicate that the scores for the severity of Knee osteoarthritis lay between 11 and 17 on the lequesne

index, which according to the index fell in the category of 'very severe' and 'extremely severe'. The post intervention scores for the severity of Knee osteoarthritis lay between 5 and 9 on the lequesne index, which according to the index fell in the category of 'moderate' and 'sever

**Fig. 1.** Pre intervention scores**Fig. 2.** Post intervention scores

4. CONCLUSION

Osteoarthritis of knee is a fairly common disorder among the Pakistani population especially women. A regimen of therapeutic exercises comprising Isometric Quads, VMO reinforcing, partial squats, calves and hamstring stretches, is more effective when administered under clinical Supervision, than without supervision for the treatment of Knee osteoarthritis.

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CONFLICT OF INTEREST

The authors declare no conflict of interest

ETHICAL APPROVAL

A prior consent was taken in writing from the all patients

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