

Effectiveness of agility exercise on Pain and Knee Health Status among Patients with Knee Osteoarthritis

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Abstract

Background: The prevalence of osteoarthritis is thought to be around 4% of the present population. Knee pain is the most common complaint involving a peripheral joint and has been observed to affect 5%–13% of adult populations in Asia. Agility exercise may address the needs of the patients and promote knee health status.

Methods: An experimental study was done to evaluate the effectiveness of Agility exercise on pain and knee health status among patients with knee osteoarthritis. Sixty samples were selected (30 each in experimental and control group) through non probability purposive sampling technique. The pain was assessed by numerical pain intensity scale and knee health status was assessed by modified lower extremity functional scale. The investigator demonstrated Agility exercises to only experimental group for 21 days.

Conclusion: The findings reveal that, in experimental group the pretest and posttest mean score of pain was 7 ± 0.6 and 5.6 ± 1.51 respectively. In experimental group the pretest and posttest mean score of knee health status was 18.4 ± 3.33 and 13.4 ± 3.53 respectively. The calculated 't' value for pain was 12.77 and for knee health status was 18.37 which was greater than the table value. In posttest experimental and control group the mean score for pain was 5.6 ± 1.51 and 7.2 ± 1.2 respectively. In posttest experimental and control group the mean score for knee health status was 13.4 ± 3.53 and 18.5 ± 2.32 respectively. The calculated 't' value for pain was 3.7 and for knee health status was 3.36 which was greater than the table value. Thus it become evident that agility exercise was effective in reducing pain and improving knee health status among patients with knee osteoarthritis. The study concluded that agility was effective on reducing pain and improving knee health status among patients with knee osteoarthritis.

Key Words: Osteoarthritis, Knee health status, Agility exercise, Knee pain

Introduction

The most prevalent type of arthritis in the knee is osteoarthritis. It is a degenerative, "wear and tear" kind of arthritis that most frequently affects persons over the age of 50, however it can sometimes affect younger people. The cartilage in the joint gradually deteriorates

in osteoarthritis.¹ The protecting area between the bones narrows as the cartilage deteriorates, becoming ragged and rough. This may cause painful bone spurs as a result of the friction of the bones.

Osteoarthritis affects 20% of elderly people worldwide and is a source of pain and dysfunction

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for 41% of women and 20% of men. Osteoarthritis is the second most prevalent condition in India, with a prevalence rate ranging from 22 to 39%.² Women are more likely than men to develop osteoarthritis of the knee, and prevalence rates range from 10-15% at age 35 to 35-45% at age 65.³

Osteoarthritis's main clinical symptoms include pain, stiffness, and functional impairment. Management of these patients is a challenge because the condition has a higher impact on the patient's physical function and quality of life. For people with knee osteoarthritis, exercise is crucial.⁴

The Knee Osteoarthritis Research Association International Guidelines recommend a combination of nonpharmacologic and pharmacologic therapies for optimal management of patients with knee osteoarthritis. This recommendation covers 12 nonpharmacologic therapies. These include physical therapist referrals, aerobics, muscle strengthening, aquatic exercise, education and self-care, regular phone calls, crutches, knee braces, heat therapy, and transcutaneous electrical nerve stimulation.^{5,6}

Therapeutic exercises, particularly strength exercises and the use of physical activity in general, are particularly helpful in reducing pain and improving functional status in people with knee osteoarthritis.⁷

A variety of therapeutic exercise recipes are used to relieve symptoms of knee osteoarthritis and improve physical function related to activities of daily living. Because quadriceps muscle weakness is prevalent in patients with knee osteoarthritis, leg strength training is often used in intervention programs. Several lines of evidence suggest that shorter programs incorporating kinesthetic, balance, and mobility (CBA) techniques may result in more rapid symptom relief and functional improvement compared to conventional therapeutic exercise.⁸

Agility exercises are designed to improve dynamic joint stability through a series of physical activities that stress the participant's neuromuscular system and maintain balance and coordination. It also aids in the rehabilitation and prevention of anterior circulation ligament ruptures and ankle sprains in athletes, and has been successfully used in the rehabilitation of a 10-year-old girl with bilateral juvenile rheumatoid arthritis in her knees.⁹

Mobility programs for treating knee osteoarthritis include the introduction of agility techniques based on walking rather than running. By exposing individuals to motor challenges encountered in their daily activities, such as quick turns, stops and turns, balance challenges, and overcoming obstacles, these programs promote higher levels of physical fitness while reducing pain and contribute to the improvement of functions.¹⁰

Current trends indicate that exercise regimens include balance exercises consisting of agility and perturbation training.¹¹ Agility training requires sudden changes in movement and direction. Helps improve knee health, relieve symptoms of osteoarthritis of the knee, quickly improve knee function, balance, and improve daily activities. Hence the researcher felt importance of providing agility exercises among patients with knee osteoarthritis.

Methodology

Quasi experimental pre-test post-test control group design was adopted for this study with 60 patients suffering from knee osteoarthritis. Among them 30 patients were selected for the experimental group and 30 patients were selected for control group. The Numerical Pain Intensity Scale was used to assess the pain and the scoring was done according to the level of the pain. Modified lower extremity functional Scale was used to assess the knee health status and scoring was done according to the functional ability. Informed consent was obtained from all participants and followed the ethical principles. Agility exercise was demonstrated to experimental group and asked the patients to continue for twice daily for 3 days in a week for three weeks. The investigator has done the follow up through phone calls and given a diary for the patients to maintain it. Whereas in control group, patients were carried out with routine care and no agility exercise was given for them.

Results

The frequency and percentage distribution of all participants according to their personal and health related variables are given in the following tables.

Table 1: Frequency and percentage distribution of patients according to their personal variables in experimental and control group. (n=60)

Sl. No	Personal variables	Experimental group		Control group	
		F	%	F	%
1	Age in years				
	35-45	7	23.33	2	6.66
	46-55	13	43.33	18	60
	56-65	10	33.34	10	33.34
2	SEX				
	Male	5	16.66	4	13.34
	Female	25	83.34	26	86.66
3	Educational status				
	No formal education	10	33.33	12	40
	Primary education	10	33.33	8	26.66
	Secondary education	6	20	4	13.34
	Degree	4	13.34	6	20
4	Occupation				
	Professional	4	13.34	3	10
	Daily wages	9	30	11	36.66
	Farmer	9	30	9	30
	Business	3	10	3	10
	House wife	5	16.66	4	13.34
5	Marital status				
	Married	30	100	30	100
	Unmarried	0	0	0	0
	Divorced	0	0	0	0
6	Family income per month				
	Below Rs.5000	12	40	11	36.66
	Rs.5001 to 10000	13	43.33	11	36.66
	Rs. 10001 to 15000	1	3.33	4	13.34
	Above Rs.15001	4	13.34	4	13.34

Table 2: Frequency and percentage distribution of patients according to their Health related variables in experimental and control group. n=60

Sl.No	Health related variables	Experimental group		Control group	
		F	%	F	%
1	Diet				
	Vegetarian	0	0	4	13.34
	Non-vegetarian	30	100	26	86.66
2	Habits				
	Smoking	6	20	2	6.66
	Alcohol	0	0	3	10
	Tobacco chewing	2	6.66	2	6.66
	None	22	73.34	23	76.68

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3	Duration of illness				
	Below 3 months	6	20	4	13.34
	3 to 6 months	7	23.33	8	26.66
	6 to 9 months	4	13.33	9	30
	9 to 12 months	13	43.34	9	30
4	Treatment taken previously				
	Yes	24	80	21	70
	No	6	20	9	30
5	Presence of co-morbid illness				
	Yes	9	30	4	13.34
	No	21	70	26	86.66

Table 3: Frequency and percentage distribution of patients according to pretest and post test scores on pain among patients with knee osteoarthritis in experimental and control group. n=60

Level of pain	Experimental Group				Control Group			
	Pre test		Post test		Pre test		Post test	
	F	%	F	%	F	%	F	%
No pain	0	0	0	0	0	0	0	0
Mild pain	0	0	1	3.34	0	0	0	0
Moderate pain	5	16.66	24	80	6	20	0	0
Severe pain	25	83.34	5	16.66	24	80	6	20
Worst possible pain	0	0	0	0	0	0	24	80

The above table 3 shows that in experimental group, maximum 25(83.34%) participants were having severe pain whereas in posttest maximum 24(80%) were having moderate pain. In control group maximum 24(80%) participants were having severe

pain whereas in posttest maximum 24(80%) were having worst possible pain. There is reduction in the level of pain after agility exercises in experimental group were noted.

Table 4: Frequency and percentage distribution of patients according to pretest and posttest scores on Knee Health status among patients with Knee osteoarthritis in experimental and control group. n=60

Knee health status	Experimental group				Control group			
	Pre test		Post test		Pre test		Post test	
	F	%	F	%	F	%	F	%
Good	0	0	8	26.66	0	0	1	3.34
Average	20	66.66	22	73.34	19	63.34	20	66.66
Poor	10	33.34	0	0	11	36.66	9	30

The above table 4 shows that in experimental group, maximum 20(66.66%) participants were having average knee health status and 10(33.34%) were having poor knee health status, whereas in posttest maximum 22(73.34%) were having average knee health status and 8(26.66%) were good knee health status. In control group maximum 19(63.34%)

participants were having average knee health status, and 11(36.66%) were having poor knee health status, whereas in posttest maximum 20(66.66%) were having average knee health status and 9(30%) were having poor knee health status. The knee health status was improved in experimental group after agility exercises were noted.

Table 5: Mean, standard deviation and mean difference on pre test and post test scores on pain among patients with knee osteoarthritis in experimental and control group. n=60

Groups	Pre test			Post test			Difference in Mean %	df	“t” value	Table value
	Mean	SD	Mean %	Mean	SD	Mean %				
Experimental group	7	0.6	70	5.6	1.51	56.3	13.7	58	3.7*	2.01
Control group	7	0.9	70.3	7.26	1.2	72.6	2.3			

*significant at $p \leq 0.05$ level

The above table 5 shows that in experimental group the pretest mean score is 7 ± 0.6 and mean percentage is 70%, where as in posttest mean score is 5.6 ± 1.51 and mean percentage is 56.3. The mean difference is 13.7. In control group the pretest mean score is 7 ± 0.9 and the mean percentage is 70.3, where as in posttest the mean score is 7.26 ± 1.2

and mean percentage is 72.6. The mean difference is 2.3. Experimental group patients have less pain when compared to the control group patients. The calculated ‘t’ value is 3.7 which is greater than the table value. Thus it is significantly evident that Agility exercise is effective in reducing pain among patients with Knee osteoarthritis in experimental group.

Table 6: Mean, standard deviation and mean difference on pretest and post test scores on Knee health status among patients with knee osteoarthritis in experimental group and control group. n=60

Groups	Pre test			Post test			Difference in Mean %	df	“t” value	Table value
	Mean	SD	Mean %	Mean	SD	Mean %				
Experimental group	18.4	3.33	61.5	13.4	3.53	44.8	16.7	58	3.36*	2.01
Control group	18.6	3.01	62	18.5	3.2	61	1			

*significant at $p \leq 0.05$ level

The above table 6 shows that in experimental group the pretest mean score is 18.4 ± 3.33 and mean percentage is 61.5 % whereas in posttest mean score is 13.4 ± 3.53 and mean percentage is 44.8. The mean difference is 16.7. In control group the pretest mean score is 18.6 ± 3.01 and mean percentage is 62% whereas in posttest mean score is 18.5 ± 3.2 and mean percentage is 61 %. The mean difference is 1. Experimental group patients have Good Knee Health status when compared to the control group patients. The calculated ‘t’ value is 3.36 which is greater than the table value. Thus it is significantly evident that Agility exercise is effective in improving the knee Health status among patients with knee osteoarthritis in experimental group.

In experimental group there is no association found between the level of pain and selected demographic variables such as age in years, sex, education, occupation, marital status, family income per month, diet, habits, duration of illness, any treatment taken previously, any comorbid illness. In control group

there is significant association found between the level of pain and demographic variables such as age, educational status, occupation and duration of illness. There is no association found between pain and selected demographic variables such as marital status, family income per month, diet, habits, any treatment taken previously, any comorbid illness.

In experimental group there is no association found between knee health status and selected demographic variables such as age in years, sex, education, occupation, marital status, family income per month, diet, habits, duration of illness, any treatment taken previously, any comorbid illness. In control group there is association found between knee health status and selected demographic variables such as age in years. There is no association found between the knee health status and selected demographic variables such as sex, education, occupation, marital status, family income per month, diet, habits, duration of illness, any treatment taken previously, any comorbid illness.

Conclusion

The present study was done to evaluate the effectiveness of agility exercise on pain and knee health status among patients with knee osteoarthritis at selected hospitals, Salem. The findings of the study revealed that agility exercise was effective to reducing the pain and improving the knee health status among patients with osteoarthritis. There was no significant association between the level of pain and their selected demographic variables in experimental group. In control group there was significant association found between the level of pain and occupation, age, educational status, duration of illness. There was no significant association between the level of knee health status and their selected demographic variables in experimental group. In control group there was significant association found between the level of knee health status and age.

Relevant to Nursing Practice:

- Nurses can identify the importance of agility exercise and use it as an adjuvant to pharmacological therapy to reduce pain and improving knee health status.
- Nurses can demonstrate the agility exercise for knee osteoarthritis patients and encourage the patients to practice it.
- Nurses can demonstrate agility exercise to improve the functional performance of the patients with knee osteoarthritis.

Relevant to Nursing Education:

- In service education program should be conducted for nurses and help them to gain knowledge regarding agility exercises.
- Provide exposure to various non-pharmacological measures and therapies and update the nursing curriculum.

Conflict of interest: Nil

Source of Funding: Self

Ethical Clearance: Ethical approval was obtained from the institutional ethical committee. Permission sought from the concern authorities of the hospital before conducting the research.

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