

Effectiveness of quadriceps isometric exercise on pain among patients with osteoarthritis

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Abstract: The aim of a quasi-experimental study was to assess the effectiveness of quadriceps isometric exercise on pain among patients with osteoarthritis in the Orthopaedic OPD of AVMC & H, Puducherry. A total of 30 patients was selected using a simple random sampling technique. The pretest pain level was measured using a Numeric Pain Rating Scale (NPRS). After the pretest, Quadriceps Isometric Exercise (QIE) was taught to the patients with osteoarthritis and instructed them to practice QIE at home for 7 days. The post test level of pain was measured immediately after QIE and at the end of 7th day using a same instrument. The study results showed that in the pretest, 70% of patients had severe pain and 30% of them had a moderate level of pain, whereas in the post test, 60% of the patients had a moderate level of pain and 40% of them had mild pain. The paired 't' test was applied and its score was significant at $p < 0.001$. The Chi-square test showed that there was no significant relationship between pretest pain score and the demographic variables except marital status and source of getting health information ($p < 0.05$).

Keys: Osteoarthritis, Quadriceps isometric exercise, Pain, Osteoarthritis patients.

INTRODUCTION

Osteoarthritis (OA) is a major public health issue because it causes chronic pain, reduces physical and diminishes quality of life. Aging of the population and increased global prevalence of obesity are anticipated to dramatically increase the prevalence of knee OA and its associated impairments. The disease imposes a significant healthcare burden and accounts for high annual hospitalizations in the developed world⁵.

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. It is the most common reason for seeking health care. Pain occurs as the result of many disorders, diagnostic tests, and treatment; it disables and distresses more people than any single disease. Because nurses spend more time with patients in pain than other health care providers do, nurses need to understand the patho physiology of pain, the physiologic and psychological consequences of acute and chronic pain, and the methods used to treat pain. Nurses encounter patients in pain in a variety of settings, including acute care, outpatient, and long-term care setting, as well as in the home. Therefore, they must have the knowledge and skills to assess pain, to implement pain relief strategies, and skills to assess pain, to implement pain relief strategies, and to evaluate the effectiveness of these strategies, regardless of setting³.

OA is a chronic disease, located in the joints, affecting one third of adults and presenting a tendency to increase with age. Knee OA can be associated with symptoms of pain, instability, reduction of Range of Motion (ROM) and consequently, deterioration in Quality of Life (QOL) and function. This functional limitation results increases the risk of morbidity and mortality⁴.

These factors have given impetus for the investigator to select and conduct a study related to assess the effectiveness of quadriceps isometric exercise on pain among patients with OA.

STATEMENT OF THE PROBLEM

A quasi experimental study to assess the effectiveness of quadriceps isometric exercise on pain among patients with osteoarthritis in a selected hospital of Puducherry.

OBJECTIVES

1. To assess the level of pain among patients with OA using a numeric pain rating scale.

2. To evaluate the effectiveness of quadriceps isometric exercise on pain among patients with OA.
3. To associate the pretest level of pain with the selected demographic variables of patients with OA.

RESEARCH HYPOTHESES

H₁ – There will be a significant difference between pretest and posttest level of pain among patients with OA.

H₂ – There will be a significant association between the pretest level of pain and the selected demographic variables.

RESEARCH METHODOLOGY

Research Design

The quasi experimental research design was adopted for this study.

Experimental group: O₁ x O₂

O₁: Pretest

X: Intervention (Quadriceps isometric exercise)

O₂: Posttest

Setting of the study

This study was conducted in the Orthopaedic OPD of AVMC&H, Puducherry.

Variables

Independent variable : Quadriceps isometric exercise

Dependent variable : Level of pain among patients with OA

Population

The population consisted of patients with OA attending the Orthopaedic OPD of AVMC&H, Puducherry.

Sample size

A total of 30 male and female patients with OA who met the inclusion criteria were selected using a simple random sampling technique.

Sampling technique

The simple random sampling technique was used to select the subjects for this study.

Data Collection Procedure

The main study was conducted between 18.06.2018 to 30.06.2018 at Orthopaedic OPD of AVMC&H, Puducherry. Informed consent was obtained from each patient. The investigator established good rapport with the patients by an informal talk. The purpose of the study was explained to the patients to ensure their cooperation. The structured interview was conducted by the investigator. Five subjects were selected per day. The pain levels of patients with OA were assessed using a NPRS. The time spent for each subject was 20 minutes.

Five subjects were selected per day and patients were gathered and seated them comfortable at Orthopaedic OPD of AVMC&H, Puducherry. The Investigator demonstrated steps of QIE to the study subjects and asked them to do a supervised return demonstration.

The post test level of pain was assessed by using a same NPRS after the intervention. Investigator encouraged the study subjects to practice QIE at home for one week. The post test level of pain was assessed after one week of intervention.

MAJOR FINDINGS OF THE STUDY

Distribution of demographic variables

Regards to age, the majority of patients (36.7%) were belonged to the age group of 41 to 50 years and 33% belonged to the age group of 31-40 years. Sixteen (53.3%) patients were females and 14 (46.7%) of them were males. Regards to residence, 26 (86.7%) were from rural place and 4 (13.3%) were from urban place. The majority of patients (30%) were studied up to primary school and 10 patients (33.3%) were employed. Regards to marital status, the majority of patients were married (86.7%), 10% were widowed / widowers and 3.3% were singles. The majority of patients

were Hindus (93.3%) and 6.7% were Christian. Fifteen (50%) patients had monthly income of Rs.5001-Rs.10000, 10 (33.3%) had monthly income of Rs.10001-Rs.15000 and 10% had monthly income above Rs.15000. Regards to work, the majority (50%) of patients had moderate work and 22 (73.3%) them were getting health information from mass media.

Distribution of health profile

The majority (63.3%) of patients had OA for the duration of 4 to 5 years and 26.7% of them had OA for 2 to 3 years. Nineteen (63.3%) patients had a previous history of hospitalization due to OA and 66.7% of them were taking regular treatment for OA.

Comparison of mean pain score of the patients with OA between pretest and posttests

Level of pain	Mean	SD	Paired 't' value	'p' value
Pretest	7.1	0.8849	30.328	<0.001* (S)
Post test I (Immediately after QIE)	5.833	0.9129		
Post test II (At the end of 7 th day)	3.8	1.0306		

***S – Significant**

This table shows the average mean pain score of patients with OA at pretest as 7.1 with a standard deviation of 0.8849. Similarly the average level of pain at post test I was found to be 5.833 with the standard deviation of 0.9129 and the average level of pain at post test II was found to be 3.8 with the standard deviation of 1.0306. The paired't' test was applied to compare pre and post test mean pain score. The result indicated that there was a significant decrease in

post test mean pain scores. These findings indicated that QIE was effective. The results are shown in figure 1.

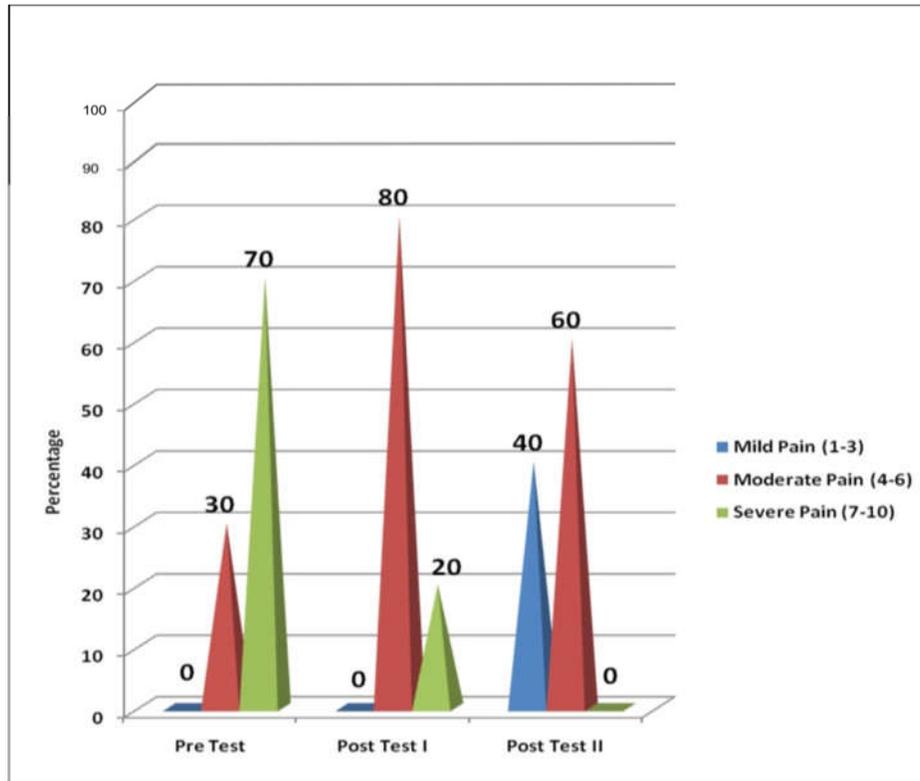


Fig 1: Mean pain scores of patients with OA between pretest and post tests

Distribution of the level of pretest pain score in relation to selected demographic variables

Marital status and source of getting health information had significant association with pretest pain score and other variables had no association with pretest pain score.

CONCLUSION OF THE STUDY

The study concluded that:

- Reduction of pain level had increased after QIE among patients with OA.
- QIE was found to be effective in reduction of pain among patients with OA.

- The study showed that, the demographic variables except marital status and source of getting health information had no influence on the reduction of pain among patients with OA in the pretest.

RECOMMENDATIONS

- Quadriceps isometric exercise should be given periodically and instructed the patients with OA to practice QIE at home.
- Osteoarthritis self-management education material tailored to the educational level of patients should be available at the clinics.
- Osteoarthritis self-management education should be made mandatory in hospital.

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