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Effectiveness of Isometric Exercise on Pain among Patients with Osteoarthritis at Selected Hospitals, Salem

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Abstract: ***Background of the Study: Isometric exercise are a type of strength training in which the joint angle and muscle length do not change during contraction (compared to concentric or eccentric contractions, called dynamic/isotonic movements). Isometrics are done in static positions rather than being dynamic through a range of motion. Isometric or static or setting exercise are the exercise in which the joint and muscle are either worked against an immobile force or held in a static position while opposed by resistance. It is a form of exercise involving static contraction of muscle without any visible movement in the angle of the joint. This is reflected in the name , the term isometric combines Greek the prefixes "iso" (same) with 'metric' means(distance), meaning that in these exercises the length of the muscle and the angle of the joint do not change , though contraction strength may varied. Mechanical factors such as joint misalignment a role in the development and progression of other risk factors, such as muscle weakness impaired motor control and diminished physical stress are modifiable with exercises. (Phillips, 2004) Objectives: To assess the pain among patients with osteoarthritis in experimental and control group, To evaluate the effectiveness of isometric exercise on pain among patients with osteoarthritis in experimental and control group. To associate the pain among patients with osteoarthritis with their selected demographic variables in experimental and control group. Hypothesis, H_1:There will be a significant difference in post test score on pain among patients with osteoarthritis in experimental and control group at $p \leq 0.05$ level, H_2:There will be a significant association between the pain among patients with osteoarthritis in experimental and control group with their selected demographic variables at $p \leq 0.05$ level. Methodology: one Quasi Experimental pre test post test control group design was used for the study. Non probability convenience sampling technique was used for the study. Final Result and Conclusion: During pre test in experimental group, none of the patients have no pain, 2(6.7%) patients have mild pain, 10 (33.3%) patients have moderate pain, 16 (53.3%) patients have severe pain and 2 (6.7%) patients have worst possible pain. Whereas in control group none of the patients have no pain and worst possible pain, 2(6.7%) patients have mild pain, 10 (33.33%) patients have moderate pain and 18 (60%) patients have severe pain, Post test reveals that the mean score for experimental group was 1.3±0.46 and the mean for control group was 2.7±0.69, the 't' value is 9.04 which is significant at $p<0.05$ level and hypothesis (H_1) is retained. Thus it becomes evident that isometric exercise was effective in reducing pain.***

Keywords: Effectiveness, Isometric exercise, Pain, Osteoarthritis

1. Introduction

Isometric exercise are a type of strength training in which the joint angle and muscle length do not change during contraction (compared to concentric or eccentric contractions, called dynamic/isotonic movements). Isometrics are done in static positions rather than being dynamic through a range of motion. Isometric or static or setting exercise are the exercise in which the joint and muscle are either worked against an immobile force or held in a static position while opposed by resistance. It is a form of exercise involving static contraction of muscle without any visible movement in the angle of the joint. This is reflected in the name , the term isometric combines Greek the prefixes "iso" (same) with 'metric' means(distance), meaning that in these exercises the length of the muscle and the angle of the joint do not change , though contraction strength may varied. Mechanical factors such as joint misalignment a role in the development and progression of other risk factors, such as muscle weakness impaired motor control and diminished physical stress are modifiable with exercises. **(Phillips, 2004)**

Objectives:

1) To assess the pain among patients with osteoarthritis in experimental and control group.
2) To evaluate the effectiveness of isometric exercise on pain among patients with osteoarthritis in experimental and control group.
3) To associate the pain among patients with osteoarthritis with their selected demographic variables in experimental and control group.

Hypotheses:

H_1: There will be a significant difference in post test score on pain among patients with osteoarthritis in experimental and control group at $p \leq 0.05$ level.

H_2: There will be a significant association between the pain among patients with osteoarthritis in experimental and control group with their selected demographic variables at $p \leq 0.05$ level.

2. Methodology

Quasi Experimental pre test post test control group design was used for the study, The patients who fulfilled the inclusion criteria were selected from the hospital by non probability convenience sampling technique. Out of 60 patients, 30 patients from London Ortho Hospital were selected for experimental group and 30 patients from Sri Gokulam Hospital were selected for control group. Their general information was collected by structured interview schedule. The pre test was done using numerical pain

intensity scale to assess the pain in both experimental and control group. The isometric exercise was demonstrated to the experimental group and asked to continue for twice daily for 21 days.

Section A: Demographic data
Structured interview schedule was used to collect demographic data. This section consists of demographic variables such as age in years, sex, education, occupation, monthly income, diet, duration of illness and previous history of treatment.

Section B: Numerical Pain Intensity Scale to assess the pain
The Numerical Pain Intensity Scale was used to assess the pain and the scoring was done according to the severity of the pain.

Level of pain	Score
No pain	0
Mild pain	1 -3
Moderate pain	4-6
Severe pain	7-9
Worst pain	10

3. Results

Effectiveness of isometric exercise on post test score on pain among patients in experimental and Mean, standard deviation, 't' value on post test score on pain among patients in experimental and control group.

n = 60

Group	*Mean*	*S.D*	*df*	*Table value*	*'t' value*
Experimental group	1.3	0.46	58	2.01	9.04*
Control group	2.7	0.69			

*** Significant at p< 0.05 level**
Mean score for experimental group 1.3 ± 0.46 and the mean score for control group 2.7 ± 0.69. The calculated't' value is 9.04 * which is greater than the table value. Hence the research hypothesis H_1 is retained at p≤ 0.05 level. Thus it become evident that isometric exercise is effective in reducing pain among patients with osteoarthritis.

4. The Major Findings of the Study

- Half of patients 16(53%) were in between the age group of 50 to 60 in experimental group and 13(43%) patients were in between the age group of 61 to 70 in control group.
- In experimental group half of patients 17 (57%) were females and in control group 19 (63%) patients were females.
- In experimental group 9 (30%) had completed higher secondary education and in control group 11 (36.7%) had completed secondary education
- In experimental group14 (46.67%) and half of patients in control group 15 (50%) were house wives.
- In experimental group 13 (43.33%) patients had monthly income of Rs 5000 to 10,000 and above 10,000, where as in control group 14 (46. 66%) patients had monthly income of Rs 5000 to 10,000.
- Majority of patients in experimental group 26(86.67%) and most of patients in control group 22(73.33%) were non vegetarians
- In experimental group 10 (33.33%) patients and in control group 14(46.67%) had duration of illness between 1 year to 2 years.
- All patients in experimental and control group 30(100%) had taken allopathic treatment before.
- In experimental group during pre test 16(53.3%) patients had severe pain and in control group 18(60%) patients had severe pain where as in post test 21(70%) patients had mild pain in experimental group and 14(46.7%) patients had severe pain and moderate pain in control group.
- In experimental group the pre and post test mean score was 2.63±0.58 and 1.3±0.46 respectively. The pre and post test mean percentage was 26.3% and 13%. The mean difference was 13.3 in control group the pre and post test mean score was 2.8 ± 0.83 and 2.7±0.69 respectively. The mean percentage was 28% during pre test and 27% during post test. The mean difference was 1. Experimental group patients had less pain when compared to control group. Thus it became evident that isometric exercise reduced the pain among patients with osteoarthritis.
- In experimental group the post test mean score was 1.3±0.46 and in control group the post test mean score was 2.7±0.69. The calculated 't' value is 9.04* which was greater than table value. Hence the research hypothesis H_1 was retained at p ≤0.05 level. Thus it become evident that isometric exercise was effective in reducing pain among patients.
- In experimental group there was no association found between pain and selected demographic variables. In control group there was significant association found between the pain and occupation. Hence the hypothesis H_2 was retained only for occupation at P≤0.05 level.

5. Conclusion

The present study was done to evaluate the effectiveness of isometric exercise on pain among patients with osteoarthritis at selected hospitals, Salem. The findings of the study revealed that isometric exercise was effective on significant reduction of pain among patients with osteoarthritis. There was no significant association between the pain and selected demographic variables in experimental group. In control group there was significant association found between pain and occupation

Nursing Practice
- Isometric exercise can be practiced in nursing care.
- Nurses can develop knowledge on isometric exercise and its effectiveness on reducing pain.
- Nurses can identify the importance of isometric exercise use as an adjuvant to pharmacological therapy in reducing pain.
- Nurses can demonstrate the isometric exercise and encourage the patients to practice it, those who are suffering from osteoarthritis and other joint disorders.
- Nurses can use isometric exercise to improve the functional performance of the patients with osteoarthritis.

Nursing Education

- In service education program should be conducted for nurses and help them to gain knowledge regarding isometric exercises.
- Provide exposure to various non pharmacological measures and therapies and update the nursing curriculum.
- Nurse educator can encourage students to make new ideas in managing the pain.
- Periodic continuing education programs can be arranged regarding non pharmacological measures and other therapies to update nursing profession about its importance in reducing pain among patients with osteoarthritis.

References

Books

[1] Black Joyce M. & Jane Hokanson Hawks. (2005). Medical Surgical Nursing (7th edition). Philadelphia: W.B.Saunders Company.
[2] Brunner & Suddarth. (2004). Text book of medical surgical nursing (11th edition). Philadelphia: Lippincott Willims and Wilkins.
[3] Bryant. G.(2003). Modalities for mobilization: Orthopedic Nursing. (2nd edition). Philadelphia: Saunders Publications.
[4] Carol Taylor. (2008). Fundamentals of nursing the act and science of nursing care. (1st edition). New Delhi: Lippincott Williams and Wilkins.
[5] Denise T. Polit Hungler. (2007). Essentials of nursing research methods, appraisals and utilization. (8th edition). Newyork: Lippincott.
[6] Fawcent. (2008). Analysis and Evaluation of Conceptual Models of Nursing. New Delhi: F.A. Davis Company.
[7] Gupta.S.P. (2003). Statistical Methods (31st edition). India: Sultan Chand Educational Publication.
[8] Harrison's. (1999). Principles of internal medicine. (16th edition). New York: McGraw Hill Medical Publishing Division.
[9] Kothari. C.R. (2008). Research Methodology, Methods and Techniques. (2nd edition). New Delhi: New Age International Publishers.
[10] Kozier .B, et.al. (1991). Fundamental of Nursing Concepts, Process and Practice (4th edition). California: Wesley Publications.

Net references

[11] American Academy of orthopedic surgeons. Osteoarthritis prevalence and complications. 2005; 90(1): 10-18. www.Healio.com/orthopaedics
[12] Global Burden of Disease Report. Osteoarthritis as a major public health problem. 2005; 16(4): 150-154. www.orthop.washing.on.edu/?q.../arthritis/
[13] Guild, ester et.al,A key to past occupations: Activity related osteoarthritis in human remains from the Medieval and Post-Medieval period of North-West Europe 2012.https://openaccess.leidenuniv.nl/handle/1887/19334
[14] http://en.wikipedia.org/wiki/Osteoarthritis
[15] http://journals.humankinetics.com/japa-back-issues/japavolume13issue 4october/chronic osteoarthritis and adherence to exercise a review of the literature
[16] Osteoarthritis Research Study International. Quality of life in osteoarthritis clients. 2003; 2(6): 48-52. www.studyforarthritis.com/
[17] Top R, Whooly et.al, The effect of dynamic versus isometric resistance training on pain and functioning among adults with osteoarthritis of the knee, http://www.ncbi.nlm.nih.gov/pubmed
[18] Wlter.M. Risk of osteoarthritis associated with occupational factors. 2007; 48(4): 17-30. http://www.arthritis.com
[19] Ylby.B. Impact of an arthritis self management programme and patient education counselling. 2007; 66(1): 113-121. http://www.nursemanage.com