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# A Study to Evaluate the Effectiveness of Isometric Exercise on Pain Perception and Functional Mobility among Old Age People with Joint Pain

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### Abstract

**Background:** There has been a steady rise in the share of elderly population (aged 60 years or above) in the total population over the decades. As person grows older the cartilage that serves as shock absorber between ones can no longer sustain the rubbery and become stiff. It is also loses its elasticity and becomes damaged. When these cartilages and ligaments wear out, they cause the joint pain. Exercising is an effective and enjoyable way for sufferers of arthritis to feel better and to regain a functional lifestyle. The expression “no pain, no gain” is as untrue as it is outdated; this is particularly true for an arthritis patient.

**Aim:** The aim of the study was to give isometric exercises to a group of old age people and to determine the level of pain, functional mobility compared to a group of old age people without receiving the isometric exercise.

**Subjects and Methods:** A experimental research was conducted among 60 old age peoples in kirumampakkam village Puducherry. The research approach was quantitative and true experimental pre-post-test control group design was used. By simple random sampling 30 samples were assigned to each experimental and control group. The experimental group was taught isometric exercises and practiced every day 15 minutes for 20 days. The study revealed that in the post test level of pain in experimental group mean 4.07 is lesser than the control group mean 6.73. ‘t’ value is -5.018\*\*\* Regarding the functional mobility of experimental group mean 17.70 was higher than the control group mean 12.93. ‘t’ value was 4.208\*\*\* statistically significant at the level of  $p=0.000$ . And there was a correlation between the level of pain and functional mobility. And also there was a association between the age and level of pain and functional mobility.

**Conclusion:** The research findings of the study concluded that there was a significant reduction in the degree of pain and improvement in functional mobility in the experimental group after the intervention was due to the effect of isometric exercise. The control group without intervention did not show any difference after 20 days.

**Keywords:** Isometric exercise, joint pain, old age

### Introduction

Old age consists of ages nearing or surpassing the average life span of human beings, and thus ends of the human life cycle. When we talk about older persons, the attention is focused towards ageing which is a progressive generalized impairment of function resulting in loss of adaptive response to stress and in increasing risk of age-related diseases and disabilities. Due to the physical decline, old age people become less active. Physiologically, the aging causes functional changes in cells cause the joint pain and diminishes the functional mobility. Joint pain is the major health issue among older community.

**Need for the Study:** At present survey says that more than 65 percent of old age people are suffering from joint pain and 25 percentages from cardiovascular disease and remaining from functional immobility due to knee pain. Exercise is one of the best methods to treat joint pain. From the literature review it is quite evident that isometric exercises are beneficial to improve the functional mobility of joints in old age people. When the mobility increases, intensity of joint pain decreases. There are different techniques in carrying out the isometric

exercise and some of the techniques have already been tried out, in other countries. The isometric exercises does not take much time, requires no special equipments, except a comfortable place to do the exercises. It is a simple technique, which is considered to be appropriate for the low socio-economic status, and easily applicable for the old age people.

### Statement of the Problem

*“A study to evaluate the effectiveness of isometric exercise on pain perception and functional mobility among old age people with joint pain at Kirumampakkam Village, Puducherry”.*

### Objectives of the Study

#### Specific Objectives

- To assess the existing level of pain and functional mobility among old age people in both experimental and control group.
- To administer isometric exercise to old age people in experimental group.

- To evaluate the effectiveness of isometric exercise on level of pain and functional mobility of old age people in experimental and control group.
- To determine the correlation between the level of pain and functional mobility of old age people with joint pain in experimental group.
- To find out the association between post-test pain perception and functional mobility with selected demographic variables in experimental group.

### Methodology

A Quantitative approach, true experimental pre-post-test control group design was used and simple random technique followed for selecting samples. The tool includes

**Section A:** Demographic variable of the subjects.

**Section B:** Level of pain was assessed by standard tool numerical pain intensity scale and functional mobility was assessed by observational check list.

The study intended to evaluate the effect of isometric exercise on pain perception and functional mobility of old age people.

### Section A

**Table 2:** Distribution of demographic variable in the study in experimental and control group

S. No	Variables	Experimental Group		Control Group	
		No.	%	No.	%
<b>1.</b>	<b>Age</b>				
	60-65	10	33.33	11	36.67
	66-70	9	30.00	9	30.00
	71-75	8	26.67	8	26.67
	76-80	3	10.00	2	6.67
<b>2.</b>	<b>Educational Status</b>				
	Illiterate	13	43.33	5	16.67
	Primary level	10	33.33	14	46.67
	Secondary level	4	13.33	733	23.33
	Higher Sec. level & beyond	3	10.33	4	13.33
<b>3.</b>	<b>Type of Family</b>				
	Nuclear family	13	43.33	7	23.33
	Joint family	17	66.67	23	76.67
<b>4.</b>	<b>Occupation</b>				
	Mild worker	3	10.00	3	10.00
	Moderate worker	6	20.00	9	30.00
	Heavy worker	21	70.00	18	60.00
<b>5.</b>	<b>Income</b>				
	Rs.500-1000/-	19	63.33	16	53.33
	Rs.1001-2000/-	6	20.00	6	20.00
	Rs. Above 2001/-	5	16.67	8	26.67

### Section B

**Table 3:** Comparison of pre & post level of pain and functional mobility in experimental group

Experimental Group	Mean	S.D	't' value
<b>Level of Pain</b>			
Pre test	7.83	1.62	t = 22.984***
Post test	4.07	1.93	p = 0.000, S.
<b>Functional Mobility</b>			
Pre test	11.33	4.79	t = -13.883***
Post test	17.70	4.56	p = 0.000, S.

\*\*p<0.01, S – Significant.

The experimental group receives intervention that is isometric exercise for continuous 20 days.

**Table 1:** Schematic representation of Research Design

Groups	Measurement of dependent variable	Manipulation of independent variable	Measurement of dependent variables
	Pre test		Post test
Experimental group	O <sub>1</sub>	X	O <sub>2</sub>
Control group	O <sub>1</sub>	-	O <sub>2</sub>

### Ethical Consideration

The ethical clearance were obtained from ethical committee from my own institution (MTPG & RIHS). Each individual client was informed about the purpose of the study. Informed consent was obtained. No physical or psychological harm was caused. The samples were given freedom to withdraw from the study at any time of the study period.

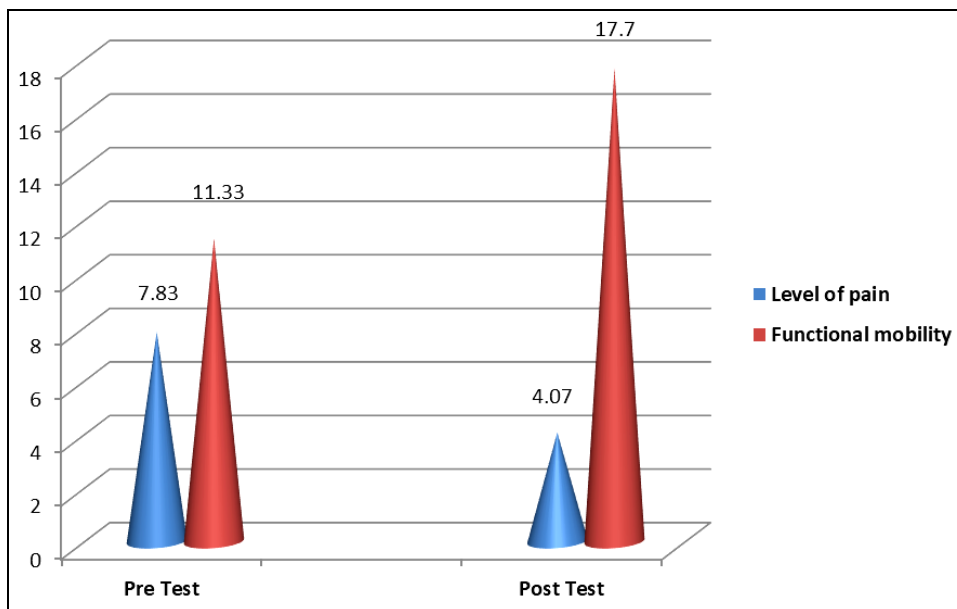


Fig 1: Comparison of pre & post-test level of pain and functional mobility and in experimental group

From the above table, in experimental group, the mean pain score before intervention (7.83) is higher than the mean pain score (4.07) after intervention. The difference observed in mean pain score of pre and post intervention is statistically significant ( $t = 22.984^{***}$ ,  $p = 0.000$ , Significant).

Regarding functional mobility of the experimental group before intervention mean score (11.33) is lower than the mean functional mobility score after intervention (17.70). Statistically there is a significant difference between the mean score of functional mobility after intervention ( $t = -13.38$ ,  $p = 0.000$ , Significant).

**Section C**

Table 4: Correlation of post-test level of pain and functional mobility score in experimental group

Variable	Experimental Group		
	Mean	SD	'r' value
Pain	44.07	1.93	$r = -0.824^{**}$ $P = 0.000$ , S.
Functional mobility	117.70	4.56	

\*\* $p < 0.01$ , S-Significant

Correlation was examined between the level of pain score and functional mobility by Karl Pearson's correlation co-efficient. The obtained 'r' value of level of pain score and functional mobility score was  $r = -0.824^{**}$  in experimental group. When statistically computed there was strong correlation found between the pain score and level of functional mobility. It concludes that, when the pain score reduces, the level of functional mobility will increase.

**Section D**

Table 5: Association of post-test level of pain with the selected demographic variables in the experimental group

Demographic variables	Chi-square value	Level of significance
Age in years	11.892	0.018, S*
Education	7.110	0.311, N.S
Type of family	1.831	0.400, N.S
Occupation	2.697	0.610, N.S
Income	10.909	0.091, N.S.

**Results**

**Demographic Data**

- Major findings of the distribution of demographic variables with the respect to the age in the experimental group majority of sample (33.33%) in the age group of 60-65 years, where in control group (36.67%) were in the age group of 60-65 years.
- Regarding educational level in experimental group 13 samples (43.33%) were illiterate and in control group 14 sample (46.67%) had primary level of education.
- With respect to the type of family in both the groups, majority sample were joint family, in experimental groups 17 sample (66.67%) and in control group 23 samples (76.67%).
- With regard to occupation, in both the groups samples were heavy worker, in experimental group 21 samples (70%) and in control group 18 samples (60%).
- Regarding income in both the group majority samples earning Rs. 500/-1000/- in the experimental group 10 samples (63.33%) and in control group 16 samples (53.33%).

### Pain in Experimental and Control Group

- In pre-test, higher percentage of 14 samples (46.67%) had severe pain in experimental group 12 samples (40%) had moderate pain in control group?
- In post-test, higher percentage of 17 samples (56.67%) had moderate pain in experimental group 13 samples (43.33%) had severe pain in control group?
- Mean pain score of experimental group reduced from 7.83 to 4.07 after the intervention and mean pain score of control group was the 6.57 before intervention and 6.73 after intervention.
- There was significant improvement in the pain reduction of the experimental group compared to the control group after the intervention ( $t = -5.018^{***}$ ,  $p=0.000$ , S).

### Functional Mobility in the Experimental and Control Group

- In pre-test, higher percentage of 17 samples (56.67%) were partially dependent in experimental group and 19 samples (63.33%) were partially dependent in control group.
- In post-test, higher percentage of 20 samples (66.67%) were independent in experimental group and 21 samples (70%) were partially dependent in control group.
- Mean functional mobility score of experimental group after intervention is increased to 17.70 from 11.33 before intervention, where in the control group the pre-test mean score was reduced from 13.17 to 12.93 after 20 days.
- In the experimental group there was significant improvement in the functional mobility after intervention compared to before intervention ( $t=4.208^{***}$ ,  $P=0.000$ , S).

### Conclusion

It is concluded that, the daily activities of experimental group of old age people was increased due to reduction in the degree of pain and improvement in functional mobility based on the impact of Isometric exercises after 20 days. Whereas, the control group without the Isometric exercises did not show any difference in their functional mobility after 20 days. It reveals that, the Isometric exercises are strongly reducing the joint pain and helps to improve the functional mobility among the old age people suffering from joint pain. Hence, the intervention of Isometric exercises is supports the old age people to live a healthier life in the society. Additionally, isometric exercises are helps to build up connective tissues, such as tendons and ligaments, providing extra support and protection for the joints so as the old age people can get the healthier life.

### References

1. Polit Hungler. *Nursing Research Principles & Methods*, 6<sup>th</sup> edition. Philadelphia, Lippincott Publishers, 1999, 277-304.
2. Polit Denise Fand Black. *Nursing Research* 7<sup>th</sup> edition, Philadelphia, Published by Lippincott, 2006, 115.
3. Kothari CR. *Research Methodology Methods and Techniques*, 2<sup>nd</sup> edition, New Delhi; new age International (P) Limited, 2004, 63-68.
4. Sunderlal, Adarsh. Pankaj. *Text book of Community Medicine Preventive and Social Medicine* 2<sup>nd</sup> edition, CBS Publishers & Distributions; New Delhi, Bangalore, Puna (India), 2009, 419-525.
5. Stanhope Marcia & Jeanette Lancaster. *Public Health Nursing*. Missouri: Mosby. 7<sup>th</sup> ed., 2008, 892, 902, 908 & 909.
6. Gupta JP, Sood AK. *Contemporary Public Health*. New Delhi: Apothecaris Publication. 2005; 6:53-56.
7. Gupta Piyush, Ghai OP. "*Text book of Preventive & Social Medicine*". New Delhi: CBS Publishers. 2<sup>nd</sup> Ed., 2007, 320
8. Judith Ann Allender, Barbara Walton Spradley. *Community Health Nursing*. Philadelphia: Lippincott Williams & Wilkins. 6<sup>th</sup> ed., 2005, 642-668.
9. Gulani KK. *Community Health Nursing*, Delhi: Kumar Publishing House., 2008, 453-465.
10. Park JE, Park K. *Text book of preventive and social medicine*. 19<sup>th</sup> ed. Jabalpur; Banarsidas Banot Publication, 2005, 146-152.
11. Krishner, Carolyn. "*Therapeutic Exercise, foundation and Technique*", (4<sup>th</sup> ed), New Delhi, Jaypee Brothers, 2002, 99-104.
12. Alindran M. "Exercise perception for knee Orthrities", *Journal of American Physiotherapy*. 2008; 101:479-481 August.
13. Espen H. "Physical therapy intervention for patients with Osteoarthritis of the knee", *Journal of Physical Therapy*, 2008.
14. Thomas. K.S. "Benefits of exercise in old age people", *Asian Medical Jouraal*, 83; 4 April.
15. Population projections for India and States-1996-2016
16. Situational analysis of elderly in India 2011
17. <http://goliath.ecnext.com/coms2/-gi0099-719>
18. [http://en.wikipedia.org/wiki/Old\\_age](http://en.wikipedia.org/wiki/Old_age)
19. <http://www.who.int/healthinfo/survey/ageingdefnolder/en/index.html>
20. <http://www.allwords.com/word-old+age.html>
21. <http://www.online exercises.com>