

A Study to Assess the Effectiveness of Isometric Exercise on Improved Function Performance among Older Adults with Osteoarthritis at St.Thomas Old Age Home, Poonamalle

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Abstract: Osteoarthritis is the most common musculoskeletal condition affecting the quality of life of older adults. Isometric exercises are a type of strength training exercise which involves 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. Exercising is an effective and enjoyable way for sufferers of osteoarthritis to feel better and to regain a functional lifestyle. Isometric exercise can be effective in reducing pain and improving functional ability of clients with osteoarthritis. Hence a study aimed to assess the effectiveness of isometric exercise on improved function performance among older adults with osteoarthritis. Experimental research design was used with 60 samples who matched the inclusion criteria were selected by using simple random sampling technique. Demographic variables were collected by interview method. The functional performance was assessed by using WOMAC scale. Out of 60 samples, In pre-test 2(3.33%) older adults comes under very severe level of functional performance, 7(11.66%) older adults comes under moderate level of functional performance, 51(85%) older adults comes under severe level of functional performance. In post test, 36(60%) older adults comes under slight level of functional performance, 24(40%) older adults comes under moderate level of functional performance. There is a poor pre-test scoring among 60 samples. The result revealed that isometric exercise is most effective and there is a significant improvement in the functional performance of the older adults with Osteoarthritis. Isometric exercises is the most effective method for improving functional performance

Keywords: Osteoarthritis, Isometric exercise, WOMAC Scale, older adults

1. Introduction

Old age is when a person is near or beyond the usual life expectancy, usually from the age of 60 onwards. Old people will also have a lot of symptoms. For example, healthy bones are critical to senior health. As the body ages, it begins to absorb old bone tissue faster than new bone tissue can be created, thus bones tend to become thinner and weaker. As person grow older the cartilage that serves as shock absorber between bones can no longer sustain the rubbery and become stiff. It also loses its elasticity and becomes damaged. When these cartilages and ligaments wear out. They cause the joint pain (Joint pain is the common most problem of the old age people) (Pekker, 2004). Osteoarthritis is the most common musculoskeletal condition affecting the quality of life of older adults. Strength of the quadriceps musculature is one of the intrinsic factors was affected knee joint function. It is evident that lower extremity strength has a muscle role in knee joint shock attenuation during weight bearing activities, Reduction of pain and disability is the main aim of any treatment approach in the management of knee osteoarthritis. (Shahnawaz-2014). Osteoarthritis (OA) is a slowly progressive non inflammatory disorder of the synovial joints that affect the joint cartilage, synovial and joint capsule and affects around 60% of individuals aged over 50 years. In generally Osteoarthritis affects 9% of men and 18% women over 65 years old. Osteoarthritis is high in India, ranging from 22%-39%. (Paulo June -2013). As

majority of the senior citizens suffers from joint pain which restrains the functional ability like walking, climbing stairs up and down, sitting on the floor, chair and squatting position. Exercise is beneficial for osteoarthritis, Strong leg muscles support the knee and absorb shock before it gets to the knee. Exercising the quad muscles increase circulation in the knee joint and stimulate beneficial biochemical changes in the joint fluid of the knee, improving its lubricating properties. It also improves the range of motion of the knee (Bell & Hinman 2009). Osteoarthritis is a condition in which the cartilage that acts as a cushion between bones in joints being to wear out, causing inflammation and pain in joints, thereby restricting movement. Osteoarthritis is also known as degenerative arthritis or degenerative joint disease. It is estimated that by 2030 the proportion of people with osteoarthritis will rise from 20% to 30% in those aged 60 years or over (Croft, 2005). India is likely to notice an endemic of osteoarthritis with about 80% of the 55 years and above population in the country suffering with wear and tear of joints. 40% of these people are likely to suffer from severe osteoarthritis, which will disable them from daily activities, say the experts quoting the world Health Organization (WHO). Exercise is one of the best method to treat Osteoarthritis. 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 technique 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 simplest technique, which is considered to be appropriate for the low socio – economic status, and easily applicable for the old age people. Exercising is an effective and enjoyable way for sufferers of osteoarthritis to feel better and to regain a functional lifestyle. Isometric exercise can be effective in reducing pain and improving functional ability of clients with osteoarthritis.

2. Objectives

- 1) To assess the pre-test level of functional performance among older adults
- 2) To assess the effectiveness of isometric exercise among older adults
- 3) To assess the post-test level of functional performance among older adults after the isometric exercises
- 4) To associate the post-test level of functional performance among older adults with their selected demographic variables.

3. Materials and Methods

The research approach adopted in the study was quantitative approach by using experimental research design. Formal permission was obtained from the Authority of St. Thomas Old Age Home at Poonamalle, Chennai. The study was conducted at St. Thomas Old Age Home at Poonamalle, Chennai. 60 older adults with osteoarthritis were selected by using simple random sampling technique-lottery method. After the sample selection, informed consent was obtained from each sample. Demographic variables consists of age group, gender, marital status, educational status, type of family, income, BMI, diet and use of drugs. Demographic variables were collected by interview method followed by assessing the physical function by using WOMAC Scale. Isometric exercises were taught to the patients, the program session was twice daily for duration of 30 minutes. After 4 weeks, assessed (post-test) the level of functional performance with the same WOMAC scale. The data was analyzed by using descriptive and inferential statistics.

4. Result and Discussion

Table – I Shows that out of 60 samples 29(48.33%) belongs to the age group of 60-69years. Regarding gender 60(100%) samples were males. Regarding marital status 42(70%) samples were married. Regarding type of family 38(63.33%) samples belongs to nuclear family. Regarding educational status 29(48.33%) samples were come under high school. Regarding income 41(68.33%) samples were come under <10,000. Regarding BMI 24(40%) samples come under 19-24. Regarding diet 41(68.33%) samples consumes non-vegetarian. Regarding use of drugs 33(55%) samples were using anti-hypertensive drugs.

Table –II shows frequency and percentage distribution of pre & post test level of functional performance among older adults with osteoarthritis. In pre-test, the data revealed that 7(11.66%) older adults comes under moderate level of

functional performance, 51(85%) older adults comes under severe level of functional performance, 2(3.33%) older adults comes under very severe level of functional performance. In post-test, the data revealed that 36(60%) older adults comes under slight level of functional performance, 24(40%) older adults comes under moderate level of functional performance.

Table- III Reveals that, the post –test mean value is lower than pre-test. The paired ‘t’ value found statistically significant, and it shows that isometric exercise is effective on improving functional performance among older adults with osteoarthritis

5. Discussion

Table I: Frequency and Distribution of the Demographic Variables among older adults with Osteoarthritis

S. No	Demographic Variables	Frequency (N)	Percentage (%)
1.	Age Group		
	a) 50-59 Years	12	20%
	b) 60-69 Years	29	48.33%
	c) 70 Years and above	19	31.66%
2.	Gender		
	a) Male	60	100%
	b) Female	0	0%
3.	Marital Status		
	a) Married	42	70%
	b) Unmarried	18	30%
4.	Type of Family		
	a) Joint family	22	36.66%
	b) Nuclear family	38	63.33%
5.	Educational Status		
	a) Elementary school	19	31.66%
	b) High school	29	48.33%
	c) Graduate	12	20%
6.	Income		
	a) <10,000	41	68.33%
	b) 11,000-20,000	16	26.66%
	c) >21,000	3	5%
7.	BMI		
	a) <18	19	31.66%
	b) 19-24	24	40%
	c) 25-29	17	28.33%
8.	Diet		
	a) Vegetarian	19	31.66%
	b) Non-vegetarian	41	68.33%
9.	Use of Drugs		
	a) Anti-diabetic	10	16.66%
	b) Anti-hypertensive	33	55%
	c) Osteoarthritis	17	28.33%

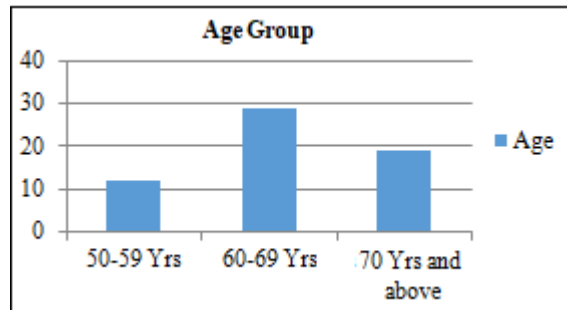
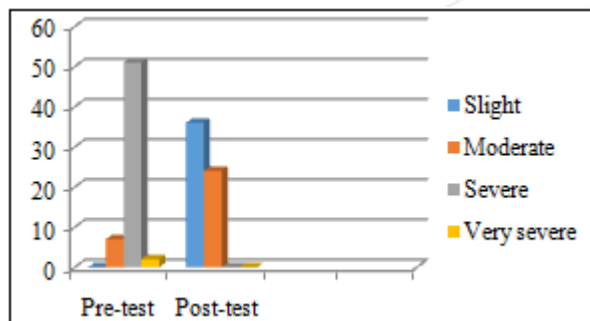
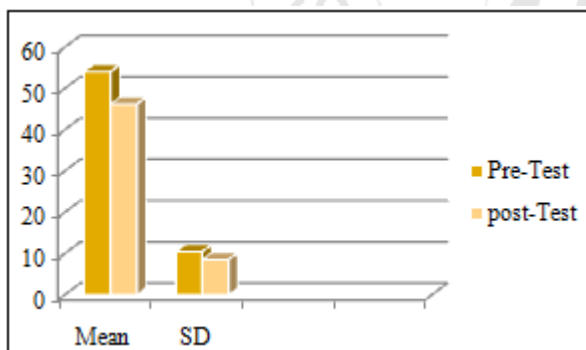
Table II: Frequency and percentage distribution of pre & post-test level of functional performance among older adults with osteoarthritis

Level of Functional Performance	Experimental Group			
	Pre-Test		Post-Test	
Scoring	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Slight	-	-	36	60%
Moderate	7	11.66%	24	40%
Severe	51	85%	-	-
Very Severe	2	3.33%	-	-
TOTAL	60	100%	60	100%

Table III: Mean and standard deviation of the effectiveness of isometric exercise

Isometric Exercise	Pre-Test	Post-Test	Paired 't' Value
Mean	54.1	46.2	12.95
Standard Deviation	10.48	8.55	

Graphical Representation Showing the Frequency Distribution of Demographic Variable

**Figure I A****Figure II:** Frequency and percentage distribution of pre & post-test level of functional performance among older adults with osteoarthritis**Figure III:** Mean and standard deviation of the effectiveness of isometric exercise.

References

- [1] Black joyce m. &jane Hokanson Hawks. (2005). medical surgical Nursing (7th edition) Published by W.B.Saunders company .
- [2] Brunner & suddarath.(2004). Text book of medical surgical nursing (11th edition). Published by Lippincott williams and Wilkins.
- [3] Bryant .G.(2003).Modalities for mobilization orthopedic Nursing , (2nd edition) . Published by Saunders publications.
- [4] American Geriatrics society panel on Exercise and osteoarthritis (2001) Exercise for older adults with

osteoarthritis pain ; Consensus Practice recommendations . Journals of the American geriatrics society , 49(6) 808 -823 .

- [5] Roddy, E.(2005) .Evidence –based recommendations for role of exercise in the management of osteoarthritis of the hip or knee the MOVE consensus. Rheumatology, 44 67-73.
- [6] Roddy, E.Zhang W., & Doherty , (2005).Aerobic walking or strengthening exercise for osteoarthritis of knee ? Annals of the Rheumatic Disease : 64 : 544-548
- [7] Topd , R , woolley . S ,Hornyak ,J, Khuder S , KAHALEH B .. (2003) . The effect of dynamic versus isometric resistance on pain and functioning among adults with osteoarthritis of the knee. Arch Phys Med Rehabil 83 : 1187 -1197 .
- [8] Hurley MV, ScottDL, Ress Jet.al . sensorimotor change and functional performance in patients with Knee osteoarthritis ,Annals of Rheumatic Diseases 1993;52(3) 258- 62 .
- [9] MC Alindon TE, Cooper c, Kirwan JR et .al determinants of disability in osteoarthritis of the knee . Annals of Rheumatic Diseases 1993;52(3); 258-62.
- [10]Norden DK , Leventhal A, schumacher RH. Prescribing exercise for osteoarthritis of the knee.Journal of musculoskeletal medicine 1994;11:1421.
- [11]Petrella RJ, Bartha C. Isometric exercise therapy for older patients with knee osteoarthritis. Journals of Rheumatology 200;27:2215-21.
- [12]Frasen M , MC connell s, Bellm Therapeutic exercise for people with osteoarthritis of the hip or knee; The Journals of Rheumatology 2002;1737-45.
- [13]Slemenda c , Brandt KD, Helman DK et al. Quadriceps weakness and osteoarthritis of the knee.Annals of internal medicine 1997;127;97104.
- [14]Zhang W, MOSKOWITZ RW, Nuki.G OARSI recommendations for the management of hip and knee osteoarthritis, osteoarthritis cartilage 2007;15(7);981-1000.
- [15]Osteoarthritis Research Study International. Quality of life in osteoarthritis clients. 2003; 2(6): 48-52.

Net Reference

- [16]<http://www.elsevier.com>.
- [17]<http://www.arthritisday.org.com>.
- [18]<http://www.anals.org/content>.
- [19]<http://www.kneeservices.com>.
- [20]<http://www.olderdageelfare.com>
- [21]<http://www.online excrises.com>.
- [22]<http://www.nursemanage.com>
- [23]<http://www.arthritis.com>.
- [24]<http://www.Healio.com/orthopaedics>.
- [25]<http://www.studyforarthritis.com>.