A QUASI EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF ISOMETRIC EXERCISES ON KNEE PAIN PERCEPTION AND FUNCTIONAL IMMOBILITY AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITI IN SELECTED OLD AGE HOME AT TRICHY DISTRICT.

A DISSERTATION SUBMITTED TO

THE TAMIL NADU DR.M.G.R MEDICAL UNIVERSITY

CHENNAI.

IN PARTAL FULFILLMENT OF THE REQUIEMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

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MRS. JULI AROKYA MARY.S

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OCTOBER 2018

CERTIFIED BONAFIDE WORK DONE BY

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

1) _____ **2) _____**

CERTIFICATE

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College seal : _____

A QUASI EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF ISOMETRIC EXERCISES ON KNEE PAIN PERCEPTION AND FUNCTIONAL IMMOBILITY AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITI IN SELECTED OLD AGE HOMES AT TRICHY DISTRICT.

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This is to certify that the dissertation entitled "**A quasi experimental Study To Assess The Effectiveness of Isometric Exercises on knee Pain Perception and Functional Immobility among the old Age People With Knee Osteoarthritis In Selected Old Age Home At Trichy District"** is a bonafide research work done by **Mrs. Juli Arockya Mary.S.** in partial fulfillment of the requirement for the degree of Master of Science in Nursing (Medical And Surgical Nursing).

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ABSTRACT

A study was conducted. A quasi experimental study to assess the effectiveness of isometric exercise on knee pain and functional mobility among the old age people with knee osteoarthritis in selected old age home at Trichy District. It was conducted by **Mrs. Julie Arokya Mary.S.** as a partial fulfilment of the requirement for the degree of Master of science in Medical and Surgical Nursing department to the Tamilnadu Dr. M.G.R Medical University, Chennai during the year of 2016- 2018

The objectives of the study are... 1) To assess the pre and posttest level of knee pain and functional immobility among the of old age people with knee osteoarthritis in Experimental group and Control group. 2) To evaluate the effectiveness of isometric exercise on knee pain and functional immobility among the old age people with knee osteoarthritis Experimental group and Control group. 4) To correlate the level of knee pain and functional immobility among the old age people with knee osteoarthritis in Experimental group and Control group. 5) To find out the association between the levels of pain among the old age people with their selected demographic variables in the Experimental group and Control group.

And the hypothesis:H_1- The mean posttest level of knee pain score is significantly lower than the mean pretest level of knee pain score among the old age people with knee osteoarthritis in an experimental group**.**H_2 – The mean posttest level of functional immobility is significantly higher than the mean posttest level of functional immobility score among the old age people with knee osteoarthritis in an experimental group.H_3-- There will be a significant association between the posttest level of knee pain among old age people with knee osteoarthritis selected demographic variables in the control and experimental group.H_4 - There will be a significant

association between the posttest level functional mobility among the old age people with knee osteoarthritis in selected demographic variables in the control and experimental group

A qualitative evaluative approach with non-equivalent control group pretest and posttest design were used. The non-probability purposive sampling technique with 60 samples were selected. 30 for experimental group and 30 for control group were assigned.

The data regarding the demographic variables and with the use of '10' point numerical pain the knee pain level data was collected and with the use of WOMAC scale the functional immobility data has assessed for the experimental group and control group. The investigator should give the isometric exercise only for the experimental group for 15 days twice a day no intervention to the control group.

The findings revealed that in the experimental group, 25(83.3%) had severe level of knee pain, 3(10%) had worst level of knee pain and 2(6.7%) had 6.7% level of knee pain in the pre-test whereas in the post test after the intervention, 25(83.3%) had moderate level of knee pain, 3(10%) had mild level of knee pain and 2(6.7%) had no pain.

The findings also depicts that in the control group, 25(83.3%) had severe level of knee pain, 3(10%) had worst level of knee pain and 2(6.7%) had 6.7% level of knee pain whereas in the post test, 28(93.3%) had severe knee pain and 2(6.7%) had worst pain.

The findings revealed that in the experimental group, 28(93.3%) were fully dependent and 2(6.7%) were partially dependent in the pre-test, whereas in the post after the intervention, 15(50%) were partially dependent, 12(40%) were dependent and 3(10%) were fully independent.

The findings also portrays that in the **control group**, 28(93.3%) were fully dependent and 2(6.7%) were partially dependent in the pre-test, whereas in the post, 28(93.3%) were fully dependent and 2(6.7%) were partially dependent.

The administration of isometric exercise on knee pain was found to be effective in reducing the level of pain and improvement in functional immobility among old age people with knee osteoarthritis in the experimental group than the control group who had undergone normal hospital routine measures.

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INTRODUCTION

CHAPTER I

INTRODUCTION

"A human rights convention that would specifically protect older Persons from the diseases".

- (United Nations, 2011)

Background of the Study:

Old age refers to ages nearing or surpassing the life expectancy of human beings, and is thus the end of the human life cycle. Terms and euphemisms include old people (worldwide usage), seniors (American usage), older adults in the social science the elderly, and elders (in many cultures- including the cultures of aboriginal people).old people often have limited regenerative abilities and re more susceptible to disease, syndromes, injuries and sickness than younger adult. The word arthritis means inflammation (swelling) of a joint. Osteoarthritis, also known as "wear and tear" arthritis and is the most common type of arthritis.

* The organic process of ageing is called **Senescence**.
* The medical study of the ageing process is called **Gerontology.**
* The study of diseases that afflict the elderly is called **Geriatrics.**
* The elderly also" face other social issues around retirement, loneliness, and ageism

Osteoarthritis is most common among adult over 65 years of age but people of any age can develop the disease. Prevalence rises significantly after the age of 50 in men and after the age of 40 in women. 70 percent of people over 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.

Although exercise is recommended for anyone, osteoarthritis exercises are intended to maintain and build muscle strength without aggravating the body in those suffering from the disease. Physiotherapy involves a safe, gradual program designed to increase mobility while, at the same time reducing pain. Osteoarthritis physical therapy can be extremely beneficial and with increased endurance and the build-up of muscle tissue, and activities of the old age people. Regular physical activity is crucial when dealing with arthritis as it was help to increase both muscle and bone strength while increasing flexibility and decreasing fatigue, another common symptom of osteoarthritis. Both isotonic and isometrics are considered to be strengthening exercises those who are affecting with knee pain with osteoarthritis especially old age people.

Knee osteoarthritis is the leading cause of chronic disability mainly affecting the elderly population may appear as early as 35 years of age. It is characterized by a range of disorders of clinical and pathological outcome resulting in structural and functional abnormalities and reduced functional performance abilities.

Dillon et al., (2017): It has been estimated that over 27 million persons in the United States have osteoarthritis in one or both joints. Symptomatic Knee osteoarthritis alone affects 12% of Americans adults, making it one of the most frequent causes of physical disability and pain among older persons. Such persons offer report difficulty with daily activities such as walking, climbing stairs, shopping and standing up from a seated position due to knee pain, weakness or disability

Indian journal of orthopedics, (2016): Epidemiology of knee osteoarthritis in India and related factors is a community based cross sectional study was done to find

out the prevalence of primary knee OA in India which has a population of 1.252 billion. The study was done across five states in India. Each states was further divided into big city, small city, town, and village. The total sample size was 5000 subjects. Tools consisted of a structured questionnaire and plain ski grams for confirmation of Osteoarthritis. Diagnosis was done using Kellgren and Lawrence scale for osteoarthritis. Overall prevalence of knee Osteoarthritis was found to be 28.7%. The associated factors were found to be female gender (prevalence of 31.6%), obesity, age and sedentary work.

Prof.Hemavathy (Tamilnadhu 2016): Osteoarthritis is a type of joint disease that results from breakdown of joint cartilage and underlying bone mostly affecting middle-age to elderly people. The joints most commonly affected are the hips, knees, hands and spine and great toes. According to the Arthritis Foundation, more than 27 million people in the U.S. have osteoarthritis, with the knee being one of the most commonly affected areas. In India Osteoarthritis affects over 15 million people every year. The overall incidence of knee osteoarthritis is approximately 200 per 100,000 person- years. However the incidence of knee osteoarthritis after age 50 is thrice as greater in woman as in men.

Yolanda Smith, (2016) Osteoarthritis is a degenerative joint disease that involves the degradation of joints, articular cartilage and subchondral bone as a result of mechanical stress on the area. The word osteoarthritis is derived from Greek word **"Osteo"** which means **"of the bone",** "**arthr"** which means **"joint", "It is"** means **inflammation**. The risk of osteoarthritis increases with higher body mass index adds ratio of 3.12 at $p<0.01$ overweight is a risk factor for osteoarthritis.

S.Srinivasan,T.M.Jeyasree, et al., (2015): stated that, in India, the prevalence of osteoarthritis in older adults more than 65 years of age was 32.6% in the rural

population rate and 60.3% in the urban population rate.40% of cases are suffered with knee osteoarthritis

Ganapathyswamy, (2015): Worldwide prevalence of osteoarthritis was 20 % for men and 41% for women and it causes pain and dysfunction in 20% of the elderly. In India osteoarthritis is the 2nd most common disorder and has a prevalence rate of 22 to 39 %. Osteoarthritis of the knee typically affects women more than men and prevalence rate between 10-15% at age 35 and 35-45% at age 65 years.

American Academy of Orthopedic (2014): Osteoarthritis is the most common form of arthritis in the knee. It is a degenerative, "wear and tear" type of arthritis that occurs most often in people 50 years of age and older, but may occur in younger people too. In osteoarthritis, the cartilage in the joint gradually wears away. As the cartilage wears away, it becomes frayed and rough, and the protective space between the bone decreases. This can result in bone rubbing and produce painful bone. It is evident that lower extremity strength has a muscle role in knee joint shock attenuation during weight bearing2activities, Reduction of pain and disability is the main aim of any treatment approach in the management of knee osteoarthritis.

Paulo June –(2013): 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%.

William (2013): The prevalence of Osteoarthritis increases with age. In those under age 45, about one-fifth have Osteoarthritis of the hands, while for those aged 75 to 79 years, 85% have Osteoarthritis of the hands. Osteoarthritis of the knee occurs in less than 0.1% of those aged 25 to 34 years, but in 10% to 20% of those aged 65 to

74 years. The overall incidence of hip or knee Osteoarthritis is approximately 200 per 100,000 person- years. The incidence of hip Osteoarthritis is greater in women than in men, whereas the rate for knee Osteoarthritis is similar between genders. In men, rates of knee and hip Osteoarthritis increase with age, but in women rates remain stable. Based on these population data, one-half million symptomatic cases of idiopathic Osteoarthritis are estimated to occur annually in the U.S.

The reason behind the onset of this endemic is said to be increasing longevity of Indians. By 2020 the number of 65+ population in India is likely to be about 177 million, where as India had 100 million people in this age group in 2010. Osteoarthritis, which is the most prevalent form of arthritis and the leading cause of disability in India affects over 15 million Indians each year. About 20 years ago, osteoarthritis was known as a disease of the elderly affecting those above the age of 65 years. However, Ortho pedicians are increasingly diagnosing younger people in the age group of 35 55.

Zhangand Ashraf (2012): Osteoarthritis is one of the major causes of impaired function that reduce quality of life. More than 50% of people over 65 years of age have evidence of osteoarthritis. The pain and disability associated with osteoarthritis affects approximately 10% of men and 18% of women over60 years of age have evidence of osteoarthritis. The incidence and prevalence of osteoarthritis was continue to rise as the population ages unless measures are taken to improve disease prevention.

Chaitow (2011): Exercise is one of the most non pharmacological management strategies for osteoarthritis of the knee. Health care providers and Patients share varied and often pseudoscientific beliefs regarding the effects of exercise on knee osteoarthritis formulated on outdated notion of the etiology, pathophysiology, and progression of the condition. Based on the literature, regular exercise should moderate physical activity have both preventive and therapeutic benefits for individuals with knee

osteoarthritis Exercise regimens with strong evidence of benefit include those that focus on aerobic/cardiovascular conditioning and lower extremity strength training. Through the isometric exercise the functional immobility will reduce. So that, the old age people can do their daily activities normally.

NEED FOR THE STUDY

"Old age people are like the tones of knowledge and experience in your basket but their suggestion not fit for this generation ".

(Hendry Donald)

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. 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. 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 equipment's, 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 to reduce the joint pain and improve the functional mobility.

In National Institute of Health published in "Arthritis", April 2008:

The number of people with osteoarthritis is expected to increase significantly in the next two decades. Osteoarthritis affects the ADLs and increases the risk of depression, which in itself has an additive impact.

The researchers suggested that isometric exercise only reduces the pain and improves the physical mobility of osteoarthritis patients but also a catalyst in improving mood and outlook. By being proactive with exercise, an Osteoarthritis patient may feel that he is not passively allowing the disease to overtake his life. Exercise also released endorphins, the body's natural feel good hormones that attach the receptors in the brain and create a feeling of wellbeing.

By reviewing the prevalence of osteoarthritis and effect of isometric exercise in reducing pain, decrease the disabilities and improving the activities of daily living of osteoarthritis, influencing the investigator to select the isometric exercise to reduce the pain and improve the comfort level in daily activities of osteoarthritis patients.

In India reported that the prevalence: According to **WHO** report on global burden of disease is Osteoarthritis, because it is eight most important cause of disability in men and the fourth most important cause of disability in women. There are three types of basic therapeutic exercise is there Isometric exercise, Isotonic exercise, Isokinetic exercise of these three isometric exercise might be the most appropriate and easily and safety by the patients and can be easily and safely performed at home because it requires no or minimal apparatus.

Lanfeng Huang Bin Guo (2017) International journal of rheumatic diseases:

A study to investigate the effects of isometric exercise method in the treatment of knee osteoarthritis .the patient were randomly divided into an exercise treatment test group 128 patients, control group 122 patients. Isometric exercise is used to test group were as isometric exercise were used to control group. Knee pain was evaluated with visual analogue scale, functional mobility was evaluated with WOMAC index scale. Questionnaires showed significant relief in pain in one month after treatment in the test group but no relief in the control group. And joint function improvement in the experimental group but significant improvement in the control group

A recent British study in the journal arthritis & rheumatism (2017): They found that nearly two –thirds of women aged 50 and over experienced persistent, incident, or intermittent knee pain.in that the knee osteoarthritis is an illness and a disease condition that is diagnosed by a clinical. Osteoarthritis commonly affects middle age to elderly population.it occurs in the entire joint, involving not only the joint

lining but also cartilage, ligaments and bone. The treatment option for the knee osteoarthritis is pharmacological and non-pharmacological strategies particularly exercise are recommended by clinical guidelines.

Suresh kumar (2014): A study was conducted on activity modification in 162 patients with osteoarthritis knee at Chittagong Medical College, Bangladesh. Out of them, 96(59.3%) were male and 66 (40.7%) were female and male: female ratio was 1: 0.68. The mean age of the patients was 53.7±11.3 years. The cross sectional study patients were divided into two groups. The Group A was treated with shortwave diathermy, exercise, naproxen and activity modification and the Group B was treated with isometric exercise. Improvement was found more in Group A than Group B after 4th week (95 % CI was -2.59 to 6.56). Then it was found that the improvement was gradually increased in Group A than Group B and finally, it was found that there was highly significant improvement in Group A than Group B after 6th week (95 % CI was -3.45 to -0.70).

National Journal of Medical Research, (2014): A cross sectional study was conducted on variables associated with knee Osteoarthritis in a Tertiary Care Hospital of Tamil Nadhu. It was done in 3 private hospitals of Tamil Nadhu. Total 135 patients interviewed after taking informed written consent. Questions pertaining to their physical activities, symptoms experienced, and postures were asked. Maximum numbers of patients were from age group of 61 to 70 years. Body Mass Index was an important correlates of Osteoarthritis as 79 (58.52%) patients were obese. It was observed that Osteoarthritis patients were using Squatting and Cross legged positions in day today activities like Job work, Food Preparation, Sweeping and Moping. Most common symptom was Usage related pain (42.22%) and persistent pain (27.41%). Most common sign was crepitus and it was followed by bony enlargement.

Indian academy of arthritis (2013): In the present study 362 elderly of more than 65 years were interviewed and assessed clinically. The examinations were conducted in 1882 houses comparing of 7937 persons. The study revealed that the majority (66.6%) of elderly belonged to age group 65-74 years, about 6.6% were aged greater than 85 years. 5 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 and reduce pain an old age people. When the mobility increases, intensity of joint pain decreases. The isometric exercises does not take much time, requires no special equipment's, 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.

Internet Journal of Rheumatology and Clinical Immunology, (2013): A study was conducted on Prevalence of knee osteoarthritis in rural areas of Bangalore urban district. The mean age of the population was 42.56 ±16.5 years. The corresponding prevalence of osteoarthritis calculated using the ACR and the EULAR 2009 criteria were 17% and 5.6% in the adult population and 54.1% and 16.4% in the elderly. The etiological factors found to be associated with osteoarthritis are age, poor education, previous knee injury, and regular climbing of stairs**.**

Geater AF et al., (2013): A study was conducted a population based survey to estimate the prevalence of osteoarthritis in relation to the positions used by the clients, 288women and 288 men with the age of over 40 years from Southern Thailand have been studied in association with three common positions in floor activities in squatting position, side knee bending and kneeling. The activities were recorded and multinomial logistic regression analysis was used. The results showed that squatting and side lying

positions had increased the relative risk of moderate to severe knee Pain among osteoarthritis patients rubbing and produce painful bone

Zhang et al. (2013): He found that in knee osteoarthritis patients, 4 weeks of dynamic and isometric exercises 4 times per week led to a reduction in these inflammatory chemicals in the knee joint synovial fluid. Thus, research suggests that regular moderate intensity exercise may actually have an anti-inflammatory effect, positively reducing the deleterious consequences of osteoarthritis**.**

Wafser.M (2013) did a review by using meta-analysis to identify the risk of osteoarthritis associating with occurrence of fracture among Belgium residents, totally 1233 patients were involved in this study among that 75% of patients had fracture associated with osteoarthritis (n=989), and they feel difficulty for the joint flexion in the early stages, moreover four relevant epidemic studies also showed a correlation between osteoarthritis of the knee joint and knee flexion under16physiological stresses leads to degeneration of osteophytes and early onset of tibia femoral osteoarthritis in the elderly

Vijay Batra, (2011): Knee osteoarthritis results in structural functional abnormalities and reduced functional performance abilities. National Prevalence rate estimated in India, Thailand, Malaysia, Shanghai and Philippines is approximately 13.2, 12.5, 9.3, and 10. 9 and 5percentage approximately. The male female ratio was 2.7%, 6%, 9.4%, 10.9% and 8.5%, 12.3% for the Chinese, Malaysians and Indians respectively.

Mounch'A'. et.al., (2011) conducted a comparative study to estimate the relationship between osteoarthritis with body weight in 182 Moroccan samples.15 Interviews were conducted and information were obtained from 95% cases with osteoarthritis and controls taken from general population.

Bark.K., (2011) conducted a descriptive study to determine the health concerns of men with osteoarthritis of knee. A group of 104 men with a clinical diagnosis of osteoarthritis from Missouri Hospital were selected by convenient sampling technique. Arthritis impact measurement scale was used. The men had more concerned about pain, walking, bending, and stairs climbing. They predicted that in the next 10 years arthritis would be a major health problems, so the interventions should focus on strategies to deal with pain and decrease mobility.

STATEMENT OF THE PROBLEM

A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain perception and functional immobility among the old age people with knee osteoarthritis in selected old age home at Trichy District.

OBJECTIVES OF THE STUDY

I. To assess the pre and posttest level of knee pain and functional immobility among the of old age people with knee osteoarthritis in experimental group and control group.

II. To evaluate the effectiveness of isometric exercise on knee pain and functional immobility among the old age people with knee osteoarthritis in experimental group and control group

III. To correlate the level of knee pain and functional immobility among the old age people with knee osteoarthritis in Experimental group and Control group

IV. To find out the association between the levels of knee pain and functional immobility among the old age people with their selected demographic variables in the experimental group and control group.

HYPOTHESIS:

H_1- The mean posttest level of knee pain score is significantly lower than the mean pretest level of knee pain score among the old age people with knee osteoarthritis in an experimental group.

H_2 – The mean posttest level of functional immobility is significantly higher than the mean posttest level of functional immobility score among the old age people with knee osteoarthritis in an experimental group.

H_3-- There will be a significant association between the posttest level of knee pain among old age people with knee osteoarthritis selected demographic variables in the experimental group and control group.

H_4 - There will be a significant association between the posttest level functional immobility among the old age people with knee osteoarthritis in selected demographic variables in the experimental group and control group.

OPERATIONAL DEFINITION:

ASSESS:

In this study it refers to a process of systematically and continuously, Collecting and validating the data regarding level of knee pain and effectiveness of Isometric exercise on level of pain among osteoarthritis patients age group between the 55-75 years.

EFFECTIVENESS

The degree to which something is successful in producing a desired result or success.

In this study effectiveness refers to the extent to which the isometric exercise achieve the desired result among old age people with osteoarthritis in improving knee pain perception and it measured by Numerical Pain Intensity Rating Scale.

KNEE PAIN:

Pain in the knee. It can originate in any of the bony structures compromising the knee joint

In this study an unpleasant bodily sensation experienced by a person which is self-reported and measured using Numerical Pain Intensity Scale.

FUNCTIONAL IMMOBILITY

Functional immobility describes a person's inability to move around in his or her environment.

In this study the old age people can able to move freely and do the daily activities are... (E.g. walking, sitting on the floor and standing from the floor, lifting, and washing, climbing the stairs etc. which are measurable and reportable).

In this study the functional immobility is assessing By using modified Western Ontarian Mc-Master Index Scale (**WOMAC SCALE)**

ISOMETRIC EXERCISE:

Isometric exercise is a system of exercise to strengthen specific muscles of the body by pushing parts of the body.

In this study the isometric exercises are….

I) .Straight Leg Raising (SLR):

A) In supine position: The patients are advised to lift the legs individually 4-6 Inches away from the floor and bring back to the floor after 5 seconds. This exercise 8 will be advised to continuous five repetitions for each legs followed with two times a day.

B) In high sitting position: The patients are advised to lift the straighten legs Individually in high sitting position to be equal to hip level for a seconds and bring back to the same position to be continued 5 times for each leg and follow for two times a day.

II. Step up and step down exercise:

- Advice the patient to step up and step down for 10 times and followed for 2 times a day.

III. Wall slide exercise:

- Advised the patient to stand against the wall with back and slowly slide
- Down the wall with the 75- 90° bending of the knee and hold this position for 5 seconds. Then ask to stand up and rest for 5 seconds.
- Repeat it continuously for 10
- Times and followed for 2 times a day.

IV. Hip adduction exercise:

- Advised the patient to lie flat or sit with leg straight. Place a inch roll under
- Knee, allowing the knee to be bend. Tighten the muscle in front of knee as much as possible & and lift the heel off the floor.
- Hold this position for 10 seconds.
- Total duration of isometric exercise will be 30 minutes per time for two times a day subsequently for the period of 7 days.

v) Isometric minisquats exercise:

- Advise The Patient To Use The Chair and Squat Down Bending Both The Knees
- Advise The Patient Keeping The Back Straight.
- Repeat The Procedure Up To 10 Times.

OLD AGE PEOPLE:

Old age people consist of ages nearing or surpassing the average life span of human beings, and thus the end of human life cycle .Old people have limited regenerative abilities and are more prone to disease, syndromes, and sickness than other adults. Hence they require specific care and skilled support.

In this study, the old age peoples are with the age group of 55-75 years with knee pain and functional immobility.

KNEE OSTEOARTHRITIS:

Osteoarthritis is a degenerative disease, involving all the joints in old age carrying joint pain and swelling which restricts the joint movements.

OLD AGE HOME:

Old age home is a multi-residence housing facility intended for senior citizens .Typically each person or couple in the home has a separate rooms. Additional facilities are provided within the building, including facilities for meals, gathering, recreation, and some form of health or hospice care.

Inn this study I have selected at the old age home for the pilot study sree sai old home Trichy, and Annaikum Karankal old age home at Trichy for the main study.

ASSUMPTION:

This study assumes that,

- Isometric exercise is an easy and executable method for treating knee pain in all old age people with knee osteoarthritis
- Isometric exercise is considered as a safe and effective intervention for reducing pain among old age people with knee osteoarthritis age people.
- Isometric exercise will improve the functional ability of the old people with knee osteoarthritis.
- Isometric exercise will help to improve the old age people to do their daily activities without any struggle
- Isometric exercise causes the least intra-articular inflammation pressure and bone destruction.

DELIMITATION:

The study was limited to

- Who have a knee pain with functional immobility
- Age group between 55 to 75 years.
- Both male and female can be selected.
- Unilateral and bilateral knee pain with knee osteoarthritis
- Data collection period of 6 weeks.
- Who are willing to participate in the study?

PROJECTED OUTCOME:

This study will be able to assess the effectiveness of isometric exercise on knee pain perception and functional immobility among the old age people with knee osteoarthritis at selected old age home at Trichy.

CHAPTER II

REVIEW OF LITERATURE

REVIEWS OF LITERATURE

"A literature review involves the systematic identification, location, scrutiny and summary of written materials that contain information on a research problem"

- (Poilte and Beck, 2010)

"The review of literature in the research report is a summary of current knowledge about a particular practice problem and includes what is known and not known about the problem. The literature is reviewed to summarize knowledge for practices or to provide a basis for conducting a study". **- (Burns, 1997)**

Osteoarthritis treatment have more successful at decreasing pain rather than disability. Many of the factors that lead to disability can be improved with isometric exercise. Exercise, both aerobic and strength training, have been examined as treatments for knee osteoarthritis, with considerable variability in the results. A majority of the studies had positive effect on pain and or disability.

Isometric exercise is one of the best method to treat knee osteoarthritis from the literature Review it is quite evident that isometric exercise are beneficial to improve the functional mobility of the joints in old age people when the mobility increases the intensity of joint pain will reduces. There are different techniques in caring to the Isometric Exercise does not take much time, requires no special equipment's, except a comfortable place to do the exercise. 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

This chapter deals with the information collected in relation to the present study through published and published materials, which provided the foundation to carry out this study.

In the present study the review of literature is organized and present as follows:

- **SECTION A** - Studies related to knee pain with osteoarthritis in old age people.
- **SECTION** B - Studies related to Isometric exercise for knee pain with osteoarthritis.
- **SECTION C -** Studies related to functional immobility with knee pain osteoarthritis.

SECTION-A

Studies related to knee pain with Osteoarthritis in old age people:

Deepak D Chitragar (2017): a study was conducted to evaluate the variables associated with knee pain osteoarthritis in a tertiary care hospital of Tamil nahdu. The study was cross sectional study totally 135 patients were included in this study. The study result revealed that age group of 60 to 70 years is the most common age group for Osteoarthritis of knee pain. Study also shows predominance of female gender. Over weight and obesity are one of the most common risk factors. Patients using Indian styles toilets, having squatting crossed leg position and bending position in day to day activities are more commonly affected. Most common sign is crepitus and it was followed by bony enlargement. The study results shows that, those who are overweight they are affecting more (89.3%).Than males females are more affecting with their desirable factors affecting(91.4%).

Nicola Veroonese, MD et.al (2016): The study to assess the pain related with osteoarthritis with cross- sectional analysis study in community setting in North America. The subjects were 1,775 older men and women with osteoarthritis. Pain was ascertained according to medical records. The prospective analysis of 1,152 no osteoarthritis subjects at baseline demonstrated that 19.9% developed the condition of

being weak and delicate because of osteoarthritis. The baseline prevalence of osteoarthritis related pain in knee joint 28%. The overall prevalence of being weak and delicate at baseline was for women 14.5% and for men 11.7%. The conclusion for this study is women's are more prone to get the knee osteoarthritis than males

Mohadshadab et al., (2014): A study was done to assess the knee osteoarthritis pain at the NIUM hospital Bangalore. Total of 507 patients were participated. The cross sectional study design is Pre-designed and pre tested semi structured schedule was used to estimate the prevalence of osteoarthritis. The result revealed that overall prevalence of knee osteoarthritis in this study population was 83.23% and prevalence are common in females was higher in comparison to males. Maximum patients were of grade II 207 (40.82%) followed by 130 (25.64%) in grade I, 80 (15.78%) in grade III and 5(0.99%) patients in grade IV. Female predisposition was seen. The risk factors of this disease are advancing age, obesity and low socio economic status.

S.Srinivasan, T.M. Jeyasree, et al., (2015): she did a community based cross sectional survey in primary health center of Bhwanagir, cuddalore health unit district, to find out the prevalence of osteoarthritis of the knee joint among elderly population in rural area with selected socio-demographic variables. Totally 468 persons were participated in the study, among them 191 were males, 277 were females. The 14 researcher used the elderly population above 60 years in rural area using ACR (American College of Rheumatology) clinical criteria to diagnose osteoarthritis was 39% found to be independent risk factors for osteoarthritis knee. From the result of the study as the population of India is increasing, the number of elderly is going to increase resulting in higher magnitude of burden of osteoarthritis.

David.T.Felson., (2015) : A Study was conducted a population based study, to estimate the prevalence and severity of osteoarthritis among 1637 persons of age group of 65-74years in the rural areas of Puvaneswar. By systemic random sampling technique they have selected a list of houses. The data was collected by house to house survey on as pre designed and pretested format. Osteoarthritis was considered as if an elderly was suffering from pain, swelling and limitation of movement of larger joint or if one has already been diagnosed as having osteoarthritis. The study revealed that the majority (61.6%) of elderly were aged 65-74 yrs., about 7.6% were aged >85yrs.The overall prevalence of osteoarthritis in elderly of Puvaneswar was 52.6% in rural areas it was32.6% in urban, it was 60.3 %Osteoarthritis was more in females as compared to males (68% vs 44.7%).

Jordan.J.W. (2013): The study to conduct a population based study to estimate the prevalence of osteoarthritis in North California, among African American of Caucasians aged 74years.Totally 3018 participants have been selected conveniently, Kellagren and Lawrence radiographic grading was used to find out the osteoarthritis clients. They found that 28% had knee osteoarthritis 16% had symptomatic osteoarthritis 8% had severe osteoarthritis, increased prevalence present in older individuals, especially among women.

Grotle et al. (2011): A study was to investigate the impact of obesity on incident of osteoarthritis in knee in a general population. A total of 1854 people aged 24-76 years participated in a Norwegian study on musculoskeletal pain from 1994 and 2004. The main outcome measure was osteoarthritis at follow up based on self-report. Obesity was defined by a body mass index (BMI) of 30 and above. At 10 years follow-up, the incident rates were 5.8% for hip osteoarthritis, 7.3% for knee osteoarthritis and 5.6% for hand osteoarthritis. When adjusting for age, gender, work status and leisure time

activities, a high body mass index (> 30) was significantly associated with knee osteoarthritis. There was no significant interaction effect between body mass index and gender age or any of the other confounding variables. A high body mass index was significantly associated with knee osteoarthritis.

SECTION B:

Studies related to Isometric exercise for knee pain with osteoarthritis in old age:

Davey RC Mathes Edward S.M (2016): A pre experimental matched control study in Hillsboro hospital was used to estimate the lower limb osteoarthritis knee pain in older patients. The main study was a randomized controlled trial of the effectiveness of isometric exercise treatment and physical function assessments were carried out 106 patients in that 93women, 13 men over the age of 60 years with confirmed osteoarthritis. In that experimental group received the isometric exercise usually were it the control group received the telephone interview. Pain score is assessed by WOMAC index scale. The result is 0.44(95% confidence interval 0.03 to 0.85) on WOMAC knee pain to 0.76 (10.33 to 1.77) or WOMAC physical function.

Cochrane Database of Systematic Reviews (2015)-High-quality evidence indicates that land-based therapeutic isometric exercise provides short-term benefit that is sustained for at least two to six months after cessation of formal treatment in terms of reduced knee pain, and moderate-quality evidence shows improvement in physical function among people with knee osteoarthritis Confidence intervals around demonstrated pooled results for pain reduction and improvement in physical function do not exclude a minimal clinically important treatment effect. Since the participants in most trials were aware of their treatment, this may have contributed to their improvement. Despite the lack of blinding we did not downgrade the quality of

evidence for risk of performance or detection bias. This reflects our belief that further research in this area is unlikely to change the findings of our review.

Shahnawaaz anweer , amad alghadir (2014): The study was to investigate effect of isometric exercise on muscle strength, pain and function in knee osteoarthritis king saud university , Riyadh with the out patients (N-42, 21 per group, 13 men and 29 women) the experimental group isometric exercise for 5 days a week whereas control group did not performed. The outcome measures or dependent variables selected for this study. The variables were measured using the numerical pain rating scale. The result: At the 5^{th} week significantly greater than those of the control group. The 5^{th} week isometric exercise programme showed beneficial effects on isometric exercise in reduction of knee pain, knee strength in patient with knee osteoarthritis.

Rosa UH, et al (2013): A comparative study was conducted at Mexico to find the effectiveness of isometric therapeutic exercise in patients with osteoarthritis knee. It was a quasi-experimental study in a population of 45 to 75-year-old patients with a diagnosis of knee osteoarthritis. Group 1 (experimental) was put under isokinetic exercises and group 2 (control) under isometric exercises. The sample size was of 33 patients per group; the allocation to the experimentation or control group was non-random, the effectiveness of the exercise was measured in three dimensions: muscle strength, joint range and pain. The intervention lasted eight weeks and the physical activity was carried out every third day. The analysis of muscle strength comparing the categories independently demonstrates differences at 8 weeks; 33.3% of the isokinetic exercise is in the normal category and 15.2% in the isometric exercise (P=.04). There was no difference of joint range between groups, despite finding a stage I range in 100.0% of the isometric group and 97.0% in the isometric group. Pain was milder in

the isokinetic exercise group at 8 weeks. Hence they proved that isometric exercises is greater effectiveness for muscle strength and pain in patients with knee osteoarthritis

Ebnezar J, et al (2012), the study to conducted the prospective, randomized, active controlled trial study to evaluate the isometric exercise for osteoarthritis of the knee joints. At Bangalore, India. They selected 250 participants who had osteoarthritis knees and who were between 35 and 80years, were randomly assigned to receive exercise therapy both of the groups practiced supervised interventions (40 minutes per day) for 3 months. One hundred and eighteen (118) (Isometric exercise) and 117 (control) subjects were available for the final analysis they got result as There were significant differences within and between the groups on all the variables, with better improvements in the isometric exercise than the control groups. So they concluded an integrated approach of isometric exercise is improving walking pain, range of knee flexion, walking time, tenderness, swelling, crepitus, and knee disability in patients with knees osteoarthritis.

Abdul Kalam Azad et.,al. (2011) : conducted a study on role of muscle strengthening exercise on osteoarthritis of the knee joint was conducted among 106 patients with knee osteoarthritis in Sheikh mujib medical university,Dhaka Bangladesh. Both male and female were included. They were divided into two groups. A were treated with NSAID and also with isometric exercise and group B were treated with only NSAID only. The study duration was six weeks. The improvement was assessed with WOMAC scoring system. The group A who received NSAID and isometric exercise improved more significantly than those who received NSAID only. The study findings shows that quadriceps muscle strengthening exercise is effective in the patients with knee osteoarthritis.

Amany. S.Sorour., (2011) – The quasi experimental study was conducted with the inpatient and outpatient sections at Al.Aini Hospital Cairo University. It involved three groups of patients, each groups had an interventions like Isometric exercise and data were collected by the interview form and the western Ontario and mc master universities index scale (WOMAC). The study revealed high initial scores of pain, stiffness and impaired physical functioning. After the intervention groups compare to the control group, while the scores of stiffness and impaired physical function were significantly lower in the isometric group compared to the other two groups.

MD.A.Shakoor (Bangladesh medical research council bulletin 2010): A quasi experimental study to assess the effect of isometric exercise with knee osteoarthritis patient with old age. A total of 64 patients of osteoarthritis of the knee joints were studied to observe the effects of isometric quadriceps muscle strengthening) on osteoarthritis of knee joints. They were assessed by visual analogue scale and range of motion of the knee joints and followed – up weekly for six weeks. Improvements was found in both groups after treatment as a67%. In comparison, more improvement was found in the exercise group after four weeks. Then improvement was gradually increased day by day and finally there was highly significant improvement 97.0%. This study suggests that isometric quadriceps muscle strengthening exercise has its beneficial role to reduce symptoms in knee pain.

SECTION-C

Studies related to function immobility with knee pain osteoarthritis:

Jelena sokk et al(2017): A quasi experimental study to assess the functional performance in patient with knee osteoarthritis after 8 week home exercise programe a physical motor performance was assessed by isometric strength of quadriceps femurs and hamstring muscles, gait, five –time-sit-to-stand tests and knee active, range of

motion exercise before and after 8 week. Outcome was measured by WOMAC. After 8-week home exercise programme, quadriceps femurs and hamstring muscles isometric strength, knee ROM during flexion and the gait stride length for the involved score increased and **five time sit to stand test (FTSTS)** shortened after 8 week. Difference in measured parameters between the patients involved leg decreased as compared to uninvolved leg controls.

S.Liew CM et al., (2017): A study was conducted as a retrospective study to investigate the functional ability between squatting and prevalence of knee osteoarthritis. A random sample of 72 Beijing residents more than 60 years were enquired about duration of squatting at youth 40% of the men and 68% of the women reported squatting one hour per day at youth were having the greatest incidence. Prevalence of tibia femoral osteoarthritis was found to be increased in both men and women who squatted more than 30mts per day at youth compared to subjects who squatted less than30mts per day at youth. The study showed that after 8-week it is improved.

Ivan Luis Andrade Araujo (Sep 2016): A cross sectional study composed of 93 patients with knee osteoarthritis for evaluation of the patients overall. Functional independence was assessed by Barthel index scale. The patient's quality of life was measure. The age between 55 to 70 years only. The total patients were 32 in that (34.3%) were found to be independent. The quality of life including physical function, physical role, bodily pain, general health. Correlation with functional independence was strongest for physical function. so the result is the functional independence with quality of life and positive correlation with all quality of life indicating the grater and the functional independence is the higher than the quality of life.

Nikil chouldry, (2013). A case control study was conducted to assess the effect of Functional ability in patients with knee osteoarthritis at pushpanjali cross lay hospital, Delhi. Total 50 samples were selected for this study by random sampling technique. The samples were divided in to two groups A and B with n=25 respectively. (ADL) Activities of Daily Living and Western Ontario and Mc Master Scale (WOMAC) scale were used to measure the outcome of osteoarthritis. The mean score of post knee osteoarthritis outcome survey. (ADL) and (WOMAC) score were 68.32 and 10.56 group A and group B respectively. The results revealed that conventional exercise along functional improvement training had a great improvement in the symptoms of subjects with osteoarthritis of knee.

Mariette J Jansen. et al., (2012): A was conducted on strength the functional ability training, with passive manual mobilization each reduce pain and disability in people with knee osteoarthritis at Netherland. Samples selected for the randomized control study the adults with osteoarthritis of the knee. The data was collected by using western Ontario and mc master scale (WOMAC) scale. The result revealed that effect size on pain was 0.38(95%, CI 0.23 to 0.54) for strength training, 0.34(95%, CI 0.19 to 0.49) for exercise, and 0.69 (95%, CI 0.42 to 0.96) for exercise plus manual mobilization. The study concluded that the motivation of functional training is effective in osteoarthritis with old age.

S.Lamb.J. et al., (2012): She did a cross sectional analysis on 769 older women with physical disability. Mobility was measured using timed functional ability performance tests. The result showed the prevalence of knee pain was 53%, one third of women with pain reported it to be severe. In women who had severe pain, activity like walking increased the risk of disability more than in activity. In old women with

recent knee pain, a high pain severity score, obesity and activity are important factors that increase the risk of mobility limitation

Wong YK, et al., (2011): A study was conducted to assess efficacy of a functional ability program for elderly people with knee pain conducted via video conferencing. 22 persons aged 60 years or above with knee pain. A 12-week exercise program, including strengthening and balance training and also the physical activities, was given via videoconferencing in. The outcome measures included the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), quadriceps muscle strength, Berg's Balance Scale (BBS) and subjects' degree of acceptance of videoconferencing. Twenty subjects completed the 12-week program and significant improvements occurred in all domains of the WOMAC score 0.39%. There was a 44% and a 13% increase in quadriceps muscle strength and, respectively.

O'Reilly SC, et al. Ann Rheum Dis (2011): A study to assess the effectiveness of home exercise on pain and Functional disability from osteoarthritis of the knee. A randomized controlled study with 191 men and women with knee pain 40-80 were recruited from the community and randomized to exercise (n-113) or no intervention (n=78). The exercise group performed strengthening exercise daily for 6 months, the primary outcome measure was change in knee pain with western Ontario McMaster Osteoarthritis index (WOMAC). Secondary measures included visual analogue scales (VAS) for pain on stairs and walking and WOMAC physical function scores. The pain score reduced by 22.5% in the exercise group and by 6.2% in the control group (between group difference 16.3percent in unpaired' test). VAS scores for pain also reduced in the exercise group compared with control group. Physical function scores reduced by 17.4% in the exercise group and were unchanged in control group.

CONCEPTIONAL FRAMEWORK

The conceptional frame work is inter related Concepts on abstraction that are assembled together in some rational by virtue of this relevance to a common scheme. It is a device that helps to stimulate research and the extension of knowledge by providing both direction and impetus. **-Polite and Hungler**

The present study was aimed at determining the effectiveness of isometric exercise on knee pain functional mobility among the old age people with knee osteoarthritis. The conceptional frame work of this study derived from Gate control theory.

GATE CONTROL THEORY OF PAIN

The gate control theory first postulated by Ronald Melzack and Patrick David wall in 1965. This theory suggests that for the pain to pass through the gate there must be unopposed passage for nociceptive information arriving at the synapses in the substantial gelatinosa. The pain impulses will be carried out by the small diameters. Slow conducting A, ∝ and C fibers. Impulses travelled through small diameter fibers will open the pain gate and the person feels pain. Pain gate is also receiving the impulses produced by the stimulation of thermo receptors or mechano receptors transmitted via large diameter myelinated A,ß fibers inhibit and super impose the small diameter impulse. Many non-pharmacological procedures such as application of pressure, TENS stimulate the nerve endings connected with large diameter fibers which can produce a reduction of pain by closing the pain gate.

If nonciceptive information is allowed through the gate then this traffic will continue up the lateral spino-thalamic tract of the spinal cord to the thalamus, and from here to the cerebral cortex. As this stimulus passes through the brain stem it may cause

an interaction between the grey matter and the mid brain, hence transmitting the pain. Suppression system and their descending neurons csn release an endogeneous opiate substance into substantial gelatinosa at spinal cord level. The chemical nature of this endogenous opiate, which may be endorphin or encephalin, is such as to cause inhibition of transmission in the noniceptive circuit synapses. This is achieved by blocking the release of the chemical transmitter (substance P) in the pain circuit.

Based on the principles of gate control theory, the conceptional framework was developed methods used to reduce the pain are influenced by selected variables such as age, gender , occupation, educational status, reason for coming, duration of stay, number of children's, mode of admission, food pattern, body built.

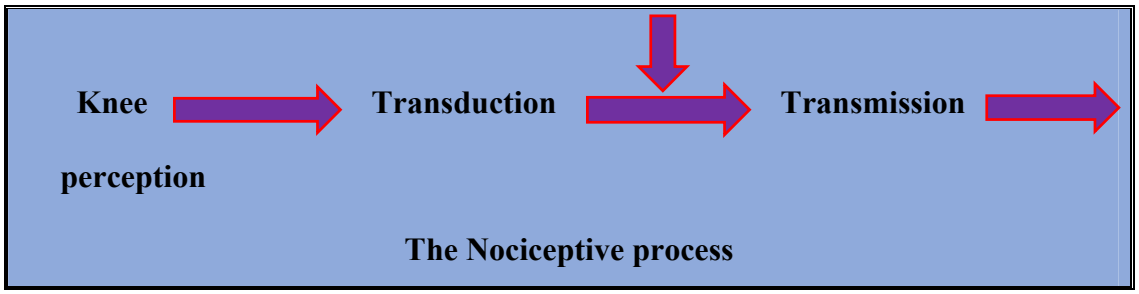
OSTEOARTHRITIS KNEE PAIN

Pain in the knee. It can originate in any of the bony structures compromising the knee joint

PATHOPHYSIOLOGY

Physiologic processes, including the activity of neuro transmitters, are operative at multiple sites along this structural pathway to aid in conveying the signal. This process is referred to as nociception. Non-ciceptive process begins at peripheral level. When damage occurs, Biochemical agents that initiate and sensitize the nociceptive response are released. These agents include potassium, substance P, bradykinin, prostaglandin and others. The initial injury provokes a series of physiologic events.

MODULATION



The Nociceptive process

GATING MECHANISM

During the knee pain period the pain impulses are transmitted through spinal nerve segment of T11-12 and necessary lower thoracic and upper lumbar sympathetic verve which are travelled through (A, ∝ and C) small diameter and slow conducting myelinate fibers and reach the pain gate and open the gate, thus patient perceives pain. Impulses from isometric exercise travel through fast conducting myelinated A ß fibers which super impose small fibers and closes the pain gate and endorphin which is released from the inter neuron at spinal cord level which also closes the gate of pain. Thus patient perceives reduction in pain level

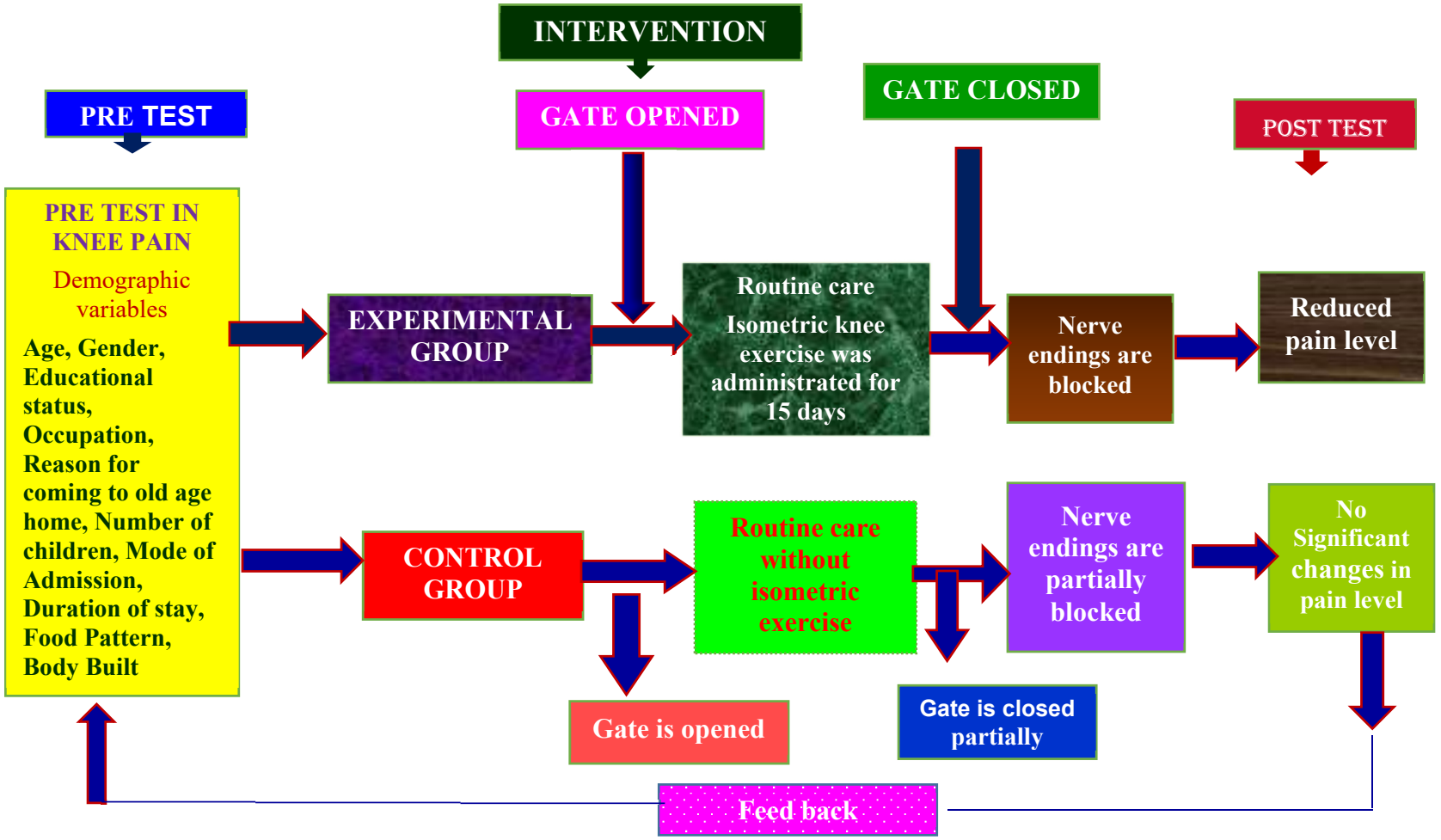


Fig.1 CONCEPTUAN FRAMEWORK BASED ON MODIFIED WALL MELZACK'S GATE CONTROL THEORY (1965)

CHAPTER III

METHODOLOGY

CHAPTER III

METHODOLOGY

"The Methodology of research indicates the general pattern of organizing, the procedure for gathering valid and reliable data for the problem under investigation".

- (Polite and Beck, 2010)

Methodology is the systematic, theoretical analysis of the methods applied to a field of study. ... Typically, it encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques. A **methodology** does not set out to provide solutions - it is, therefore, not the same as a method.

This chapter deals with the research approach, research design, variable under the study, setting of the study, population of the study, sample size, description of the interventions, development and description of the tool, validity and reliability of the tool, pilot study, procedure for data collection and statistical analysis.

RESEARCH APPROACH

The investigator adopted an Experimental approach, because the aim of the researcher was to assess the effectiveness of 'isometric exercise on knee pain perception and functional immobility among the old age people with knee osteoarthritis for old age people.

RESEARCH DESIGN:

Research design is the overall plan for obtaining an answer, to the research question for testing the research hypothesis. **- (Polit and Hungler 1999)**

The Research design used for this study is quasi experimental one group pretest & posttest control group design is adopted

The Quasi experimental design involves the manipulation of an independent variables that is an intervention. Quasi experimental design lacks randomization, the signature of a true experiment. **-(Polit and Beck 2010)**

The design can be represented as,

GROUP	PRE-TEST	INTERVENTION	POST-TEST
Experimental group	**Q1**	**X**	**Q2**
Control group	**Q1**	**No intervention**	**Q2**

Q1 – Assessment of knee pain level with knee osteoarthritis among old age people before administering the isometric exercise in experimental group and control group.

X -- Administration of isometric exercise for 2 weeks to experimental group.

Q2 --Assessment of knee pain level with knee osteoarthritis among old age people before administering the isometric exercise in experimental group and without intervention in control group.

RESEARCH VARIABLES:

A variables is defined as a concept idea that can be described in measurable terms. In research this term refers to the measurable characteristics, qualities, triats, or attributes of a particular individual, object, or situation being studied.

VARIABLES UNDER THE STUDY:

INDEPENDENT VARIABLES:

Variables that are purposely manipulated or changed by the researcher also called manipulated variables

In this study independent variables is Isometric exercise on old age people with knee pain perception and functional immobility.

DEPENDENT VARIABLES:

A dependent variables is what you measure in the study and what is affected during the experiment.

Reducing knee pain and improving the functional immobility. among the old age people with knee osteoarthritis.

EXTRANEOUS VARIABLES:

Extraneous variables are the factor that are not the part of the study but may affect the measurement of the study variables.

Demographic variables include Age, Gender, Occupation, Education, Reason for coming old age home, Duration of stay, No.of. Children's, Mode of Admission, Food pattern, and body built.

SETTING OF THE STUDY:

Setting is the general location and condition in which data collection takes place for the study **- (Polite and Beck, 2010)**

This study is conducted among the old age people with knee pain Osteoarthritis and functional immobility in selected old age home at Trichy.

POPULATION

A population is defined as the entire set of individuals or object having common characteristics called universe **- (Polite, and Beck, 2010)**

THE TARGET POPULATION

The entire group of individual or objects to which researchers are interested in generalized the conclusion

For this study the Target population will be the old age people with knee pain with knee osteoarthritis and functional immobility in selected old age home at Trichy (DT).

THE ACCESSIBLE POPULATION

The population researcher to which the researchers can apply their conclusions

For this study the accessible population will be the Old Age Group (55 to 75 years) with knee pain perception and functional immobility in selected old age home at Trichy District.

SAMPLE:

A subset of a population selected to participate in a study.

- (Pilot and Bungler)

The sample selected for the present study was 60 old age people in selected old age home at Trichy.

SAMPLE SIZE:

Sample size means very large samples become heterogeneous and do not exhibit characteristic of whole population in general also there are always chances of a biased sample. It sample is too small, researcher may not be able to generalized the study findings to the whole population.

The selected sample size is 60

- ✓ **30 samples is experimental group**
- ✓ **30 samples is control group.**

SAMPLING TECHINGUE:

Sampling technique is the process of selecting a representative part of the population. **- (Polite, and Beck, 2007)**

The sampling technique adopted for the study is **Non- Probability Purposive sampling** technique.

CRITERIA FOR SAMPLE SELECTION:

The study samples will be selected keeping in view of the following pre determine criteria.

INCLUSION CRITERIA:

Old age people with...

- ✓ Above 55 to75 years of age group.
- ✓ Bilateral or unilateral knee joint pain and Functional immobility
- ✓ Persons not engaged in a regular leg exercise program for minimum of 6 months.
- ✓ Those who are present at time of study.
- ✓ Those who are willing to participate

EXCLUSION CRITERIA:

The study excluded who are...

- ✓ Person with fracture of knee(or)ligament tear
- ✓ Bed ridden persons
- ✓ Persons who are undergone orthopaedic surgery.(e.g. Amputation, knee replacement)
- ✓ Persons with unresolved neurological and balance disorder

- ✓ Persons with mentally retarded
- ✓ Those who are absent at time of study. And not willing to participate

DISCRIPTION OF TOOL:

The Instrument consist of three parts...

- ✓ **SECTION 1** = Demographic Variables
- ✓ **SECTION 2** = Numerical pain scale
- ✓ **SECTION 3** = Functional Performance (Western Ontario and McMaster universities Osteoarthritis index – **(WOMAC Scale)**.

SECTION I

DEMOGRAPHIC VARIABLES:

It consist of questions to elicit demographic data such as Age, Gender, Education, and Occupation, reason for coming to the old age home, number of children, mode of admission, duration of stay.

SECTION II

NUMERICAL PAIN RATING SCALE:

The Numeric pain scale ranges from '0' representing one pain extreme (e.g. “no pain”) to '10' representing the other pain extreme (e.g. “pain as bad as you can imagine” or “worst pain.

SCORING PROCEDURE:

- ❖ 0 - No pain
- ❖ 1-3 - Mild pain
- ❖ 4-6 - Moderate pain
- ❖ 7-9 - Severe pain
- ❖ 10 - Worst pain

SECTIN III

FUNCTIONAL PERFORMANCE :

This Western Ontario and McMaster universities Osteoarthritis index - **WOMAC Scale** was developed to assess the ability like knee pain and stiffness of the subjects to perform activities before and after the intervention. There were 8 physical activities such as (walking, sitting, standing, climbing, lifting, bending etc.). To record the response the columns were provided to mark the response before and after intervention. WOMAC (modified) scale was used.

SCORING PROCEDURE

- Fully Independent = 4 marks
- Partially Independent = 3 marks
- Dependent = 2 marks
- Fully dependent = 1 marks

TESTING OF THE TOOL:

VALIDITY OF THE TOOL:

Validity is the degree to which an instrument measures what is intended to measure.

The Validity of the tool obtained from the 5 experts in the field of nursing and medicine. The suggestions and advices given by the experts were considered and duly corrected.

RELIABILITY OF THE TOOL:

Reliability is the degree of consistency or dependability with instruments measures the attribute is designed to measure.

The Reliability of the Numerical Pain Rating Scale (NPRS)) and Functional mobility performance check list modified Western Ontario and McMaster universities Osteoarthritis index was used to assessed by using test and retest method.

PILOT STUDY:

The pilot study was conducted to find out the feasibility of the study. It was conducted in Sreesai old age home at trichy among old age people with knee osteoarthritis and functional immobility. The investigator got the formal permission from the college authority of Sakthi College of nursing and concerned authority of old age homes for doing pilot study the study participants those who are full fill their inclusion criteria were selected by Non-probability purposive sampling techniques. Total no of samples are 6 in that 3 for experimental group and 3 for control group were assigned. Brief explanation about the study purpose and objective has given to old age people. Assurance is given to the old age people that, the collected data will be utilized only for the purpose of the study only. Oral consent is obtained from the each old age people and it will be maintained confidentially.

First, the investigator should introduce our self with kindly manner and maintained the good rapport with old age people and collect the data regarding the demographic variables and with the use of '10' point numerical pain the knee pain level data was collected and with the use of Western Ontario and McMaster universities Osteoarthritis index (modified WOMAC scale) the functional immobility data has assessed for the experimental group and control group. The investigator should give the isometric exercise only for the experimental group for 15 days twice a day no intervention to the control group.The results of the Pilot Study showed that the study was feasible.

PRODURE FOR DATA COLLECTION:

The investigator got the formal permission from the college authority of Sakthi College of nursing and concerned authority of old age homes for doing pilot study and Main study (for the experimental group and control group). The study participants those who are full fill their inclusion criteria were selected by non-probability purposive sampling techniques. Total no of samples are 60 in that 30 for experimental group and 30 for control group were assigned. Brief explanation about the study purpose and objective has given to old age people. Assurance is given to the old age people that, the collected data will be utilized only for the purpose of the study only. Oral consent is obtained from the each old age people and it will be maintained confidentially.

First, the investigator should introduce our self with kindly manner and maintained the good rapport with old age people and collect the data regarding the demographic variables and with the use of '10' point numerical pain the knee pain level data was collected and with the use of Western Ontario and McMaster universities Osteoarthritis index (modified WOMAC scale) the functional immobility data has assessed for the experimental group and control group. The investigator should give the isometric exercise only for the experimental group for 15 days twice a day no intervention to the control group.

STASTICAL ANALYSIS

Collected data were analyzed of by the descriptive and inferential stasistics. The data related to demographic variables were analyzed by using descriptive measures like frequency, percentage, distribution. Inferential statistics of't' test was used to evaluate the effectiveness of isometric exercise on knee pain level and functional immobility. Karl pearson's correlation, co-efficient test was used to analyze the correlation between the level of knee pain and functional immobility. Chi-square test was used to associate

the level of knee pain and the functional immobility among the old age people with their selected demographic variables**.**

PROTECTION OF HUMAN RIGHTS

The study was conducted after getting the approval from the ethical committee. Permission was obtained from the authority of old age home. A formal concern was obtained from the respondents of the study from the old age people before administering the interventions like isometric exercise. The investigator explained the objectives, purpose and goal & importance of the isometric exercise and its steps of exercise. Investigator explained because of isometric exercise, how its relive the osteoarthritis knee pain and improve the functional immobility.

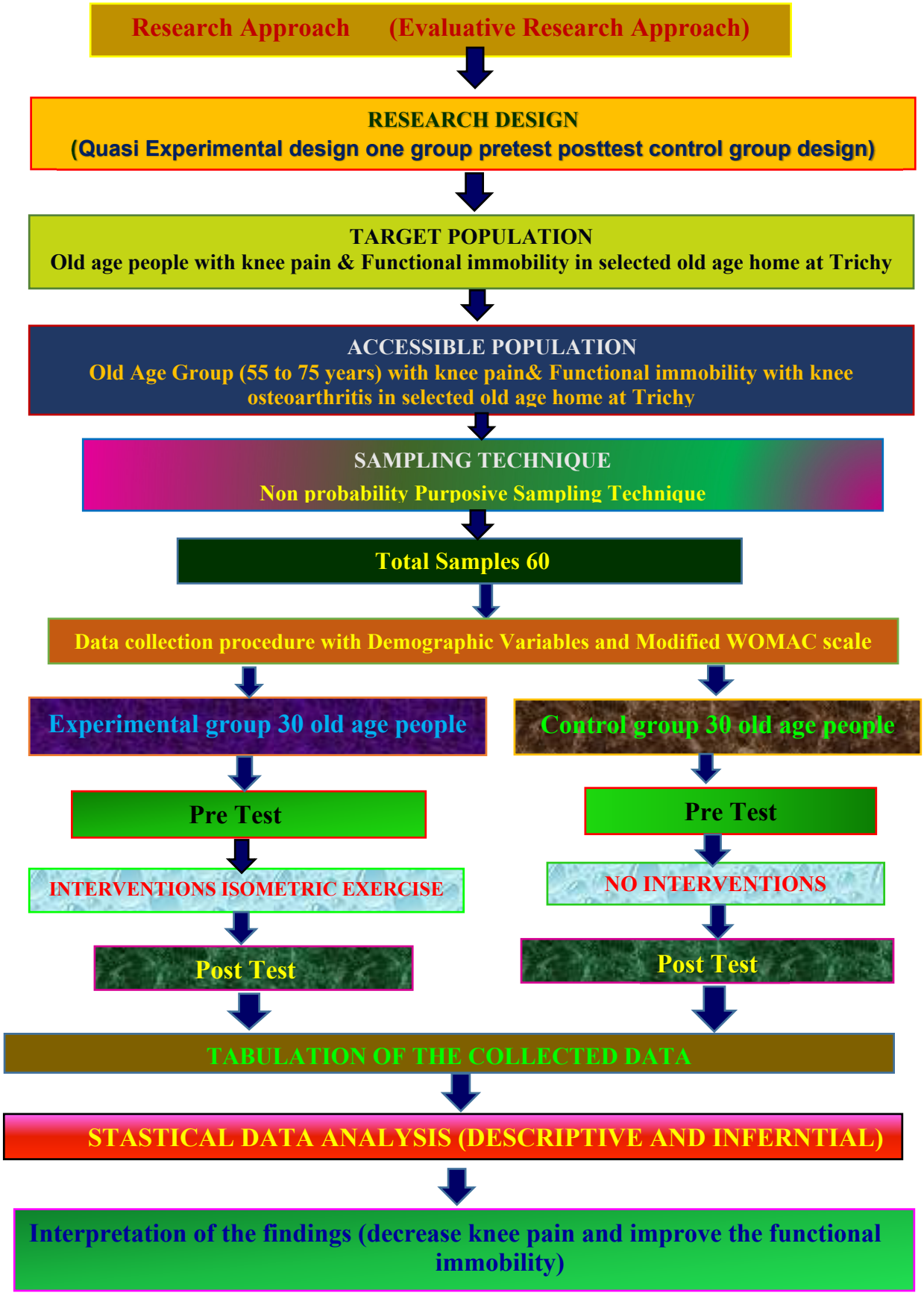


Figure 2 Schematic Representation of Research Methodology

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

CHAPTER-IV

DATA ANALYSIS AND INTERPRETATION

"Analysis is a process of organizing and synthesizing data so as to answer research questions and test hypothesis".

- (Poilte and Beck, 2010)

The process of evaluating data using analytical and logical reasoning to examine each component of the data provided. This form of analysis is just one of the many steps that must be completed when conducting a research experiment. Data from various sources is gathered, reviewed, and hen analysis method, some of which include data mining, text analytics, business intelligence and data visualizations.

Description of the tables shows that …..

SECTION A

Table 1. – Distribution of the demographic variables according to the percentage

SECTION-B

Table 2. -- Frequency and percentage distribution of pretest and post test level of knee pain among old age people with knee osteoarthritis in experimental and control group.

Table 3.-- Frequency and percentage distribution of pretest and post test level of functional immobility among old age people with knee osteoarthritis in experimental and control group.

SECTION-C

Table 4- Comparison of pretest and post test level of knee pain among old age people with knee osteoarthritis in the experimental and control group.

SECTION A:DATA ON DESCRIPTION OF DEMOGRAPHIC VARIABLES.

Table: 1: Frequency and percentage distribution of demographic variables of old age people with knee osteoarthritis. N = 60 (30+30)

Demographic Variables	Control group (n=30)		Experimental group (n=30)	
	f	%	f	%
1. Age (in years):				
55-65	13	43.3	8	26.7
65-70	10	33.3	13	43.3
70-75	7	23.3	9	30
2. Gender:				
Male	10	33.3	13	43.3
Female	20	66.7	17	56.7
3. Educational status:				
Illiterate	3	10	10	33.3
Primary	10	33.3	3	10
High school	2	6.7	10	33.3
Higher secondary & above	15	50	7	23.3
4. Occupation:				
Home maker	6	20	7	23.3
Private employee	9	30	3	10
Government employee	7	23.3	5	16.7
Self employed	3	10	11	36.7
Agriculture	5	16.7	4	13.3
5. Reason for coming:				
Loneliness	13	43.3	9	30
Lack of love and affection	0	0	6	20
Loss of parter	15	50	11	36.7
No children	2	6.7	4	13.3
6. Number of children:				
1	3	10	12	40
2	20	66.7	6	20
3	5	16.7	11	36.7
More	2	6.7	1	3.3
7. Mode of admission:				
Voluntary	22	73.3	19	63.3
Involuntary	8	26.7	11	26.7
8. Duration of stay:				
1-2 yrs	20	66.7	17	56.7
3-4 yrs	6	20	9	30
5-7 yrs	4	13.3	4	13.3
More than 7 yrs	0	0	0	0

Demographic Variables	Control group (n=30)		Experimental group (n=30)	
	f	%	f	%
9. Food pattern:				
Vegetarian	9	30	7	23.3
Non vegetarian	21	70	23	76.7
10. Body Built:				
Thin	2	6.7	3	10
Normal	7	23.3	5	16.7
Obese	21	70	22	73.3

The above table 1 shows that in the experimental group, majority 13(43.3%) were in the age group of 55 – 65 years, 20(66.7%) were female, 15(50%) were educated upto higher secondary and above, 9(30%) were private employee, 15(50%) had the reason of loss of partner, 29)66.7%) had 2 children, 22(73.3%) were admitted voluntarily, 20(66.7%) were staying for 1 – 2 years, 21(70%) were non-vegetarian and 21(70%) were obese.

Whereas in the control group, majority 13(43.3%) were in the age group of 65 – 70 years, 17(56.7%) were female, 10(33.3%) were educated upto higher secondary and above and high school education respectively, 11(36.7%) were self employed, 11(36.7%) had the reason of loss of partner, 12(40%) had only 1 child, 19(63.3%) were admitted voluntarily, 17(56.7%) were staying for 1 – 2 years, 23(76.7%) were non-vegetarian and 22(73.3%) were obese.

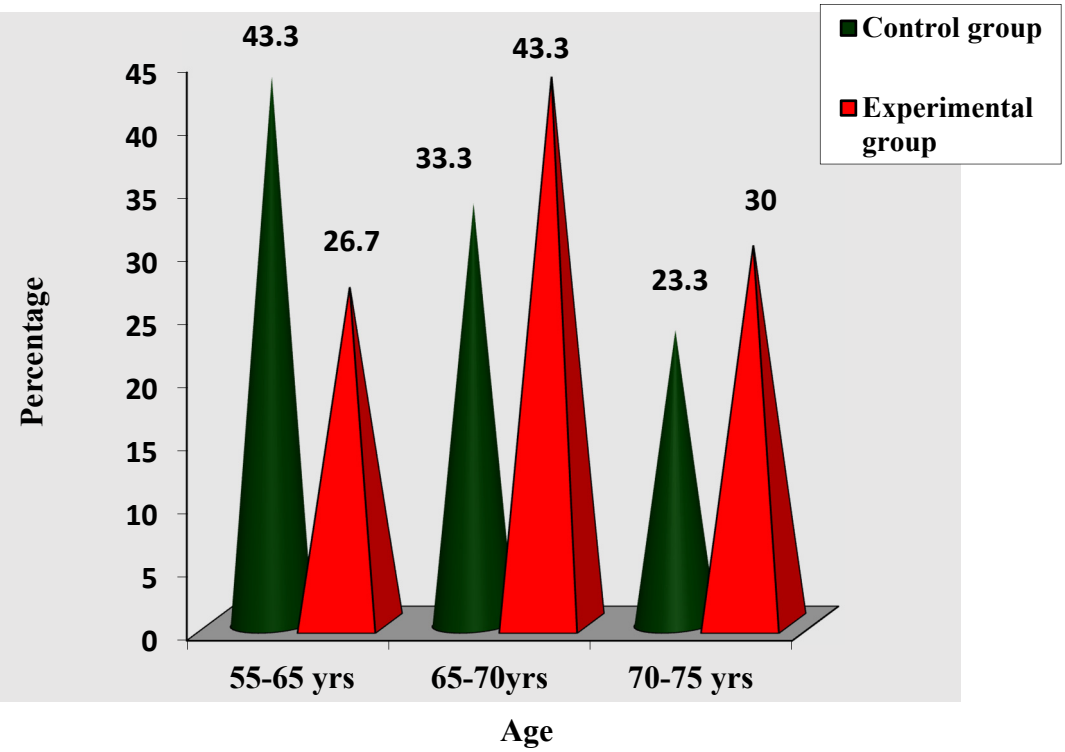


Fig 3: 3D Clustered column diagram showing percentage wise distribution according to their age in Control group and Experimental group.

The figure 3 shows that in 55-65 years age group 43.3% in control group,26.75 in control group.in age 65-70 years 33.35 are in control group,43.3% are in experimental group.in 70-75 years 23.35 are in control group,30% are in experimental group.

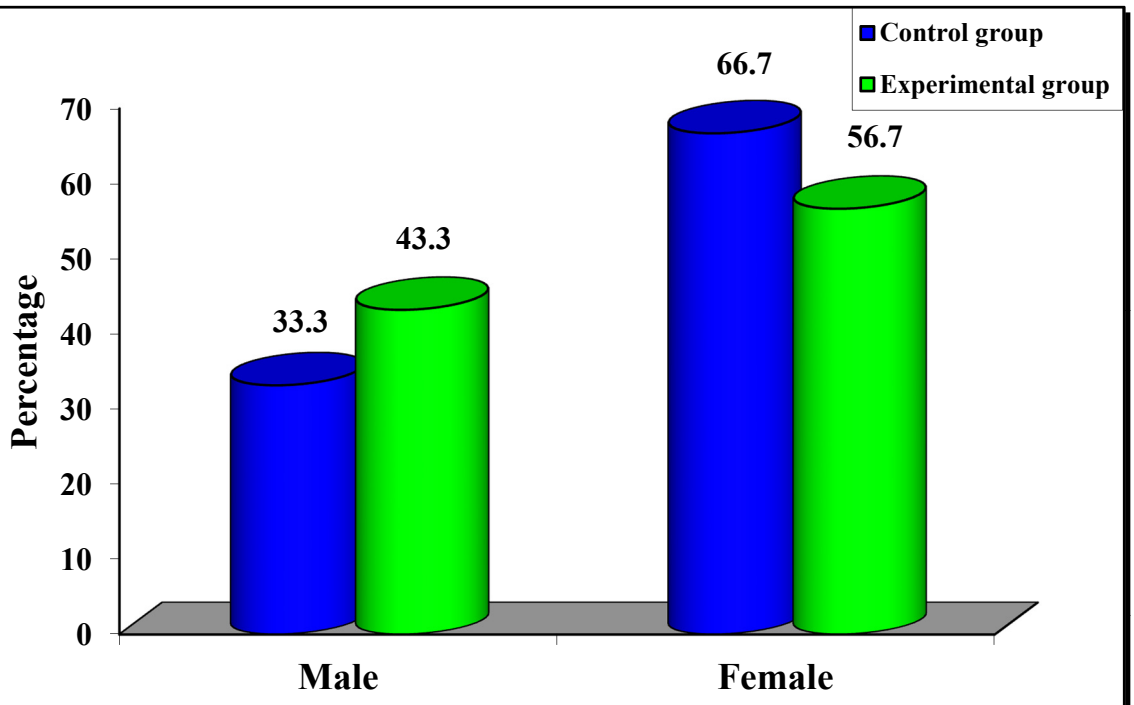


Fig 4: Multiple cylinder diagram showing Percentage wise distribution according to their gender in ontrol group and Experimental Group .

The firgure 4 shows that 33.3% of males in control group, 43.3% are in experimental group, 66.7 % are females in control group, 56.7% females in experimental group.

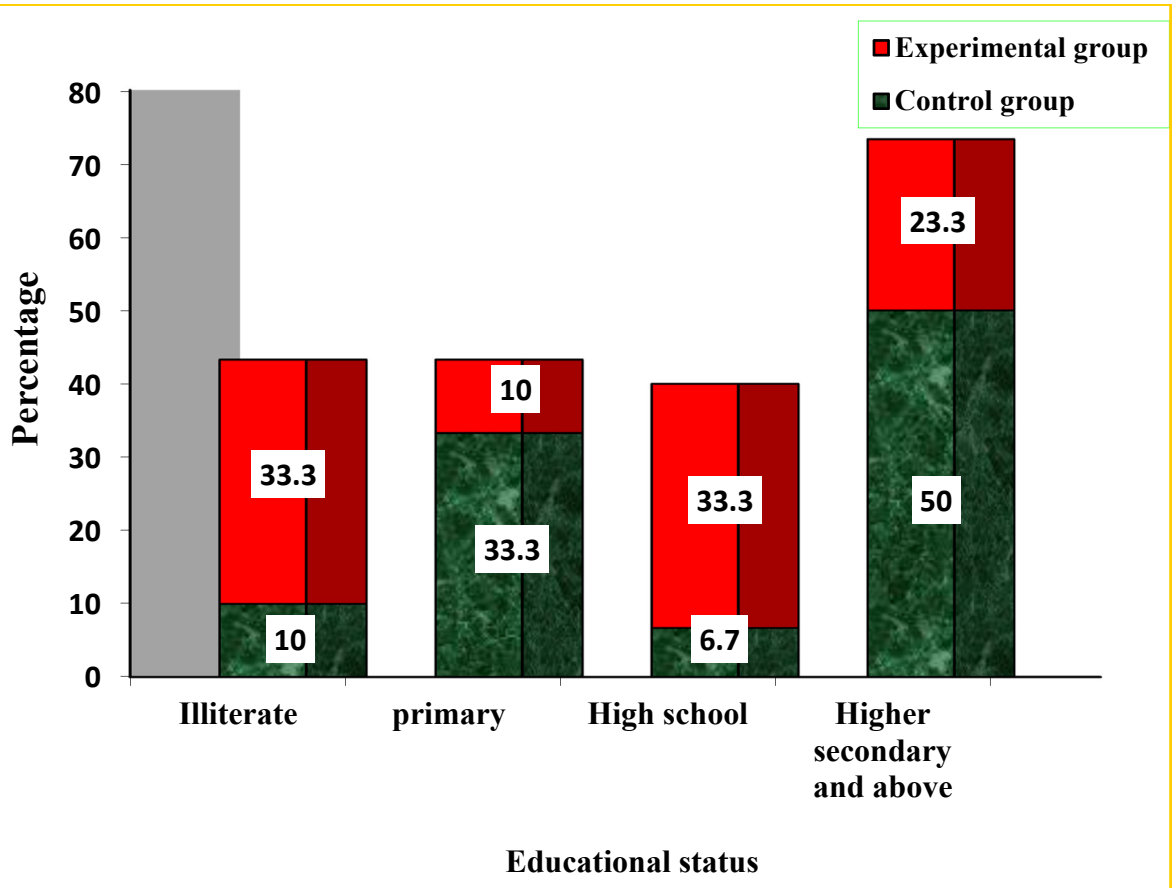


Fig 5: 3D stacked column diagram showing percentage wise distribution of Educational status .

The figure 5 shows that illiterate 10% people are in control group,33.35 % in experimental group,in primary education 33.35 in control group,10% are in experimental group, in High school education 6.75 are in control group, 33.% in experimental group, In higher secondary education 50% are in control group, 23.3% are in experimental group.

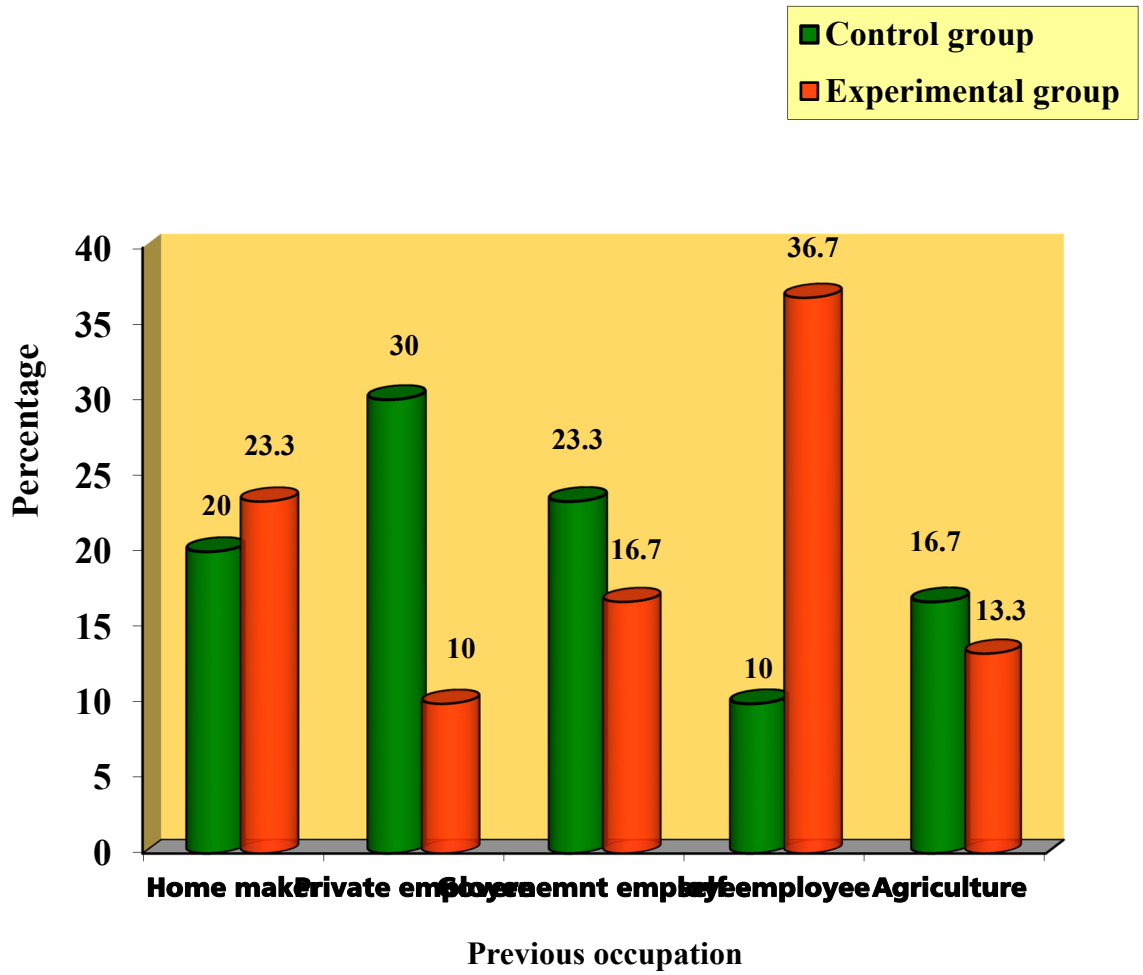


Fig.6: Percentage wise distribution according to their occupation .

The figure 6 shows that as a home maker 20% are in control group,23.3% are in experimental group,As a private employee 305 are in control group, 10% are in experimental group, As a government employee 23.35 are in control group, 16.75 are in experimental group, as a self employee 10% are in control group, 36.7% in experimental group,At last as a Agriculture 16.7% are in control group, 13.3% are in experimental group

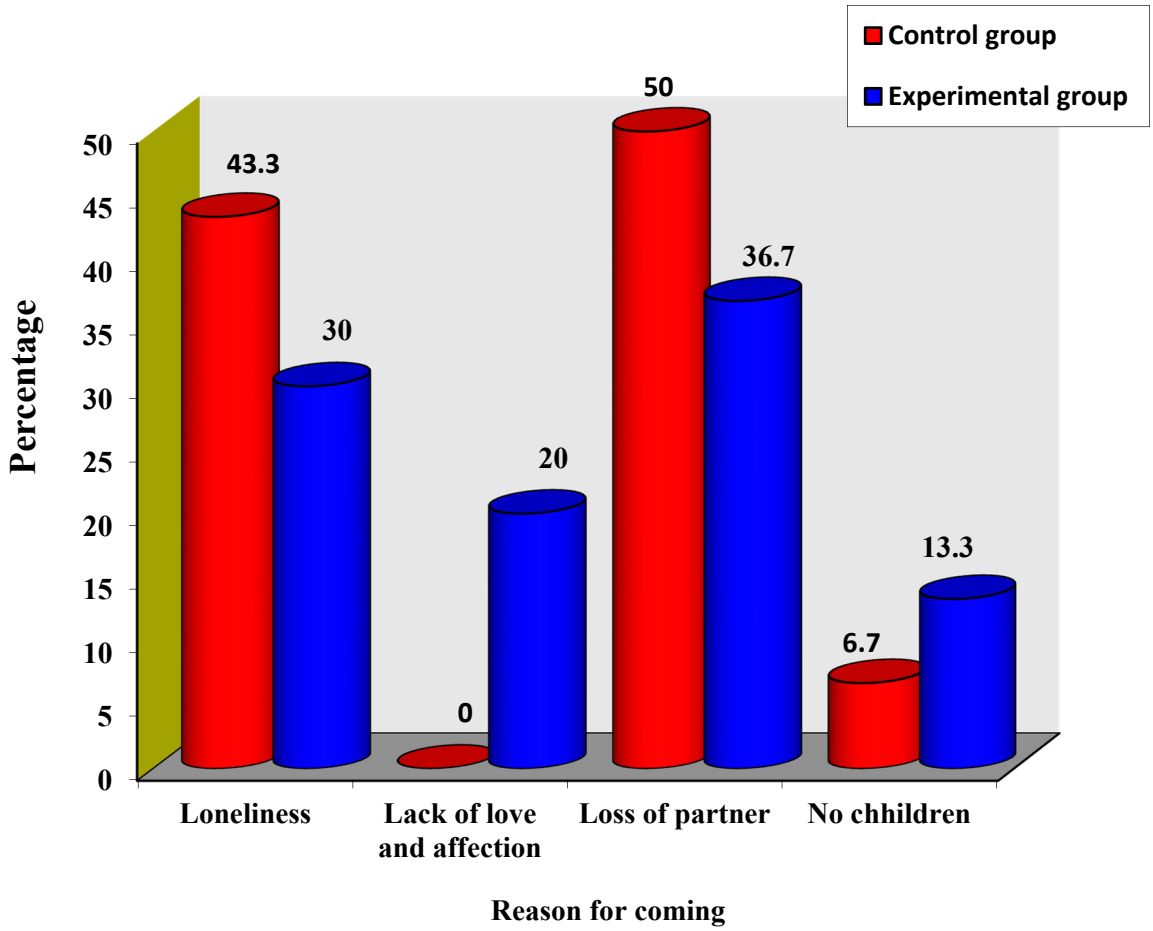


Fig 7 : showing percentage wise distribution according to their reason for coming .

The figure 7 shows that being loneliness 43.3% are in control group,30% are in experimental group,0% lack of love and affection in control group, 20% in experimental group,in loss of partner 50% are in control group, 36.7% in experimental group, there is no children 6.7% in control group, 13.3% in experimetal group.

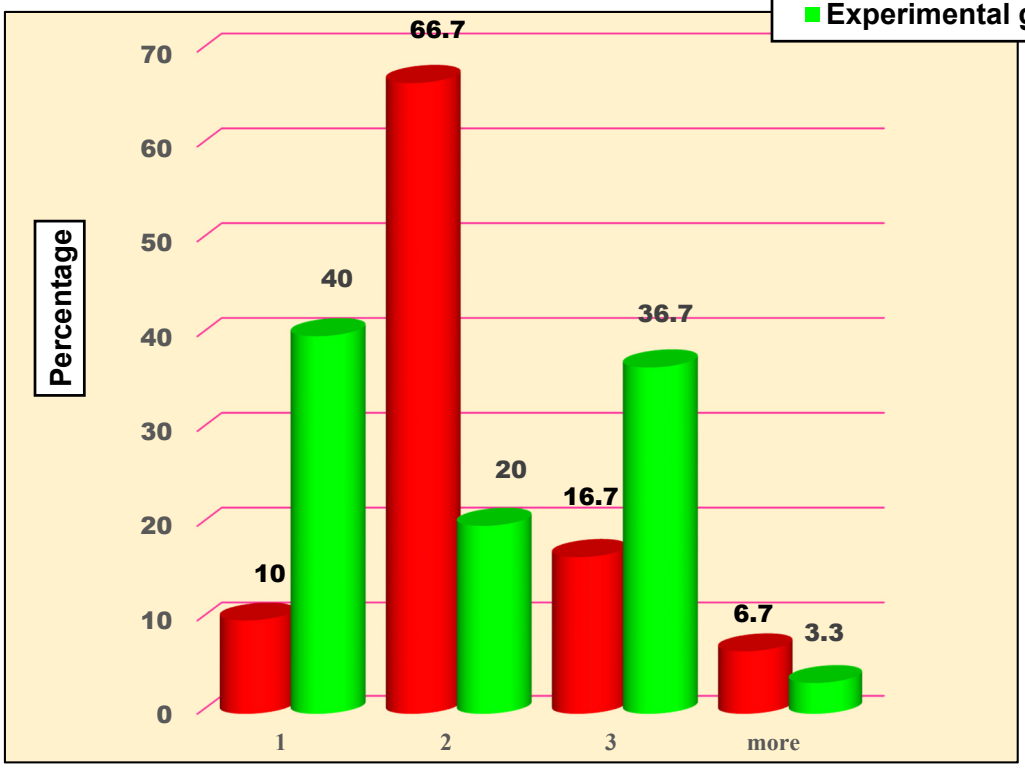


Fig 8 : Percentage wise distribution according to their Number of children's.

The figure 8 shows that 105 of old age people have only one children in control group, 40% are in experimental group, Ans As a 2 children 66.75 are in control group, 20% are in experimental group.As a 3 children 16.7% are in control group & 36.7% are in experimental group.More than 3 childrens 6.7% are in control group, 3.3% in experimental group.

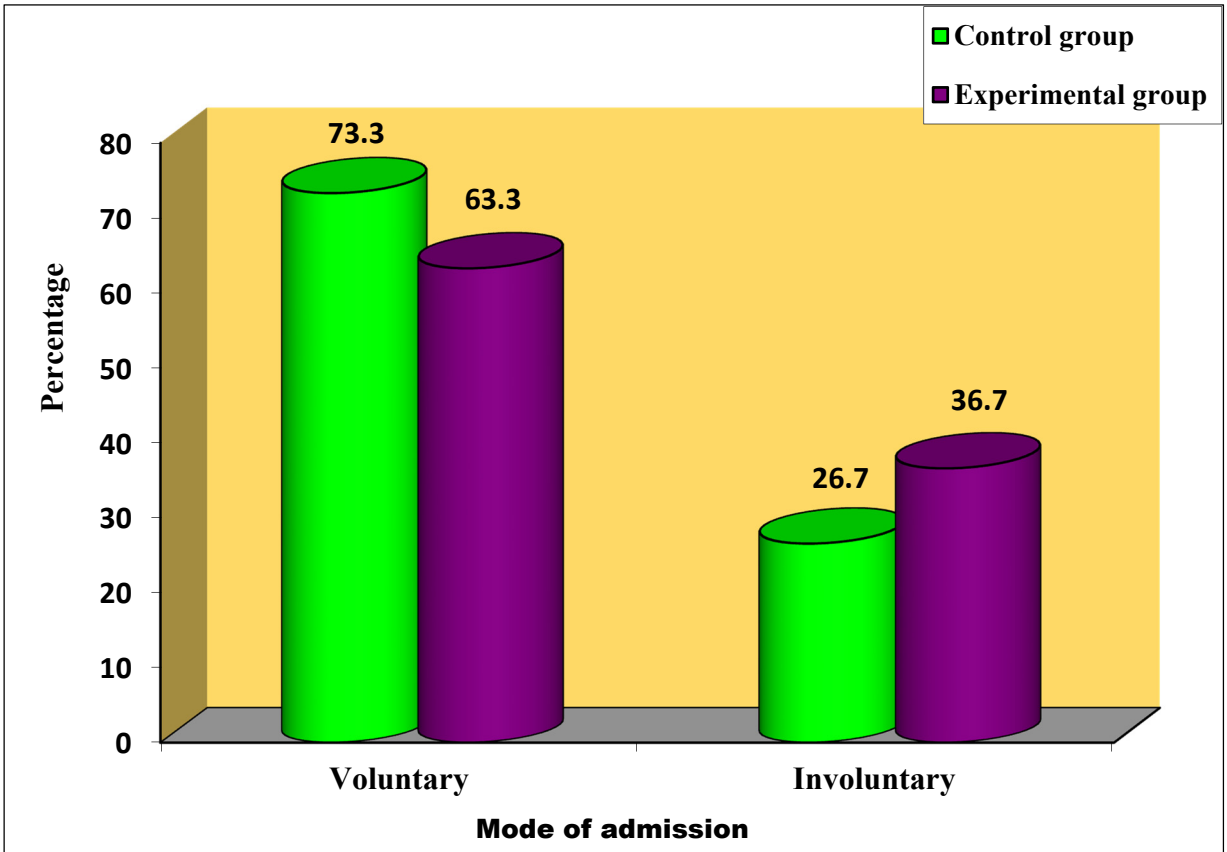


Fig 9: Showing percentage wise distribution according to their mode of admission.

The figure 9 shows that 73.3% voluntary admission in control group , 63.3% in experimental group.26.7% as a involuntary admission in control group,36.7% are in experimetal group.

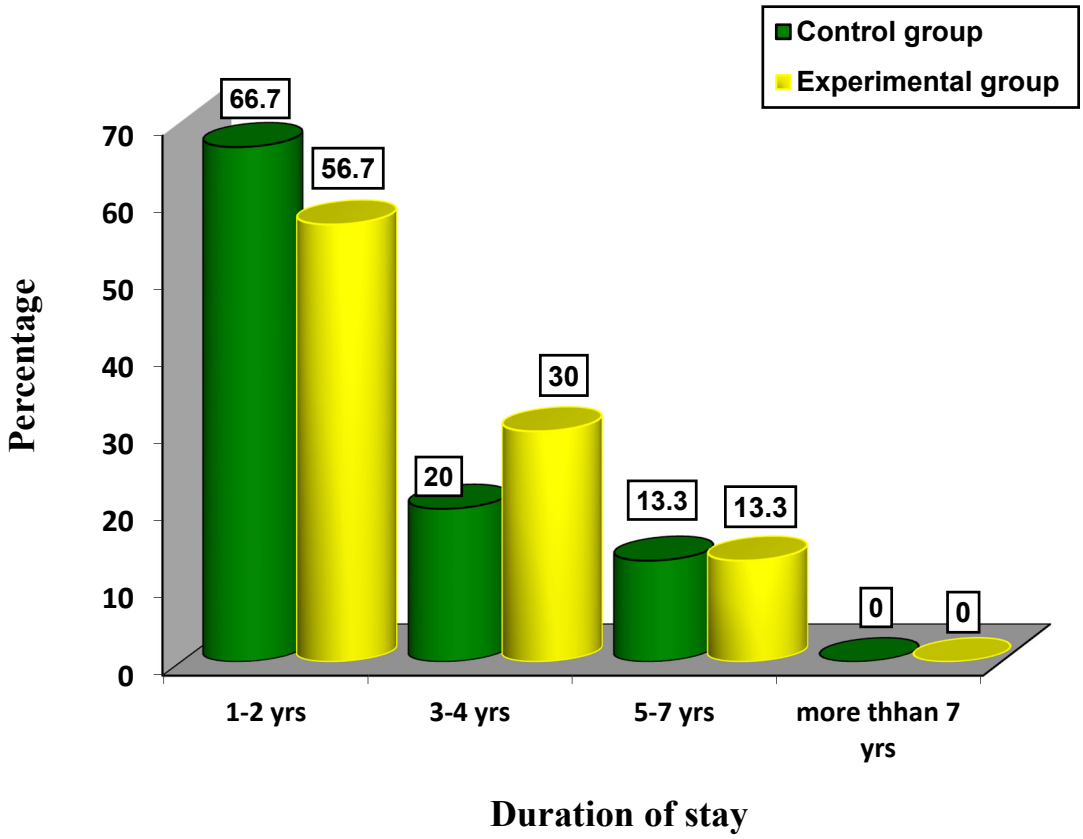


Fig 10: Showing percentage wise distribution according to their duration of stay.

The figure 10 shows that in control group 66.7% are staying fro past 1-2 years, were as in experimental group 56.7%. and in 3-4 years 20% are in control group, 30% are in experimental group, and in 5-7 years 13.3% are in control group, and experimental group.no one staying more than 7 years in control group and experimental group.

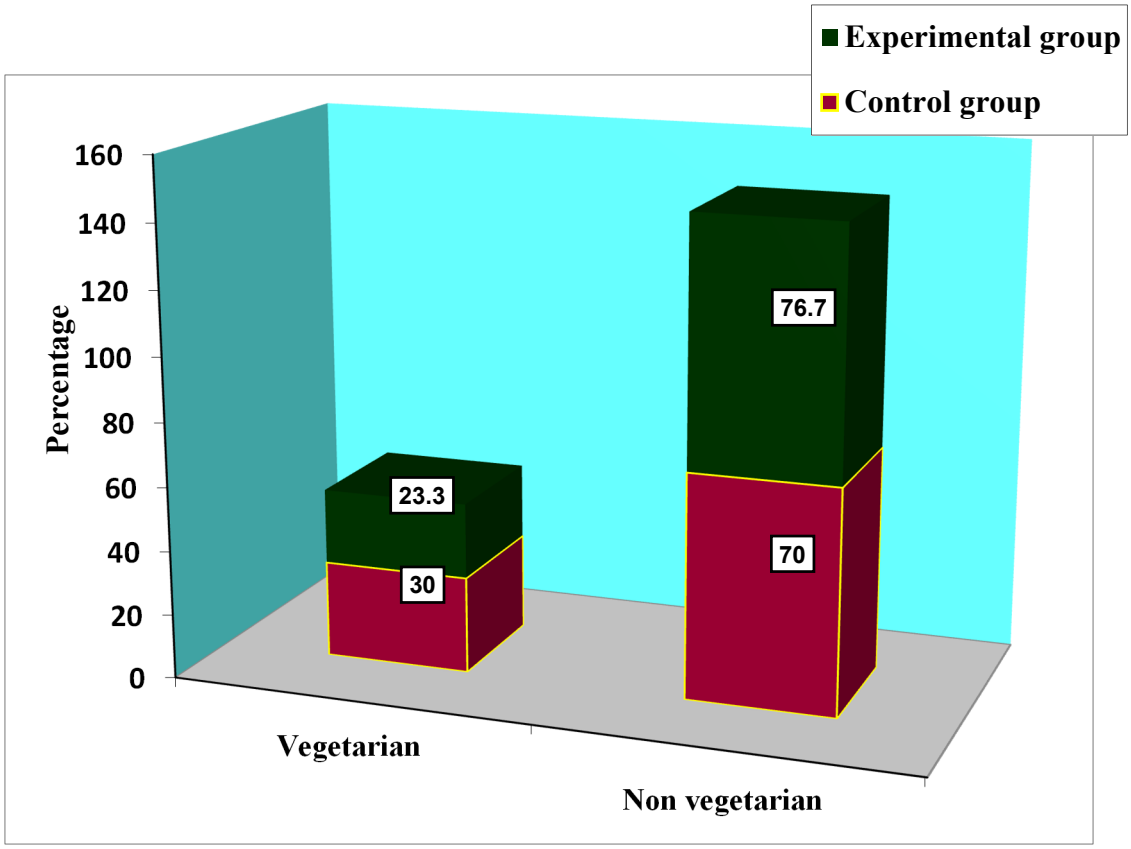


Fig 11 : Showing percentage wise distribution according to their food pattern.

The Figure 11 shows that 30% are vegetarian in control group, 23.3 % are in experimental group. As a non vegetarian 70% are in control group and 76.7 re in experimental group.

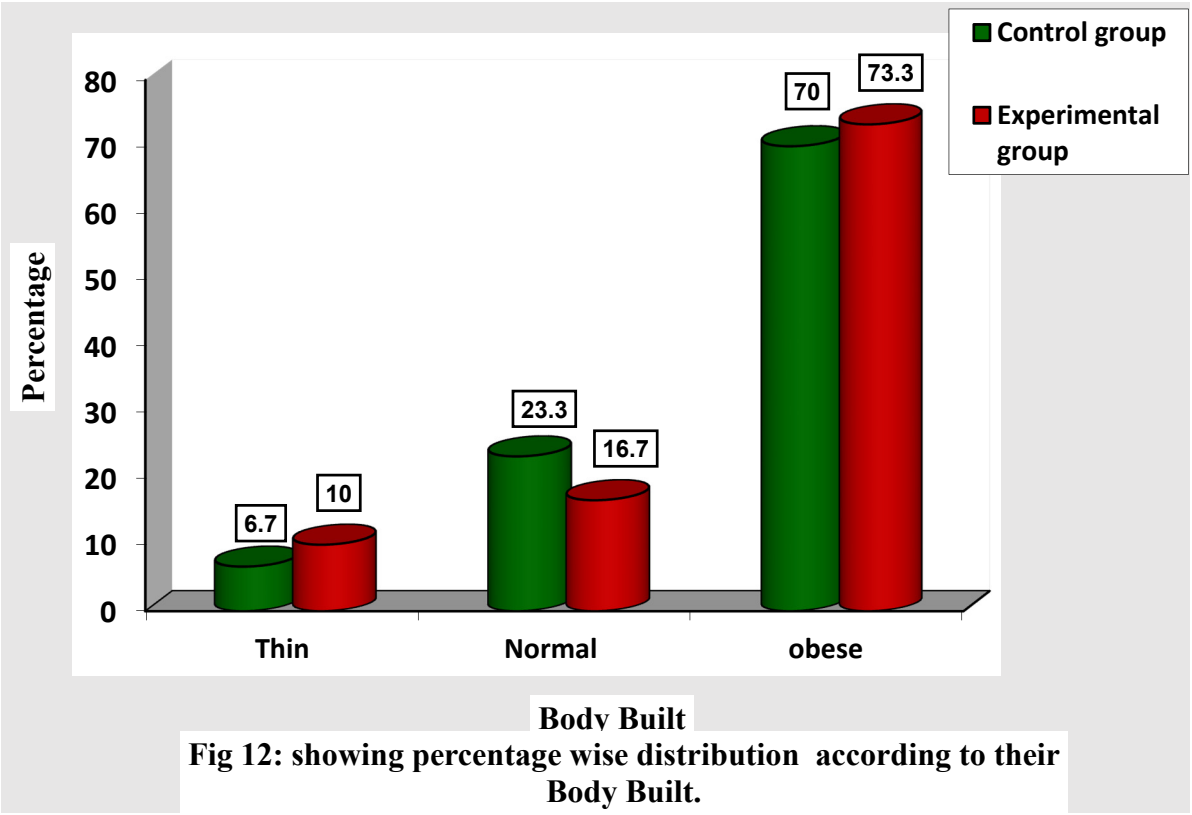


Fig 12: showing percentage wise distribution according to their Body Built.

The figure 12 shows that 6.7% are thin in control group,10%^ are thin experimental group, 23.3% are normal in control group, 16.7% are normal in experimental group,70% are obese in control group, 73.3% are obese in experimental group.

SECTION – B

OBJECTIVE 1) : ASSESS THE OF PRETEST AND POSTTEST LEVEL OF KNEE PAIN AND FUNCTIONAL IMMOBILITY AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITIS IN EXPERIMENTAL GROUP AND CONTROL GROUP.

Table 2 : Data on Frequency and percentage distribution of pretest and post test level of knee pain among old age people with knee osteoarthritis in experimental and control group.

N = 60 (30+30)

LEVEL OF KNEE PAIN	EXPERIMENTAL GROUP				CONTROL GROUP			
	PRE TEST		POST TEST		PRE TEST		PRE TEST	
	F	%	F	%	F	%	F	%
No	-	-	2	6.7	-	-	-	-
Mild	-	-	3	10	-	-	-	-
Moderate	2	6.7	25	83.3	2	6.7	-	-
Severe	25	83.3	0	0	25	83.3	28	93.3
Worst	3	10	0	0	3	10	2	6.7
Total	**30**	**30**	**30**	**30**	**30**	**100**	**30**	**100**

The above table 2. Shows that in the experimental group, 25(83.3%) had severe level of pain, 3(10%) had worst level of pain and 2(6.7%) had 6.7% level of pain in the pretest whereas in the post test after the intervention, 25(83.3%) had moderate level of pain, 3(10%) had mild level of pain and 2(6.7%) had no pain.

The table also depicts that in the control group, 25(83.3%) had severe level of pain, 3(10%) had worst level of pain and 2(6.7%) had 6.7% level of pain whereas in the post test, 28(93.3%) had severe pain and 2(6.7%) had worst pain

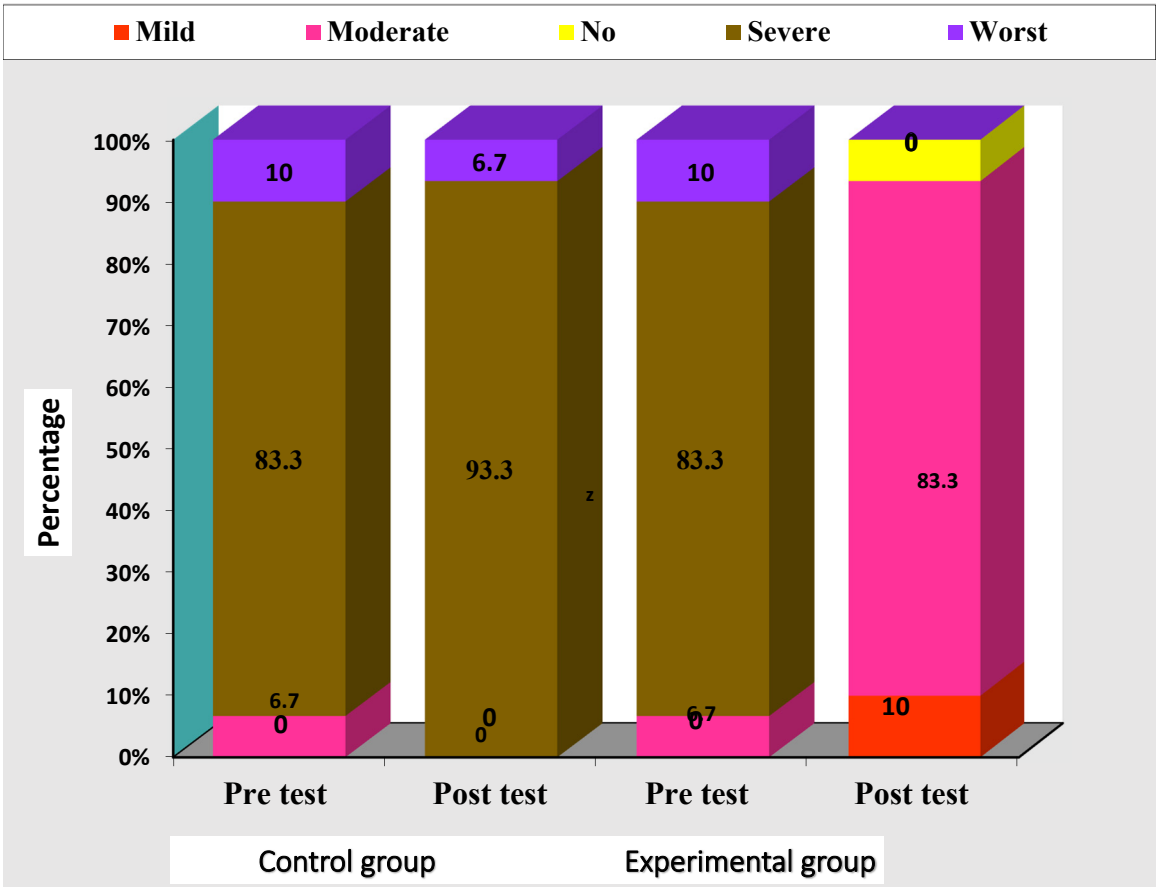


Fig 13 : Percentagewise distribution of Level of Knee Pain

Figure shows 13, that, in the control group pretest score is (83.3%) have a severe pain and posttest is (93.3%) and in the experimental group pretest score is (83.3%) have a severe pain and in the post test score is (83.3%) moderate pain. So most of the old age peoples are having the severe pain in control group as well as in the experimental group posttest the pain as reduced as a moderate (83.35%) (10%) mild pain, 2(6.7%) no pain.

Table 3 : Data on Frequency and percentage distribution of pretest and post test level of Functional immobility among the old age people with knee osteoarthritis in experimental and control group.

N = 60 (30+30)

LEVEL OF FUNCTIONAL MOBILITY	EXPERIMENTAL GROUP				CONTROL GROUP			
	PRE TEST		POST TEST		PRE TEST		POSTTEST	
	F	%	F	%	F	%	F	%
Fully independent	0	0	3	10	0	0	0	0
Partially independent	2	6.7	15	50	2	6.7	2	6.7
Dependent	28	93.3	12	40	28	93.3	28	93.3
Fully dependent	0	0	0	0	0	0	0	0
Total	**30**	**30**	**30**	**30**	**30**	**100**	**30**	**100**

The table 3 portrays that in the experimental group , 28(93.3%) were dependent and 2(6.7%) were partially independent in the pretest, whereas in the post after the intervention, 15(50%) were partially independent, 12(40%) were dependent and 3(10%) were fully independent

The above table also shows that in the control group, 28(93.3%) were dependent and 2(6.7%) were partially independent in the pretest, whereas in the post, 28(93.3%) were fully dependent and 2(6.7%) were partially independent

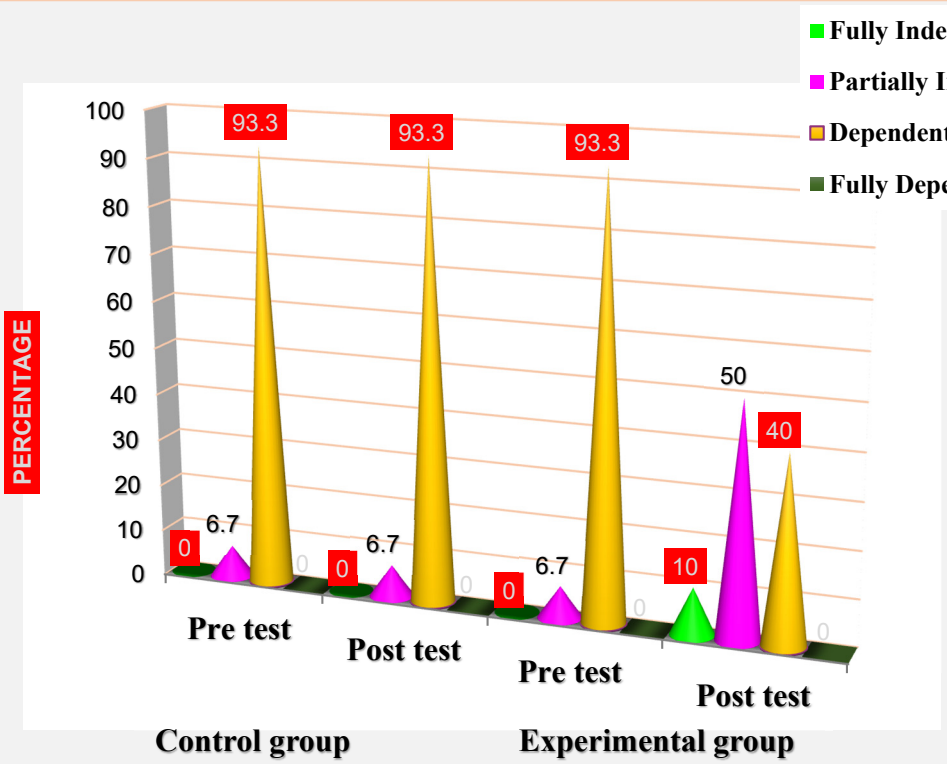


Fig 14 Level of functional mobility

The figure 14 shows that in control group during the pretest0 were fully dependent and partially independent,93.3% are dependent,6.7 rfully indepent,in post test 93.3% dpendent, for the experimental group 93.3% are dependent in pretest and in the post test 50% are partially independent,40% are dependent,10% are fully independent,

SECTION – C

OBJECTIVE 2 : TO EVLUATE THE EFFECTIVENESS OF ISOMETRIC EXERCISE ON KNEE PAIN AND FUNCTIONAL IMMOBILITY AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITIS IN EXPERIMENTAL AND CONTROL GROUP.

Table 4 : Data on the Comparison of pretest and post test level of knee pain among old age people with knee osteoarthritis in the experimental and control group.

N = 60 (30+30)

Level of knee Pain	Pretest		Post Test		Mean Difference & %	Paired 't' Value
	Mean	S.D	Mean	S.D		
Experimental Group	8.23	1.10	4.5	1.67	3.73 (37%)	**t = 16.62 P = 0.0001 S*****
Control Group	8.26	1.08	8.33	0.84	0.07 (1%)	t = 0.44 P = 0.662 N.S
Mean Difference & %	0.03 (0%)		3.83 (38%)			
Unpaired 't' Value	t = 0.11 P = 0.906 N.S		**t = 11.18 P = 0.0001 S*****			

*****p<0.001, S – Significant, N.S – Not Significant; SD- Standard deviation**

The table 4 shows that in the experimental group, the pretest mean score of pain was 8.23 ± 1.10 and the post test mean score was 4.5 ± 1.67. The mean difference score was 3.72 i.e., 37%. The calculated paired 't' value of t = 16.62 was found to be statistically highly significant at p<0.001 level.

In the control group, the pretest mean score was 8.26 ± 1.08 and the post test mean score was 8.33 ± 0.84,. The mean difference score was 0.07 i.e, 1%. The calculated paired 't' value of t = 0.44 was not found to be statistically significant.

The table also shows that the comparison of pretest level of pain between the experimental and control group, the calculated unpaired 't' value of t = 0.11 was not found to be statistically significant which clearly indicates that there was no difference in the level of pain in the pretest between the experimental and control group whereas in the post test after the intervention, the calculated unpaired 't' value of t = 11.18 was found to be statistically highly significant which clearly indicates that there was significant difference in the level of pain among old age people with knee osteoarthritis between the experimental and control group.

The above findings clearly indicates that the administration of isometric exercise on knee pain was found to be effective in reducing the level of pain among old age people with knee osteoarthritis in the experimental group than the control group who had undergone normal hospital routine measures.

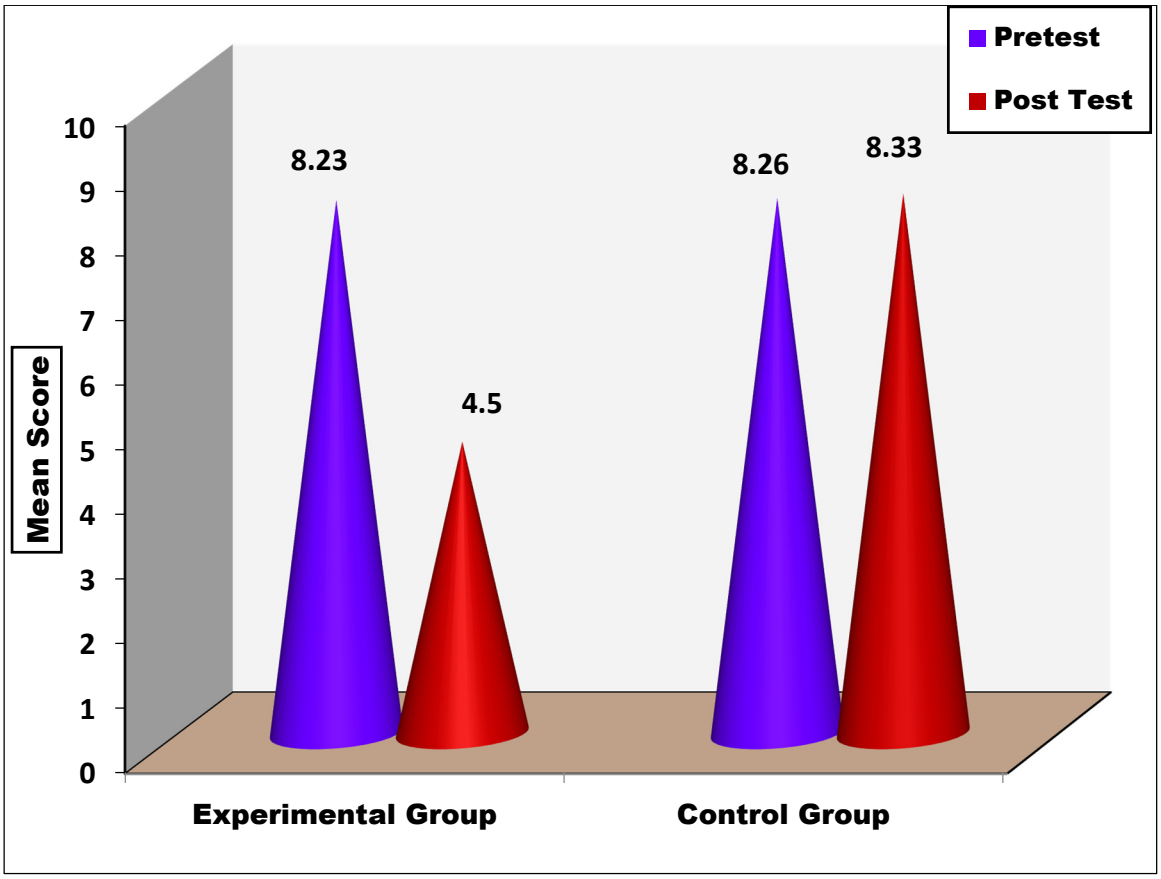


Fig 15: Comparison of pretest and post test level of pain among old age people with knee pain osteoarthritis in the experimental and control group

The figure 15 shows that the experimental group pre test mean score is 8.23 and post test mean score is 4.5 and in the conteol group pretest mean score id 8.26 and post test score is 8.33.

Table 5 : Data on the Comparison of pretest and post test level of functional immobility among old age people with knee osteoarthritis in the experimental and control group.

N = 60 (30+30)

Level of Functional immobility	Pretest		Post Test		Mean Difference & %	Paired 't' Value
	Mean	S.D	Mean	S.D		
Experimental Group	56.7	8.77	37.6	11.1	19.17 (23.96%)	**t = 13.16 P = 0.0001 S*** **
Control Group	56.93	8.12	57.07	8.48	0.13 (0.16%)	t = 0.501 P = 0.619 N.S
Mean Difference & %	0.17 (0.21%)		19.47 (24.33%)			
Unpaired 't' Value	t = 0.076 P = 0.939 N.S		**t = 7.62 P = 0.0001 S*** **			

***p<0.001, S – Significant, N.S – Not Significant; SD-standard deviation**

The table 5 shows that in the experimental group, the pretest mean score of functional immobility was 56.7 ± 8.77 and the post test mean score was 37.6 ± 11.1. The mean difference score was 19.17 i.e., 23.96%. The calculated paired 't' value of t = 13.16 was found to be statistically highly significant at p<0.001 level.

In the control group, the pretest mean score was 56.936 ± 8.12 and the post test mean score was 57.07 ± 8.48,. The mean difference score was 0.13 i.e, (0.16%). The calculated paired 't' value of t = 0.501 was not found to be statistically significant.

The table also shows that, the comparison of pretest level of pain between the experimental and control group, the calculated unpaired 't' value of t = 0.076 was not

found to be statistically significant which clearly indicates that there was no difference in the level of functional immobility in the pretest between the experimental and control group whereas in the post test after the intervention, the calculated unpaired 't' value of t = 7.62 was found to be statistically highly significant which clearly indicates that there was significant difference in the level of knee pain among old age people with knee osteoarthritis between the experimental and control group.

The above findings clearly indicates that the administration of isometic exercise on knee pain was found to be effective in reducing the level of functional immobility among old age people with knee osteoarthritis in the experimental group than the control group who had undergone normal hospital routine measures.

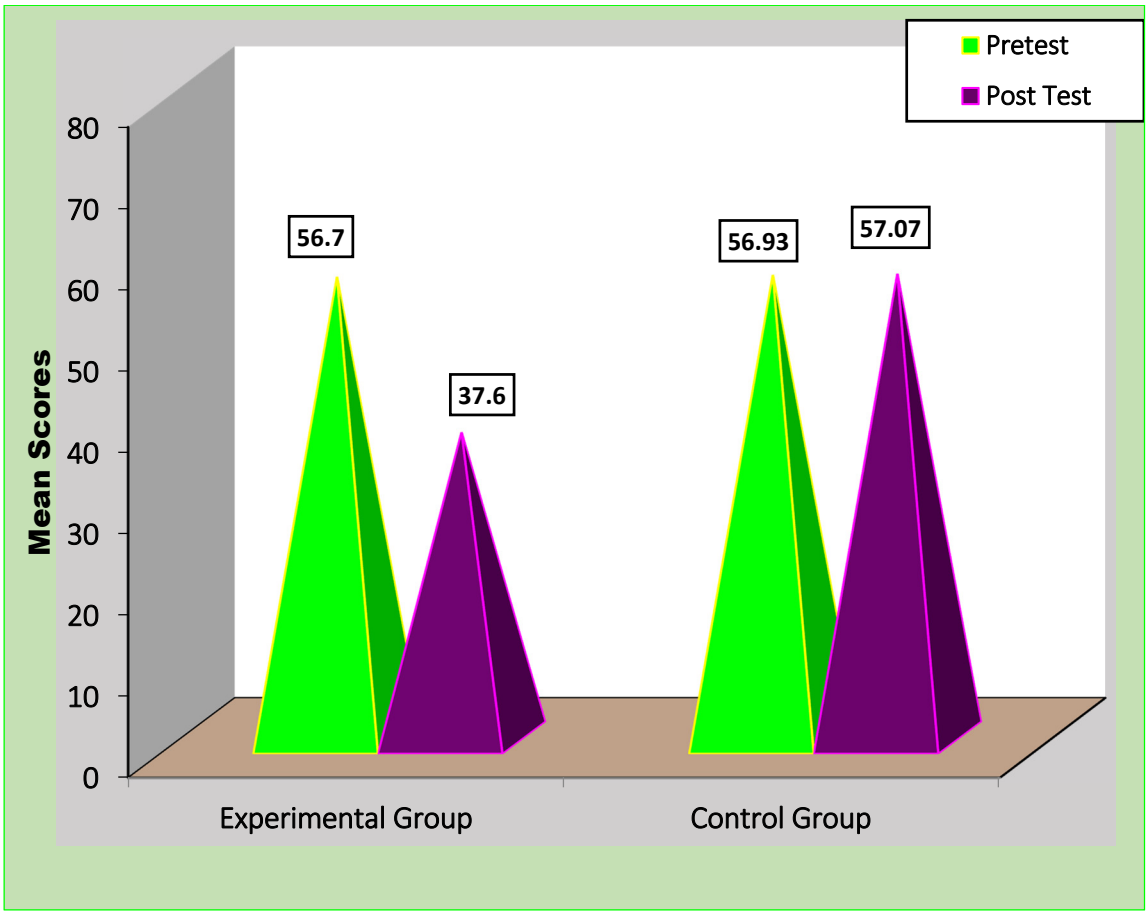


Figure 16 - Comparison of pretest and post test level of functional immobility among old age people with knee osteoarthritis in the experimental and control group

The figure 16 shows that, the functional immobility mean score in the experimental pre test 56.7 and in the post test 37.6, Control group functional immobility mean score level in pretest 56.93 and in the post test 57.07.

SECTION - D

OBJECTIVE 3 : CORRELATION BETWEEN THE LEVEL OF KNEE PAIN AND FUNCTIONAL IMMOBILITY AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITIS IN EXPERIMENTAL AND CONTROL GROUP.

Table 6 : Data on the Correlation between pretest and post test level of knee pain and functional immobility among old age people with knee osteoarthritis in the experimental group.

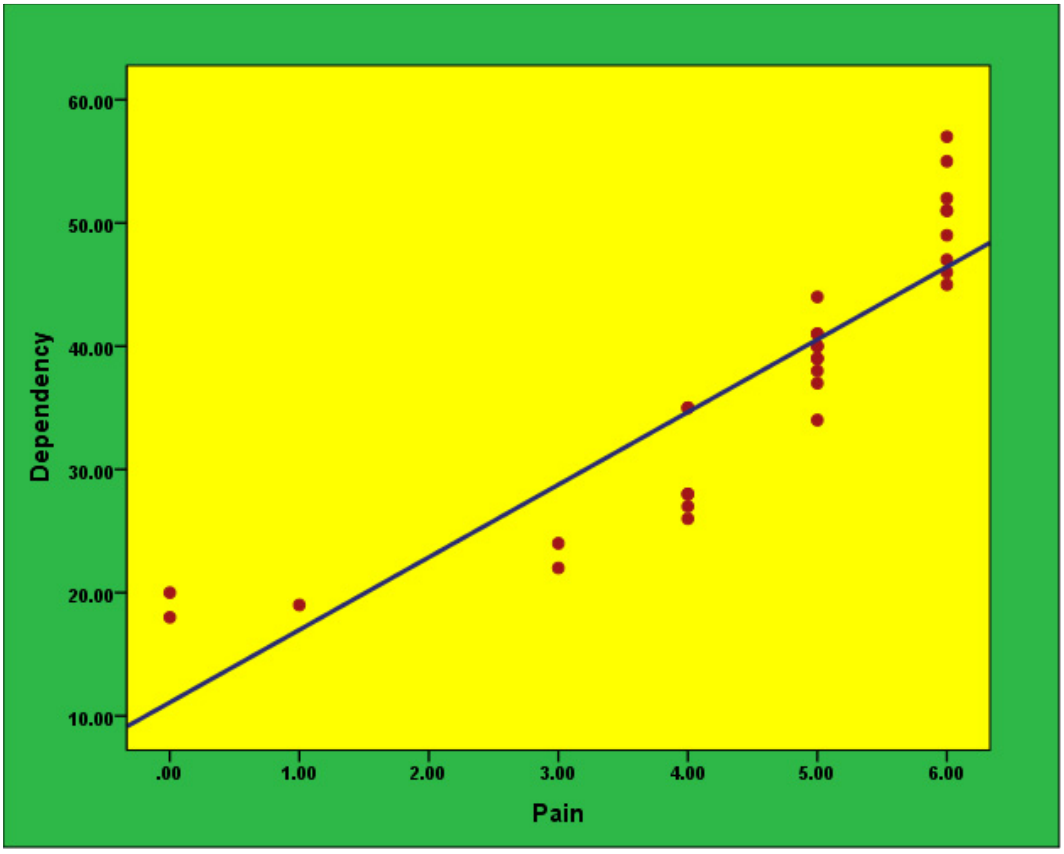
N = 30

Variables	Pain		functional mobility		Correlation 'r' Value
	Mean	S.D	Mean	S.D	
Pretest	8.23	1.10	56.77	8.77	r = 0.251 P = 0.180 N.S
Post Test	4.50	1.68	37.60	11.13	**r = 0.887** **P = 0.0001** **S*** **

***p<0.001, S – Signficant, N.S – Not Significant; SD- Standard deviation**

The table 6 shows that in the pretest the mean score of pain was 8.23 ± 1.10 and the mean score of functional immobility was 56.77 ± 8.77. The calculated Karl pearson's correlation value of r = 0.251 shows a positive correlation but not found to be statistically significant.

In the post test, the mean score of pain was 4.50 ± 1.68 and the mean score of functional immobility was 37.60 ± 11.13 The calculated Karl pearson's correlation value of r = 0.887 shows a positive correlation and was found to be statistically highly significant at p<0.001 level which clearly indicates that when the level of pain decreases the dependency also decreases which results in increase in the level of functional mobility among old age people with knee osteoarthritis in the experimental group.



The figure 17 Scatter Dot diagram showing the correlation between post test level of knee pain and Functional immobility among old age people with knee osteoarthritis in the experimental group

Table 7 : Data on the Correlation between pretest and post test level of knee pain and functional immobility among old age people with knee osteoarthritis in the control group.

N = 30

Variables	Pain		Functional immobility		Correlation 'r' Value
	Mean	S.D	Mean	S.D	
Pretest	8.27	1.08	56.93	8.13	r = -0.218 P = 0.248 N.S
Post Test	8.33	0.84	57.07	8.48	r = -0.119 P = 0.532 N.S

N.S – Not Significant

The table 7 shows that in the pretest the mean score of pain was 8.27 ± 1.08 and the mean score of Functional immobility was 56.93 ± 8.13. The calculated Karl pearson's correlation value of r = -0.218 shows a negative correlation between level of pain and depedency.

The table also shows that in the post test, the mean score of pain was 8.33 ± 0.84 and the mean score of Functional immobility was 57.07 ± 8.48 The calculated Karl pearson's correlation value of r = -0.119 shows a negative correlation between level of knee pain and Functional immobility in the control group.

SECTION - E

OBJECTIVE 4 : ASSOCIATION BETWEEN THE POST TEST LEVEL OF KNEE PAIN AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITIS IN EXPERIMENTAL GROUP.

Table 8 : Data Association between the post test level of knee pain among the old age people with knee osteoarthritis with their selected demographic variables in the experimental group.

Demographic Variables	No Pain		Mild		Moderate		χ^2 (df)	p-value (N/NS)
	f	%	f	%	f	%		
1. Age (in years):								
55-65	1	3.3	0	0	7	23.3	2.33	0.675
65-70	1	3.3	2	6.7	10	33.3	(df=4)	NS
70-75	0	0	1	3.3	8	26.7		
2. Gender:								
Male	2	6.7	1	3.3	10	33.3	2.85	0.24
Female	0	0	2	6.7	15	50	(df=2)	NS
3. Educational status:								
Illiterate	1	3.3	0	0	9	30		
Primary	0	0	0	0	3	10	8.01	0.237
High school	0	0	3	10	7	23.3	(df=6)	NS
Higher secondary & above	1	3.3	0	0	6	20		
4. Occupation:								
Home maker	1	3.3	0	0	6	20		
Private employee	0	0	0	0	3	10	4.06	0.851
Government employee	0	0	1	3.3	4	13.3	(df=8)	NS
Self employed	1	3.3	1	3.3	9	30		
Agriculture	0	0	1	3.3	3	10		
5. Reason for coming:								
Loneliness	1	3.3	0	0	8	26.7		
Lack of love and affection	0	0	1	3.3	5	16.7	3.17	0.786
Loss of parter	1	3.3	1	3.3	9	30	(df=6)	NS
No children	0	0	0	0	3	10		

6.Number of children:								
1	0	0	0	0	12	40	7.99 (df=6)	0.239 NS
2	1	3.3	0	0	5	16.7		
3	1	3.3	3	10	7	23.3		
More	0	0	0	0	1	3.3		
7.Mode of admission:								
Voluntary	2	6.7	3	10	14	46.7	3.47 (df=2)	0.176 NS
Involuntary	0	0	0	0	11	36.7		
8.Duration of stay:								
1-2 yrs	2	6.7	0	0	15	50	5.59 (df=4)	0.232 NS
3-4 yrs	0	0	2	6.7	7	23.3		
5-7 yrs	0	0	1	3.3	3	10		
More than 7 yrs	0	0	0	0	0	0		
9.Food pattern:								
Vegetarian	0	0	1	3.3	6	20	0.78 (df=2)	0.676 NS
Non vegetarian	2	6.7	2	6.7	19	63.3		
10. Body Built:								
Thin	0	0	0	0	3	10	2.95 (df=4)	0.566 NS
Normal	1	3.3	1	3.3	3	10		
Obese	1	3.3	2	6.7	19	63.3		

***p<0.05, S – Significant, N.S – Not Significant**

The above table 8 shows that none of the demographic variables had shown statistically significant association with post test level of knee pain among old age people with knee osteoarthritis in the experimental group

Table 9 :Data on the Association between the post test level of knee pain among the old age people with knee osteoarthritis with their selected demographic variables in the control group.

N = 30

Demographic Variables	Severe		Worst		χ^2 (df)	p-value (S/NS)
	F	%	F	%		
1. Age (in years):						
55-65	13	43.3	0	0	7.04	**0.030* S**
65-70	10	33.3	0	0	(df=2)	
70-75	5	16.7	2	6.7		
2. Gender:						
Male	10	33.3	0	0	1.07 (df=1)	0.301 NS
Female	18	60	2	6.7		
3. Educational status:						
Illiterate	3	10	0	0	0.535 (df=3)	0.911 NS
Primary	9	30	1	3.3		
High school	2	6.7	0	0		
Higher secondary & above	14	46.7	1	3.3		
4. Occupation:						
Home maker	6	20	0	0		
Private employee	9	30	0	0	3.37	0.498
Government employee	6	20	1	3.3	(df=4)	NS
Self employed	3	10	0	0		
Agriculture	4	13.3	1	3.3		
5. Reason for coming:						
Loneliness	12	40	1	3.3	0.16 (df=2)	0.921 NS
Lack of love and affection	0	0	0	0		
Loss of parter	14	46.7	1	3.3		
No children	2	6.7	0	0		
6. Number of children:						
1	2	6.7	1	3.3	6.43 (df=3)	0.093 NS
2	20	66.7	0	0		
3	4	13.3	1	3.3		
More	2	6.7	0	0		
7. Mode of admission:						
Voluntary	21	70	1	3.3	0.59 (df=1)	0.440 NS
Involuntary	7	23.3	1	3.3		
8. Duration of stay:						
1-2 yrs	19	63.3	1	3.3	2.68 (df=2)	0.264 NS
3-4 yrs	6	20	0	0		

Demographic Variables	Severe		Worst		χ^2 (df)	p-value (S/NS)
	F	%	F	%		
5-7 yrs	3	10	1	3.3		
More than 7 yrs	0	0	0	0		
9. Food pattern:					0.408 (df=1)	0.523 NS
Vegetarian	8	26.7	1	3.3		
Non vegetarian	20	66.7	1	3.3		
10. Body Built:					8.19 (df=2)	**0.018* S**
Thin	1	3.3	1	3.3		
Normal	6	20	1	3.3		
Obese	21	70	0	0		

The above table 9 shows that the demographic variables age and body built had shown statistically significant association with post test level of knee pain at $p<0.05$ level and the other demographic variables had not shown statistically significant association with post test level of knee pain among old age people with knee osteoarthritis in the experimental group.

Table 10 : Association between the post test level of functional immobility among the old age people with knee osteoarthritis with their selected demographic variables in the experimental group.

N = 30

Demographic Variables	Fully independent		Partially independent		Partially dependent		χ^2 (df)	p-value (S/NS)
	f	%	f	%	f	%		
1. Age (in years):								
55-65	1	3.3	6	20	1	3.3	9.19	0.056
65-70	1	3.3	8	26.7	4	13.3	(df=4)	NS
70-75	1	3.3	1	3.3	7	23.3		
2. Gender:								
Male	3	10	8	26.7	2	6.7	8.01 (df=2)	**0.018* S**
Female	0	0	7	23.3	10	33.3		
3. Educational status:								
Illiterate	1	3.3	3	10	6	20	3.17 (df=6)	0.786 NS
Primary	0	0	2	6.7	1	3.3		
High school	1	3.3	6	20	3	10		
Higher secondary & above	0	0	4	13.3	2	6.7		
4. Occupation:								
Home maker	1	3.3	3	10	3	10		
Private employee	0	0	2	6.7	1	3.3	2.58	0.958
Government employee	0	0	3	10	2	6.7	(df=8)	NS
Self employed	1	3.3	5	13.3	5	16.7		
Agriculture	1	3.3	2	6.7	1	3.3		
5. Reason for coming:								
Loneliness	1	3.3	4	13.3	4	13.3	1.71 (df=6)	0.945 NS
Lack of love and affection	1	3.3	3	10	2	6.7		
Loss of parter	1	3.3	5	16.7	5	16.7		
No children	0	0	3	10	1	3.3		
6. Number of children:								
1	0	0	6	20	6	20	7.62 (df=6)	0.267 NS
2	1	3.3	1	3.3	4	13.3		
3	2	6.7	7	23.3	2	6.7		
More	0	0	1	3.3	0	0		
7. Mode of admission:								
Voluntary	3	10	8	26.7	8	26.7	2.44 (df=2)	0.295 NS
Involuntary	0	0	7	23.3	4	13.3		

8. Duration of stay:								
1-2 yrs	2	6.7	7	23.3	8	26.7	5.03 (df=4)	0.284 NS
3-4 yrs	0	0	7	23.3	2	6.7		
5-7 yrs	1	3.3	1	3.3	2	6.7		
More than 7 yrs	0	0	0	0	0	0		
9. Food pattern:								
Vegetarian	1	3.3	2	6.7	4	13.3	1.68 (df=2)	0.432 NS
Non vegetarian	2	6.7	13	43.3	8	26.7		
10. Body Built:								
Thin	0	0	1	3.3	2	6.7	4.67	0.323
Normal	1	3.3	4	13.3	0	0	(df=4)	NS
Obese	2	6.7	10	33.3	10	33.3		

***p<0.05, S – Significant, N.S – Not Significant**

The above table 10 shows that the demographic variables age had shown statistically significant association with post test level of dependency at p<0.05 level and the other demographic variables had not shown statistically significant association with post test level of dependency among old age people with knee osteoarthritis in the experimental group

Table 11: Association between the of post test level of functional immobility among the old age people with knee osteoarthritis with their selected demographic variables in the control group.

N = 30

Demographic Variables	Partially independent		Dependent		χ^2 (df)	p-value (S/NS)
	F	%	F	%		
1. Age (in years):						
55-65	1	3.3	12	40	1.38	0.499
65-70	0	0	10	33.3	(df=2)	NS
70-75	1	3.3	6	20		
2. Gender:						
Male	0	0	10	33.3	1.07 (df=1)	0.301 NS
Female	2	6.7	18	60		
3. Educational status:						
Illiterate	0	0	3	10		
Primary	0	0	10	33.3	2.14 (df=3)	0.543 NS
High school	0	0	2	6.7		
Higher secondary & above	2	6.7	13	43.3		
4. Occupation:						
Home maker	0	0	6	20		
Private employee	1	3.3	8	26.7	2.85	0.582
Government employee	0	0	7	23.3	(df=4)	NS
Self employed	0	0	3	10		
Agriculture	1	3.3	4	13.3		
5. Reason for coming:						
Loneliness	2	6.7	11	36.7		
Lack of love and affection	0	0	0	0	2.80 (df=2)	0.246 NS
Loss of parter	0	0	15	50		
No children	0	0	2	6.7		
6. Number of children:						
1	0	0	3	10		
2	1	3.3	19	63.3	1.88 (df=3)	0.599 NS
3	1	3.3	4	13.3		
More	0	0	2	6.7		
7. Mode of admission:						
Voluntary	0	0	22	73.3	5.89 (df=1)	**0.015* S**
Involuntary	2	6.7	6	20		
8. Duration of stay:						
1-2 yrs	0	0	20	66.7		
3-4 yrs	1	3.3	5	16.7	4.55 (df=2)	0.103 NS
5-7 yrs	1	3.3	3	10		
More than 7 yrs	0	0	0	0		

Demographic Variables	Partially independent		Dependent		χ^2 (df)	p-value (S/NS)
	F	%	F	%		
9. Food pattern:					5.0 (df=1)	**0.025* S**
Vegetarian	2	6.7	7	23.3		
Non vegetarian	0	0	21	70		
10. Body Built:					0.918 (df=2)	0.632 NS
Thin	0	0	2	6.7		
Normal	1	3.3	6	20		
Obese	1	3.3	20	66.7		

***p<0.05, S – Significant, N.S – Not Significant**

The above table 11 shows that the demographic variables mode of admission and food pattern had shown statistically significant association with post test level of dependency at $p<0.05$ level and the other demographic variables had not shown statistically significant association with post test level of dependency among old age people with knee osteoarthritis in the control group.

CHAPTER V

DISCUSSION

CHAPTER V

DISCUSSION

A detailed discussion based on what the study found, is interpreted by statistical analysis, is discussed in this chapter. The findings are discussed in relation to the objectives, need for the study, related literature and conceptual framework.

The present study was executed to assess the Effectiveness of Isometric Exercise on Knee Pain perception and Functional immobility among the Old Age People with Knee Osteoarthritis at Selected Old Age Home at Trichy. There was a significant improvement in the levels of functional mobility after the administration of Isometric Exercise was found in this study. The findings are discussed objective wise and presented below.

Description of demographic variables

The analysis of the demographic variables revealed that in the experimental group, majority 13(43.3%) were in the age group of 55 – 65 years, 20(66.7%) were female, 15(50%) were educated upto higher secondary and above, 9(30%) were private employee, 15(50%) had the reason of loss of partner, 29)66.7%) had 2 children, 22(73.3%) were admitted voluntarily, 20(66.7%) were staying for 1 – 2 years, 21(70%) were non-vegetarian and 21(70%) were obese.

Whereas in the control group, majority 13(43.3%) were in the age group of 65 – 70 years, 17(56.7%) were female, 10(33.3%) were educated up to higher secondary and above and high school education respectively, 11(36.7%) were self-employed, 11(36.7%) had the reason of loss of partner, 12(40%) had only 1 child, 19(63.3%) were

admitted voluntarily, 17(56.7%) were staying for 1 – 2 years, 23(76.7%) were non-vegetarian and 22(73.3%) were obese.

The first objective was to assess the pre-test and post-test level of knee pain and functional immobility among the old age people with knee osteoarthritis in experimental group and control group.

The findings revealed that in the experimental group, 25(83.3%) had severe level of knee pain, 3(10%) had worst level of knee pain and 2(6.7%) had 6.7% level of knee pain in the pre-test whereas in the post test after the intervention, 25(83.3%) had moderate level of pain, 3(10%) had mild level of knee pain and 2(6.7%) had no knee pain.

The findings also depicts that in the control group, 25(83.3%) had severe level of pain, 3(10%) had worst level of pain and 2(6.7%) had 6.7% level of knee pain whereas in the post test, 28(93.3%) had severe knee pain and 2(6.7%) had worst knee pain.

About the pre-test and post-test level of functional immobility among the old age people with knee osteoarthritis in experimental group and control group.

The findings revealed that in the experimental group, 28(93.3%) were fully dependent and 2(6.7%) were partially dependent in the pretest, whereas in the post after the intervention, 15(50%) were partially dependent, 12(40%) were dependent and 3(10%) were fully independent.

The findings also portrays that in the control group, 28(93.3%) were fully dependent and 2(6.7%) were partially dependent in the pre-test, whereas in the post, 28(93.3%) were fully dependent and 2(6.7%) were partially dependent.

The above findings are supporting with this study **S.Srinivasan, T.M. Jeyasree, et al., (2015):** conducted a population based study, to estimate the

prevalence and severity of osteoarthritis among 1637 persons of age group of 65-74 years in the rural areas of Puvaneswar. By systemic random sampling technique they have selected a list of houses. The data was collected by house to house survey on a pre-designed and pretested format. Osteoarthritis was considered as if a elderly was suffering from knee pain, swelling and limitation of movement of larger joint or if one has already been diagnosed as having osteoarthritis. The study revealed that the majority (61.6%) of elderly were aged 65-74 yrs, about 7.6% were aged >85yrs.The overall prevalence of osteoarthritis in elderly of Puvaneswar was 52.6% in rural areas it was32.6% in urban, it was60.3%.Osteoarthritis was more in females as compared to males (68% vs 44.7%) and also the functional immobility has improved with the effective interventions.

The second objective was to assess the effectiveness of isometric exercise on knee pain and functional immobility among the old age people with knee osteoarthritis in experimental and control group.

The analysis in the table 4.3.1 revealed that in the experimental group, the pre-test mean score of pain was 8.23 ± 1.10 and the post-test mean score was 4.5 ± 1.67. The mean difference score was 3.72 i.e., 37%. The calculated paired' value of t = 16.62 was found to be statistically highly significant at $p<0.001$ level.

Therefore, the hypothesis H_1 stated earlier, "The mean post-test level of knee pain score is significantly lower than the mean pre-test level of knee pain score among the old age people with knee osteoarthritis in an experimental group"

In the control group, the pre-test mean score was 8.26 ± 1.08 and the post-test mean score was 8.33 ± 0.84. The mean difference score was 0.07 i.e., 1%. The calculated paired' value of t = 0.44 was not found to be statistically significant.

The analysis also shows that the comparison of pre-test level of pain between the experimental and control group, the calculated unpaired 't' value of t = 0.11 was not found to be statistically significant which clearly indicates that there was no difference in the level of pain in the pre-test between the experimental and control group whereas in the post test after the intervention, the calculated unpaired 't' value of t = 11.18 was found to be statistically highly significant which clearly indicates that there was significant difference in the level of knee pain among old age people with knee osteoarthritis between the experimental and control group. **Hence the hypothesis H_1 was accepted.**

The above findings are supporting with this study **Ms. Grena.J (2016)**: The design adopted for this study was quasi experimental Pre-test and Post-test control group design to assess the effectiveness of Isometric exercises on level of pain among osteoarthritis patients. Non-probability purposive sampling technique was used to select 30 samples for experimental group from zaminkollankondan village and the same method was used to select 30 samples for control group from avarampatti . The data collection tool used for the study was modified Lequence observational checklist for osteoarthritis to identify the severity of osteoarthritis. the post-test level of pain among experimental group it was ound that the mean value is 3.2 and the standard deviation is 2.35, where as in control group mean value is 5.93 and standard deviation is 2.63 and the 't'value was 7.01, it shows that there is significant reduction in post-test level of pain in experimental group than post-test level of pain in control group at$p<0.05$ level From the result of the study, it was concluded that, rendering Isometric exercises to the osteoarthritis patient was effectiveness in reduction of knee pain.Therefore the

investigator felt that the importance of isometric exercise for osteoarthritis patient used to reduce the level of pain

Therefore, the hypothesis H_2 stated earlier, **"The mean post-test level of functional immobility is significantly higher than the mean pre-test level of functional immobility score among the old age people with knee osteoarthritis in the experimental group"**

In the control group, the pre-test mean score was 56.936 ± 8.12 and the post-test mean score was 57.07 ± 8.48,. The mean difference score was 0.13 i.e., (0.16%). The calculated paired' value of t = 0.501 was not found to be statistically significant.

The table also shows that the comparison of pre-test level of pain between the experimental and control group, the calculated unpaired 't' value of t = 0.076 was not found to be statistically significant which clearly indicates that there was no difference in the level of dependency in the pre-test between the experimental and control group whereas in the post test after the intervention, the calculated unpaired 't' value of t = 7.62 was found to be statistically highly significant which clearly indicates that there was significant difference in the level of pain among old age people with knee osteoarthritis between the experimental and control group.

The above findings clearly indicates that the administration of isometric exercise on knee pain was found to be effective in reducing the level of pain and improvement in functional immobility among old age people with knee osteoarthritis in the experimental group than the control group who had undergone normal hospital routine measures. **Hence the hypothesis H2 was accepted.**

The third objective was to correlate the level of knee pain and functional immobility among the old age people with knee osteoarthritis in experimental and control group.

The findings revealed that in the pretest the mean score of pain was 8.23 ± 1.10 and the mean score of dependency was 56.77 ± 8.77. The calculated Karl pearson's correlation value of r = 0.251 shows a positive correlation but not found to be statistically significant.

Therefore, the hypothesis H_3 stated earlier, **"There is a significant relationship between the levels of knee pain with functional immobility among the old age people with knee osteoarthritis in experimental group"** was rejected.

The table also depicts that in the post test, the mean score of pain was 4.50 ± 1.68 and the mean score of functional immobility was 37.60 ± 11.13 The calculated Karl pearson's correlation value of r = 0.887 shows a positive correlation and was found to be statistically highly significant at $p<0.001$ level which clearly indicates that when the level of pain decreases the functional immobility also decreases which results in increase in the level of functional immobility among old age people with knee osteoarthritis in the experimental group.

Therefore, the hypothesis H_3 stated earlier, "There is a significant relationship between the level of knee pain with functional immobility among the old age people with knee osteoarthritis in experimental group" Hence the hypothesis H3was accepted.

The analysis revealed that in the pretest the mean score of pain was 8.27 ± 1.08 and the mean score of functional immobility was 56.93 ± 8.13. The calculated Karl pearson's correlation value of r = -0.218 shows a negative correlation between level of pain and functional immobility

The table also shows that in the post test, the mean score of pain was 8.33 ± 0.84 and the mean score of functional immobility was 57.07 ± 8.48 the calculated Karl

pearson's correlation value of r = -0.119 shows a negative correlation between level of pain and functional immobility in the control group.

Therefore, the hypothesis H_3 stated earlier, "There is a significant relationship between the levels of knee pain with functional immobility among the old age people with knee osteoarthritis in control group" was rejected.

The above findings were found to be consistent with the study conducted by **Tug well. P. (2011)**: A study was conducted to assess efficacy of an exercise program for elderly people with knee pain conducted via video conferencing. Twenty-two community-dwelling subjects aged 60 years or above with knee pain were recruited from two community centers in Hong Kong. A 12-week exercise program, including strengthening and balance training, was given via videoconferencing to subjects at both centers, in conjunction with a home-based exercise program. The outcome measures included the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), quadriceps muscle strength, Berg's Balance Scale (BBS) and subjects' degree of acceptance of videoconferencing. Twenty subjects completed the 12-week program. And significant improvements occurred in all domains of the WOMAC score. There was a 44% and a 13% increase in functional immobility Over 80% of the elderly subjects who joined the program agreed or strongly agreed about all aspects of using isometric exercise. Most of them felt that the system was user-friendly and convenient for the community-dwelling elderly persons with knee pain.

The fourth objective was to find out the association between the levels of knee pain and functional immobility among the old age peoples of old age home with their selected demographic variables in experimental and control group.

The analysis showed that none of the demographic variables had shown statistically significant association with post-test level of pain among old age people with knee osteoarthritis in the experimental group.

Therefore, the hypothesis H_4 stated earlier, **"There is a significant association between the post-test levels of knee pain among old age people with knee osteoarthritis selected demographic variables in the experimental group"** was accepted.

The analysis further shows that the demographic variables age and body built had shown statistically significant association with post-test level of knee pain at $p<0.05$ level and the other demographic variables had not shown statistically significant association with post-test level of pain among old age people with knee osteoarthritis in the control group.

Therefore, the hypothesis H_4 stated earlier, **"There is a significant association between the post-test levels of knee pain among old age people with knee osteoarthritis selected demographic variables in the control group"** was accepted for the demographic variables age and body built and rejected for other demographic variables.

The analysis in table 4.5.3 shows that the demographic variables age had shown statistically significant association with post-test level of functional immobility at $p<0.05$ level and the other demographic variables had not shown statistically significant association with post-test level of functional immobility among old age people with knee osteoarthritis in the experimental group.

Therefore, the hypothesis H_5 stated earlier, **"There is significant association between the post-test level functional immobility among the old age people with knee osteoarthritis in selected demographic variables in the experimental group"**

was accepted for the demographic variable age and rejected for all other demographic variables.

The findings in table 4.5.4 shows that the demographic variables mode of admission and food pattern had shown statistically significant association with post-test level of functional immobility at $p<0.05$ level and the other demographic variables had not shown statistically significant association with post-test level of functional immobility among old age people with knee osteoarthritis in the control group..

Therefore, the hypothesis H_5 stated earlier, **"There is significant association between the post-test level functional immobility among the old age people with knee osteoarthritis in selected demographic variables in the control group"** was accepted for the demographic variables mode of admission and food pattern and rejected for all other demographic variables.

The above findings were found to be consistent with the study conducted by the

Liew CM et al., (2014): The retrospective study to investigate the association between level functional mobility and prevalence of knee osteoarthritis. A random sample of 72 Beijing residents more than 60 years were enquired about duration of squatting at youth 40% of the men and 68% of the women reported squatting one hour per day at youth were having the greatest incidence. Prevalence of tibia knee osteoarthritis was found to be increased in both men and women who squatted more than 30mts per day at youth compared to subjects who squatted less than 30mts per day at youth.

Jordan.J.W. (2010): A subsequent 12-week study investigated the effects of functional mobility (measured by using 3D motion analysis during gait) on knee pain and functional mobility in individuals with knee osteoarthritis Measures of knee varus/valgus laxity were assessed as well as isometric exercise. Each participant

completed the Western Ontario and McMaster Osteoarthritis Index (WOMAC), which is a 24- question self - assessment questionnaire regarding pain, stiffness and function. Performance measures included the step test, stair climb test and walking speed. Quadriceps exercises were performed over a 12-week period, which consisted of heated knee extension, short arc quads, straight leg raises and isometric knee flexion exercises with ankle weights. In this study, the severity of the disease was significantly associated with the degree of mal-alignment. Both the groups with neutral and mal-aligned knees had an increase in quadriceps strength and functional measures; however, the increase in quadriceps strength was not associated with an increase in the knee adduction moment in the group with mal-aligned knees, which may suggest that quadriceps strength may be indicated in this population. In fact, dynamic optimization (i.e. mathematical formulae) utilizing a 3D model for gait analysis demonstrates that during stance, the knee is stabilized in the frontal plane by the quadriceps and gastocnemius muscles. This muscular stabilization of the knee serves as a mechanism to control the knee adduction movements.

CHAPTER VI

SUMMARY AND RECOMMENDATION

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENTATIONS

This chapter gives account of the present study along with conclusion drawn from recommendation, implication, conclusion, suggestion for further studies and nursing implications.

SUMMARY OF THE STUDY:

The primary aim of the study was to assess the effectiveness of isometric on knee pain perception and Functional immobility among the Old Age People with Knee Osteoarthritis at Selected Old Age Home at Trichy.

OBJECTIVES OF THE STUDY:

Objectives of the study are….

i) To assess the pre and posttest level of knee pain and functional immobility among the of old age people with knee osteoarthritis in control group and experimental group.

ii) To evaluate the effectiveness of isometric exercise on knee pain and functional immobility among the old age people with knee osteoarthritis control group and experimental group.

iii) To correlate the level of knee pain and functional immobility among the old age people with knee osteoarthritis in Control group and Experimental group

iv) To find out the association between the levels of knee pain and functional immobility among the old age people with their selected demographic variables in the control and experimental group.

HYPOTHESIS

H_1- The mean posttest level of knee pain score is significantly lower than the mean pretest level of knee pain score among the old age people with knee osteoarthritis in an experimental group.

H_2 – The mean posttest level of functional immobility is significantly higher than the mean posttest level of functional immobility score among the old age people with knee osteoarthritis in an experimental group.

H_3-- There is a significant association between the posttest level of knee pain among old age people with knee osteoarthritis selected demographic variables in the control and experimental group.

H_4 - There is a significant association between the posttest level functional immobility among the old age people with knee osteoarthritis in selected demographic variables in the control and experimental group.

The design adopted for the study was quasi experimental study, non-randomized control group pretest – posttest design. The conceptional frame work was based on the gate control theory of pain. The gate control theory was first postulated by Ronald Melzack and Patrick David Wall in 1965. This theory suggests that for pain to pass through the gate there must be unopposed passage for nociceptive information arriving at the synapses in the substantia gelatinosa. The pain impulses will be carried out by the small diameters and it will open the pain gate and the person feels pain. Many non-pharmacological procedures such as isometric exercise, TENS stimulate the nerve endings connected with large diameter fibers which can produce a reduction of pain by closing the pain gate.

The sample size of the study was 60, in this 30 consider as an experimental group and 30 consider as a control group. For this study the Non-prophapility purposive

sampling technique was adopted for the selection of the sample. Demographic data of the subjects were collected.

The investigators collected pretest data using numerical pain scale and modified WOMAC scale for the assessment of functional mobility for the both the group. Experimental group has received the interventions of isometric exercise for 15-20 minutes twice a day with daily routine care two weeks. Control group received routine care without intervention. Post test was conducted by the investigator for the both the groups. The experimental group post test was conducted. The post result was highly significant (P>0.001***) than the pretest. The study of isometric exercise is effective with old age people with knee pain osteoarthritis.

MAJOR FINDINGS

With the regards to age in control group 13 (43.3%) belongs to the age group between 55-65 yrs and in experimental group 13(43.3%) belongs to the age group between 65-70 yrs.

Were in considering the gender of the old age in control group 20 (66.7%), and in experimental group 17 (56.7%).

In relation to educational status of the old age in the control group 15 (15.5 %) were as higher secondary and above and primary school education 10 (33.3%), and high school education 2 (6.7%) as a, and in experimental group 10 (33.3%) as an illiterate and primary school education and higher secondary school and above 7 (23.3%) and primary school education 3 (10%).

Regarding the occupation in control group 9(30%) members as a private employee 7(23.3%) members as a government employee, 6(20%) members as a home makers, 5(10%) members as a agriculture, 3(10%) as a self-employed. In the experimental group 11 (36.7%) as a self-employed, 7(23.3%) as homemakers,

5(16.7%) as a government employed, 4(16.7%) as an agriculture, (16.7%) as a private employee.

With concern to the old age people reason for coming old age home in control group because of loss of life partner 15 members (50%) and 11 (36.7%) members because loss of life partner in experimental group.

With respect of number of children 20(66.7%) of old age people have a two children's in control group and 12 (40%) of old age people have a only one children in experimental group.

In the mode of admission 22(73.3%) of old age people are voluntary admission and 8(26.7%) of old age people are in voluntary admission in control group and 19 (63.3%) of old age people are in voluntary admission and 11 (26.7) of people are involuntary admission in experimental group.

In the duration of stay 20 (66.7%) old age peoples are staying as a 1- 2 years in control group, and 17 (56.7%) old age peoples were staying as 1-2 years.

Considering the food pattern of the old age people were in vegetarian 9(30%) and Non-vegetarian (70%) in control group, and in experimental group vegetarian 7(23.3%) and Non -Vegetarian 23 (76.7%). With respect of body built 21 (70%) obese in the control group, and 22(73.3%) obese in experimental group.

The findings shows that, in the control group pretest score is 25 (83.3%) have a severe pain and posttest is 28 (93.3%) and in the experimental group pretest score is 25 (83.3%) have a severe pain and in the post test score is 25 (83.3%) moderate pain. So most of the old age peoples are having the severe pain in control group as well as in the experimental group posttest the pain as reduced as a moderate 25(83.35%)&3(10%) mild pain,2(6.7%)no pain

The findings shows that the overall knee pain score is 10 in that , control group pretest mean score is 8.26 , SD is 1.08, mean % is 82% and in the post test mean score is 8.33, is SD 0.84%, Mean percentage is 83% total mean percentage score difference 1%.

The findings shows that the overall knee pain score is 10 in that , Experimental group pretest mean score is 8.23 , SD is 1.1, mean % is 82% and in the post test mean score is 4.5 , Standard deviation is 1.67 %, Mean percentage is 45 % total mean percentage score difference 37 %.

The findings shows that, the overall knee pain perception in Control Group posttest have an Mean score is 8.33 and SD is 0.84 and Mean Percentage is 83% were as Experimental Group posttest have an Mean score is 45, SD is 1.67 and the Mean percentage is 45% so the Mean Difference is 38%

The findings shows that, in control group pretest mean score is 8.26, SD is 1.08 and in the post test mean score is 8.33, SD is 0.84 so the mean difference is 0.07 and the calculated' value is 0.44 were as p- value is 0.662.so statistically significant which clearly shows that there is no difference between the pretest and posttest level of pain among the old age people.

The findings shows that, in Experimental Group pretest mean score is 8.23, SD is 1.1 and in the post test mean score is 4.5, SD is 1.67 so the mean difference is 3.73 and the calculated' value is 16.62 were as p- value is P<0.001***level.so statistically significant which clearly shows that because of isometric exercise the knee osteoarthritis pain level is reduced among the old age people. Hence the hypothesis H1 is accepted.

The findings shows that obtained't' value for the knee pain in the pretest score between the control group and experimental group. In that unpaired' value shows 0.11. So stastically which clearly shows that there is no difference in the pretest.

The findings shows that obtained' value for overall the knee pain in the posttest score between the control group and experimental group is11.18. So stastically it shows that highly significant (P<0.001).through the isometric exercise the knee pain level is reduced significantly. Hence the hypothesis H2 is accepted

Table shows that, in control group 28(93.3%) were dependent, 2(6.7%) Partially independent, in pretest, and in the posttest 28(93.3%) were dependent, 2(6.7%) Partially independent. And in the experimental group during the pretest 28(93.3%) dependent, 2(6.7%) in partially independent, in posttest 15(50%) partially independent and 12(40%) were as a dependent and 3 (10%) were fully independent. So the isometric exercise is improving the functional mobility with old age people with knee osteoarthritis.

The findings shows that in the unpaired "t" test in control group posttest mean score is 57.7, SD is 8.48 and in the experimental group mean score is 37.6, and SD is 11.1. So the mean difference is 19.47, were as the "t" value is 7.62.so stastically the study calculation is highly significant P>0.001*** Hence the hypothesis H is accepted

The Table shows that, there was a positive correlation (r =0.887) in osteoarthritis knee pain in experimental group. It shows that there is a highly significant improvement in pain reduction and improvement in the functional ability. Hence the hypothesis H2 is accepted.

The findings shows that , in experimental group posttest ,there is no significant association between the level of knee pain at their selected demographic variables of age, gender, educational status, occupation, reason for coming, number of children,

mode of admission, duration of stay, food pattern, and body built. Hence research hypothesis H3 is partially accepted

The findings shows that there is no association between the level of functional mobility **(WOMAC SCALE)** and their demographic variables of , educational status, occupation, reason for coming, number of children, duration of stay, admission and food pattern, and body built. There is significant in age in Experimental group posttest. Hence research hypothesis H4 is accepted

SUMMARY

This study is a quasi-experimental study to assess the knee pain and functional immobility among the old age people (55-75 years) with knee osteoarthritis in old age at Trichy district. In this study the total population is 60 in that 30 each in control group and experimental group. As an intervention isometric exercise was given to the experimental group to reduce the knee pain and improve the functional immobility. The intervention was given to the experimental group not to the control group. The intervention has given to the experimental group for 15 days twice a day. The isometric exercise was effective for the knee the pain. The knee pain has reduced and the old age people functional immobility was improved.

CONCLUSION:

The main conclusion of this present study was the isometric exercise effectively improving the level of functional immobility among old age people with knee osteoarthritis. This study clearly stated that isometric exercise plays a vital role in improving the functional immobility and reducing the knee pain among the old age people with knee osteoarthritis.

IMPLICATIONS:

The nurses are one of the important team member can help the old age people in health promotion activities with love and care. The findings of the study have practical application in the field of nursing. The study could be discussed in four areas namely: Nursing practice, nursing administration, Nursing education and Nursing research.

IMPLICATION IN NURSING PRACTICE:

- Early identification of the risk factors and its prevention of osteoarthritis in old age people**.**
- Nurses can demonstrate the Isometric Exercise for knee osteoarthritis patients and encourage the patients to practice it.
- Encourage the old age people to follow the proper isometric exercise progamme to improve their knee all over functional immobility and also the health status.
- Nurses can identify the importance of Isometric Exercise and use it as an adjuvant to pharmacological therapy to reduce knee pain and improving knee health status.

IMPLICATIONS FOR NURSING ADMINISTRATION:

The nurse administrator should take initiatives to make protocol of isometric exercise for old age with joint pain.

- These findings help the administration to arrange continuing education programme for nurses regarding osteoarthritis in elderly its complication and its management.

- It can motivate the administration to conduct awareness programmes about osteoarthritis and physical disability among elderly population in the community.
- Nurse administrator can arrange seminars and workshops to educate the learners and staff nurses regarding the importance of geriatric care.
- Screening programmes can be arranged in the community for identifying the vulnerable group for osteoarthritis.
- It helps to provide critical thinking regarding osteoarthritis and its management.

NURSING IMPLICATION IN NURSING EDUCATION:

- In service education program should be conducted for nurses and help them to gain knowledge regarding isometric exercise.
- This study helps the nursing students to acquire knowledge regarding assessment of old age patients and helps them in performing isometric exercises.
- Nurse educator can encourage to nursing students to make new ideas in managing the functional disability.
- This study enhances the student to think comprehensively in planning the intervention in preventing complication of osteoarthritis.
- This study helps the nurse educator to plan classes to teach the student about the isometric exercise and functional mobility exercise.
- In the curriculum, the Old Age care especially the prevention of disability and management of old age patient's problems can be included.

IMPLICATION IN NURSING RESEARCH:

- This study motivates nursing personnel to do further studies related to this field.

- This study gives way for further study on other therapies to reduce pain inpatients with osteoarthritis.
- This study was help the researcher to formulate new methods to prevent complication in old age due to osteoarthritis.

LIMITATIONS:

"During the period of study the limitation faced by the investigator were as follows"….

- Only the age group of 55-75 years old age people were selected for the study.
- Only Old age people with knee osteoarthritis

RECOMMENDATIONS:

The following recommendations were made by the researcher after the study.

- A similar study can be conducted on a larger scale to generalize the study Findings.
- An explorative study can be done at various settings like in hospitals or in Ortho clinics to identify factors influencing osteoarthritis among elderly age.
- A similar study can be conducted to find out the effectiveness of other therapies like yoga and muscle relaxation technique.
- A comparative study can be done between aerobic exercise and isometric exercise for osteoarthritis.
- A study can be conducted to evaluate the knowledge and attitude of nurses regarding isometric exercises for osteoarthritis.

CHAPTER VIII
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ANNEXURE

ANNEXURE-I

LETTER SEEKING PERMISSION TO CONDUCT THE PILOT STUDY

SAKTHI INSTITUTION
SIVAGAMI CHARITABLE TRUST
LIVE TO SERVE

SAKTHI COLLEGE OF NURSING
(Approved by Govt. of Tamilnadu, Recognised by INC, TNC & Affiliated to Dr. M.G.R. Medical University)

Sakthi Nagar, Dindigul - Palani Main Road,
Palakkanuthu - (Po.),
Oddanchatram - 624 619.
Dindigul (Dt.), Tamilnadu.

Phone : 0451 - 2050272
Mobile : 97509 56810
Fax : 0451-2554317
E-mail : sakthinursingcollege@gmail.com

PERMISSION LETTER

From

The Principal,
Sakthi College of Nursing,
Oddanchatram, Dindigul (Dt)

To

I/C. MR. P. Karthikeyan
Shree Sayee Charitable Trust.
Old No: 60; New No:-04, 7th Main Road
Srinivasa Nagar, 11th Cross, Trichy.

Respected Sir / Madam,

Sub.: Request for permission to conduct research study – reg.

Mrs. Julie Arockya mary.S. is a bonfide M.Sc., Nursing student studying in our college. As a partial fulfillment of The TamilNadu Dr. MGR Medical University requirement for the award of the M.Sc., Nursing Degree, she is undertaking **("A QUASI EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF ISOMETRIC EXERCISE ON KNEE PAIN PERCEPTION AND FUNCTIONAL IMMOBILITY AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITI IN SELECTED OLD AGE HOMES AT TRICHY DISTRICT").** She has identified your center as the best place to conduct the study.

Further details of the proposed project will be furnished by the student personally. She will hinder your routine in any way and she will to the rules and regulations of the institution. All the information collected from institution will be kept confidential.

I kindly request you to grant her permission to conduct the study at your esteemed Institution.

Thanking you,

yours sincerely,

PERMISSION GRANTED TO CONDUCT PILOT STUDY

SHREE SAYEE CHARITABLE TRUST
Shree Sayee Old AGE Home
Old No:60, New No:4
Srinivasa Nagar, 7th Main Road
11th Cross, Vayalur Road
Trichy- 620 017

PRINCIPAL
Sakthi College of Nursing
Sakthi Nagar, Palakkanuthu
Dindigul - (Dist)
624 624

ANNEXURE-II

LETTER SEEKING PERMISSION TO CONDUCT THE MAIN STUDY

SAKTHI INSTITUTION
SOWDAMMAN CHARITABLE TRUST
LIVE TO SERVE

SAKTHI COLLEGE OF NURSING

(Approved by Govt. of Tamilnadu, Recognised by INC, TNC & Affiliated to Dr. M.G.R. Medical University)

Sakthi Nagar, Dindigul - Palani Main Road,
Palakkanuthu - (Po.),
Oddanchatram - 624 619.
Dindigul (Dt.), Tamilnadu.

Phone : 0451 - 2050272
Mobile : 97509 56810
Fax : 0451-2554317
E-mail : sakthinursingcollege@gmail.com

PERMISSION LETTER

From

The Principal,
Sakthi College of Nursing,
Oddanchatram, Dindigul (Dt)

To

Mr. Senthil Kumar,
Anaikum Karankal old age home,
Crawfort, Trichy (Dt)

Respected Sir / Madam,

Sub.: Request for permission to conduct research study – reg.

Mrs. Julie Arockya mary.S. is a bonfide M.Sc., Nursing student studying in our college. As a partial fulfillment of The TamilNadu Dr. MGR Medical University requirement for the award of the M.Sc., Nursing Degree, she is undertaking **(“A QUASI EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF ISOMETRIC EXERCISE ON KNEE PAIN PERCEPTION AND FUNCTIONAL IMMOBILITY AMONG THE OLD AGE PEOPLE WITH KNEE OSTEOARTHRITI IN SELECTED OLD AGE HOMES AT TRICHY DISTRICT”).** She has identified your center as the best place to conduct the study.

Further details of the proposed project will be furnished by the student personally. She will hinder your routine in any way and she will to the rules and regulations of the institution. All the information collected from institution will be kept confidential.

I kindly request you to grant her permission to conduct the study at your esteemed Institution

Thanking you,

yours sincerely,

Date :

Place :

ANAIKKUM KARAN[illegible] OLD AGE HOME
Regd. No.[illegible]/2018
FOUNDER & CHAIRMAN
[illegible]NTHIL KUMAR

PRINCIPAL
Sakthi College of Nursing
Sakthi Nagar, Palakkanuthu
Dindigul - (Dist)
624 624

ANNEXURE-III

LETTER SEEKING PERMISSION FOR CONTENT VALIDITY

From

Mrs.S.Juli Arokya Mary,
II Year M.Sc Nursing,
Department of Medical and Surgical Nursing,
Sakthi College of nursing,
Oddanchatiram,
Dindigul.

To

Respected Madam/sir,

Sub: Requisition for the expert opinion and content validity- reg

I am a M.Sc. Nursing II year student of Sakthi College of nursing, Oddanchatiram, Dindigul, Under Dr.M.G.R.Medical University. As a partial fulfillment of M.Sc. Nursing Degree Program, I am conducting a research study on **"A quasi experimental study to assess the effectiveness of isometric exercise on knee pain perception and functional immobility among the old age people with knee osteoarthritis in selected old age homes at Trichy District "I** am sending the tool for the content validity and for your valuable opinion will be very thankful if you return it at the earliest. Here with I have enclosed the necessary documents.

Thanking you

Yours sincerely,

Enclosures:

1. Statement of the problem and objectives of the study
2. Tool for the data collection
3. Brief note on the research methodology and the intervention tools
4. Certificate of the content validity

ANNEXURE-IV

LIST OF EXPERTS

1) **Prof.V.Janahi Devi, M.Sc(N)**
Principal
Sakthi College of Nursing,
Oddanchatiram, Dindigul.

2) **Dr.M. Karthikeyan**
M.S.Ortho (Chief Civil Surgeon)
Government District Headquarters Hospital
Manapparai, Trichy.

3) **Prof.A.Mangaiyarkarasi, M.Sc(N)**
Principal
Servite College of Nursing,Trichy.

4) **Prof. N. Iraimani**
Vice Principal
Ourlady of Health College of Nursing, Thanjavur-7

5) **Asso.Prof. M.Jeyanthi, M.Sc(N)**
Our lady of Health College of Nursing, Thanjavur-7

6) **Ass.Prof.Mrs. A.Shobana, M.Sc (N)**
Christian College of Nursing, Ambilikai.

7) **Mrs. G.Vignesh, MPT in Ortho**
HOD spine injure & Rehabilitation center
Kavundapalayam, Coimbatore.

8) **Mr. V. Mani,**
Bio-Statistician,
Meenakshi Mission Hospital & Research center,
Madurai.

ANNEXURE-V

CERTIFICATE OF CONTENT VALIDITY

This is to certified that the tool prepared by **Mrs.Julie Arockya Mary M.Sc** Nursing II year student of Sakthi College of Nursing for the conduction of the research study **"A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain and Functional Immobility among the old age people with knee osteoarthritis in selected old age home at Trichy. District"** is valid. She can proceed in conducting data collection.

CHIEF CIVIL SURGEON
GOVT. DIST. HEADQUARTERS HOSPITAL
MANAPPARAI
TRICHY DIST. - 621 306

Signature of the validator

Name of the Validator: Dr. M. KARTHIKEYAN

Designation : Hospital Suptd (I/c)

CERTIFICATE OF CONTENT VALIDITY

This is to certified that the tool prepared by **Mrs.Julie Arockya Mary M.Sc** Nursing II year student of Sakthi College of Nursing for the conduction of the research study **"A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain and Functional Immobility among the old age people with knee osteoarthritis in selected old age home at Trichy. District"** is valid. She can proceed in conducting data collection.

Signature of the validator

Our Lady of Health College of Nursing. THANJAVUR-613 007.

Name of the Validator: N. IRAIMANI.

Designation : VICE PRINCIPAL,
OURLADY OF HEALTH COLLEGE OF NURSING. THANJAVUR-7.

CERTIFICATE OF CONTENT VALIDITY

This is to certified that the tool prepared by **Mrs.Julie Arockya Mary M.Sc** Nursing II year student of Sakthi College of Nursing for the conduction of the research study **"A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain and Functional Immobility among the old age people with knee osteoarthritis in selected old age home at Trichy. District"** is valid. She can proceed in conducting data collection.

Signature of the validator

Name of the Validator: M. JEYANTHI M.Sc(N)

Designation : ASSOCIATE PROFESSOR.

CERTIFICATE OF CONTENT VALIDITY

This is to certified that the tool prepared by **Mrs.Julie Arockya Mary M.Sc** Nursing II year student of Sakthi College of Nursing for the conduction of the research study **"A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain and Functional Immobility among the old age people with knee osteoarthritis in selected old age home at Trichy. District"** is valid. She can proceed in conducting data collection.

Signature of the validator

Name of the Validator: SHOBANA A

Designation : ASSOCIATE PROFESSOR
CHRISTIAN COLLEGE OF NURSING

CERTIFICATE OF CONTENT VALIDITY

This is to certified that the tool prepared by **Mrs.Julie Arockya Mary M.Sc** Nursing II year student of Sakthi College of Nursing for the conduction of the research study **"A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain and Functional Immobility among the old age people with knee osteoarthritis in selected old age home at Trichy. District"** is valid. She can proceed in conducting data collection.

Signature

Name of the institution/~~Hospital~~: SERVITE COLLEGE OF NURSING TRICHY-12

PRINCIPAL
SERVITE COLLEGE OF NURSING
MANIKANDAM (PO)
EDAMALAIPATTIPUTHUR (VIA)
TRICHIRAPPALLI - 620 012.

Designation: PRINCIPAL

Place: TRICHY

Date:

CERTIFICATE OF CONTENT VALIDITY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mrs.S.Julie Arokya Mary, has under gone the one month training regarding isometric exercise. She is capable to give an isometric exercise to the old age people with knee osteoarthritis. Through this Isometric exercise osteoarthritis knee pain will reduce and joint mobility will increase, so the old age people can do their daily activities without struggle.

Signature with designation

G. VIGNESH
PHYSIOTHERAPIST
M.I.A.P - L-20387

APPENDIX – VI

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the Dissertation **"A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain and Functional Immobility among the old age people with knee osteoarthritis in selected old age home at Trichy. District"** by **Mrs.Julie Arockya Mary M.Sc** Nursing II year student of Sakthi College of nursing was edited for English Language Appropriatness by **Ms.S.Josephin Rani M.A .B.Ed. in English SreeSai Vidhiyanikethan Public School Coimbatore District.**

Signature

APPENDIX – VII

CERTIFICATE OF TAMIL EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the Dissertation **"A quasi experimental study to assess the effectiveness of Isometric Exercise on knee pain and Functional Immobility among the old age people with knee osteoarthritis in selected old age home at Trichy. District"** by **Mrs.Julie Arockya Mary M.Sc** Nursing II year student of Sakthi College of nursing was edited for English Language Appropriatness by **MRS.FathimaRani M.A .B.Ed. in Tamil, Government Middle School, Manapparai. Trichy. District.**

Signature

APPENDIX – VIII

RESEARCH CONSENT FORM

Dear Participants,

I am Julie Arokya Mary.S. M.Sc Nursing II year student of sakthi college of nursing, Oddanchatiram, Dindigul. As a part of my study, a research on "A quasi-experimental study to assess the effectiveness of isometric exercise on knee pain perception and functional immobility among the old age people with knee osteoarthritis in selected old age homes at Trichy District is to be conducted study will be helpful to reduce the knee and will improve the functional mobility among the old age people with knee osteoarthritis.

I hereby seek your consent and co-operation to participate in this study, I request you to be frank and honest in your responses. The information will be kept confidential and anonymity will be maintained.

Thanking you

Signature of the researcher

Here by i ……..consent to participate and undergone the study

Date:

Place

கருவி எண் : 8

ஆய்வில் பங்கு கொள்ள ஒப்புதல் படிவம்

அன்பார்ந்த பங்களிப்பார்களே,

.S.ஜீலி ஆரொக்கிய மேரி ஆகிய நான் சக்தி செவிலியர் பயிற்சியில் முதுகலைப்பட்டம் பெறுவதற்கு பயிற்சியின் ஒரு பகுதியாக முதியவர்களுக்கான கீல்வாதம் மற்றும் அதனால் ஏற்படும் கீல்வாதமூட்டு வலிக்கான எளிய ஐசோமெட்ரிக் உடற்பயிற்சி முறைகள் கொண்டு மூட்டு வலியை குறைத்து அதன் மூலம் முதியவர்களின் அன்றாட வேலை தரத்தினை உயர்த்தலாம், என்பதை பற்றி அறிவதற்காக ஆய்வு செய்கிறேன். இதனால் இந்த ஆராய்ச்சியில் நீங்கள் பங்கு பெற உங்களுடைய ஒப்புதல் மற்றும் ஒத்துழைப்பையும் வேண்டுகிறேன். மேலும் உங்களுடைய பதில்கள் வெளிப்படையாகவும், உண்மையாகவும் இருக்க வேண்டும். உங்களுடைய குறிப்புகள் இரகசியமாக வைக்கப்படும் மற்றும் உங்களுடைய பெயர் வேறு எங்கும் வெளியிடப்படமாட்டாது.

ஆராய்சியாளரின் கையொப்பம்

…….. என்ற நான் இந்த ஆராய்ச்சியில் பங்குபெற ஒப்புதல் அளிக்கிறேன்.

பங்குபெறுவோரின் கையொப்பம்

APPENDIX-IX

SAKTHI COLLEGE OF NURSING

CERTIFICATE FOR ETHICAL CLEARANCE

Committee members	
Chairman 1.Dr.Vembanan .M.B.B.S,M.S President Sakthi Education Institution **Members** 1. Mrs.Janahi Devi M.Sc (Nursing) Principal, Sakthi College of Nursing. 2. Dr. Ambrose Raju, M.B.B.S.,D.C.H., Baby dot care hospital, Dindigul 3. Mrs.D.Thulasimani M.Sc(Nursing) Medical and Surgical Nursing Associate Professor, Sakthi College of Nursing. 4. Mr.V.Palanicamy, B.A.B.L., Advocate 5. Mr.Diaz Prabhakaran, M.A., Sociology 6. Ms.Mariyammal, Ph.D., Psychology	This is to certify that **Mrs.Julie Arokya Mary.S.** M.Sc Nursing student in Medical and Surgical Nursing Department submitted a protocol on study as **"Effectiveness of Isometric Exercise on knee pain perception and functional immobility among the old age people with knee osteoarthritis in selected old age home at Trichy District**." The above protocol was received by ethical committee approved and mentioned that the study is feasible to carry out under the guidance of an eligible guide. Signature of the Chairman.

APPENDIX-X

SECTION-I

DEMOGRAPHIC VARIABLES

Introduction to the Participants:

Dear Participants,

This section consists of personal information and you are requested to answer the questions correctly. The information collected from you will be kept confide

Sample No

1. Age (in years)

a) 55 to 65 Years

b) 65 to 70 Years

c) 70 to 75 Years

2. Gender

a) Male

b) Female

3. Educational Status

a) Illiterate

b) Primary school

c) High school

d) Higher Secondary & Above

4. Occupation (Before coming to the old age home)

a) Home maker

b) Private employee

c) Government employee

d) Self – Employed

e) Agriculture

5) Reason for coming to the old age home

a) Loneliness
b) Lack of love and affection
c) Loss of partner
d) No children

6) Number of children

a) 1
b) 2
c) 3
d) More

7) Mode of admission

a) Voluntary
b) Involuntary

8) Duration of stay –

a) 1 –2 yrs.
b) 3 - 4 yrs.
c) 5 -7 yrs.
d) More than 7 years

9) Food pattern?

a) vegetarian
b) Non – Vegetarian

10) Body Built?

a) Thin
b) Normal
c) Obese

சொந்த விவரங்கள்

அன்பார்ந்த பங்களிப்பாளர்களே இந்த பகுதியில் உங்கள் சொந்த விவரங்கள் கொடுக்கப்பட்டுள்ளது. இதற்கு தகுதியான விடை அளிக்குமாறு கேட்டுக்கொள்கிறேன். இந்த விவரங்கள் பாதுகாத்து வைத்துக்கொள்ளப்படும்.

1. **வயது**

   அ) 55 to 65

   ஆ) 65 to 70

   இ) 70 to 75

2. **இனம்**

   அ) ஆண்

   ஆ) பெண்

3. **கல்வித்தகுதி**

   அ) படிப்பறிவு அற்றவர்

   ஆ) துவக்கப்பள்ளி

   இ) மேல்நிலைப்பள்ளி

   ஈ) உயர்நிலைப்பள்ளி

4. **தொழில் (முதியோர் இல்லம் வருவதற்கு முன்)**

   அ) இல்லத்தரசி

   ஆ) தனியார் துறையில் வேலை செய்தவர்

   இ) வாழ்க்கை துணையை இழந்தவர்

   ஈ) குழந்தை இல்லாதவர்

5. **முதியோர் இல்லம் வந்ததர்கான காரணம்**

   அ) தனிமை

   ஆ) அன்பு, பாசம் கிடைக்காதவர்

   இ) வாழ்க்கை துணையை இழந்தவர்

   ஈ) குழந்தை இல்லாதவர்

6.குழந்தைகளின் எண்ணிக்கை

அ) ஒன்று

ஆ) இரண்டு

இ) மூன்று

ஈ) அதற்கு மேல்

7. சேர்க்கையின் விவரம்

அ) தன் சொந்த விருப்பத்தில்
ஆ) பிறரால் சேர்த்துவிடப்பட்டோர்

8. தங்கியிருந்த காலம்

அ) ஒன்று முதல் இரண்டு வருடம்

ஆ) மூன்று முதல் நான்கு வருடம்

இ) ஐந்து முதல் ஏழு வருடம்

ஈ) ஏழு வருடத்திற்கு மேல்

9. உணவு முறை

அ) சைவம்
ஆ) அசைவம்

10. உடல் எடை

அ) ஒல்லியாக

ஆ) சரியான உடல் எடை

இ) பருமனான உடல் எடை

SECTION II

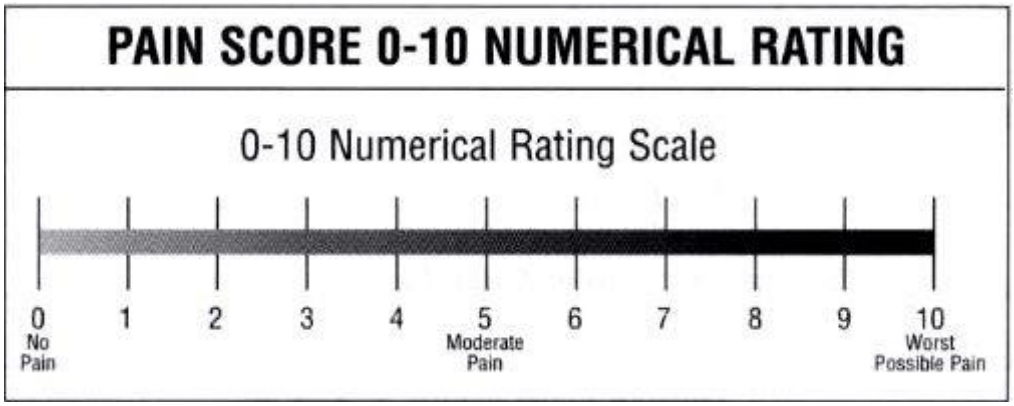
Numerical Pain Scale

Instruction to the participants:

The Numerical pain scale shows to the participants by the investigator to mark the intensity of knee pain among the old age people with knee osteoarthritis.

DISCRIPTION OF TOOL

The 11-point Numeric Pain Scale ranges from '0' representing one pain extreme (e.g. “no pain”) to '10' representing the other pain extreme (e.g. “pain as bad as you can imagine” or “worst pain.



SCORING PROCEDURE:

Scoring was given according to the pain level

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

SECTION III

The Western Ontario and Mc Master Universities Osteoarthritis Index

MODIFIED WOMAC SCALE

Sample No:

Instructions: Please rate the activities in each category according to the following scale of physical function difficulties.

Sl.no	Perception	Sl. no	Physical Activities	1	2	3	4
1	Knee pain	1	Walking				
		2	Stair climbing				
		3	Nocturnal				
		4	Rest				
		5	Weight bearing				
2	stiffness	1	Morning stiffness				
		2	Stiffness occurring later in the day				
3	Physical Function	1	Descending stairs				
		2	Ascending stairs				
		3	Rising from sitting				
		4	Standing				
		5	Bending to floor				
		6	Walking on flat surface				
		7	Lying in bed				
		8	Rising from bed				

		9	Getting in / out of bath				
		10	Sitting				
		11	Getting on / off Toilet				
		12	Heavy Domestic Duties				
		13	Light Domestic Duties				

Total Score

_____/80 =_____%

SCORING:

- ❖ Fully Independent = 4 marks
- ❖ Partially Independent = 3 marks
- ❖ Dependent = 2 marks
- ❖ Fully dependent = 1mark

மாற்றம் செய்யப்பட்ட ஓமாங்க் அளவீடு

பெயர்: வயது: தேதி:

குறிப்பு: கீழே கொடுக்கப்பட்டுள்ள செயல் திறன்களுக்கு ஏற்ற சரியான அளவினை தேர்வு செய்யவும்.

செயல் திறன்கள்	வரிசை எண்	உடல் செயல் திறன்கள்	1	2	3	4
வலி	1	நடத்தல்				
	2	படி ஏறுதல்				
	3	இரவில் நடத்தல்				
	4	ஓய்வு				
	5	எடை தூக்குதல்				
விறைப்பு தன்மை	1	காலை வேளையில் கடினம்				
	2	ஒரு நாளில் எத்தனை முறை				
உடல் செயலியல்	1	படி இறங்குதல்				
	2	படி ஏறுதல்				
	3	உட்கார்ந்து எழுதல்				
	4	நிற்றல்				
	5	தரையில் நடக்கும் போது வளைதல்				
	6	சமதளத்தில் நடக்கும் போது				
	7	படுக்கையில் உறங்கும் போது				

	8	படுக்கையிலிருந்து எழும் போது				
	9	குளியலறைக்கு செல்லும் போதும், வெளியே வரும் போதும்				
	10	உட்காரும் போதும்				
	11	கழிவறையின் மேல் உட்காரும் போதும், எழும்பும் போதும்				
	12	கடினமான வீட்டு வேலைகள்				
	13	மிதமான வீட்டு வேலைகள்				

மொத்தம்……./ 80= ……%

முழுமையான சுதந்திரமாக - 4 மதிப்பெண்

பகுதி சுதந்திரமாக - 3 மதிப்பெண்

சார்ந்து இருத்தல் - 2 மதிப்பெண்

முழுமையாக சார்ந்து இருத்தல் - 1 மதிப்பெண்

SECTION III

ISOMETRIC EXERCISE

INRODUCTION

Isometric exercise are thousands of years old interventions with examples listed from the static holds in certain branches of yoga or oriental martial arts.

The term isometrics combines the Greek words **"lsos" (equal) ans "metria" (measuring)**.meaning the isometrics are a type of strength training in which the joint angle of the joint do not change.

ISOMETRIC EXERCISE DEFINITION:

Isometric exercise or Isometrics are a type of strength training in which the joint angle and muscle length do not change during contraction. Isometric exercise or done in the static position, rather than being dynamic through a range of motion

BENEFITS OF ISOMETRIC EXERCISE IN OLD AGE:

Strength training exercise at least twice a day will help to improve the following:

- Build the strength
- Maintain bone density
- Improve the balance, co-ordination
- Improve the functional mobility
- Reduce the risk of falling
- Maintain independence in performing the physical activity and wellbeing.

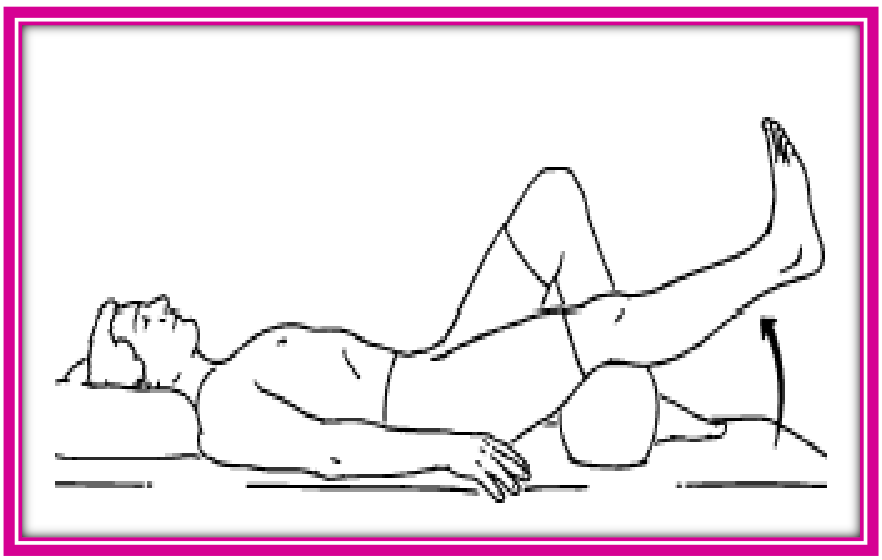
ISOMETRIC EXERCISE TECHNIQUE:

- **Straight Leg Raising Exercise:**
- **Step-Up And Step Down Exercise**
- **Wall Slide Exercise**
- **Hip Adduction Exercise**

✦ STEPS OF EXERCISE

I.STRAIGHT LEG RAISING (SLR) EXERCISE:

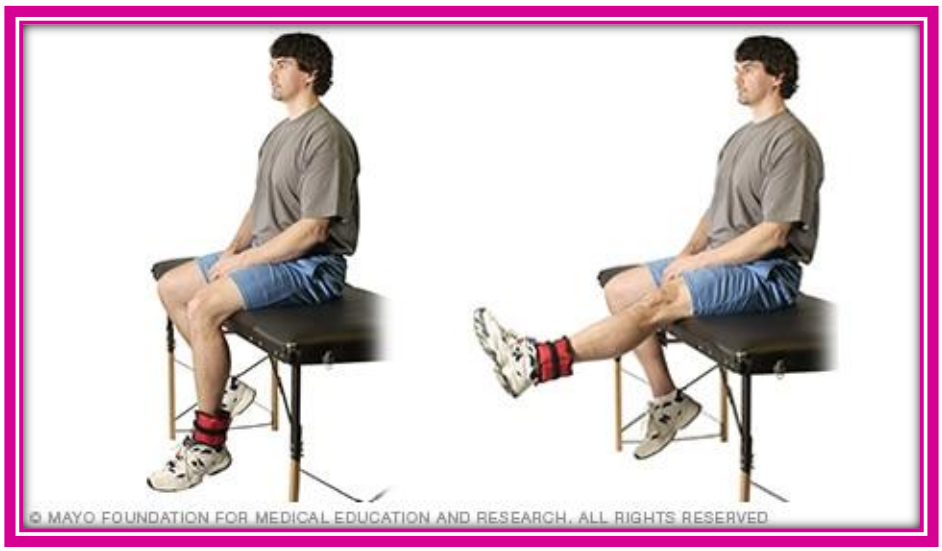
A) IN SUPINE POSITION



Procedure

- ❖ Advise the patient to lie flat or sit with leg straight.
- ❖ Instruct those to tighten the muscles in front of thigh as much as she / he can, pushing the back of the knee flat against the floor/bed.
- ❖ Lift the leg/heel 4 to 6 inches off the floor/bed. After 5 seconds.
- ❖ Bring leg/heel back to the floor. Keep the muscle in front of the thigh as tight as Possible as lower the leg, then relax.
- ❖ Repeat the exercise 10 times for 2 times per day.

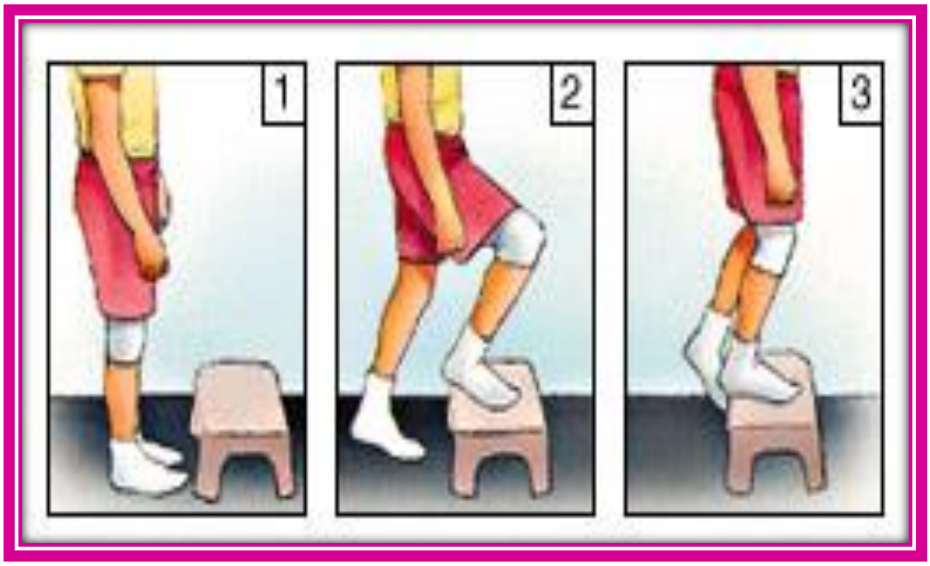
B) HIGH SITTING POSITION



Procedure

- Advise the Patients to sit at the edge of bed with the hanging of legs.
- Instruct them to pull the toes up, tighten the thigh muscles and straighten the Knee of the legs.
- Lift the straighten leg individually to be equal to hip level for a second and bring
- Back to same position.
- Repeat the exercise 5 times for each legs and follow for two times a day.

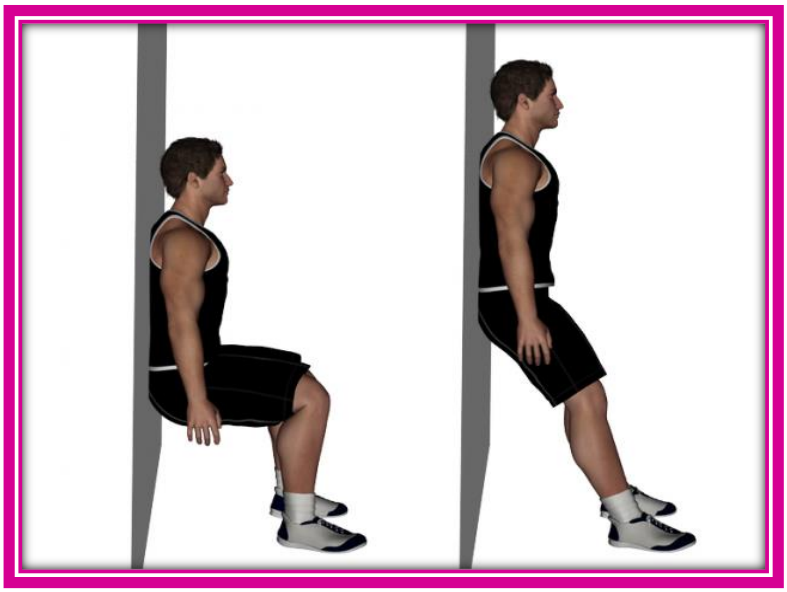
II. STEP-UP AND STEP DOWN EXERCISRE:



Procedure:

- Stand on the edge of step.
- Place the foot on the step approximately 7 inches in hight. Hold on to a hand walls, chair or other objects for balance if needed.
- Slowly step-up and down. Make sure that kneecap is always in line with the
- Second toe and hips are level.
- Lightly touch the heel of the opposite legs to the floor and return to the starting position.
- Repeat exercise ten times,2 times per day.

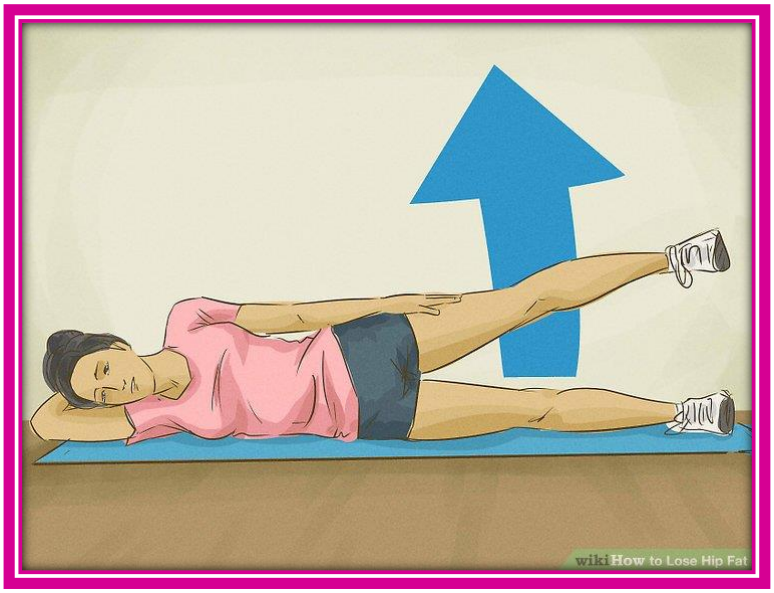
III. WALL SLIDE EXERCISE:



Procedure:

- Stand with back against the wall. The feet should be shoulder with apart and approximately 18 to 24 inches away from the wall. Kneecap should be line with the tip of second toe.
- Slowly slide down the wall so that 75to90 degree bend the knees.
- Hold this position for 5 seconds. Stand up and rest for 5 seconds.
- Repeat exercise 10 times, 2 time/day

IV. HIP ADDUCTION EXERCISE:



Procedure

- Advise the patient to lie flat or sit with leg straight.
- Place an inch roll under knee, allowing it to be bend.
- Tighten the muscle in front of knee as much as can, and lift the heel off floor.
- Hold this position for 10 seconds.
- Repeat exercise for 10 times, 2 times/day.

LESSON PLAN

ON

ISOMETRIC EXERCISE

LESSON PLAN ON ISOMETRIC EXERCISE

- **Name of the student teacher** : **Mrs.S.Julie Arokya Mary**
- **Course** : **M.Sc Nursing II year**
- **Department** : **Medical and Surgical Nursing**
- **Date** : **15-02-2018**
- **Place/ venue** : **Old Age Home, Trichy**
- **Time/Hours** : **1 hr**
- **A.V.Aids** : **Demonstration**
- **medium of instruction** : **Tamil**
- **Name of the supervisor** : **Mrs.D.Thulasimani M.Sc Nursing**
  Associate Professor
  HOD of Medical and surgical nursing

GENERAL OBJECTIVE:

The Old age will be able to gain the knowledge, attitude, skills regarding the isometric exercise and the benefits of isometric exercise, and also the technique of isometric exercise.

SPECIFIC OBJECTIVE:

At the end of the class the old age people will be able to gain the knowledge

- define the isometric exercise.
- list down the benefits of isometric exercise.
- list down the benefits of isometric exercise
- return demonstrate of the isometric exercise

SL. NO	Time	SPECIFIC OBJECTIVE	CONTENT	TEACHERS ACTIVITY	LEARNERS ACTIVITY	A.V.AIDS	EVALUATION
1		-	**INRODUCTION** Isometric exercise are thousands of years old interventions with examples listed from the static holds in certain branches of yoga or oriental martial arts. The term isometrics combines the Greek words **"lsos" (equal) ans "metria" (measuring)**. meaning the isometrics are a type of strength traning in which the joint angle of the joint do not change.	EXPLAINING	**L I S T E N I N G**		**What is isometric execise?**
2		The old age people should able to define the isometric exercise	**ISOMETRIC EXERCISE** Isometric exercise or Isometrics are a type of strength traning in which the joint angle and muscle length do not change during contraction. Isometric exercise or done in the static position, rather than being dynamic through a range of motion	EXPLAINING	**L I S T E N I N G**	FLASH CARDS	**What are all the benefits of isometric exercise?**

3 4		The old age people will be able to list down the benefits of isometric exercise. The old age people will be able to demonstrate the isometric exercise	**BENEFITS OF ISOMETRIC EXERCISE IN OLD AGE**: **Strength training exercise at least twice a day will help to improve the following:** ❖ Build the strength ❖ Maintain bone density ❖ Improve the balance, co-ordination ❖ Improve the functional mobility ❖ Reduce the risk of falling ❖ Maintain independence in performing the physical activity and wellbeing. **ISOMETRIC EXERCISE ARE…….** ➢ Straight Leg Raising (SLR): ▪ In supine position ▪ In high sitting position ➢ Step up and step down exercise ➢ Wall slide exercise ➢ Hip adduction exercise ➢ Isometric minisquats exercise	EXPLAINING EXPLAINING	**L I S T E N I N G** **L I S T E N I N G**	FLASH CARDS **D E M O N S T R A T I O N**	**Return Demonstration of the isometric exercise**

			I) Straight Leg Raising (SLR **A) In supine position:** The patients are advised to lift the legs individually 4-6 Inches away from the floor and bring back to the floor after 5 seconds. This exercise 8 will be advised to continuous five repetitions for each legs followed with two times a day. **B) In high sitting position:** ➢ The patients are advised to lift the straighten legs ➢ Individually in high sitting position to be equal to hip level for a seconds and bring back to the same position to be continued 5 times for each leg and follow for two times a day. **II. Step up and step down exercise:** ➢ Advice the patient to step up and step down for 10 times and followed for 2 times a day	EXPLAINING EXPLAINING	**LISTENING**	**DEMONSTRATION**	**Return Demonstration of the isometric exercise**

			III. Wall slide exercise: ➢ Advised the patient to stand against the wall with back and slowly slide ➢ Down the wall with the 75- 90° bending of the knee and hold this position for 5seconds. Then ask to stand up and rest for 5 seconds. ➢ Repeat it continuously for 10 ➢ Times and followed for 2 times a day. **IV. Hip adduction exercise:** ➢ Advised the patient to lie flat or sit with leg straight. Place a inch roll under ➢ Knee, allowing the knee to be bend. Tighten the muscle in front of knee as much as possible & and lift the heel off the floor. ➢ Hold this position for 10 seconds. Total duration of isometric exercise will be 30 minutes per time for two times a day subsequently for the period of 7 days.	EXPLAINING	**LISTENING** **LISTENING**	**DEMONSTRATION**	**Return Demonstration of the isometric exercise**

5 6			**V) ISOMETRIC MINISQUATS EXERCISE**: ➢ Advise The Patient To Use The Chair and Squat Down Bending Both The Knees ➢ Advise The Patient Keeping The Back Straight. ➢ Repeat The Procedure Up To 10 Times **SUMMARY:** Isometric exercise is very effective those who are having the knee pain and functional difficulties. Through this exercise it will improve the all the difficulties. **CONCLUSION:** Through this lesson plan we learned the isometric exercise and its benefits and the techniques of the isometric exercise.				

CHAPTER IX

PHOTO GALLERY

DEMONSTRATION

ON

ISOMETRIC EXERCISE

AND

ASSESSING THE FUNCTIONAL ABILITY BY USING WOMAC SCALE

DEMOGRAPHIC DATA COLLECTION BY THE INVESTIGATO

DEMONSTRATE THE ISOMETRIC EXERCISE TENSE EXERCISE BY THE INVESTIGATOR

DEMONSTRATE THE ISOMETRIC KNEE EXERCISE IN SITTING POSITION BY THE INVESTIGATOR

ASSESSING THE FUNCTIONAL ABILITY BY USING THE WOMAC SCALE BY THE INVESTIGATOR