"EFFECTIVENESS OF MUSTARD PLASTER ON KNEE PAIN AND INABILITY IN ELDERLY AT SELECTED OLD AGE HOME IN VELLORE"

BY
MS.K.YASHODA

A Dissertation Submitted to

THE TAMIL NADU Dr.MGR MEDICAL UNIVERSITY, CHENNAI

In Partial Fulfilment of

THE REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE IN NURSING

OCTOBER -2014

CERTIFICATE

Certified that this is the bonafied work of

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"EFFECTIVENESS OF MUSTARD PLASTER ON KNEE PAIN AND INABILITY IN ELDERLY AT SELECTED OLD AGE HOME IN VELLORE"

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DECLARATION

I here by declare that the present dissertation entitled **"EFFECTIVENESS OF MUSTARD PLASTER ON KNEE PAIN AND INABILITY AMONG ELDERLY"** Is the original research work undertaken and carried out by me under the guidance of Mrs.Snitha **Priyadharshini.J M.Sc., (N) M.Sc (Psy)** Associate Professor in Medical Surgical Nursing .I also declare that the material of this has not formed anyway ,the basis for the award of any degree or diploma in this University or any other Universities.

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K.YASHODA

ABSTARCT

Effectiveness of Mustard plaster on knee pain and inability in elderly at selected old age home the objectives of the study are to assess

To assess the pretest and post test level of pain and inability in Elderly.

To assess the effectiveness of mustard plaster application among the clients with Knee pain in Elderly .

To find the association between the pretest level and post test level of inability and pain in elderly with selected demographic Variables.

To find the association between the pretest level and post test level of inability and pain in elderly with selected clinical Variables.

The research approach is pre-expermental involving only only one group pretest and post test design was adopted .purposive sampling technique was adopted to choose . Inability was assessed by Womac index and Pain was assessed by using Numeric Rating scale. Mustard plaster was applied on the knee for 15 minutes once a day for five days continously.

The major findings of the study are

- Most of the Elderly were of the age group >70 years (53.33%).40% of them had sedentary life style previously and level of education 56.67% had only primary education and 30% were illiterate remaining 13.33% were educated. Majority of them 46.67% were Non –vegeterian and 20% ova lacto vegeterians ,33.33% were pure vegeterians. 41% of them are heavy workers previously, 33%moderate workers and 26% sedentary workers. Elderly involving with habits of Smoking ,Alcoholism and other habits were minimal. Only 13.33% had involved in sports previously.43.33% elderly were taking medications.

- Significant percentage of them had body Mass index 25-30 ,were obese 36.67% and overweight were 33.33%,46.67 elderly had staggering gait in which 36.67used sticks and 13.33% used tripods to walk 33.33 % had stable gait.40.00% had pain from squatting to standing and 36.67% had pain when standing for long periods .There is equal distribution of Acute and chronic involvement of pain 23.67% - 26.33% could climb only few stairs or could not climb at all level of exertion was low.Most of them 40.00% had pain on the whole Knee 23.33 % - 26.67% had pain in both lower and upper aspect of knee .Very few 10.00% had pain in the Medial region.80.00% were not involved in any physical activity,only20.00% involved in physical activity like walking and Cycling.

- The elderly with Knee joint inability level was (M = 15.36; SD = 11.20) And Pain was (M = 3.30 ; SD = 1.55) It is noted that the difference statistically significant at $p < 0.05$ level which indicates that mustard plaster is effective in reducing knee joint pain and improves inability .

- There was no significant association between the selected demographic Variables like Age, Gender, Previous nature of Job ,food habits ,Habits , History of sports involvement and use of Medication before mustard plaster application

RECOMMENDATIONS

- Same study can be under taken for effectiveness along with other therapies

- Same study can be undertaken for larger sample.

- Same study can be applied for back pain and shoulder pain .

- Similar study can be under taken for chest congestions in Pediatrics and adults .

- Same study can be done as experimental study for two groups.

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CHAPTER – I
INTRODUCTION

BACK GROUND OF THE STUDY

"Pain is such an uncomfortable feeling that even a tiny amount of it is enough to ruin every enjoyment''

- Will Rogers

Knee pain is a common complaint for many people. There are several factors that can cause knee pain. Awareness and knowledge of the causes of knee pain lead to a more accurate diagnosis. Management of knee pain if accurately diagnosised could be effective and accurately treated. Knee pain can be either referred as lateral ipsi pain or can be related to the knee joint itself.

According to a recent report released by the World Health Organization , musculoskeletal disorders are the most frequent cause of disability in the modern world, and the prevalence of these diseases is rising at an alarming rate. The most prominent reason for loss of joint mobility and function is chronic or episodic pain, which leads to psychological distress and impaired quality of life. Current therapies to help alleviate joint pain have limited effectiveness and certain drugs produce unwanted side effects, thereby precluding their long-term use. In short, millions of patients are suffering from the debilitating effects of joint pain for which there is no satisfactory treatment. One of the reasons for this lack of effective pain management is the paucity in our knowledge of what actually causes joint pain. We are only now starting to identify some of the mediators and mechanisms that cause joints to become painful, allowing us to develop future new targets that could alleviate arthritic pain. This review summarizes what is known about the origin of joint pain by describing the neurobiological processes initiated

in the joint that give rise to neural signals and that are ultimately decoded by the central nervous system into pain perception.

Knee pain causes many limitations and disability's , which include difficulty in floor level activities, ascending and descending stairs, squatting, etc. High impact activities that include running or jumping can be detrimental and painful. These difficulties or limitations can significantly reduce the quality of life in an active individual.

Most of the older, obese population in India are suffering from Knee joint pain with the age group of above 60 years, 95% of them are less than 85 years. In this 87% are having acute illness and96% are having chronic illness.

Knee pain can be a result of injury or disease of the knee joint. Injury can affect any of the internal structures like ligaments, menisci , synovium and cartilage inside the knee joint. The complexity of the design of the knee joint and the fact makes the knee one of the most commonly injured joints.

Pain can also occur in the knee from diseases or conditions like obesity ,constant weight bearing etc involving the soft tissues and bones surrounding the knee and the nerves that supply sensation to the knee area. In fact, the knee joint is the most commonly involved joint in rheumatic diseases, rheumatoid arthritis, reactive arthritis, systemic lupus erythematosus, as well as osteoarthritis. Diseases that cause knee pain can lead to swelling, synovial with effusion redness, warmth, weakness, tenderness, and stiffness of the joint instability.

No curative treatment has yet been found for knee pain and treatment is directed towards symptom relief and preventing of further functional deterioration. Current modes of treatment helps to decrease pain and improve functioning range from information, education, physical therapy and aids, analgesics, non-steroidal anti-inflammatory drugs, joint injections and knee replacement procedures in which all or part of the joint is replaced with , metal or ceramic implants.

As a nurse working closely with the clients ,finds out the best relief measures and most effectively can provide comfort by understanding the nature of pain and client's perception.

Yung R (2001) reported that knee pain is primarily due to the high incidence of osteoarthritis in the elderly. The socio-economic burden of this disease is substantial and not able to be treated for the symptoms. Knee osteoarthritis, a problem that is much more prevalent in India than in the West, accounts for at least as much disability as any other chronic conditions including congestive heart failure, diabetes, heart disease, chronic obstructive airway disease or depression.

Hutton CW in 1996 explained that Primary osteoarthritis (OA) is almost a disease of elderly population while secondary osteoarthritis e.g. Paget's disease, osteoporosis etc can affect any age. OA presents as loss of cartilage and accompanying periarticular bone response. Age related changes in articular cartilage are distinct from those of OA, but give clues to increasing susceptibility of cartilage to damage in old age.

Chaturvedi VP in 2001 informed that Osteoarthritis was earlier described as a disease of wear and tear, a degenerative disorder but recent advances show that it represents a dynamic process, which involves uncoupling of balance between cartilage degeneration and regeneration. Changes in cartilage in osteoarthritis some what differs from normal aging changes. It usually presents as joint pain with structural changes, crepitus, bony enlargements (Osteophyte), deformity, instability and restriction of movements occurs. Associated muscular weakness and wasting may also occur. Morning stiffness is a common complaint but brief in duration usually 5-15 minutes but not exceeding 30 minutes. It is seen most commonly in clinical practice ,like Rheumatoid Arthritis one of the medial compartments of knee joint bears the brunts in obesity commonly female sex are usual risk factors. Although there is no known cure for most forms of arthritis, treatment designed for individual patient can eliminate or atleast reduce these symptoms and limit functional impairment. The goals of contemporary management of

arthritis extend beyond pain control to the enhancement of patients' functional status and health-related quality of life.

Many types of minor knee pain respond well to self-care measures. Natural methods of management prove more effective in the long run and also pose a little or no risk of side effects. Sprains and muscle aches are believed to be relieved when a paste or poultice of mustard is applied on the affected area. A mustard soak or bath is also considered helpful in relieving back aches, muscle aches, and fatigue feet. In India only few studies are available for effectiveness of Mustard upon knee pain.

NEED FOR THE STUDY

"A physically active individual lives much healthier and active life than people who are physically inactive". This is true for everyone but especially for people with Knee pain.

Pain particularly experienced by elderly is one of the most common clinical situations which encounters health professionals especially nurses. The nurse is most effective in providing comfort by understanding the nature of pain and client's perception and working closely with the clients able to find out the best relief measures. There are many ways to relieve pain ,from drugs to surgery depending on the type of severity risk factors involved with using a particular treatment and personal preference . Commonly used treatments for pain are Analgesics , Opoids etc Pain is often under treated treatment with complimentary therapies can be followed which avoids unnecessary complications.

Pain and stiffness are the main features and it may result in deformity and disability. So people are commonly worried about the pain. People with knee pain need pain management & easier movement.

The aim of this study is to reduce the dependence of elderly on the Over the Counter (OTC) medications to reduce joint pain by

introducing the home remedies, thereby reducing the side effects of the over The Counter drugs and to improve the quality of life.

Since elderly patients are more prone to develop complications of Non steroidal anti-inflammatory drugs, physicians should be careful in selecting proper drugs on individual basis looking into the cost, efficacy and toxic profile. However, paracetamol may be tried initially as an analgesic in osteoarthritis. Other NSAIDs can be used especially newer selective cyclo- oxygenase II (Cox-II) inhibitors. Locally applied NSAIDs are also useful but costlier .

The easy availability of mustard , it's medicinal properties to relieve pain and it's low cost with less side effects and long term in topical application makes mustard plaster as an adjuvant therapy in reduction of pain among elderly with joint pains.

Sprains and muscle aches are believed to be relieved when a paste or poultice of mustard is applied on the affected area.

STATEMENT OF THE PROBLEM

"Effectiveness of Mustard Plaster on Knee Pain and inability among elderly in selected old age home at Vellore".

OBJECTIVES OF THE STUDY

- To assess the pretest and post test level of pain and inability in Elderly To assess the effectiveness of mustard plaster application among the clients with Knee pain in Elderly .
- To find the association between the pretest level and post test level of inability and pain in elderly with selected demographic Variables.
- To find the association between the pretest level and post test level of inability and pain in elderly with selected clinical Variables.

OPERATIONAL DEFINITION

Effect

In this study it refers to the reduction of knee pain and inability by the application of mustard plaster.

Pain

An unpleasant sensory and emotional experience arising from actual or potential tissue damage .In this study pain is assessed using Numeric Rating scale and inability using WOMAC INDEX.

Inability

Difficulty in incorporating activities due to knee pain and inability in elderly people .in this study inability is assessed through WOMAC assessment.

Mustard plaster

A paste prepared by mixing 1 part of mustard powder with 2 parts of wheat flour and luke warm water

Elderly

In this study age above 55 years with knee pain is taken as sample for the study.

NULL HYPOTHESIS

H_{01}: There will be a no significant difference in pretest and post test level of knee pain and inability after application of mustard plaster

H_{02}: There will be a no significant association between pre and post test level of pain and inability with selected demographic variables.

H_{03}: There will be a no significant association between pre and post test level of pain and inability with selected clinical variables .

ASSUMPTIONS

- Every client is unique and responds in a unique manner to pain .
- Elderly are at risk of developing knee joint pain Knee joint pain is a common problem after the age of 40 years Mustard contains allyl iso thiocyanate, an anti congestant, anti inflammatory by property which reduces pain.

DELIMITATIONS

- The study was delimited to Elderly with knee joint pain.
- The study was delimited to Elderly with age group above 55 years
- The was delimited to a period of 4 weeks .

CONCEPTUAL MODEL OF ORLANDO'S THEORY

The conceptual framework for research study presents the reasoning on which the purposes of study are based. The frame work presents the perspective from which the investigator views the inter related concepts that are assessable together in some rational schemes by virtue of their relevance to a common theme The conceptual frame work for the present study was based on ORLANDO'S THEORY.

Orlando's nursing process discipline is rooted in the interaction between a nurse and a patient at a specific time and place. A sequence of interchanges involving patient behavior and nurse reaction takes place until the patient's need for help, as he perceives it, is clarified. This action is evaluated after it is carried out. If the patient behavior improves, the action was successful and the process is completed. If there is no change or the behavior gets worse, the process recycles with new efforts to clarify the patient's behavior or the appropriate nursing action. Orlando's theory has radically shifted the nurse's focus from the medical diagnosis that is findings and meeting the client's immediate

needs. The patient cannot state the nature and meaning of his distress for his need without the nurses help or without her first having established a helpful relationship with him.

ORGANIZING PRINCIPLE

Finding out and meeting theindividuals immediate needs for help "Nursing….is responsive to individuals who suffer or anticipate a sense of helplessness, it is focused on the process of care in an immediate experience, it is concerned with providing direct assistance to individuals in whatever setting they are found for the purpose of avoiding, relieving, diminishing or curing the individuals sense of helplessness .In this study the Orlendo theory is applied in Organizing principle is by collecting demograhic Variables and Clinical Variables of elderly with knee pain and inability.

PRESENTING BEHAVIOR

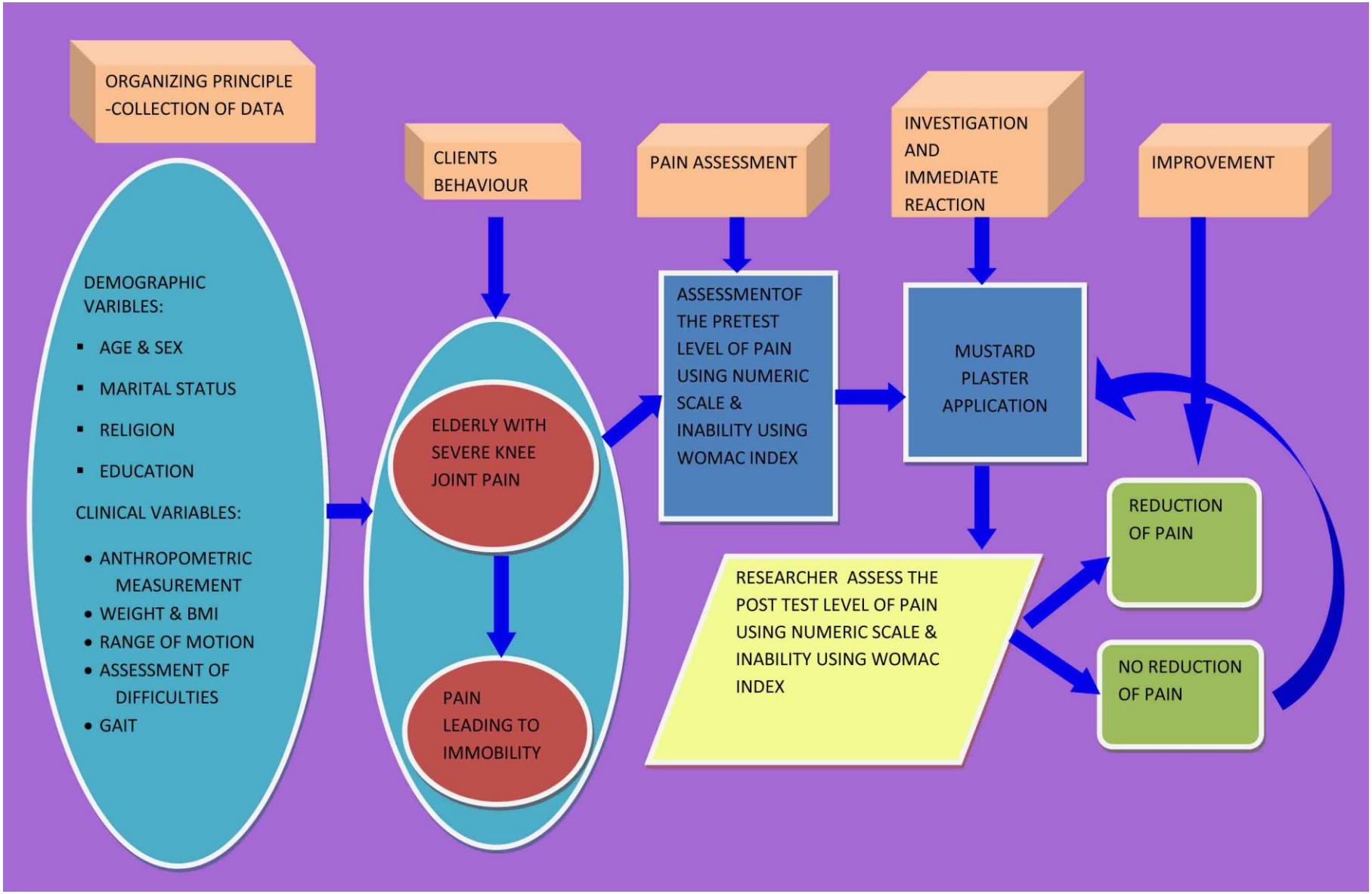
The presenting behavior of the individual, regardless of the form in which it appears, may represent a plea for help The presenting behavior of the individuals and the stimulus causes an automatic internal response in the nurse,. Pain and inability are the presenting behaviours faced by the elderly in this study the level of pain is assessed using Numeric Rating scale and inability using WOMAC INDEX

INVESTIGATION AND IMMEDIATE REACTION

The nurse does not assume that any aspect of her reaction to the patient is correct, helpful or appropriate until she checks the validity of it in exploration with the patient The nurse initiates a process of exploration to ascertain how the patient is affected by what she says or does . The perceptions stimulate automatic thought ,Each thought stimulates an automatic feeling Then the person acts on what to do In this study the researcher applies Mustard plaster for elderly in knee joint for five days and 15 minutes and investigates its effectiveness.

IMPROVEMENT

It is not the nurses activity that is evaluated but rather its result , whether the activity serves to help the patient communicate her or his need for help and how it is met.In each contact the nurse repeats a process of learning how to help the individual patient. In this study the improvement after therapy is assessed by posttest level of pain and inability.


ORGANIZING PRINCIPLE
-COLLECTION OF DATA
CLIENTS BEHAVIOUR
PAIN ASSESSMENT
INVESTIGATION AND IMMEDIATE REACTION
IMPROVEMENT
DEMOGRAPHIC VARIBLES:
AGE & SEX
MARITAL STATUS
RELIGION
EDUCATION
CLINICAL VARIABLES:
ANTHROPOMETRIC MEASUREMENT
WEIGHT & BMI
RANGE OF MOTION
ASSESSMENT OF DIFFICULTIES
GAIT
ELDERLY WITH SEVERE KNEE JOINT PAIN
PAIN LEADING TO IMMOBILITY
ASSESSMENTOF THE PRETEST LEVEL OF PAIN USING NUMERIC SCALE & INABILITY USING WOMAC INDEX
MUSTARD PLASTER APPLICATION
RESEARCHER ASSESS THE POST TEST LEVEL OF PAIN USING NUMERIC SCALE & INABILITY USING WOMAC INDEX
REDUCTION OF PAIN
NO REDUCTION OF PAIN

CHAPTER- II
REVIEW OF LITERATURE

Literature review is an essential component for the researcher which helps the investigator to familiarize with practical and theoretical issues relating to the problem area and helps the researcher to generate ideas and focus the research problem and its major aspects .

Review of literature is the process of reading, analyzing, evaluating, and summarizing scholarly materials about a specific topic .Literature review assists the researcher to have an insight in the selection and development of the theoretical and methodological approaches of the problem.

Review of literature is categorized as follows

- Studies related to prevalence, incidence and risk factors of knee joint pain among elderly.
- Studies related to cartilage changes in aging
- Studies related to complimentary therapies for pain management
- Studies related to Mustard Plaster .
- Studies related to Mustard Plaster Application on knee pain and inability management.

INTRODUCTION

Nurses must rely heavily on knowledge, interviewing techniques, and physical assessment skills to competently assess and manage patients with acute pain, because these skills have not been replaced by technology. Pain is a common reason for patients to seek healthcare and be admitted to hospitals. According to the National Center for Health Statistics, 46 million Americans undergo inpatient surgical procedures

each year and experience acute surgical pain. In 2006, pain was a frequent "chief complaint" for adults who presented to emergency departments (EDs), and pain severity was reported as moderate to severe by 45% of patients in the ED.

"Pain" is defined by the International Association for the Study of Pain as "an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of such damage. although this is a technical description of pain, it recognizes both the physiologic and affective nature of the pain experience. Pain is a highly personal, subjective experience which can only be accurately described by the individual who is experiencing pain. Recognition and acceptance of the subjectivity of pain are among the most challenging aspects of patient care; concepts that have evolved since 1968 when Margo Mc Caffery first defined pain as "whatever the person experiencing says it is, existing whenever he says it does. This definition, which has endured for more than 40 years, has allowed healthcare providers to intervene and treat patients on the basis of the self-report of the pain experience. In recent years, definitions of pain have been further refined to include the fact that a person's inability to verbally communicate does not preclude the possibility that pain is present or the responsibility of healthcare providers to treat it.

In Michigan, (2006) a cross sectional study was conducted among elderly in an old age home. It is found that 118 cases of elders were suffering with knee joint pain. The risk factors were overweight, nutritional deficiency etc and was associated with repair of tissues in the knee joint

A Medline and CINAHL search was carried out using MeSH terms rheumatoid arthritis, osteoarthritis, quality of life and pain in various combinations. Seventeen articles were identified that met the

requirements for methodological quality and inclusion criteria. No study focused only on respondents aged 75 years or over. The studies had varying representation of this age group. Pain was common in both groups and was found to increase with age and disease duration among those with rheumatoid arthritis but not among those with osteoarthritis. Increased pain could lead to depression. Pain, functional limitation and increased age were found to decrease quality of life among those with rheumatoid arthritis and osteoarthritis alike. Social support was found to buffer against negative effects and decrease quality of life . It is, however, hard to draw any firm conclusions about older people's pain because of the lack of studies including respondents aged 75 years or over. Thus, research about pain especially focusing on the old and the very elderly with rheumatoid arthritis/osteoarthritis, is needed. The article 2008 reported especially the pain is the major symptom of most musculoskeletal disorders.

Pain, functional limitation and increased age were found to decrease quality of life among those with rheumatoid arthritis and osteoarthritis alike. Social support was found to buffer against negative effects and decrease quality of life . It is, however, hard to draw any firm conclusions about older people's pain because of the lack of studies including respondents aged 75 years or over. Thus, research about pain especially focusing on the old and the very elderly with rheumatoid arthritis/osteoarthritis, is needed. It also seems justified to say that nursing care should especially focus on older people and that these people should be assessed for their level of pain, functional limitations and quality of life especially in the case of having pain .

Studies related to prevalence , incidence and risk factors of knee joint pain among elderly

Musculoskeletal pain is a major health problem among geriatric population according to the surveys undertaken in both developed and

developing countries. Knee and low back pain are the most frequent complaints among this population. Knee pain is more common than back pain among this population and with increase in life expectancy in developed and developing countries, this is an epidemic which is destined to grow. Most of geriatric population is troubled by chronic knee pain that has a major effect on their quality of life. It accounts for approximately one-third of musculoskeletal problems in this population.

Buelletin of World Health Organization by Anthony D. Woolf and Bruce Pfleger Professor of Rheumatology, Peninsula Medical School, Duke of Cornwall Department of Rheumatology, Royal Cornwall Hospital,Volume 81 September 2003 explains that Musculoskeletal conditions are a major burden on individuals, health systems, and social care systems, with indirect costs being predominant. This burden has been recognized by the United Nations and WHO, by endorsing the Bone and Joint Decade 2000–2010. This paper describes the burden of four major musculoskeletal conditions: osteoarthritis, rheumatoid arthritis, osteoporosis, and low back pain. Osteoarthritis, which is characterized by loss of joint cartilage that leads to pain and loss of function primarily in the knees and hips, affects 9.6% of men and 18% of women aged >60 years. Increases in life expectancy and ageing populations are expected to make osteoarthritis the fourth leading cause of disability by the year 2020. Joint replacement surgery, where available, provides effective relief. Rheumatoid arthritis is an inflammatory condition that usually affects multiple joints. It affects 0.3–1.0% of the general population and is more prevalent among women and in developed countries.

As the prevalence of co-existing chronic conditions with joint pain is reported to be between 65-85% in the older population , this could represent an important problem in primary care. The observed suboptimal care for patients with joint pain and the relation of both joint

pain and other chronic conditions with disability and impairment, indicate that older adults with joint pain and co morbidity have a higher risk of poor functional outcome and decreased quality of life and may benefit from more effective management in primary care.

"Knee Pain Worsens With Age "By Eric Metcalf, MPH, Medically reviewed by Pat F. Bass III, MD, MPH Health Article shows that researchers around the world have found that knee pain is common in people who are 65 and older. A recent British study in the journal Arthritis & Rheumatism 2011 found that nearly two-thirds of women aged 50 and over experienced persistent, incident, or intermittent knee pain. And in the United States, about 25 percent of women and 16.5 percent of men over age 70 report having knee pain, according to a paper in the December 2011 Annals of Internal Medicine Though it's not just about getting older, adds Dr. Joel Press, MD, medical director of the Spine and Sports Rehabilitation Center at the Rehabilitation Institute of Chicago Press. Certain factors that can go hand-in-hand with aging may increase the chances of knee pain:

Osteoarthritis, According to the Centers for Disease Control and Prevention, July 20,2013,Anna Litwic, MD, Specialist Registrar in Rheumatology,* Mark Edwards, MRCP, Clinical Research Fellow in Rheumatology,* Elaine Dennison, PhD FRCP, Professor of Rheumatic Disease Epidemiology, and Cyrus Cooper, FMedSci, Professor of Rheumatology and Director. found that about 14 percent of Americans over the age of 24 have osteoarthritis. This is a common type of arthritis in which the cartilage that protects the bones in your knees breaks down, leaving you more vulnerable to knee pain. After the age of 65, that number rises steeply to nearly 34 percent.

- ***Obesity:*** As age increases Weight gain is increased, as many people do, those extra pounds add up to more load that knees have

to bear, Dr. Joel Press, MD, medical director of the Spine and Sports Rehabilitation Center at the Rehabilitation Institute of Chicago says. knees feel the effects of the extra wear and tear from carrying any extra weight. Along with age, being overweight is a leading factor that raises risk of developing osteoarthritis.

- ***Muscle Changes***: Between the ages of 20 and 60, your muscles may shrink in size by roughly 40 percent. As a result, strength is lost. The muscles in hips and legs take up some of the force on legs that results from walking and doing other activities, Dr.Press MD, medical director of the Spine and Sports Rehabilitation Center at the Rehabilitation Institute of Chicago. Losing this muscular support as ageing increases vulnerablity to knee pain.

- Aging change Bone mass or density is lost as people age, especially in women after menopause. The bones lose calcium and other minerals.

- Joints become stiffer and less flexible. Fluid in the joints may decrease, and the cartilage may begin to rub together and erode. Minerals may deposit in and around some joints (calcification). This is common in the shoulder.

- Hip and knee joints may begin to lose joint cartilage (degenerative changes). The finger joints lose cartilage and the bones thicken slightly. Finger joint changes are more common in women and may be hereditary.

- Lean body mass decreases, caused in part by loss of muscle tissue (atrophy). The rate and extent of muscle changes seem to be genetically determined. Muscle changes often begin in the 20s in men and the 40s in women.

- Lipofuscin (an age-related pigment) and fat are deposited in muscle tissue. The muscle fibers shrink. Muscle tissue is replaced more slowly, and lost muscle tissue may be replaced with a tough fibrous tissue. This is most noticeable in the hands, which may appear thin and bony.

- Changes in the muscle tissue, combined with normal aging changes in the nervous system, cause muscles to have less tone and ability to contract. Muscles may become rigid with age and may lose tone, even with regular exercise.

EFFECT OF CHANGES

- Bones become more brittle and may break more easily. Overall height decreases, mainly because of shortening of the trunk and spine.

- Inflammation, pain, stiffness, and deformity may result from breakdown of the joint structures. Almost all elderly people are affected by joint changes, ranging from minor stiffness to severe arthritis.

- The posture may become more stooped (bent) and the knees and hips more flexed. The neck may become tilted, and the shoulders may narrow while the pelvis becomes wider. Movement slows and may become limited. The walking pattern (gait) becomes slower and shorter. Walking may become unsteady, and there is less arm swinging. Older people become tired more easily, and have less energy.

- Strength and endurance change. Loss of muscle mass reduces strength. However, endurance may be enhanced somewhat by changes in the muscle fibers. Aging athletes with healthy hearts and lungs may find that performance improves in events that

require endurance, and decreases in events that require short bursts of high-speed performance.

One of the most quoted studies is that by Crook et al. (1984), who randomly sampled the patients of a group of general practitioners located near Toronto, Canada. Their telephone survey had a gratifying 95% response rate, but there were few participants over the age of 80, a problem common to most community studies that explore issues relevant to the elderly. Questions regarding the temporal nature of pain did not follow the usual pattern of description for acute and chronic pain, and this study's classification of pain as temporary or persistent is not easily compared with classifications used in other studies. Nevertheless, it was one of the first studies to clearly demonstrate increased pain prevalence with increasing age, and it highlighted pain as a frequent problem for a large number of older people.

Thomas 1987; Anderson et al (1993) is often strikingly different to that reported in studies that pain is asked in each anatomical location and then request specific details ***(Stern bach 1986; Von Korff et al. 1988; Brattberg et al. 1989, 1996; Mobily et al. 1994)*** asked respondents if they had experienced any pain in their legs at night or while walking, and then asked similar questions about joint pain, back pain, and chest pain prior to asking about any other pain condition. This type of rich contextual information is likely to provide a more salient prompt to the recollection of pain symptoms than studies like that of Crook et al. (1984) that simply ask whether the subject is often troubled by pain.

Indian census (2011) shows that among 1.2 billion, 60 million are above the age of 65years. Old age is the resting period of life after years of long tough journey; the body needs to have a calm and comfortable period of rest. But around 40 % of the geriatric population are suffering

from different types of non- communicable diseases, in a gross reduction in the quality of life. Recent census in 2013 shows 55-64 years: 6.9% (male 42,307,170/female 41,785,413) 65 years and over: 5.7% (male 32,992,850/female 36,494,985)

As per 2010 statistics of arthritis organization, in Karnataka, among the total population, 28.4% of people over the age of 60years suffer from severe joint pain, among these 15% of the population have some degree of limitations of movement and 6% cannot perform daily activities.

According to the survey conducted by "The Hindu in Bangalore" among the total population, 18% of people over the age of 70years suffer from severe joint pain, 33% of the population have some degree of limitations of movement and 3% cannot perform daily activities.

A cross- sectional descriptive study was conducted to assess the geriatric health problems and the socio- economic status in a rural community of Sreepur Thana, Bangladesh in 2007. The study population included those aged 50years or more. A total of 226 respondents were selected purposively and interviewed using a pre -tested questionnaire. The mean age of the respondents was found to be 62years. Mean family size and monthly family income were estimated to be 5.31 and 5.85 respectively. More than half (64.2%) of the respondents were illiterate. Results shown that 80% of them were unemployed and 67.3% were found to be dependent on their family members. Among these, most of them (65.5%) were found to be suffering from joint pains.

A community based cross- sectional study to assess the morbidity among elderly in the rural service areas of Pondicherry, India was undertaken by Pondicherry Institute of Medical Sciences (PIMS) between October 1, 2002 to October 31, 2003. The sample was 320, all

the persons above the age of 60years residing in 4 villages of the area were randomly selected for the study. They were interviewed and examined in their own houses using a predesigned and pretested questionnaire. A clinical examination and a set of basic laboratory tests including ECG were taken for each individual by a team of medical officers and field health staff. The results showed that the average illness per person was 2.77. Pain in the joints and Joint stiffness was the most common morbidity in 139 (43.4)%, followed by dental and chewing complaints in 135 (42)%, decreased visual acuity in 40, (14)%, diarrhea in 38 (12)%, chronic cough in 37 (12)%, skin disorders in 38 (12)%,heart illness in 27 (9)%, diabetes in 26, (8.1)%, asthma in 19 (6)% & urinary complaints 18, (5.6)%.

The world - wide Statistics in 2008 shows that, among the total population, 40% of the people at the age of 60years, suffer from severe joint pain, 80% of the population have some degree of limitations of movement and 25% cannot perform daily activities.

In the Health and Retirement Survey, Kramer et al interviewed 9802 subjects aged 51-61 years of age. Results indicated that 15.5% reported that pain made it difficult to do normal work, with the highest among American Indians (24.7%), Latinos (23.4%), and African Americans (19.3%), as compared with whites (14.4%) and Asians (14.2%). More Latinos (9.8%), African Americans (7.0%), and Asians (5.8%) described their usual pain as severe compared with whites (2%) or American Indians (2.0%). Ethnicity was a significant predictor of pain when controlled for age and gender.

Kramer et al studied an American Indian subpopulation with chronic joint pain in urban Los Angeles to examine how American Indians understand and communicate their symptoms of chronic joint pain. Elderly American Indians (> age 62 years) more often chose to

endure chronic pain. The studies revealed that American Indians used words such as “ache,” “pain,” and “discomfort” to describe pain of varying intensities ranging from mild to severe.

A cross sectional study was conducted to estimate the burden of musculoskeletal disorders in the community was done in 1998 in US. An age and sex stratified sample of 6000 adults from the two practices (Allopathy & Ayurveda) were mailed a questionnaire that sought data on demographic factors, musculoskeletal symptoms (pain in the past month lasting for more than a week), and physical disability (using the modified Health Assessment Questionnaire- MHAQ). The response rate was 78.5%. The results showed that the most common sites of joint pain was back (23%; 95% CI 21, 25) followed by knee (19%; 95% CI 18, 21), and shoulder (16%; 95% CI 14, 17). The majority of subjects who reported pain had pain in more than one site. The prevalence of physical disability and joint pain in the community rose with age. It was the highest in those with multiple joint problems, but was also high in those with isolated back or knee pain.

A cross sectional survey conducted in 2000 at Chandigar was carried out to estimate the morbidity, co -morbidity & patterns of treatment seeking and to determine relationship of morbidity with disability, psychological distress and socio demographic variables among the elderly population from the urban population of Chandigarh city and the rural population of Haryana, India in 2000, by using a cluster sampling technique. The sample size was 252.Various socio demographic characteristics were recorded at base line. A clinical diagnosis was made by physician based on reported illness, clinical examination and cross checking of medical records and medications held by the subjects. The results showed that out of total samples 88.9 % reported illness based on their perception and of these 43.5% were diagnosed as having 4 – 6 morbidities. The mean of number of

morbidities among elderly people was 6.1 (SD- 2.9). A total of 87.5% had minimal to severe disabilities and 66% of elderly people were distressed physically, psychologically or both. The most prevalent morbidity was anemia followed by joint pains, immobility, hypertension and COAD (Chronic Obstructive Airway Diseases). Morbidity was significantly associated with age.

RISK FACTORS

In Research Article Prevalence and Identification of Risk Factors for Knee Osteoarthritis among Elderly Men and Women By S.D. Ganvir, B.R. Zambare The study was conducted in Vikhe Hospital; Ahmednagar (M.S), from July 2011to June 2012 and it was an observational study, a pilot study as a part of Ph.D. Research. The patients were randomly selected from OPD and IPD of Vikhe hospital. The interview was structured as follows, data was recorded on a standardized predesigned and a pre-tested questionnaire. Questionnaire focused on possible risk factors (age, family history, obesity, physical activity, and occupational knee bending and knee injury). In 205 subjects (73% response rate). Participation was poorer among men and There was a slightly higher prevalence of radiographic changes of OA in women than in men however, there was a significantly higher proportion of women with symptomatic disease (11% of all women versus 7% of all men; P = 0.003). The age-associated increase in OA was almost entirely the result of the marked age-associated increase in the incidence of OA in the women studied. This study extends current knowledge about OA of the knee to include elderly subjects, and shows that the prevalence of knee OA increases with age throughout the elderly years. In this study it was observed that there is relationship between age, sex and BMI with OA. The number of people with OA increased as the age increased; hence it is likely that if preventive measures can be taken in the earlier age groups OA can be prevented.

According to the United Nations' worldwide statistics for the year 2009, the percentage of individuals aged 60 years and over will increase from 11% to 22% by 2050 . In comparison to global numbers, Malaysia is expected to have an ageing society by 2035, where the population size of people aged 60 years and over will reach 44.11 million, 15% of the total population size . Falls as a cause of death in Malaysia is ranked 150 in the world, compared to 80 in the United States of America and 4 (critical) in Thailand . In developed countries, approximately 32% older people will fall within one year, where 20% of fallers will need medical attention, and less than one in ten cases result in a fracture . Growth of the older population is expected to be associated with an increase in number fallers presented to health care services, which will incur higher health care and social care costs, unless effective interventions can be implemented widely.

Falls is not a part of the natural ageing process. They are often the result of a collective and individualized set of risk factors. The total count of possible risk factors contributing to falls exceeds 400, among the many are impaired sensorimotor functioning, cardiovascular complications, muscle weakness, environmental factors, osteoarthritis, visual limitations and depression.

A prospective study conducted on August 10 2002 on knee pain and its risk factors by ***H. Miranda, E. Viikari-Juntura, R. Martikainen, H. Riihimaki*** on 2122 workers free of knee pain and another cohort of 333 workers with severe knee pain were followed up for one year. The effects of the risk factors on the incidence and persistence of knee pain were studied using multivariable logistic regression models. Significant predictors of incident knee pain in the multivariable model were higher age, overweight, smoking, and previous knee injuries. Also, working with the trunk forward flexed in kneeling or standing position and physically strenuous work were non-

significant predictors of incident knee pain. Of those 333 workers with severe knee pain at baseline, 220 (66%) still reported severe knee pain after one year. Higher age and job dissatisfaction increased the risk of persistent symptoms. General physical exercise and different sports activities did not predict the incidence or persistence of knee pain.

STUDIES RELATED TO CARTILAGE CHANGES IN AGING

Changes in posture and gait (walking pattern) are common with aging as changes in the skin and hair.The skeleton provides support and structure to the body. Joints are the areas where bones come together. They allow the skeleton to be flexible for movement. In a joint, bones do not directly contact each other. Instead, they are cushioned by cartilage in the joint, synovial membranes around the joint, and fluid.

Muscles provide the force and strength to move the body. Coordination is directed by the brain but is affected by changes in the muscles and joints. Changes in the muscles, joints, and bones affect the posture and gait, and lead to weakness and slowed movement.

AGING CHANGES

Bone mass or density is lost as people age, especially in women after menopause. The bones lose calcium and other minerals.

The long bones of the arms and legs, although more brittle because of mineral loss, do not change length. This makes the arms and legs look longer when compared with the shortened trunk.

The joints become stiffer and less flexible. Fluid in the joints may decrease, and the cartilage may begin to rub together and erode. Minerals may deposit in and around some joints (calcification). This is common in the shoulder.

Hip and knee joints may begin to lose joint cartilage (degenerative changes). The finger joints lose cartilage and the bones thicken slightly. Finger joint changes are more common in women and may be hereditary. Some joints, such as the ankle, typically change very little with aging.

Inflammation, pain, stiffness, and deformity may result from breakdown of the joint structures. Almost all elderly people are affected by joint changes, ranging from in or stiffness to severe arthritis. The walking pattern (gait) becomes slower and shorter.

C Ding, F Cicuttini, F Scott, H Cooley, G Jones Menzies Research Institute, Private Bag 23, Hobart,Tasmania 7000, Australia;in 12 August 2004 A cross sectional convenience sample of 372 male and female subjects (mean age 45 years, range 26–61) was studied. Knee measures included a cartilage defect five site score (0–4 respectively) and prevalence (defect score of $\geqslant$2 at any site), cartilage volume and thickness, and bone surface area and/or volume. These were determined at the patellar, medial, and lateral tibial and femoral sites using T_1 weighted fat saturation MRI. Height, weight, and radiographic osteoarthritis (ROA) were measured by standard protocols. In multivariate analysis, age was significantly associated with knee cartilage defect

A cross sectional study documents associations between age and knee cartilage defects, thickness, volume, and bone size in a convenience sample. In particular, the severity and prevalence of knee cartilage defects and bone size increased, whereas knee cartilage thickness decreased with increasing age at all compartments or sites. While patellar cartilage volume in women decreased with increasing age, tibial cartilage volume remained unchanged, suggesting knee cartilage thinning and defects and bone enlargement are the main processes that occur with aging

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STUDIES RELATED TO COMPLIMENTARY THERAPHIES FOR KNEE PAIN

Knee pain can be treated in a variety of ways, from over-the-counter remedies to surgery. Complementary and alternative medicine (CAM) is an option, too.

"Patients need to realize that some of these therapies are great adjuncts [add-on treatments]. They won't cure knee pain, but they will control the symptoms," says ***Robert Gotlin, DO, director of sports rehabilitation at Beth Israel Medical Center in New York City.***

The 2007 National Health Interview Survey showed that use of complementary health approaches was common among adults with painful conditions. For example, 47 percent of survey respondents who had migraine or back pain with sciatica used complementary approaches, as did 41 percent of those who had headaches regularly.

More adults used complementary health approaches for painful conditions than for any other type of health problem. Back pain was the number one reason why adults used complementary health approaches, and neck pain, joint pain/stiffness, arthritis, other musculoskeletal pain, and severe headache or migraine all ranked among the top 10.

PAIN RESEARCH AT NIH

Pain is an important focus of National Institue of Health(NIH) research.NIH has established a Pain Consortium to enhance research on pain and promote collaboration among researchers from the many NIH agencies that have programs and activities related to pain.

NCCAM, which is NIH’s lead agency for complementary health approaches, is part of the consortium and is working to improve the evidence on the effectiveness and safety of complementary approaches

for pain. In addition, NCCAM has a research program that focuses on the role of the brain in perceiving, modifying, and managing pain.

NIH-sponsored Research on Complementary Health Approaches for Pain

Knee Pain: Alternative Therapies

Some of the most popular alternatives therapies for knee pain are:

Acupuncture: This ancient treatment seems to be particularly helpful for knee pain related to osteoarthritis. It typically involves the use of thin metal needles that are inserted into the skin by hand and manipulated into specific points to relieve the pain. "Acupuncture is a great adjunct and it's been around for thousands of years and has many places in medicine — one is to control pain and swelling in the knee," Dr. Gotlin says.

According to a recent study at the University of Maryland, patients who received acupuncture for knee pain reported 40 percent less pain than patients who received other treatments or information about knee pain.

Magnets: Use of magnets is also a form of pain relief therapy, but research has been unable to prove whether it's truly effective. Some magnets, called electromagnets, can generate magnetic fields which can be pulsed, or turned on and off rapidly. Although one small study showed that patients with knee osteoarthritis using this therapy felt improvement in pain, researchers said more studies are needed to really prove the effectiveness.

"Magnetic pulsed therapy is on the downside and not used much anymore," Gotlin says. "It is supposed to increase blood flow in the knee and help soothe the pain, but it's not curative."

Shiatsu Massage: Massage is another of the many alternative therapies that some people may consider when seeking to reduce knee pain. One particular type of massage is called shiatsu, during which rhythmic, varying pressure is applied to your body. Other types of massage use different amounts of pressure and different stroke techniques.

"This isn't a common therapy for knee pain," Gotlin says. "Shiatsu treatment or any hands-on technique is just an adjunct therapy to help improve the way muscles fire and to reduce pain, but it's not commonly used."

Dietary Supplements: Alternative therapies in the form of supplements, particularly glucosamine plus chondroitin sulfate, are widely advertised and are supposed to help reduce the pain of knee osteoarthritis. Numerous studies have produced mixed results. One large study of 1,600 people living with knee osteoarthritis pain sponsored by the National Institutes of Health found that, after four years, glucosamine plus chondroitin sulfate did not provide substantial relief for patients who had mild pain.

Glucosamine and Chondroitin Sulfate

Glucosamine and chondroitin sulfate—taken separately or together—are marketed for supporting joint health and have also been widely used for OA. Both are produced naturally in the body. They are also available as dietary supplements.

The American College of Rheumatology (ACR) has recommended that people with hip or knee osteoarthritis not use glucosamine or chondroitin. But the recommendation was not a strong one, and the ACR acknowledged that it was controversial.

NCCAM funded a study that examined the use of glucosamine and chondroitin sulfate for knee pain from OA. The Glucosamine/chondroitin Arthritis Intervention Trial (GAIT) enrolled close to 1,600 participants. Results indicated that overall, a 6-month treatment with the dietary supplements was no better than placebo. While there was some evidence suggesting that participants with moderate-to-severe pain had modest reductions in pain with the combined supplements, this has not been confirmed. In a followup study of GAIT participants, researchers examined whether glucosamine and chondroitin could prevent the progression of Osteoarthritis an evaluation based on measuring joint space width. Results showed no significant change in joint space width or improvement in pain and function.

A 2010 meta-analysis that looked at 10 glucosamine and chondroitin trials involving 3,803 patients with knee or hip OA published similar results. Compared with placebo, glucosamine, chondroitin, or a combination of both did not significantly reduce pain or change joint space.

Glucosamine and chondroitin appear to be relatively safe and well tolerated when used in suggested doses over a 2-year period. In a few specific situations, however, there are concerns that side effects or drug interactions might occur:

STUDIES RELATED TO MUSTARD PLASTER APPLICATION

Mustard plaster was first used in Europe centuries both culinary purpose and medicinal use it was introduced to other countries by European settlers, Later by in US Army but use of mustard plaster became uncommon in late half of twentieth century.

To find holistic treatment with effective pain relief and few side effects, Americans spend billions of dollars annually on complementary

and alternative medicine, including herbal therapies. Despite extensive use, the lack of regulatory scrutiny of these herbal supplements contributes to the paucity of reliable clinical data assessing their efficacy and safety. MEDLINE,AMED, and the Cochrane Library databases were searched for the period from January 1966 to June 2005. Uses, dosages, routes of administration, and side effects were summarized. Strength of empirical evidence also was evaluated. The review found few well-controlled clinical studies. Furthermore, studies documented limited efficacy of herbal therapies to treat pain. The information presented may be used to further educate nurses and patients on the use of herbal therapies as well as direct future research efforts. 2005 by the American Society for Pain Management Nursing

Mustard seeds have been used in traditional folk medicine as a stimulant, diuretic, and purgative and to treat a variety of ailments including peritonitis and neuralgia. Mustards are still used today in mustard plasters to treat rheumatism, arthritis, chest congestion, aching back, and sore muscles. To make a mustard plaster, mix four parts of flour and two parts powdered mustard and spread it as a paste on a doubled piece of soft cloth. Apply mustard plaster to the affected area for **a maximum of 15 minutes. Prolonged application can result in burns to the skin and nerve damage.**

Mustard is mentioned in the New Testament of the Bible five times, one time referred to as the greatest herb. The mustard plant has been used since ancient times and is valued for its oil content. It can be found growing wild in many parts of the world as it is widely cultivated. There are many varieties of mustard; they all have very pungent flavors. Some medicinal mustard compounds date back to at least 400 B.C. The name is derived from the Latin, mustum. Other names for mustard are white mustard, yellow mustard, pepper grass, and hedge mustard.

Mustard seeds are the small round seeds of various mustard plants. The seeds are usually about 1 or 2 mm in diameter. Mustard seeds may be colored from yellowish white to black. The seeds can come from three different plants: black mustard, brown Indian mustard, and white mustard. Mustards have been used in traditional folk medicine as a stimulant, diuretic, and purgative and to treat a variety of ailments including peritonitis and neuralgia. Mustards are still used today in mustard plasters to treat rheumatism, arthritis, chest congestion, aching back, and sore muscles.

Mustard acts as a counter-irritant when it is applied to the skin. A counter-irritant is an agent that causes blood vessels to dilate, or open up, increasing the supply of blood to the area. When a part of the body is infected, increasing the supply of blood and lymph fluid to the area is likely to facilitate healing, because the blood will carry oxygen, nutrients, and lymphocytes (white blood cells to fight the infection) to infected cells, while lymph fluid will carry away waste products and toxins.

(Brassica) Topically, used as a poultice for bronchial pneumonia, pleurisy, arthritis, lumbago, aching feet, rheumatism, and as a counterirritant

(Natural Medicine Comprehensive Database, 2003) To treat inflammation and joint pain (Skidmore-Roth L, 2004)

(Natural Medicine Comprehensive Database, 2003) Orally: No known suggested dose. No published research related to pain. Has Generally Recognized as Safe (GRAS) status in the US (Natural Can irritate asthma, and the GI tract Orally, large amounts of black mustard seed can lead to vomiting, stomach pain, diarrhea, somnolence, cardiac failure, breathing difficulties, coma, and possibly death (Natural Medicine Comprehensive Database, 2003)

Health Benefits and Therapeutic Uses

- Since ancient times, people all over the world have used mustard for its medicinal properties. The high nutrient content in mustard helps the body to improve the metabolic process, lower blood pressure, and ward off atherosclerosis.

- Mustard seeds have multiple benefits of antiviral, antimicrobial, antifungal, and anti-inflammatory properties. The antiseptic nature of mustard seeds helps to cleanse the digestive tract and improve the body's total immune mechanism.

- The scent of mustard is considered to remove nasal congestion and help to clear up the lungs.

- Mustard oil is also used for cooking as well as a massage oil. It is considered to improve the circulation of blood through the body and ward off rheumatism and arthritis.

- A plaster of mustard paste is also believed to help bring down fevers.

- By helping to clear the sinuses of any phlegm or mucus, mustard is believed to mitigate the effects of asthma.

- Selenium, that is present in mustard, is considered to help the body reduce its cholesterol levels.

- The presence of sulphur in mustard accounts for its use in treating skin ailments. The paste of the seeds is applied on the affected area for this purpose.

- A gargle with mustard, honey, salt, lime, and hot water is believed to cure a sore throat.

- A mustard soak or bath is also considered helpful in relieving back aches, muscle aches, and tired feet.

- Brown mustard is considered to be aperitif, anodyne (a medication that alleviates pain), emetic, diuretic, stimulant and rubefacient and is a traditional medication for treating foot ache, arthritis, lumbago as well as rheumatism. In China, the mustard seed is employed in treating tumours. People in Korea use the mustard seeds in treating colds, abscesses, and rheumatism, lumbago and stomach problems. In Africa, the brown mustard root is employed in the form of a galactagogue (any medication that promotes the secretion of milk).Taking mustard internally may pass on a body smell that repels mosquitoes

Fredrick (2009) conducted the study to determine the effectiveness of mud therapy for 57 patients with bilateral primary knee pain, 32 of the patient received dailymud pack treatment on weekdays only for 3 weeks. The mud pack treatment was applied to both the knees for 30 minutes at 45oC, the remaining 25 patients, serving as control group, were given acetaminophen (2g/day). The results suggested that mudpack treatment significantly reduced the level of pain and improved functional status of patient with knee joint pain.

Studies Related To Mustard Plaster Application On Knee Pain And Inability Management

Mustard plasters and poultices are tried and true remedies to relieve arthritic joints, sciatica, neck pain, backache, neuralgia, and muscle pain. The mustard plasters work by dilating the blood vessels to promote the increase of blood flow to the surface of the skin. This warms the affected area and removes any toxins from that area. Mustard plaster Was Generally Recognized as Safe status in the US(Natural Medicine Comprehensive Database, 2003

According to book content of ***Modern Hydrotherapy For The Massage Therapist 2007 pg 102*** A plaster is a paste like mixture, usually of herbs, that can be spread upon a cloth and applied to the body.Ground mustard seeds contain chemicals and enzymes that, when combined with water, liberate compoundsthat encourage blood flow to the surface of the skin. The plaster also functions as a counter irritant,a sub-stance that stimulates nerve endings on the skin, distracting the central nervous system from deeper-seated pain and relieving it. Plasters made with ground mustard are used to warm muscle tissues, especially deeper tissues, and to treat chronic aches and pains, Use of plasters became less common in the last half of the twentieth century, and they are now seen chiefly as a home remedy. Originally mustard plasters were thought to draw out "bad humors." Practically speaking, however, the plasters were used to provide soothing heat, increase local circulation, relieve arthritis pain, and treat respiratory ailments such as chest colds and bronchitis by deeply warming the chest. Today's massage therapist may wish to use a mustard plaster before massage to ease painful muscle or joint and to bring heat to a deeper muscle before it is massaged. Mustard plasters are indeed very hot and can even cause blistering, so you must monitor the skin underneath them carefully and take the plaster off at the recommended time. Mustard plaster are used to treat inflammation and joint pain (Data from Skidmore-Roth, 2004

Apply mustard plaster to the affected area for a maximum of 15 minutes. Prolonged application can result in burns to the skin and nerve damage.

Research studies of Hungan Yangulo Department of Surgery, Faculty of Medicine, Baskent University, 06490 Ankara, Turkey & Feza Karakayali Department of Surgery, Diyarbakir Education and Research Hospital, 21400 Diyarbakir, Turkey Published online May 20, 2012 Pubmed application of mustard plaster to the affected area for a

maximum of 15 minutes only. Prolonged application can result in burns to the skin and nerve damage. Skin lesions occur within hours after exposure, and there is no significant therapy procedure.

Dr.John Abramson is a researcher and faculty instructor of Naturopathy at Harvard Medical School in his book OVERDO$ED AMERICA: The Broken Promise of American Medicine September 2012 says not to apply Mustard plaster Directly to the Skin, to wrap the paste in a cloth, not leave on the skin longer than 10 to 15 minutes, to not use a mustard poultice on sensitive or broken skin. A mustard poultice is good for arthritic joints and any condition that requires increased circulation. It can be applied to the chest to help relieve congestion, aid asthma, relieve coughs, and assist in getting rid of colds and flu.

A study was conducted at kayalvarath health complex in 2010 to determine the effectiveness of mustard plaster in reducing the knee joint pain. The study group consist of 60 clients. Mustard plaster was applied and hot water application given. Post procedural pain score indicated a significant reduction in joint pain among client.

Edward et al. in 1993 tried successfully mustard as a topical treatment for arthritis. The study group contained 90 arthritis clients. Mustard was applied over painful joint and massaged. The post procedural pain scores indicated a significant reduction in joint pain among participants.

A study conducted by Dhivya et al in 2012 unpublished ,in her study 60 elderly were selected and for whom mustard plaster was applied for knee pain for seven continous days major findings of the study was Most the elderly were moderately (60%) satisfied with mustard plaster application and significant percentage (40%) of them were highly satisfied.

CHAPTER – III
RESEARCH METHODOLOGY

The methodology of the research study is defined as the way the participant information is gathered in order to answer the research questions or analyzes the research problem .

Methodology of research organizes all the components of study in a way that is most likely to lead to valid answers to the problem that have been posed,(Burns and Groove,2002)

The present study was designed to evaluate the effectiveness of mustard plaster among elderly with knee pain and inability . This chapter deals with description of the research approach ,research design ,criteria for sample selection ,variables of the study , materials, pilot study main study and techniques of data collection procedure and summary.

RESEARCH APPROACH

Research approach is the most essential part of any research. The entire study is based on it .The research approach used in this study is an applied form of intervention. In this study the effectiveness of mustard plaster application on Knee pain and inability is evaluated Therefore a evaluative approach is applied.

RESEARCH DESIGN

The term research design refers to the plan of scientific investigations. The research design helps the researcher in selection of subjects, identification of variables, the over all plan for addressing a research question including specification for enhancing the integrity of the study (Polit & Beck2004)

The research design adapted to carry out the present study is Pre - experimental study involving only one group. The group received the mustard plaster application on knee once a day for 5 days duration 15 minutes regularly.Pre test and post test score was measured.

DIAGRAMATIC REPRESENTATION OF THE RESEARCH DESIGN

O1	X	O2

The symbols used,

O1 – Pre test assessment of Knee joint pain and inability in elderly.

X - Application of mustard plaster on knee

O2 – Post test assessment of Knee joint pain and inability in elderly.

VARIABLES UNDER STUDY

Independent variable

Independent variable in this study is application of mustard plaster .

Dependent variable

The level of knee joint pain and inability among elderly .

RESEARCH SETTING

Settings are the most specific place where data collection takes place This study was conducted in an old age home Mahatma Gandhi home for elderly at Arcot,Vellore District .

ETHICAL CLEARANCE

Institutional human ethics committee clearance and permission was obtained to conduct the study in **Mahatma Gandhi home for elderly.** Elderly were informed about the study and written consent was obtained from individual participant. No one were denied from their

routine treatment and the elderly were told that they were under no obligation to participate in the study

POPULATION

A group of individuals or items that share one or more characteristics from which data can be gathered and analyzed

Target Population

The group of population that the researcher aims to study and to whom the study findings will be generalised. In this study the target population comprises of elderly above 55 years who have knee joint pain and inability.

Accessible Population

A list of Population were the researcher finds in a study area well defined set which has certain specified properties. Accessible population in this study is Elderly with knee joint pain in Mahatma Gandhi home old age home Arcot ,Vellore.

SAMPLING TECHNIQUE

It is the process of selection of population, Non randomized technique was used Purposive sampling technique is used in this study to select the elderly .Elderly with knee joint pain and inability were only chosen by the researcher.

SAMPLE

A sample is “a smaller (but hopefully representative) collection of units from a population used to determine truths about that population” (Field, 2005),Samples of 30 elderly who satisfied the inclusion criteria.

SAMPLING CRITERIA

Inclusion Criteria

- ❖ Elderly who were willing to participate in the study.
- ❖ Elderly who can be communicated in local language.
- ❖ Elderly in the age group above 55 years.
- ❖ Elderly who had both unilateral and Bilateral Knee joint pain.

Exclusive Criteria

- ❖ Elderly who were not willing to participate in the study.
- ❖ Elderly who do not know Tamil or English.
- ❖ Elderly with Fractures.
- ❖ Elderly with Knee surgeries.

SELECTION AND DEVELOPMENT OF STUDY OF INSTRUMENT

Based on review of literature and experts opinion the data collection instrument was prepared to conduct this study. The instrument consisted of two parts with multiple choice questions .Demographic Variables and clinical Variables

Demographic data profile for elderly persons included age, gender, religion ,marital status, Previous history of work, Education, Source of Income, Food Habits, Smoker, Alcoholic, Other habits , Previous history of sports involvement and use of any medication.

Clinical data consisted of anthropometric measurements which included height ,weight and body mass index ,Range of Motion, Gait, assessment of difficulties like raising from chair, raising from squatting position ,Involvement of pain in which knee, Which aspect of knee is involved ,History of swelling of knee, Activity which involves pain, Aggravation of pain due to, Duration of pain, Involvement in Physical activity based on which the patients were selected

WOMAC Scale for Assessment of Knee pain and inability and Numeric rating scale:-

WOMAC Index was developed in 1982 at Western Ontario and McMaster Universities by BELLAMY. WOMAC is available in over 65 languages and has been linguistically validated.

The Western Ontario and McMaster Universities Arthritis Index (WOMAC) is widely used in the evaluation of Hip and Knee Osteoarthritis. It is a self-administered questionnaire consisting of 24 items divided into 3 subscales

Pain (5 Items): during walking, using stairs, in bed, sitting or lying, and standing upright

Stiffness (2 Items): after first waking and later in the day

Physical Function (17 Items): using stairs, rising from sitting, standing, bending, walking, getting in / out of a car, shopping, putting on / taking off socks, rising from bed, lying in bed, getting in / out of bath, sitting, getting on / off toilet, heavy domestic duties, light domestic duties

The test questions are scored on a scale of 0-4, which correspond to: None (0), Mild (1), Moderate (2), Severe (3), and Extreme (4).

SCORE INTERPRETATION:-

Mild physical inability	1-24
Moderate physical inability	25 -48
Severe physical inability	49 -72
Extreme physical inability	73- 96

The WOMAC takes approximately 12 minutes to complete, and can be taken on paper, over the telephone or computer. Both the computerized and the mobile versions of the test have been found to be comparable to the paper form, with no significant difference.

The scores for each subscale are summed up, with a possible score range of 0-20 for Pain, 0-8 for Stiffness, and 0-68 for Physical Function. THE WESTERN ONTARIO AND MC MASTER (WOMAC)was developed in the early 1980s by BELLAMY. This scale was designed to provide a standardized assessment of self reported health status . Higher scores on the WOMAC indicate worse pain, stiffness, and functional limitations.

Numerical Rating scale for pain is used to assess pain

The numeric pain rating scale is used to assess the level of pain experienced by the elderly . The rating ranges from no pain to severe pain (0 – 10).

This checklist is designed to assess the level pain of elderly before and after treatment.

Level of Pain Score interpretation

Mild 1-3

Moderate 4-6

Severe 7-10

Validity of the study instruments

Validity is described as the degree to which a research study measures what it intends to measure. The tool were submitted to experts in the field of nursing and medicine to establish the content validity. Based on the experts suggestions the researcher finalized the tool for the original study.

Reliability

The test-retest reliability of the WOMAC varies for the different subscales. The pain subscale has not been consistent across studies, but it generally meets the minimum standard. The physical function subscale is more consistent, and has a stronger test-retest reliability(r = 0.05). The stiffness subscale has shown low test-retest reliability.

PILOT STUDY

Pilot study, is a small scale preliminary study conducted in order to evaluate feasibility, time, cost, adverse events, and effect size in an attempt to predict an appropriate sample size and improve upon the study design prior to performance of a full-scale research project.

The pilot study was conducted It is a trial run, done in preparation for the major study. The pilot study was conducted in the month of November 2013 ,the study was conducted on five elderly Formal permission was obtained from the authorities and subjects prior to the pilot study . Effectiveness of mustard plaster on knee pain and inability among elderly was assessed this showed feasibility and significance in conducting the study.

DATA COLLECTION PROCEDURE

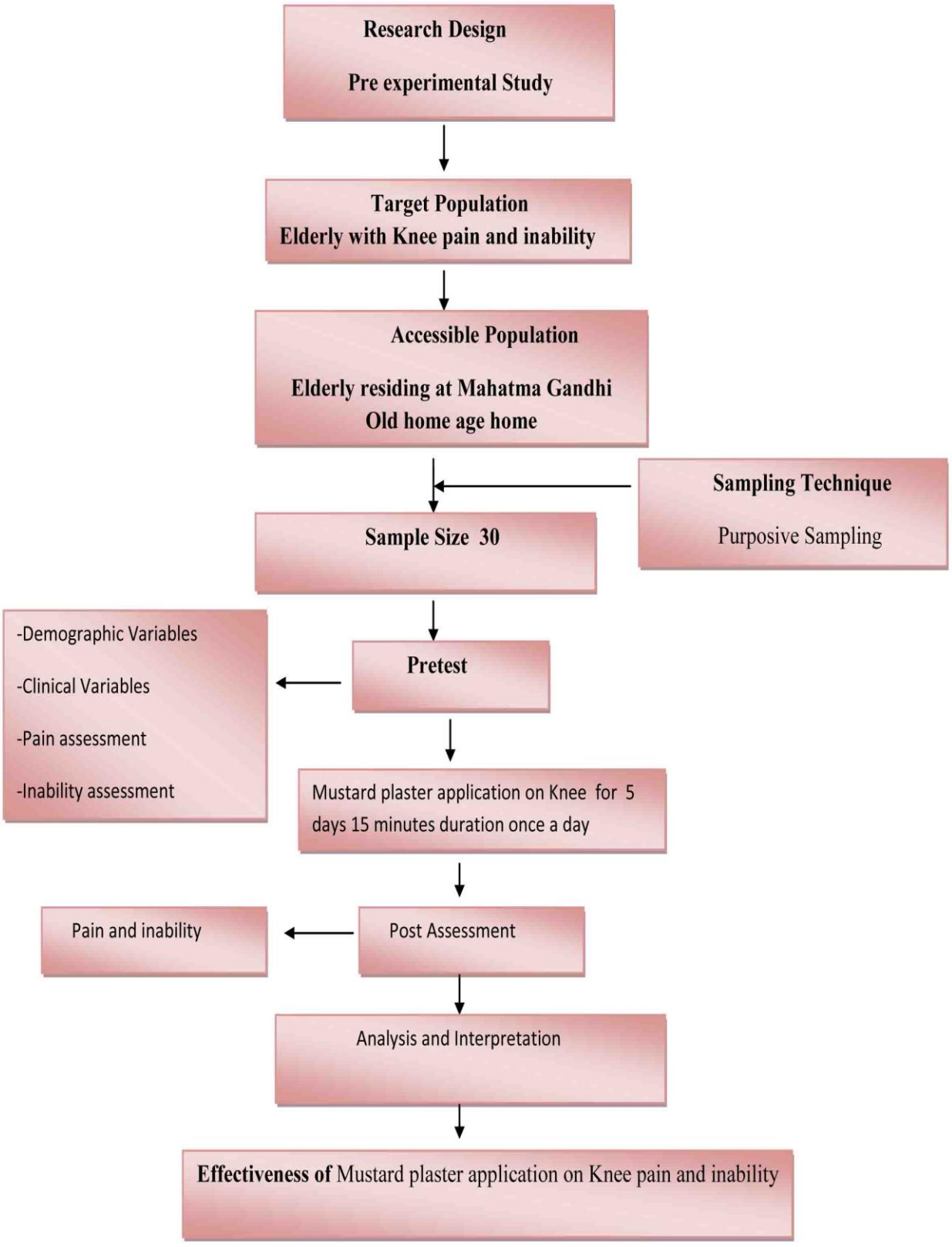
The data collection is gathering of informations needed for the study .The data was collected from 20th January to 20th February 2014.Permission from the Manager of Old age home was obtained through proper channel .The main aim of the study was to assess the Effectiveness of Mustard Plaster on Knee pain and inability among Elderly.The researcher used WOMAC Index to assess in ability and Numeric Rating Scale to assess pain .Data were collected by Interview method . The procedure was proceeded only after pilot study.

The procedure is scheduled in one time per day with the duration of 15 minutes mustard powder 1 spoon with 2 spoon of wheat flour was mixed in luke warm water and the paste is spread over a flannel cloth which is double folded and then applied to the knee joint for five continuous days . Expose the knee joint Check with the client to make sure there are no contraindications for the use of local heat. Explain the use of local heat to client and get consent. Place the cloth on a tray Mix the mustard powder ,flour with luke warm water to make a paste.Spoon the mustard mixture onto the cloth, and spread it out, leaving enough dry cloth to fold over Only one thin layer of cloth will be between the skin and the plaster .Check the area visually before applying the plaster This allows to see what the client's skin normally looks like. Monitor the client's skin carefully. If the skin becomes very red before the 15 minutes the plaster is removed or If the client feels any stinging or burning, the plaster is removed immediately.Leave it for 15 minutes. To clean the skin, apply a tissue or small cloth dipped in vegetable oil and wipe off the mustard plaster. Assess the level of pain using pain scale. The procedure is performed once a for 5 days.

PLAN FOR DATA ANALYSIS

Data analysis enables the researcher to organize, summarize, evaluate, interpret and communicate numerical information. The data collected from elderly were analyzed by using descriptive and interferential statistics . Descriptive statistics like Frequency distribution Percentage, Mean Standard deviation and Interferential statistics like Chi-square test and Paired t Value were used to analyze the data .

3.3. SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY



CHAPTER-IV
ANALYSIS AND INTERPRETATIONS

This chapter deals with analysis and interpretation of the data collected.The analysis is defined as the method of organizing data in such a way that the research question can be answered

Interpretation is the process of making sense of results and examining the simplification of the findings with in a broader context.

This chapter includes both descriptive and inferential statistics. Statistics is a field of study concerned with technique or method of collection of data, classification, summarizing, interpretation, drawing inferences, testing of hypothesis etc.

ORGANIZATION OF FINDINGS

The findings of the study were organized and presented under the following headings.

- Frequency and percentage distribution of demographic variables in elderly with knee joint pain and Inability.
- Frequency and percentage distribution of clinical variables in elderly with knee joint pain and Inability.
- Frequency and percentage distribution of level of knee joint Inability before and after mustard plaster application in elderly clients.
- Frequency and percentage distribution of knee joint pain before and after mustard plaster application in elderly clients.
- Comparison of Mean and Standard Deviation and paired difference on Level of knee joint pain and inability.
- Association between selected Demographic Variables in mustard plaster application before and after mustard plaster

Table-4.1: Frequency and Percentage Distribution of Demographic Variables of Elderly Clients with Knee Joint Pain and Inability.

N=30

Demographic Variables of Elderly		**Number n**	**Percentage %**
Age	55-60 years	3	10.00%
	60-65 years	6	20.00%
	65-70 years	5	16.67%
	>70 years	16	53.33%
Gender	Male	8	26.67%
	Female	22	73.33%
Religion	Hindu	27	90.00%
	Christian	2	6.67%
	Muslim	1	3.33%
Marital History	Married	16	53.33%
	Unmarried	4	13.33%
	Widow/Widower	10	33.33%
Previous nature of job	Heavy	9	30.00%
	Moderate	9	30.00%
	Sedentary	12	40.00%
Educational Status	Degree	1	3.33%
	HSC	3	10.00%
	Primary	17	56.67%
	Illiterate	9	30.00%
Source of income	Pensioner	15	50.00%
	Others	13	43.33%
	No Income	2	6.67%

Demographic Variables of Elderly		Number n	Percentage %
Food Habits	Veg	10	33.33%
	Ovo-Lacto	6	20.00%
	Non veg	14	46.67%
Smoker	No	25	83.33%
	Yes	5	16.67%
Alcoholism	No	22	73.33%
	Yes	8	26.67%
Other habits	No	26	86.67%
	Yes	4	13.33%
Previous history of sports involvement	No	26	86.67%
	Yes	4	13.33%
On any Medication	No	17	56.67%
	Yes	13	43.33%

The above table 4.1shows that majority of the Elderly were of the age group >70 years (53.33%).40% of them had sedentary life style previously and level of education 56.67% had only primary education and 30% were illiterate remaining 13.33% were educated. Majority of them 46.67% were Non –vegeterian and 20% ova lacto vegeterians ,33.33% were pure vegeterians. 41% of them are heavy workers previously, 33%moderate workers and 26% sedentary workers. Elderly involving with habits of smoking ,Alcoholism and other habits were minimal. Only 13.33% had involved in sports previously.

43.33% elderly were taking medications for various diseases and 56.67 % were not taking medications.

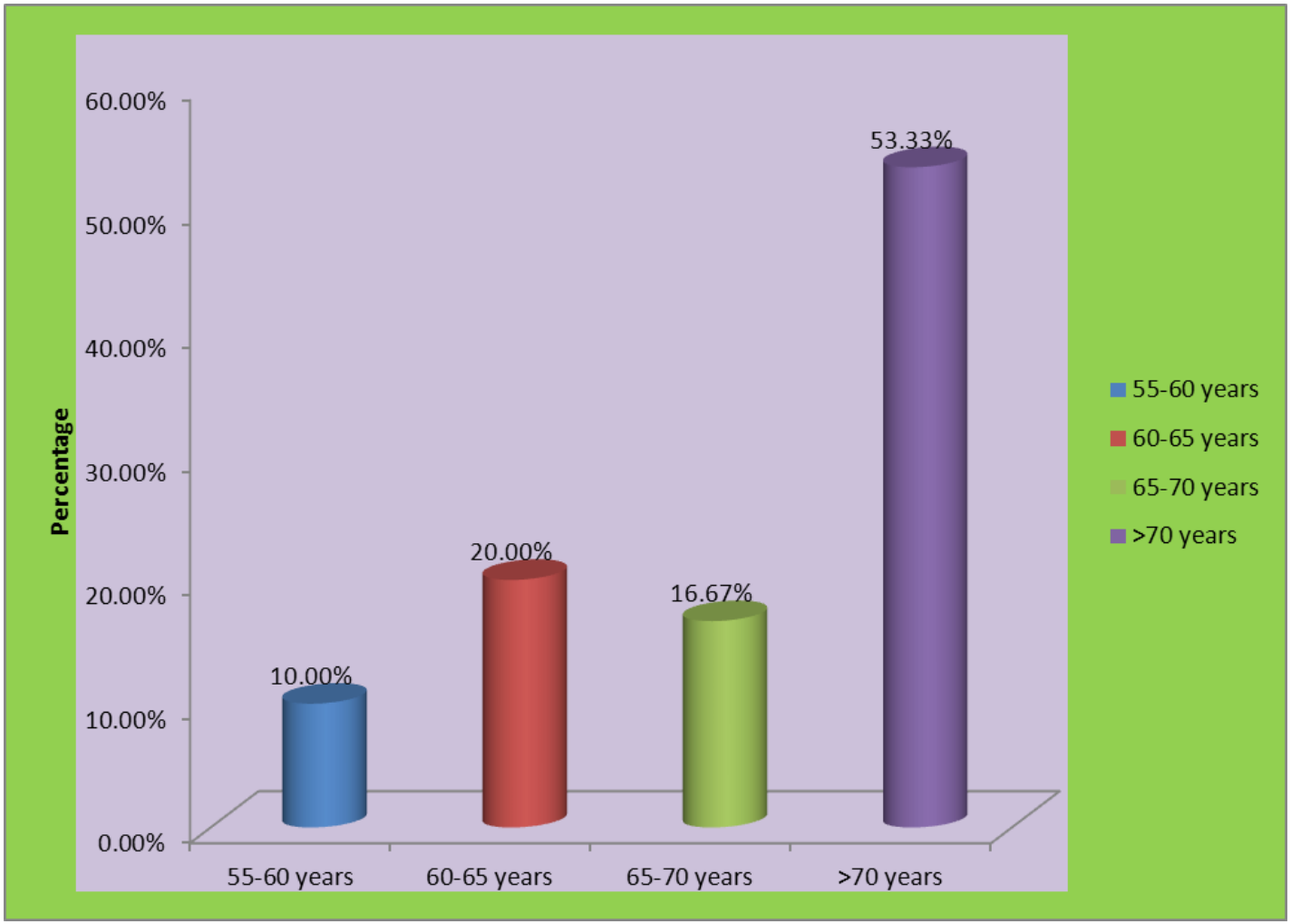


Fig -3: Percentage distribution of demographic variable Age Wise

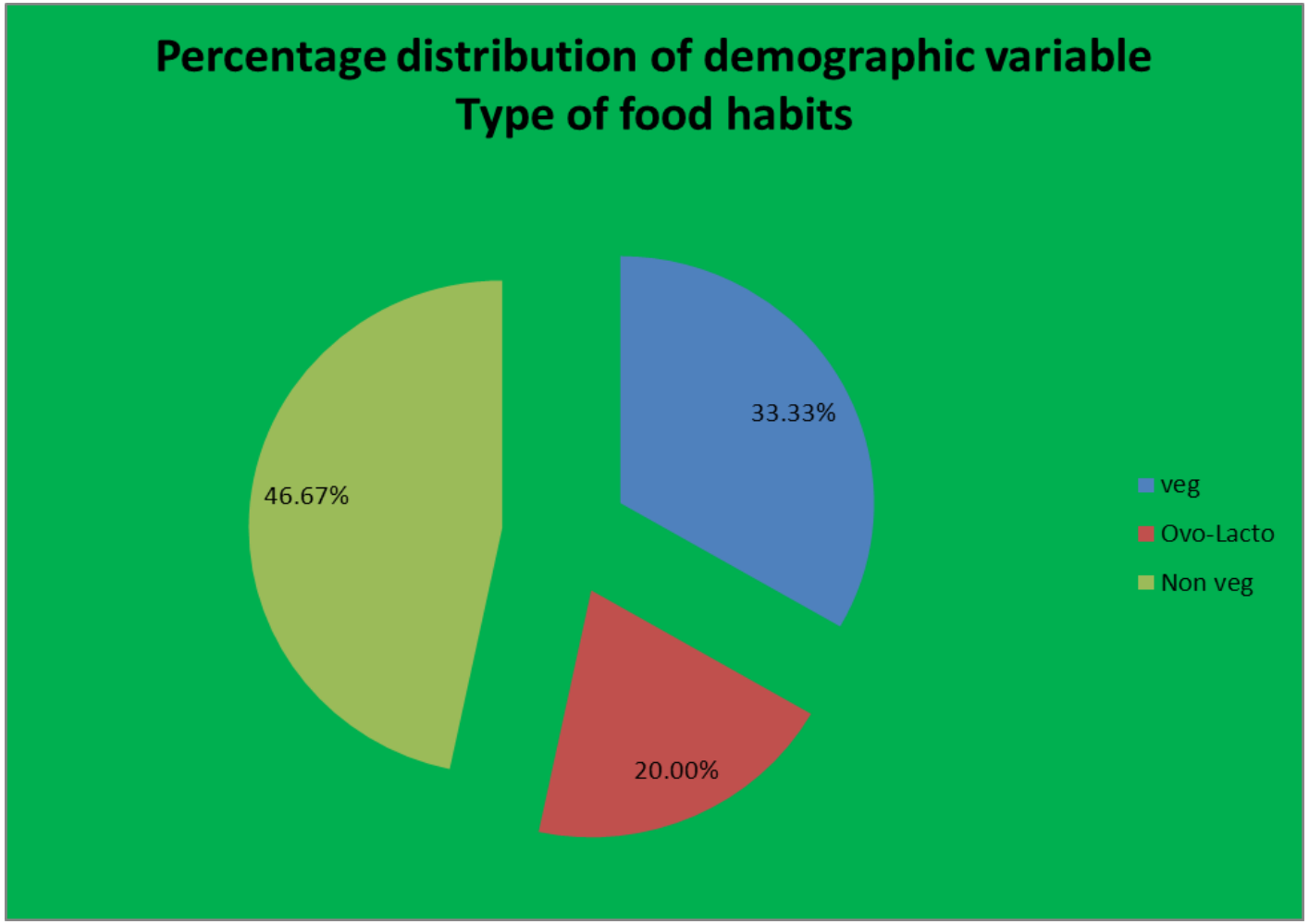


***FIG 4*: Percentage distribution of demographic variable Type of food habits**

Table:4.2 Frequency and Percentage Distribution of Clinical Variables of Elderly Clients with Knee Joint Pain and Inability.

N=30

Clinical Variables of Elderly		**Number n**	**Percentage %**
BMI	Normal 20-22	9	30.00%
	Overweight 22 -25	10	33.33%
	Obese 25-30	11	36.67%
Gait	stable	10	33.33%
	Staggering	14	46.67%
	With support	6	20.00%
Use of supportive measures to walk	Stick	11	36.67%
	Tripod	4	13.33%
	None	15	50.00%
Involvement of knee joint	Right	12	40.00%
	Left	8	26.67%
	Both	10	33.33%
Swelling of knee	No	21	70.00%
	Yes	9	30.00%
Activity involving pain	standing	11	36.67%
	Squatting to standing	12	40.00%
	walking	4	13.33%
	Raising from chair	3	10.00%
Level of Exertion	1-5 stairs	8	26.67%
	5-10 stairs	12	40.00%
	above 10 Stairs	3	10.00%
	Cannot climb	7	23.33%

Clinical Variables of Elderly		Number n	Percentage %
Duration of pain	Acute	15	50.00%
	Chronic	15	50.00%
Location of pain in knee involved	Upper	7	23.33%
	Lower	8	26.67%
	Lateral/Medial	3	10.00%
	Whole Knee	12	40.00%
Involvement in physical activity	Yes	6	20.00%
	No	24	80.00%

Table 4.2 shows that majority of them were obese 36.67% and overweight were 33.33%,46.67 elderly had staggering gait in which 36.67used sticks and 13.33% used tripods to walk 33.33 % had stable gait.40.00% had pain from squatting to standing and 36.67% had pain when standing for long periods .There is equal distribution of Acute and chronic involvement of pain 23.67% - 26.33% could climb only few stairs or could not climb at all level of exertion was low.Most of them 40.00% had pain on the whole Knee 23.33 % - 26.67% had pain in both lower and upper aspect of knee .Very few 10.00% had pain in the Medial region.80.00% were not involved in any physical activity ,only20.00% involved in physical activity like walking and Cycling.

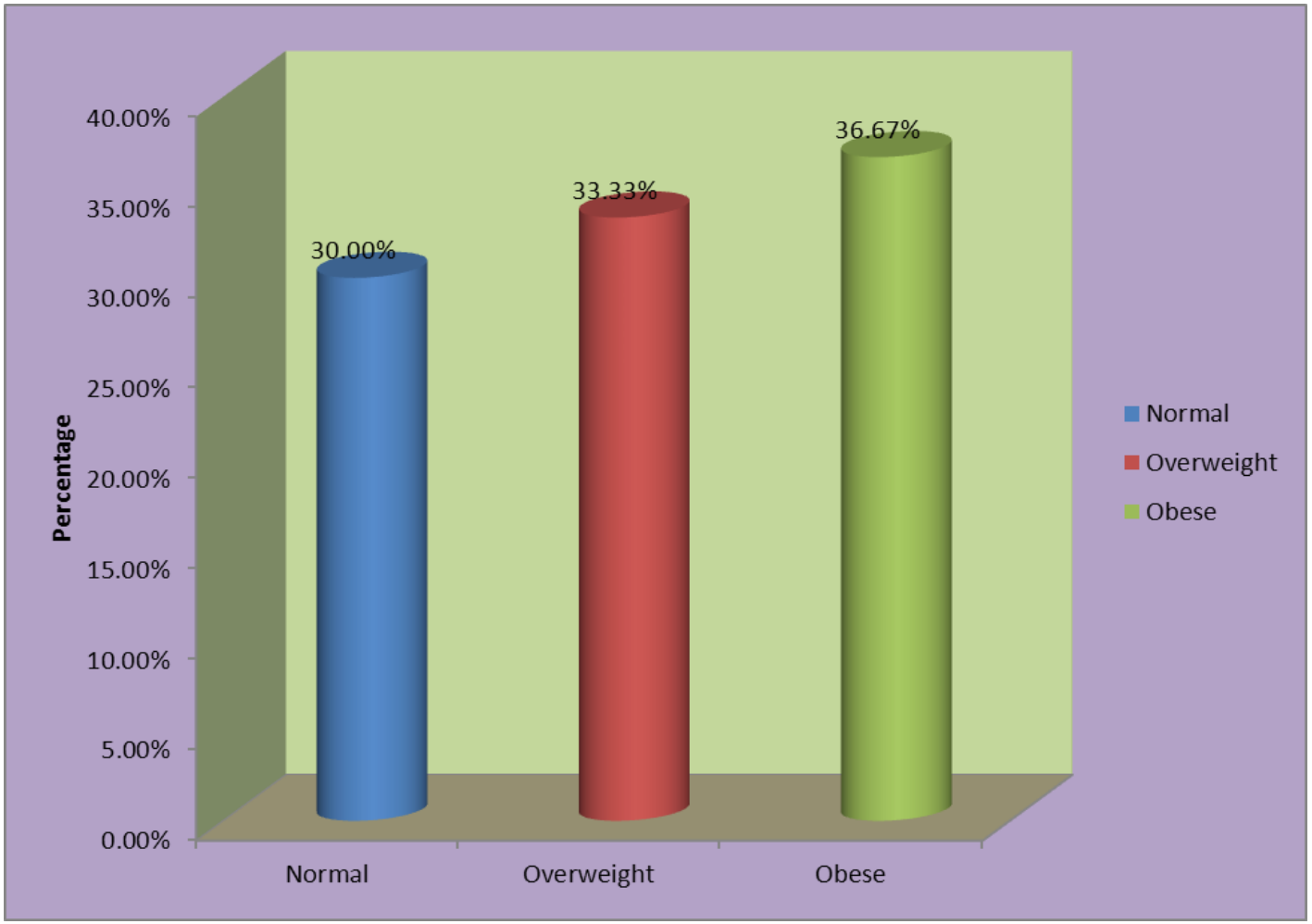


FIG 5: Percentage distribution of Clinical variable - BMI

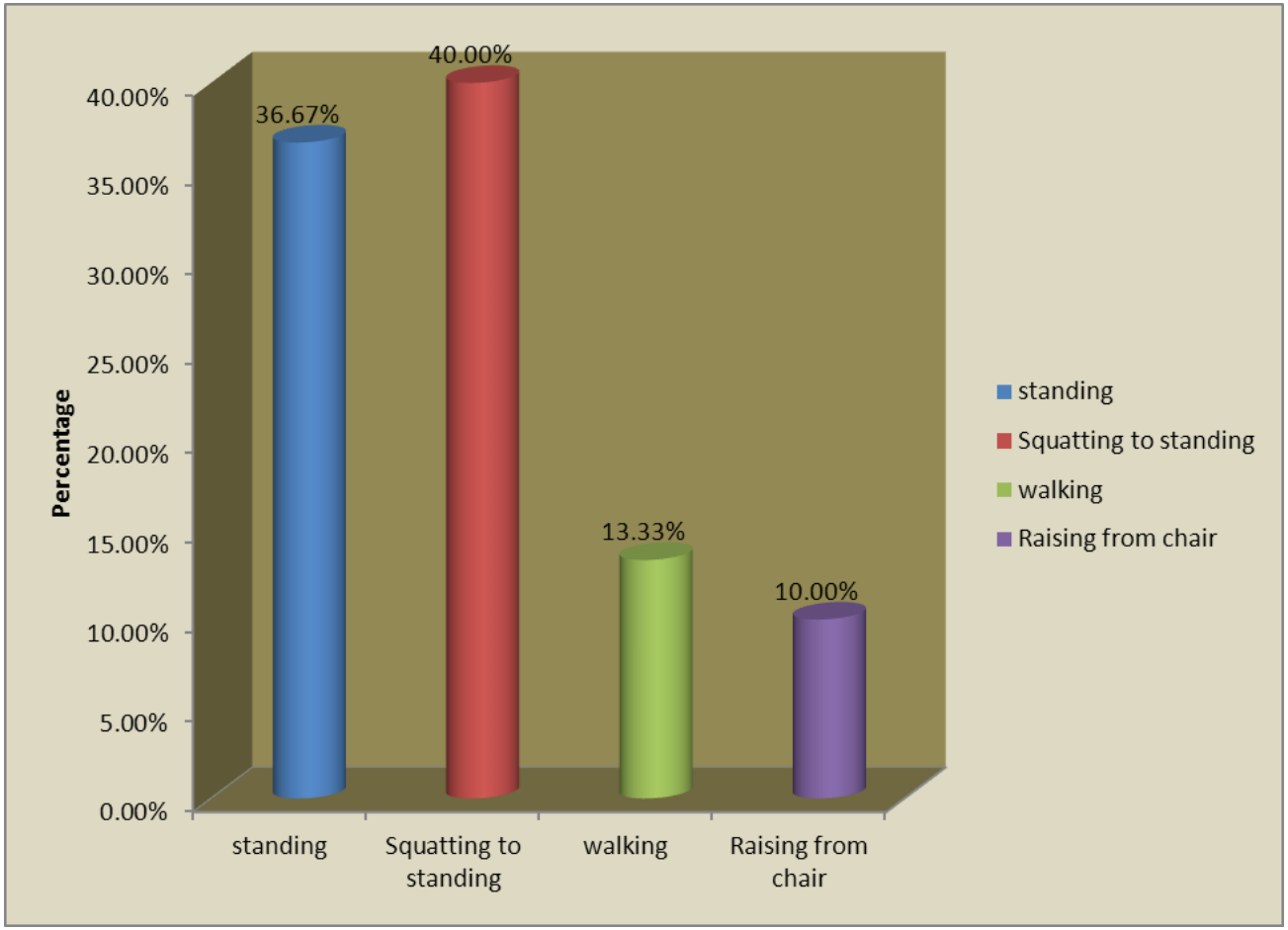


Fig6:Percentage of distribution of clinical Variables of activity involving pain

TABLE :4.3 Frequency and Percentage distribution of level of Inability Before and After application of Mustard plaster

Level of Inability	Pre -test		Post -test	
	Frequency	**Percent**	**Frequency**	**Percent**
Mild	0	0.0%	4	13.3%
Moderate	10	33.3%	16	53.3%
Severe	13	43.3%	7	23.3%
Extreme	7	23.3%	3	10.0%
Total	30	100.0%	30	100.0%

Table 3 reveals that before Mustard plaster application most of them had sever to extreme inability 43.33% Moderate inability 33,3% .After Mustard Plaster application the severity of inability has been reduced by 23.3 %.

Table :.4.4Frequency and Percentage distribution of level of Pain Before and After application of Mustard plaster

Level of Pain	Pre -test		Post -test	
	Frequency	**Percent**	**Frequency**	**Percent**
Mild	0	0.0%	7	23.3%
Moderate	9	30.0%	23	76.7%
Severe	21	70.0%	0	0.0%
Total	30	100.0%	30	100.0%

Table 4 reveals that the pain level was severe 70.0% before application ,the level of pain is reduced to from severity to moderate and mild by 23.3% after application of mustard plaster.

Table :4.5 Comparison of Mean and Standard Deviation of Level of Knee joint Inability and Pain

Level of Inability and Pain		**Mean**	**Standard Deviation**
Inability	Pre-test	58.50	17.48
	Post - test	43.13	15.97
Pain	Pre-test	7.53	1.38
	Post - test	4.23	9

In table 4.5 it is inferred that the level of inability before application of Mustard plaster is (M= 58.50 ;SD = 17.48) and post test (M=43.13; SD = 15.97) and level of pain pretest reveals (M= 7.53 ; SD = 1.38) Post test level (M= 4.23 ; SD = 9) the difference in statistical significance in level of inability and pain is shown in the table 4.6.

Table :4.6 Comparison of Mean and Standard Deviation of paired difference on Level of Knee joint Inability and Pain

Level of Inability And Pain	Paired difference				"t" Value
	Mean	Standard Deviation	95% Confidence Interval of the Difference		
			Lower	Upper	
pretest – posttest	15.36667	11.20801	11.18153	19.55181	7.51*
Pain Pre Test Pain Post Test	3.30000	1.55696	2.71862	3.88138	11.61*

*significant at p<0.05

The Table 5, inferred that the mean, standard deviation of knee joint inability level before and after application of Mustard plaster (M = 15.36; SD = 11.20) .And Pain was (M = 3.30 ; SD = 1.55) it is noted that the difference is statistically significant at $p < 0.05$ level which indicates that mustard plaster is effective in reducing knee joint pain among elderly hence the null hypothesis Ho1 was rejected.

Table : 4.7 Association between selected Demographic Variables Knee before Mustard Plaster Application

N=30

Demographic Variables		Pre Test								x^2	p value
		Mild		Moderate		Severe		Extreme			
		N	%	n	%	n	%	n	%		
Age	55-60 years	0	0.00%	1	3.33%	1	3.33%	1	3.33%	1.602	0.952
	60-65 years	0	0.00%	3	10.00%	2	6.67%	1	3.33%		
	65-70 years	0	0.00%	1	3.33%	3	10.00%	1	3.33%		
	>70 years	0	0.00%	5	16.67%	7	23.33%	4	13.33%		
Gender	Male	0	0.00%	3	10.00%	3	10.00%	2	6.67%	0.155	0.925
	Female	0	0.00%	7	23.33%	10	33.33%	5	16.67%		
Previous nature of job	Heavy	0	0.00%	6	20.00%	1	3.33%	2	6.67%	8.94	0.063
	Moderate	0	0.00%	3	10.00%	4	13.33%	2	6.67%		
	Sedentary	0	0.00%	1	3.33%	8	26.67%	3	10.00%		
Food Habits	Veg	0	0.00%	2	6.67%	6	20.00%	2	6.67%	5.472	0.242
	Ovo-Lacto	0	0.00%	1	3.33%	4	13.33%	1	3.33%		
	Non veg	0	0.00%	7	23.33%	3	10.00%	4	13.33%		
Smoker	No	0	0.00%	9	30.00%	10	33.33%	6	20.00%	0.733	0.693
	Yes	0	0.00%	1	3.33%	3	10.00%	1	3.33%		

Demographic Variables		Pre Test								x^2	p value
		Mild		Moderate		Severe		Extreme			
		N	%	n	%	n	%	n	%		
Alcoholism	No	0	0.00%	6	20.00%	10	33.33%	6	20.00%	1.543	0.462
	Yes	0	0.00%	4	13.33%	3	10.00%	1	3.33%		
	Yes	0	0.00%	2	6.67%	2	6.67%	0	0.00%	1.509	0.47
Previous history of sports involvement	No	0	0.00%	4	13.33%	7	23.33%	4	13.33%	0.62	0.734
	Yes	0	0.00%	6	20.00%	6	20.00%	3	10.00%		
On any Medication	No	0	0.00%	7	23.33%	7	23.33%	3	10.00%	1.31	0.52
	Yes	0	0.00%	3	10.00%	6	20.00%	4	13.33%		

The above table shows that there is no significant association between the selected demographic Variables like Age, Gender, Previous nature of Job, food habits, Habits, History of sports involvement and use of Medication before mustard plaster application hence the null hypothesis HO1 is accepted and the table 4.7 post test shows also insignificance which is described below.

Table 4.8 Association between selected Demographic Variables Knee after Mustard Plaster Application

Demographic Variables		Post test								x^2	Value
		Mild		Moderate		Severe		Extreme			
		n	Percent	n	Percent	n	Percent	n	Percent		
Age	55-60 years	0	0.00%	2	6.67%	0	0.00%	1	3.33%	5.615	0.778
	60-65 years	1	3.33%	3	10.00%	2	6.67%	0	0.00%		
	65-70 years	0	0.00%	3	10.00%	1	3.33%	1	3.33%		
	>70 years	3	10.00%	8	26.67%	4	13.33%	1	3.33%		
Gender	Male	1	3.33%	5	16.67%	2	6.67%	0	0.00%	1.281	0.734
	Female	3	10.00%	11	36.67%	5	16.67%	3	10.00%		
Previous nature of job	Heavy	3	10.00%	4	13.33%	2	6.67%	0	0.00%	7.063	0.315
	Moderate	1	3.33%	4	13.33%	3	10.00%	1	3.33%		
	Sedentary	0	0.00%	8	26.67%	2	6.67%	2	6.67%		
Food Habits	Veg	0	0.00%	7	23.33%	1	3.33%	2	6.67%	7.117	0.31
	Ovo-Lacto	1	3.33%	4	13.33%	1	3.33%	0	0.00%		
	Non veg	3	10.00%	5	16.67%	5	16.67%	1	3.33%		
Smoker	No	4	13.33%	13	43.33%	5	16.67%	3	10.00%	2.164	0.539
	Yes	0	0.00%	3	10.00%	2	6.67%	0	0.00%		
Alcoholism	No	2	6.67%	11	36.67%	6	20.00%	3	10.00%	2.925	0.403
	Yes	2	6.67%	5	16.67%	1	3.33%	0	0.00%		

Demographic Variables		Post test								x^2	Value
		Mild		Moderate		Severe		Extreme			
		n	Percent	n	Percent	n	Percent	n	Percent		
Other habits	No	2	6.67%	14	46.67%	7	23.33%	3	10.00%	6.202	0.102
	Yes	2	6.67%	2	6.67%	0	0.00%	0	0.00%		
Previous history of sports involvement	No	1	3.33%	8	26.67%	5	16.67%	1	3.33%	2.619	0.454
	Yes	3	10.00%	8	26.67%	2	6.67%	2	6.67%		
On any Medication	No	3	10.00%	9	30.00%	4	13.33%	1	3.33%	1.214	0.75
	Yes	1	3.33%	7	23.33%	3	10.00%	2	6.67%		

Table 4.7 illustrates that there is no significant association in demographic variables like Age , Gender, Educational Status, Nature of job ,Marital history , Food habits, Habits , History of sports involvement and Use of Medication after application of Mustard plaster hence the null hypothesis H01 is accepted here .

Table : 4.9 Association between selected Clinical Variables On Inability of Knee Before Mustard Plaster Application

N=30

Clinical Variables		Pre -Test								x^2	p value
		Mild		Moderate		Severe		Extreme			
		N	percent	n	percent	n	percent	n	percent		
BMI	Normal	0	0.00%	1	3.33%	5	16.67%	3	10.00%	4.478	0.345
	Overweight	0	0.00%	3	10.00%	5	16.67%	2	6.67%		
	Obese	0	0.00%	6	20.00%	3	10.00%	2	6.67%		
	Morbid Obese	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
Gait	Stable	0	0.00%	4	13.33%	5	16.67%	1	3.33%	6.684	0.154
	Staggering	0	0.00%	2	6.67%	7	23.33%	5	16.67%		
	With support	0	0.00%	4	13.33%	1	3.33%	1	3.33%		
Do you walk with support	Stick	0	0.00%	3	10.00%	4	13.33%	4	13.33%	2.463	0.651
	Tripod	0	0.00%	2	6.67%	2	6.67%	0	0.00%		
	None	0	0.00%	5	16.67%	7	23.33%	3	10.00%		
In which Knee is the pain felt	Right	0	0.00%	3	10.00%	7	23.33%	2	6.67%	5.916	0.206
	Left	0	0.00%	5	16.67%	2	6.67%	1	3.33%		
	Both	0	0.00%	2	6.67%	4	13.33%	4	13.33%		
Do you have swelling of knee	No	0	0.00%	5	16.67%	10	33.33%	6	20.00%	3.025	0.22
	Yes	0	0.00%	5	16.67%	3	10.00%	1	3.33%		
When is the pain felt most	Standing	0	0.00%	5	16.67%	4	13.33%	2	6.67%	5.678	0.46
	Squatting to standing	0	0.00%	3	10.00%	7	23.33%	2	6.67%		
	Walking	0	0.00%	1	3.33%	2	6.67%	1	3.33%		
	Raising from chair	0	0.00%	1	3.33%	0	0.00%	2	6.67%		

Clinical Variables		Pre -Test								x^2	p value
		Mild		Moderate		Severe		Extreme			
		N	percent	n	percent	n	percent	n	percent		
How many stairs can you climb	1-5 stairs	0	0.00%	3	10.00%	4	13.33%	1	3.33%	7.237	0.299
	5-10 stairs	0	0.00%	4	13.33%	3	10.00%	5	16.67%		
	above 10 Stairs	0	0.00%	2	6.67%	1	3.33%	0	0.00%		
	Cannot climb	0	0.00%	1	3.33%	5	16.67%	1	3.33%		
Duration of pain	Acute	0	0.00%	5	16.67%	5	16.67%	5	16.67%	1.978	0.372
	Chronic	0	0.00%	5	16.67%	8	26.67%	2	6.67%		
Where is the pain exactly felt on the knee	Upper	0	0.00%	0	0.00%	4	13.33%	3	10.00%	11.3	0.079
	Lower	0	0.00%	4	13.33%	3	10.00%	1	3.33%		
	Lateral/ Medial	0	0.00%	3	10.00%	0	0.00%	0	0.00%		
	Whole Knee	0	0.00%	3	10.00%	6	20.00%	3	10.00%		
Do you involve in physical activity	Yes	0	0.00%	1	3.33%	4	13.33%	1	3.33%	1.71	0.425
	No	0	0.00%	9	30.00%	9	30.00%	6	20.00%		

The above table shows that there is no significant association clinical Variables before Mustard Plaster application on Knee inability .Hence the null Hypothesis HO3 is retained

Table 4.10 Association between selected Clinical Variables On Inability of Knee After Mustard Plaster Application

N=30

Clinical Variables		Post -Test								x^2	p value
		Mild		Moderate		Severe		Extreme			
		n	percent	n	percent	n	percent	n	Percent		
BMI	Normal	1	3.33%	4	13.33%	4	13.33%	0	0.00%	9.29 14.917*	0.158 0.021
	Overweight	1	3.33%	5	16.67%	1	3.33%	3	10.00%		
	Obese	2	6.67%	7	23.33%	2	6.67%	0	0.00%		
	Morbid Obese	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
Gait	Stable	3	10.00%	5	16.67%	0	0.00%	2	6.67%	4.736	0.578
	Staggering	0	0.00%	7	23.33%	7	23.33%	0	0.00%		
	With support	1	3.33%	4	13.33%	0	0.00%	1	3.33%		
Do you walk with support	Stick	1	3.33%	4	13.33%	4	13.33%	2	6.67%	5.624	0.467
	Tripod	1	3.33%	3	10.00%	0	0.00%	0	0.00%		
	None	2	6.67%	9	30.00%	3	10.00%	1	3.33%		
In which Knee is the pain felt	Right	2	6.67%	7	23.33%	2	6.67%	1	3.33%	4.206	0.24
	Left	1	3.33%	6	20.00%	1	3.33%	0	0.00%		
	Both	1	3.33%	3	10.00%	4	13.33%	2	6.67%		
Do you have swelling of knee	No	2	6.67%	10	33.33%	7	23.33%	2	6.67%	9.129	0.425
	Yes	2	6.67%	6	20.00%	0	0.00%	1	3.33%		
When is the pain felt most	Standing	2	6.67%	6	20.00%	2	6.67%	1	3.33%	6.991	0.638
	Squatting to standing	0	0.00%	8	26.67%	2	6.67%	2	6.67%		
	Walking	1	3.33%	2	6.67%	1	3.33%	0	0.00%		
	Raising from chair	1	3.33%	0	0.00%	2	6.67%	0	0.00%		

Clinical Variables		Post -Test								x^2	p value
		Mild		Moderate		Severe		Extreme			
		n	percent	n	percent	n	percent	n	Percent		
How many stairs can you climb	1-5 stairs	1	3.33%	5	16.67%	2	6.67%	0	0.00%	9.619*	0.022
	5-10 stairs	1	3.33%	5	16.67%	3	10.00%	3	10.00%		
	above 10 Stairs	1	3.33%	2	6.67%	0	0.00%	0	0.00%		
	Cannot climb	1	3.33%	4	13.33%	2	6.67%	0	0.00%		
Duration of pain	Acute	4	13.33%	4	13.33%	5	16.67%	2	6.67%	17.895*	0.036
	Chronic	0	0.00%	12	40.00%	2	6.67%	1	3.33%		
Where is the pain exactly felt on the knee	Upper	0	0.00%	3	10.00%	4	13.33%	0	0.00%		
	Lower	2	6.67%	5	16.67%	0	0.00%	1	3.33%		
	Lateral/ Medial	2	6.67%	1	3.33%	0	0.00%	0	0.00%		
	Whole Knee	0	0.00%	7	23.33%	3	10.00%	2	6.67%		
Do you involve in physical activity	Yes	0	0.00%	4	13.33%	2	6.67%	0	0.00%	2.321	0.508
	No	4	13.33%	12	40.00%	5	16.67%	3	10.00%		

* significant at p <0.05 table

The above Table depicts that there is a statistical significant difference at p< 0.05 in pre –test and post-test level of inability in clinical Variable which proves that mustard plaster is effective and this rejects the null hypothesis H03

TABLE :4.11 Association between selected Demographic Variables On Knee Pain Before Mustard Plaster Application N=30

Demographic Variables		Pain Pre Test Score						x^2	p value
		Mild		Moderate		Severe			
		N	percent	n	percent	n	percent		
Age	55-60 years	0	0.00%	1	3.33%	2	6.67%	0.48	0.924
	60-65 years	0	0.00%	2	6.67%	4	13.33%		
	65-70 years	0	0.00%	2	6.67%	3	10.00%		
	>70 years	0	0.00%	4	13.33%	12	40.00%		
Gender	Male	0	0.00%	5	16.67%	3	10.00%	5.487*	0.019
	Female	0	0.00%	4	13.33%	18	60.00%		
Religion	Hindu	0	0.00%	8	26.67%	19	63.33%	0.81	0.667
	Christian	0	0.00%	1	3.33%	1	3.33%		
	Muslim	0	0.00%	0	0.00%	1	3.33%		
Marital History	Married	0	0.00%	3	10.00%	13	43.33%	2.2	0.332
	Unmarried	0	0.00%	2	6.67%	2	6.67%		
	Widow/ Widower	0	0.00%	4	13.33%	6	20.00%		
Previous nature of job	Heavy	0	0.00%	2	6.67%	7	23.33%	1.3	0.523
	Moderate	0	0.00%	2	6.67%	7	23.33%		
	Sedentary	0	0.00%	5	16.67%	7	23.33%		
Educational Status	Degree	0	0.00%	0	0.00%	1	3.33%	14.936*	0.002
	HSC	0	0.00%	3	10.00%	0	0.00%		
	Primary	0	0.00%	1	3.33%	16	53.33%		
	Illiterate	0	0.00%	5	16.67%	4	13.33%		

Demographic Variables		Pain Pre Test Score						x^2	p value
		Mild		Moderate		Severe			
		N	percent	n	percent	n	percent		
Source of income	Pensioner	0	0.00%	5	16.67%	10	33.33%	0.76	0.685
	Others	0	0.00%	3	10.00%	10	33.33%		
	No Income	0	0.00%	1	3.33%	1	3.33%		
Food Habits	Veg	0	0.00%	2	6.67%	8	26.67%	10.249*	0.006
	Ovo-Lacto	0	0.00%	5	16.67%	1	3.33%		
	Non veg	0	0.00%	2	6.67%	12	40.00%		
Smoker	No	0	0.00%	5	16.67%	20	66.67%	7.143*	0.008
	Yes	0	0.00%	4	13.33%	1	3.33%		
Alcoholism	No	0	0.00%	7	23.33%	15	50.00%	0.13	0.719
	Yes	0	0.00%	2	6.67%	6	20.00%		
Other habits	No	0	0.00%	8	26.67%	18	60.00%	0.06	0.815
	Yes	0	0.00%	1	3.33%	3	10.00%		
Previous history of sports involvement	No	0	0.00%	6	20.00%	9	30.00%	1.43	0.232
	Yes	0	0.00%	3	10.00%	12	40.00%		
On any Medication	No	0	0.00%	5	16.67%	12	40.00%	0.01	0.936
	Yes	0	0.00%	4	13.33%	9	30.00%		

There is significant association on Knee pain in selected demographic Variables in Pretest assessment like Body Mass Index, Food Habits, Smoking,this has an impact on knee pain.

Table -4.12: Association between selected Demographic Variables On Knee Pain After Mustard Plaster Application

Demographic variables		Pain Post Test Score						x^2	p value
		Mild		Moderate		Severe			
		n	percent	n	percent	n	percent		
Age	55-60 years	1	3.33%	2	6.67%	0	0.00%	0.73	0.946
	60-65 years	1	3.33%	5	16.67%	0	0.00%		
	65-70 years	1	3.33%	4	13.33%	0	0.00%		
	>70 years	4	13.33%	12	40.00%	0	0.00%		
Gender	Male	3	10.00%	5	16.67%	0	0.00%	1.224	0.269
	Female	4	13.33%	18	60.00%	0	0.00%		
Religion	Hindu	7	23.33%	20	66.67%	0	0.00%	1.014	0.602
	Christian	0	0.00%	2	6.67%	0	0.00%		
	Muslim	0	0.00%	1	3.33%	0	0.00%		
Marital History	Married	4	13.33%	12	40.00%	0	0.00%	1.491	0.475
	Unmarried	0	0.00%	4	13.33%	0	0.00%		
	Widow /Widower	3	10.00%	7	23.33%	0	0.00%		
Previous nature of job	Heavy	1	3.33%	8	26.67%	0	0.00%	3.758	0.153
	Moderate	1	3.33%	8	26.67%	0	0.00%		
	Sedentary	5	16.67%	7	23.33%	0	0.00%		
Educational Status	Degree	0	0.00%	1	3.33%	0	0.00%	1.575	0.665
	HSC	0	0.00%	3	10.00%	0	0.00%		
	Primary	5	16.67%	12	40.00%	0	0.00%		
	Illiterate	2	6.67%	7	23.33%	0	0.00%		

Demographic variables		Pain Post Test Score						x^2	p value
		Mild		Moderate		Severe			
		n	percent	n	percent	n	percent		
Source of income	Pensioner	4	13.33%	11	36.67%	0	0.00%	0.702	0.704
	Others	3	10.00%	10	33.33%	0	0.00%		
	No Income	0	0.00%	2	6.67%	0	0.00%		
Food Habits	Veg	3	10.00%	7	23.33%	0	0.00%	1.224*	0.542
	Ovo-Lacto	2	6.67%	4	13.33%	0	0.00%		
	Non veg	2	6.67%	12	40.00%	0	0.00%		
Smoker	No	6	20.00%	19	63.33%	0	0.00%	0.037*	0.847
	Yes	1	3.33%	4	13.33%	0	0.00%		
Alcoholism	No	2	6.67%	20	66.67%	0	0.00%	9.355*	0.002
	Yes	5	16.67%	3	10.00%	0	0.00%		
Other habits	No	6	20.00%	20	66.67%	0	0.00%	0.007	0.933
	Yes	1	3.33%	3	10.00%	0	0.00%		
Previous history of sports involvement	No	3	10.00%	12	40.00%	0	0.00%	0.186	0.666
	Yes	4	13.33%	11	36.67%	0	0.00%		
On any Medication	No	5	16.67%	12	40.00%	0	0.00%	0.81	0.368
	Yes	2	6.67%	11	36.67%	0	0.00%		

Table 4.10 Illustrates that there is association between selected demographic variables like gender, smoking, alcoholism, food habits on knee joint pain. Hence Mustard plaster is effective on Knee pain the null hypothesis H02 is rejected.

TABLE :4.13 Association between selected Clinical Variables On Knee Pain Before Mustard Plaster Application

N=30

Clinical Variables		Pain Pre Test Score						x^2	p value
		Mild		Moderate		Severe			
		n	percent	n	percent	n	Percent		
BMI	Normal	0	0.00%	4	13.33%	5	16.67%	1.63	0.444
	Overweight	0	0.00%	3	10.00%	7	23.33%		
	Obese	0	0.00%	2	6.67%	9	30.00%		
	Morbid Obese	0	0.00%	0	0.00%	0	0.00%		
Gait	Stable	0	0.00%	5	16.67%	5	16.67%	2.9	0.234
	Staggering	0	0.00%	3	10.00%	11	36.67%		
	With support	0	0.00%	1	3.33%	5	16.67%		
Do you walk with support	Stick	0	0.00%	2	6.67%	9	30.00%	1.57	0.455
	Tripod	0	0.00%	2	6.67%	2	6.67%		
	None	0	0.00%	5	16.67%	10	33.33%		
In which Knee is the pain felt	Right	0	0.00%	3	10.00%	9	30.00%	0.71	0.7
	Left	0	0.00%	2	6.67%	6	20.00%		
	Both	0	0.00%	4	13.33%	6	20.00%		
Do you have swelling of knee	No	0	0.00%	6	20.00%	15	50.00%	0.07	0.794
	Yes	0	0.00%	3	10.00%	6	20.00%		
When is the pain felt most	Standing	0	0.00%	6	20.00%	5	16.67%	6.3	0.098
	Squatting to standing	0	0.00%	3	10.00%	9	30.00%		
	Walking	0	0.00%	0	0.00%	4	13.33%		
	Rsising from chair	0	0.00%	0	0.00%	3	10.00%		

Clinical Variables		Pain Pre Test Score						x^2	p value
		Mild		Moderate		Severe			
		n	percent	n	percent	n	Percent		
How many stairs can you climb	1-5 stairs	0	0.00%	2	6.67%	6	20.00%	2.17	0.539
	5-10 stairs	0	0.00%	3	10.00%	9	30.00%		
	above 10 Stairs	0	0.00%	2	6.67%	1	3.33%		
	Cannot climb	0	0.00%	2	6.67%	5	16.67%		
Duration of pain	Acute	0	0.00%	3	10.00%	12	40.00%	1.43	0.232
	Chronic	0	0.00%	6	20.00%	9	30.00%		
Where is the pain exactly felt on the knee	Upper	0	0.00%	0	0.00%	7	23.33%	8.373*	0.039
	Lower	0	0.00%	5	16.67%	3	10.00%		
	Lateral/Medial	0	0.00%	0	0.00%	3	10.00%		
	Whole Knee	0	0.00%	4	13.33%	8	26.67%		
Do you involve in physical activity	Yes	0	0.00%	4	13.33%	2	6.67%	4.802*	0.028
	No	0	0.00%	5	16.67%	19	63.33%		

*significant at $p<0.05$

There is significant association at $p<0.05$ in pretest level of pain in selected clinical variables hence the null Hypothesis H03 is rejected hence.

TABLE :4.14 Association between selected Clinical Variables On Knee Pain After Mustard Plaster Application

Clinical Varaibles		Pain Post Test Score						x^2	p value
		Mild		Moderate		Severe			
		n	percent	n	percent	N	Percent		
BMI	Normal	5	16.67%	4	13.33%	0	0.00%	7.465*	0.024
	Overweight	1	3.33%	9	30.00%	0	0.00%		
	Obese	1	3.33%	10	33.33%	0	0.00%		
	Morbid Obese	0	0.00%	0	0.00%	0	0.00%		
Gait	Stable	2	6.67%	8	26.67%	0	0.00%	0.426	0.808
	Staggering	4	13.33%	10	33.33%	0	0.00%		
	With support	1	3.33%	5	16.67%	0	0.00%		
Do you walk with support	Stick	2	6.67%	9	30.00%	0	0.00%	0.263	0.877
	Tripod	1	3.33%	3	10.00%	0	0.00%		
	None	4	13.33%	11	36.67%	0	0.00%		
In which Knee is the pain felt	Right	4	13.33%	8	26.67%	0	0.00%	4.612	0.1
	Left	3	10.00%	5	16.67%	0	0.00%		
	Both	0	0.00%	10	33.33%	0	0.00%		
Do you have swelling of knee	No	4	13.33%	17	56.67%	0	0.00%	0.719	0.397
	Yes	3	10.00%	6	20.00%	0	0.00%		
When is the pain felt most	standing	2	6.67%	9	30.00%	0	0.00%	2.219	0.528
	Squatting to standing	4	13.33%	8	26.67%	0	0.00%		
	walking	0	0.00%	4	13.33%	0	0.00%		
	Rasising from chair	1	3.33%	2	6.67%	0	0.00%		

Clinical Varaibles		Pain Post Test Score						x^2	p value
		Mild		Moderate		Severe			
		n	percent	n	percent	N	Percent		
How many stairs can you climb	1-5 stairs	4	13.33%	4	13.33%	0	0.00%	5.776	0.123
	5-10 stairs	2	6.67%	10	33.33%	0	0.00%		
	above 10 Stairs	1	3.33%	2	6.67%	0	0.00%		
	Cannot climb	0	0.00%	7	23.33%	0	0.00%		
Duration of pain	Acute	3	10.00%	12	40.00%	0	0.00%	6.209	0.102
	Chronic	4	13.33%	11	36.67%	0	0.00%		
Where is the pain exactly felt on the knee	Upper	4	13.33%	3	10.00%	0	0.00%	2.981	0.084
	Lower	1	3.33%	7	23.33%	0	0.00%		
	Lateral/Medial	0	0.00%	3	10.00%	0	0.00%		
	Whole Knee	2	6.67%	10	33.33%	0	0.00%		
Do you involve in physical activity	Yes	3	10.00%	3	10.00%	0	0.00%		
	No	4	13.33%	20	66.67%	0	0.00%		

*significant at $p<0.05$

The above table signifies that difference in $p<0.05$ statistically denotes that there is association and effectiveness in clinical variable after Mustard plaster application on Knee pain and inability this denies the null hypothesis Ho3.

CHAPTER –V
DISSCUSSION

The aim of the present study was to " Effectiveness of Mustard Plaster on Knee Pain and inability among elderly at selected old age home in Vellore.

Collected data were analysed by using descriptive and inferential statistics and presented in form of tables and diagrams in chapter IV .This chapter attempts to discuss the findings as per the objective.

OBJECTIVES

- To assess the level of pain and in inability among the elderly with pre test and post test Knee pain in Interventional group.
- To assess the effectiveness of mustard plaster application among the elderly with Knee pain in interventional group.
- To associate the pre-test level of inability in elderly with selected demographic variables.
- To associate the post-test level of inability in elderly with selected demographic variables.
- To associate the pre-test level of pain in elderly with selected clinical variables.
- To associate the pos-test level of pain in elderly with selected clinical variables.

The discussions are presented under the following headings

- Demographic Variables of the elderly with Knee joint pain and inability.

- ❖ Clinical Variables of the elderly with Knee joint pain and inability.
- ❖ Comparison of Mean ,Standard deviation of knee pain and inability
- ❖ Association between selected Demographic Variables On Inability of Knee before and after Mustard Plaster Application
- ❖ Association between selected Demographic Variables On Knee Pain Before and after Mustard Plaster Application
- ❖ Association between selected Clinical Variables On Knee Pain Before and after Mustard Plaster Application

Demographic Variables of the elderly with Knee joint pain and inability

The study revealed that most of the elderly were above 70 years 53.33% and 40% of them had sedentary life style previously and 73.33% were women. Most of them 56.67% had only primary level of education.13.33% had involved in sports previously.43.3% were taking medicines for various disease and 56.67% were not taking any medications

The above finding indicate that 53.33% wewe above 70 years. In one of the finding in health article by Pat F Bass II MDMPH that knee pain is common in people above 65 years. In another recent study Journal of arthritis and Rheumatism 2011 found that two thirds of women above 50 and above experience knee pain

According to the survey conducted by "The Hindu in Bangalore" among the total population, 18% of people over the age of 70years suffer from severe joint pain, 33% of the population have some

degree of limitations of movement and 3% cannot perform daily activities.

The researcher concludes that knee pain is strongly associated with older age group. The finding was correlated with the research conducted by Jack et al in which 480 men and women aged 65 years and older had knee joint pain. It also indicates the importance of focusing on this particular age group for future research in promoting their wellness thus improving the quality of life.

Clinical Variables of the elderly with Knee joint pain and inability

The study revealed that majority of them were obese 36.67% and overweight were 33.33% , so obesity is the major cause of knee joint pain and also cartilage changes leading to inability even in younger age group. Hence this factor obesity has to be considered in future. This findings is proved by the following study

Dr.Joel Press, MD, medical director of the Spine and Sports Rehabilitation Center at the Rehabilitation Institute of Chicago says. knees feel the effects of the extra wear and tear from carrying any extra weight. Along with age, being overweight is a leading factor that raises risk of developing osteoarthritis.

Weight is one of the modifiable risk factor for developing knee joint pain. This is supported by Toivanen et.al (2009) who found that the risk of developing knee pain was strongly associated with BMI (25-29), age, gender, and other co- variables as well as obesity, heavy work load and knee injury so, the importance of weight reduction has to be insisted & they should be encouraged to exercise regularly to prevent the development of knee joint pain.

Comparison of Mean ,Standard deviation of knee pain and inability

The study concludes that the level of inability before application of Mustard plaster is (M= 58.50 ;SD = 17.48) and post test (M=43.13; SD = 15.97) and level of pain pretest reveals (M= 7.53 ; SD = 1.38) Post test level (M= 4.23 ; SD = 9). The paired difference is that the mean, standard deviation of knee joint inability level before and after application of Mustard plaster (M = 15.36; SD = 11.20) .And Pain was (M = 3.30 ; SD = 1.55) it is noted that the difference is statistically significant at $p < 0.05$ level which indicates that mustard plaster is effective in reducing knee joint pain among elderly hence the null hypothesis Ho1 was rejected.

This findings is supported by the study conducted at kayalvarath health complex in 2010 to determine the effectiveness of mustard plaster in reducing the knee joint pain. The study group consist of 60 clients. Mustard plaster was applied and hot water application given. Post procedural pain score indicated a significant reduction in joint pain among client.

Edward et al. in 1993 tried successfully mustard as a topical treatment for arthritis. The study group contained 90 arthritis clients. Mustard was applied over painful joint and massaged. The post procedural pain scores indicated a significant reduction in joint pain among participants.

Association between selected Demographic Variables On Inability of Knee before and after Mustard Plaster Application

In this present study the researcher found that there is no significant association of demographic variables before and after application of Mustard plaster hence the null hypothesis H01 is accepted here .

The findings were supported by the study conducted by Mccarne who identified that knee pain in community shares risk factors in common over 55 years. This reflects that knee joint pain is common even among 50 – 55 years of age irrespective of their demographic variables

Association between selected Demographic Variables On Knee Pain Before and after Mustard Plaster Application

In this study the researcher Illustrates that there is association between selected demographic variables like gender, smoking, alcoholism, food habbits on knee joint pain. Hence the null hypothesis H02 is rejected.

In a cross-sectional study on NHANES I(National Health and Nutrition Examination Survey) data among subjects between 25 and 74years of age, the prevalence of knee symptoms (pain,swelling, morning stiffness) increased with age and was slightly higher for women Other studies have also shown that the prevalence of knee pain is higher for women. Lower education has been shown to be associated with knee pain in some studies but not in others.

Association between selected Clinical Variables On Knee Pain Before and after Mustard Plaster Application

The researcher concludes that difference in $p<0.05$ statistically denotes that there is association and effectiveness in clinical variable after Mustard plaster application on Knee pain and inability this denies the null hypothesis Ho3.

This findings is supported by the study done by Edward et al. in 1993 tried successfully mustard as a topical treatment for arthritis. The study group contained 90 arthritis clients. Mustard was applied over painful joint and massaged. The post procedural pain scores indicated a significant reduction in joint pain among participants.

CHAPTER-VI
SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATION

This chapter deals with the summary, conclusion, implications and recommendations of the study ““A Pre - experimental study to assess the effectiveness of Mustard Plaster on Knee Pain among elderly people at selected old age home.

The main study was conducted in 20th January 2014 – 20th February 2014 . Purposive sampling technique was used .Demographic data and Clinical variables were collected .The instrument consisted of two sections.

SUMMARY

The whole research work depends on the findings of the study .The aim of the study was to assess the effectiveness of mustard plaster application on knee.

OBJECTIVES OF THE STUDY

- To assess the pretest and post test level of pain and inability in Elderly clients.
- To assess the effectiveness of mustard plaster application among the clients with Knee pain in Elderly .
- To find the association between the pretest level and post test level of inability and pain in elderly with selected demographic Variables.
- To find the association between the pretest level and post test level of inability and pain in elderly with selected clinical Variables.

NULL HYPOTHESIS

H_{01}: There will be a no significant difference in pretest and post test level of knee pain and inability after application of mustard plaster

H_{02}: There will be a no significant association between pre and post test level of pain and inability with selected demographic variables.

H_{03}: There will be a no significant association between pre and post test level of pain and inability with selected clinical variables .

ASSUMPTIONS

- Every client is unique and responds in a unique manner to pain .
- Elderly are at risk of developing knee joint pain Knee joint pain is a common problem after the age of 40 years Mustard contains allyl iso thiocyanate, an anti congestant by property which reduces pain.

Section -A

Demographic data consisted of age, gender , religion ,marital status, Previous history of work ,Education ,Source of income ,language, Food habits ,Habits and use of any medication.

Section-B

Clinical data consisted of anthropometric measurements which included height ,weight and body mass index ,Range of Motion, Gait, assessment of difficulties like raising from chair, raising from squatting position ,Involvement of pain in which knee, Which aspect of knee is involved ,History of swelling of knee, Activity which involves pain, Aggravation of pain due to, Duration of pain, Previous history of sports

activity, Previous knee injury, History of joint illness, based on which the patients were selected .

After the pretest assessment of pain was determined using Numeric rating scale and inability using WOMAC Index the application of Mustard plaster was applied for five continuous days for 15 minutes . The post test data Analysis showed that the effectiveness of Mustard plaster application and

CONCLUSION

The following conclusions are drawn from the study

The mustard plaster application could be useful and safe easily available for the elderly to reduce pain. The excavated results supported that mustard plaster is one of best method to reduce the knee joint pain level among elderly. The mustard plaster application has also shown that reduction of pain improves inability and also cost effective .

NURSING IMPLICATION

The implications of the findings have been discussed in relation to, nursing education, nursing practice , nursing administration and nursing research.

NURSING EDUCATION

Nursing curriculum should stress on the use of complimentary therapies Nurse educators when planning for instructing students, should provide opportunities for students to gain knowledge in pain reduction methods and to avoid on the Counter drugs which leads to complications. The study outlined the significance of alternative and complementary therapy. Nurse educators should check out suitable programme to educate the public and nurses on the importance of complimentary therapies to promote the quality of life. So the nursing

students at all levels should be taught about pain management techniques which are cost effective to practice.

NURSING PRACTICE

Many elderly are disabled & there is lack of activities of daily living due to knee joint pain. It was evident from the present study that mustard plaster application is effective in reducing knee joint pain. The therapy can also be implemented in ortho- clinics, hospitals and primary health centres. Nurses working in the hospitals or Nursing homes should provide and use complimentary therapy for pain reduction. Educational programme in complimentary therapies can be designed to create awareness among nurses and public.

NURSING ADMINISTRATION

Nursing administrator should take initiative in guiding nursing personnel to teach on complimentary therapy for pain reduction .Nurse administrators, have responsibility to provide nurses with continuing opportunities for adopting various pain reduction methods. Take steps to promote the quality of life and well being. This will enable the nurses to update their knowledge and acquire special skills in managing pain.Formulation of Protocols regarding care of elderly with Knee joint pain and inability and to conduct workshop and seminars regarding complimentary therapies for pain relief.

NURSING RESEARCH

The findings of the study sever as basis for the nursing professionals and the students to conduct further studies in different aspects of application of Mustard plaster for Knee pain.

There is need for wide research in this area to generate more detail and specific data base and to provide much needed information for the consumers and providers.

RECOMMENDATIONS

1) Same study can be under taken for effectiveness along with other therapies

2) Same study can be undertaken for larger sample.

3) Same study can be applied for back pain and shoulder pain .

4) Similar study can be under taken for chest congestions in Pediatrics and adults .

5) Same study can be done as experimental study for two groups.

REFERENCES

1) Ann mariner tomey and Martha ralie alligood .Nursing theories and their work .5th edition Sydney : Mosby publishers ,2001.

2) Blacks, N & Jacobs, L. (1998). Medical and surgical nursing, clinical management for continuity of care, (5thedition). Philadelphia:W.B Saunders. 567-575.

3) Bedson J, Mottram S, Thomas E, Peat G: Knee pain and osteoarthritis in the general population: what influences patients to consult? Fam Pract 2007, volume 24 Page 443-453.

4) Bruckenthal P, Reid MC, Reisner L: Special Issues in the Management of Chronic Pain in Older Adults Pain Medicine 2009, volume 10 page S67-S78.

5) Dureja, G.P. (2004). Hand Book of Pain Management, New Delhi: Elseviver.160-162.

6) Carolyn kisner, Lynn allen Colby," Theraputic Exercise-Foundation and techniques ", 6th edition FA Davis company, Jaypee pub page 765-838

7) Catananti C, Gambassi G,"Pain assessment in the elderly Surgical Oncology Oxford " 2010, Volume 19 page 140-148.

8) Covinsky KE, Lindquist K, Dunlop DD, Gill TM, Yelin E," Effect of arthritis in middle age on older-age functioning,'' Journal of the American Geriatrics Society 2008,Volume 56 Page 23

9) Ganvir SD et al., Sch. J Scholars Journal of Applied Medical Sciences 2013

10) Grazio S, Balen D; Obesity: Risk factor and predictors of osteoarthritis. Lijec Vjesn. 2009; 131

11) Grime J, Richardson JC, Ong BN: Perceptions of joint pain and feeling well in older people who reported being healthy: a qualitative study British Journal of GeneralPractice 2010, volume 60:597-603.

12) Harrisons principles of internal medicine vol 117th edition

13) Joredt, G et al. (2004). Effectiveness of mustard oil to activate skin sensory nerve needing. The Journal Of Alternative And Complementary Medicine,Volume .43, (2)Page 6-8.

14) Jane hokanson Hawks and Joyce M Black, " Text book of medical & surgical Nursing" 7th edition. Volume II.Saunders publication 2004. Page No 2332 to 2352.

15) 14.Jordan K, Jinks C, Croft P," A prospective study of the consulting behaviour of older people with knee pain British Journal of General Practice 2006, volume 56 page 269-276.

16) Jinks C, Ong BN, Richardson J,'' A mixed methods study to investigate needs assessment for knee pain and disability" population and individual perspectives.BMC Musculoskeletal Disorder 2007, volume 8 Page 59.

17) Marybetts Sinclair 2008 Modern hydrotherapy for the massage therapist , Philadelphia: Lippincott Williams and Wilkins pages Page 101 -102.

18) Mallen CD, Peat G, Thomas E, Dunn KM, Croft PR," Prognostic factors for musculoskeletal pain in primary care " a systematic review British Journal of General Practice 2007, 57:655-661.

19) Nancy Wells, Chris Pasero, Margo McCaffery ,"Improving the Quality of Care Through Pain Assessment and Management" pg474-488.

20) O'Brier bucher/Heitkemper dirkisen/Levis , "Text book of medical & surgical Nursing" 7th edition Elsevier india Pvt limited publications 2011. Page No 165 to 1658.

21) Onila salins ,''Medical surgical nursing specialities jaypee pub 217-250

22) Peat G, McCarney R, Croft P ," Knee pain and osteoarthritis in older adults: a review of community burden and current use of primary health care", Annals of the Rheumatic Diseases 2001, volume 60 page 91- 97

23) Polit, D & Beck, C. (2010). Nursing Research, Philadelphia: Lippincott Williams and Wilkins. 260 – 270, 452 – 457, 595 – 600.

24) Palmer, T. (2007). Does knee pain in the community behave like regional pain syndrome? Prospective cohort study. Annals of the rheumatic disease, 66(9). 56-57.

25) Pey June Tan, Ee Ming Khoo, Karuthan Chinna, Keith D Hill, Phillip JH Poi, Maw Pin TanBMC Geriatrics 2014, 14:78 (21 June 2014)

26) Ruby and Wesely Nursing theories and models 2nd edition,USA : Spring house publishers ,1994.

27) Siddarth's and Brunner, " Text book of Medical & surgical Nursing" – 11th edition Wolters kluwer india Pvt limited publishers 2008 volume II. Page No 1906 to 1909.

28) Thorstensson CA, Gooberman-Hill R, Adamson J, Williams S, Dieppe P: Help-seeking behaviour among people living with chronic hip or knee pain in the community Musculoskeletal Disorders 2009 Page 10

29) The Journal of the American Academy of Orthopaedic Surgeons pg 1-6 2013 volume 29. United Nations: World Population Ageing 2009. New York: United Nations: Department of Economic and Social Affairs, Population Division. Report number: ESA/P/WP/212; page 22–26.

30) Van Dijk GM, Veenhof C, Schellevis F, Hulsmans H, Bakker JPJ, Arwert H, et al. ,"Comorbidity, limitations in activities and pain in patients with osteoarthritis of the hip or knee," Clinical Journal of Pain: January 2007 - Volume 23 - Issue - pp S1-S43

NET REFFERENCES

1) http://www.rheumatology.org/practice/clinical/clinicianresearchers/outcomes-instrumentation/WOMAC.asp

2) www.jointhealthmagazine.com/arthritis-back-pain-relief-mustard-plaster..

3) www.rguhs.ac.in/cdc/onlinecdc/uploads/05_N099_17077.doc

4) www.annalsoflongtermcare.com/article/6408

5) Pub Med

6) Med scape

PERMISSION LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

போன் : 04172 - 292525
செல் : 9443106875

மகாத்மா காந்தி அறக்கட்டளை

(முதியோர் காப்பகம்) ISO 9001 - 2008

திண்டிவனம் புறவழிச்சாலை, (டெல்லிகேட் அருகில்)
ஆர்க்காடு - 632 503. வேலூர் மாவட்டம், தமிழ்நாடு.

பதிவு எண் : 170/2002

புலவர் முத்து குப்புசாமி — நிறுவனர்
J. இலட்சுமணன் — தலைவர்
Rtn. Y. அக்பர்ஷரீப் — செயலாளர்
Rtn. P.N. பக்தவச்சலம் — பொருளாளர்
S.R.B. பென்ஸ்பாண்டியன் — துணைத் தலைவர்

தேதி :....................................

திருமதி. K. மகேஸ்வரி M.Sc.
Nursing II year.
அரசு நர்சிங் காலேஜ்
வேலூர்-1.

அம்மா,

உங்கள் உடைய மருத்துவ ஆராய்ச்சிக்காக ஒரு மாதத்திற்கு [illegible] இல்லத்தில் சேவை செய்ய அனுமதி அளிக்கிறோம். மேலும் செய்யும் மருத்துவ சேவைக்கு [illegible] வேண்டுமானால், [illegible] மருத்துவ சேவைக்கு [illegible] செய்ய [illegible] கேட்டுக் கொள்கிறோம்.

இப்படிக்கு
R.A. [signature]
(K.A. RASHEETH)

மேலாளர்
மகாத்மா காந்தி இலவச
முதியோர் இல்லம்
[illegible] வே.மா.

CONTENT VALIDITY CERTIFICATE

This is to certify that the tool developed by Ms.K.Yashoda M.Sc(Nursing) student,Arun college of Nursing Thiyagarajapuram for the study of "Effectiveness of Mustard plaster on Knee pain and inability among elderly at selected old age home in Vellore " is validated by me and she can proceed with this tool to conduct the main study.

Nirmel

Signature

M. NIRMALA
ASSOCIATE PROFESSOR

Name and Designation

SHENBAGHA COLLEGE OF NURSING
METTU STREET, MADHIRAVEDU,
CHENNAI - 600 077.

CONTENT VALIDITY

This is to certify that the tool developed by Ms.K.Yashoda M.Sc (Nursing) student ,Arun college of Nursing Thiyagarajapuram Vellore for the study of "Effectiveness of Mustard Plaster on Knee for Pain and inability among elderly centre at selected old age home in vellore" is validated by me and she can proceed with this tool to conduct the main study.

SIGNATURE

For Thiurmalai Mission Hospital

NAME N. GOPALARA

Dr.N.Gopalaratnam,MBBS.,D.Orthe.,
Orthopedician
Reg.No.26702

CERTIFICATE FOR TAMIL EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation " Effectiveness of Mustard Plaster on Knee for Pain and inability among elderly centre at selected old age home in vellore ",by Ms.K.Yashoda M.Sc (Nursing) student ,Arun college of Nursing Thiyagarajapuram was edited for Tamil language appropriatness.

SIGNATURE

காந்தி மிஷன் வித்யாலயா
நிதிஉதவி நடுநிலைப் பள்ளி
தீனபந்து ஆசிரமம்
வாலாஜாபேட்டை-632513

CERTIFICATE FOR ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation "" Effectiveness of Mustard Plaster on Knee Pain a inability among elderly centre at selected old age home in vellore ,by Ms.K.Yashoda M (Nursing) student ,Arun college of Nursing Thiyagarajapuram was edited for English langua appropriatness.

VEDAVALLI VIDYALAYA
RANIPET

SIGNATU

Principa

REQUEST FOR CONTENT VALIDITY

Letter Requesting Opinions and suggestions of Experts for Establishng Content Validity of Research.

From

K.Yashoda
M.Sc (Nursing) II year
Arun College of Nursing
Thiyagarajpram Vellore

To

Mrs.Snitha Priyadharshini.J
M.Sc.,(N)M.Sc (Psy)
Principal,
Arun college of Nursing
Vellore -1

Through Proper channel

Sub: Request for opinions and suggestion of expert for establishing content validity of Research

Respected Madam /Sir

Greetings, As a part of the curriculum requirements the following research title is selected for the study ," Effectiveness of Mustard Plaster on Knee pain and Inability among Elderly Centre at selected old age Home in Vellore.''

Thanks and Regards

Date
Place

K.YASHODA

CONTENT VALIDITY CERTIFICATE

This is to certify that the tool developed by Ms.K.Yashoda M.Sc (Nursing) student,Arun college of Nursing Thiyagarajapuram for the study of "Effectiveness of Mustard plaster on Knee pain and inability among elderly at selected old age home in Vellore " is validated by me and she can proceed with this tool to conduct the main study.

Signature

Name and Designation

INFORMED CONSENT FORM

_____ at _____ old age home Vellore. I have been informed by the researcher to participate in this study to assess the effectiveness of mustard plaster application on knee joint for pain reduction. I have accepted to participate in the study.

Date **Signature of the Sample**

ஒப்புதல் அறிக்கை

_____ இந்த ஆராய்ச்சியில் நான் பங்குகொள்வது எனது சுய விருப்பம். எனது ஆய்வாளரின் ஒப்புதலின் படி நான் முட்டி வலிக்கு கடுகு மருந்து ஒத்தடம் செய்ய ஏற்று கொள்கிறேன்.

நோயாளியின் கையொப்பம்

தேதி:

DEMOGARPHIC VARIABLES PROFORMA FOR ELDERLY WITH KNEE PAIN AND INABILITY

PURPOSE

To measure the demographic Variables such as Age ,Gender,Religion , Marital status,Previous nature of Job ,Educational status ,Source of Income ,Food habits,Smoker,Alcoholic ,Other Habits ,Previous Sports involvement , On any Medication

INSTRCTIONS

The researcher will collect the tools by interview method .

PARTICIPANT NO

1.Age in Years

a) 50-55years **( )**

b) 55 -60years **( )**

c)60- 65years **( )**

d)>70 years **( )**

2. Gender

a)Male **( )**

b)Female **( )**

3.Religion

a)Hindu **( )**

b)Christian **( )**

c)Muslim **( )**

d)Others **( )**

4.Marital History

a)Married ( )

b)Unmarried ( )

c)Widow / Widower ( )

5. Previous nature of job

a) Heavy worker ( )

b) Moderate worker ( )

c) Sedentary work ( )

7. Educational Status

a) Degree ( )

b)High school ( )

c) Primary ( )

d) Illiterate ( )

8. Source of income

a)Pensioner ( )

b)Depending on others ( )

c)None ( )

9.Food Habits

a)Vegans ( )

b)Ovo-lacto vegeterian ( )

c)Non Vegeterian ( )

10. Smoker

a)Yes ( )

b)No ( )

if yes since _____

11 .Alcoholism

a)Yes ( )

b)No ( )

if yes since _____

12.Other habits

a)Yes ( )

b)No ( )

Specify_____

Previous history of sports involvement

a)Yes ( )

b)No ( )

1. **On any Medication**
    a) **Yes ( )**
    b) **No ( )**

CLINICAL VARIABLES PROFORMA FOR ELDERLY WITH KNEE PAIN AND INABILITY

PURPOSE

To measure the Clinical Variables such as Height , Weight , Body Mass Index ,Range of motion , Gait, Using supportive measures to walk ,Pain experienced in which knee, Presence of swelling , Pain experienced during ,Level of Exertion ,Type of pain, Location of pain in knee, Any involvement in Exercises

INSTRUCTIONS

The researcher will collect some information by interview method **and other by measurement and assessment**

1.Height **( )**

2.Weight **( )**

3.Body Mass Index:-

a) 20 – 22 Normal **( )**

b) 22 – 25 **( )**

c) 25 – 30 Obesity **( )**

d) > 30 Morbid obesity

4.Range of Motion

a)Flexion **( )**

b)Extension **( )**

5.Gait

a)Stable gait **( )**

b) Staggering gait **( )**

c) Walking with support **( )**

6.Do you walk with support

a) Stick ( )

b)Tripod ( )

c)None ( )

7.In which Knee is the pain felt

a) Right Knee ( )

b)Left Knee ( )

c)Both Knees ( )

8. Do you have swelling of knee

a)Yes ( )

b)No ( )

9.When is the pain felt most

a)Prolonged standing ( )

b)From squatting to standing ( )

c) walking ( )

d)Raising from chair ( )

10.How many stairs can you climb

a)5 stairs ( )

b)10 stairs ( )

c)Cannot climb ( )

11.Duration of pain

a)Acute ( )

b)Chronic ( )

12.Where is the pain exactly felt on the knee

a)upper Knee ( )

b)Lower Knee ( )

c)Lateral or Medial ( )

d)Whole Knee ( )

13. Do you involve in physical exercise

a)Yes ( )

b)No ( )

PRE TEST AND POST TEST ASSESSMENT OF PAIN AND INABILITY

Pain And Inability Tested through THE WESTERN ONTARIO AND MC MASTER INDEX

Study Joints **Right Knee** ☐ **Left Knee** ☐ **Both Knee** ☐

Activity	None	Slight	Moderate	Very	Extremely
PAIN	**0**	**1**	**2**	**3**	**4**
1.Walking	**0**	**1**	**2**	**3**	**4**
2.Stair climbing	**0**	**1**	**2**	**3**	**4**
3.Nocturnal	**0**	**1**	**2**	**3**	**4**
4.Rest	**0**	**1**	**2**	**3**	**4**
5.Weight Bearing	**0**	**1**	**2**	**3**	**4**
STIFFNESS	**0**	**1**	**2**	**3**	**4**
1.Morning Stiffness	**0**	**1**	**2**	**3**	**4**
2.Stiffness occurring later in the day	**0**	**1**	**2**	**3**	**4**
PHYSICAL FUNCTION	**0**	**1**	**2**	**3**	**4**
1. Descending stairs	**0**	**1**	**2**	**3**	**4**
2. Ascending stairs	**0**	**1**	**2**	**3**	**4**
3. Rising from sitting	**0**	**1**	**2**	**3**	**4**
4. Standing	**0**	**1**	**2**	**3**	**4**
5.Bending to floor	**0**	**1**	**2**	**3**	**4**
6.Walking on flat surface	**0**	**1**	**2**	**3**	**4**
7. Getting in / out of car	**0**	**1**	**2**	**3**	**4**
8. Going shopping	**0**	**1**	**2**	**3**	**4**
9. Putting on socks	**0**	**1**	**2**	**3**	**4**
10. Lying in bed	**0**	**1**	**2**	**3**	**4**
11. Taking off socks	**0**	**1**	**2**	**3**	**4**
12. Rising from bed	**0**	**1**	**2**	**3**	**4**
13. Getting in/out of bath	**0**	**1**	**2**	**3**	**4**

Activity	None	Slight	Moderate	Very	Extremely
14. Sitting	**0**	**1**	**2**	**3**	**4**
15. Getting on/off toilet	**0**	**1**	**2**	**3**	**4**
16. Heavy domestic duties	**0**	**1**	**2**	**3**	**4**
17. Light domestic work	**0**	**1**	**2**	**3**	**4**

TOTAL SCORE :- _____/96 = _____%

Interpretation:

• minimum total score: 0

• maximum total score: 96

• minimum pain subscore: 0

• maximum pain subscore: 20

• minimum stiffness subscore: 0

• maximum stiffness subscore: 8

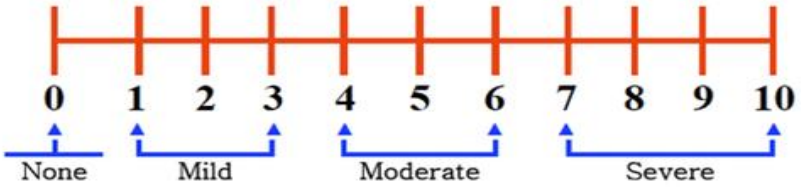
• minimum physical function subscore: 0

• maximum physical function subscore: 68

NUMERIC PAIN RATING SCALE

Purpose :-

The numeric pain rating scale is used to assess the level of pain experienced by the elderly client.



Scoring of Pain Score

Level of pain 0

No pain - 0

Mild pain 1-3

Moderate pain 4-6

Severe pain 7-10

Í Â Å¦ÅÃôÀÊÅõ

1.ÅÂÐ (ÅÕ¼í ¸Ç¦ø)

a) 55-60 ÅÕ¼í ¸û ( )

b) 65 -70ÅÕ¼í ¸û ( )

c) 70- 75 ÅÕ¼í ¸û ( )

d)>80 ÅÕ¼í ¸û ( )

3.À¡Ä¦Éõ

a) ¬ ñ ( )

b) ¦À ñ ( )

4.Á¾õ

a) þóÐ ( )

b) ¸¦È¦ŠÊÂý ( )

c) ÓŠÄ¡õ ( )

d) ÁüÈ ¨ Å ( )

5.¾ÕÁ½ ì Ì È¢ôÒ

a) ¾ÕÁ½ Á¡ É ù÷ ( )

b) ¾ÕÁ½ Á¡ ¸¡¾Å÷ ( )

c) மனைவியைஇழந்தவர் / விதவை ( )

6.Óó ¨¾Â §Å ¨ ÄÂ¢ý Å¢ÅÃõ

a) À Ù à ì Ì õ §Å ¨ Ä ( )

b) ¿¦ ñ ¼ §¿Ãõ ¿¢ü Ì õ §Å ¨ Ä ( )

c) உடல் உழைப்பு தேவைப்படாத ( )

7.¸ øÅ¢ò¾ Ì ¾¢

a) பட்டம் ( )

b) உயர்நிலை பள்ளி ( )

c) ஆரம்ப ( )

d) படிக்காதவர் ( )

8.ÅÕÁ¡ É ÅÆ¢

a) ஓய்வு கால ஊதியம் பெறுபவர் ( )

b) ÁüÈÅ÷¸ ¨ Ç º¡÷óÐ ( )

c) எதுவும் இல்லை ( )

9.¦¾¡ó¾ ¦Á¡Æ¸û

a) ¾Áú ( )

b) ¬ í ¸Äõ ( )

c) ÁüÈ ¦Á¡Æ¸û ( )

10.¯ ½ × Ó ¨ È¸û

a) சைவ உணவு உண்பவர்கள் ( )

b)முட்டைக்குள் ( )

b) « ¨ ºÅõ ( )

11. ÁÐ «ÕóÐ¾ø

a) ¬ õ ( )

b) þø ¨ Ä ( )

¬ õ ±ý È¡ø _________ÅÕ¼í ¸ û

12. Ò ¨ ¸ôÀÊò¾ø

a) ¬ õ ( )

b) þø ¨ Ä ( )

¬ õ ±ý È¡ø _________ÅÕ¼í ¸ û

13. ÁüÈ ÀÆì ¸ í ¸ û

a) ¬ õ ( )

b) þ ø ¨ Ä ( )

¬ õ ± ý È ¡ ø _____ (ÀÆ ì ¸ ò ¨ ¾ Ì È ô À ¼ × õ)

14.ÁÕóÐ Á¡ò¾ ¨ Ã ¸ Ç ý Å ÅÃõ

a) ¬ õ ( )

b) þ ø ¨ Ä ( )

மருத்துவ தரவு

¯ÂÃõ :

¯¼ø ± ¨¼ :

¯¼ø ÀÕÁ ý Å ¸ ¾õ

þÂ ì ¸ ÅÃõÒ (« Ç ×) :

Á¼ ì Ì ¾ø :

¿ ð Î ¾ø :

1.¿ ¨¼

a.¿ ¨ ÄÂ¡ É ¿ ¨¼

b.¿ ¨ ÄÂüÈ ¿ ¨¼ (¾¡ í ¸ ¿¼ò¾ø)

c.¾¡ É ¡ ¸ ¿¼ò¾ø

2. ¯¾Å ¯À ¸ Ã½ òÐ¼ ý ¿¼ò¾ø

a. ¦ ¸ ¡õÒ

b. ¯¾Å ¸ ¡ø

3. ¿ ¡ü ¸ ¡ÄÂÄÕóÐ ±Ø¾ø

a.±ÇÐ

b. ¸ Ê É õ

4. ±ó¾ ÓðÊÂ¢ø ÅÄ¢Â¢Õì ¸¢ÈÐ?

a.ÅÄÐ ÓðÊ

b.þ¼Ð ÓðÊ

c.þÃ ñ Î ÓðÊ¸ Ùõ

5. ÓðÊÂ¢ø Å¦ì ¸õ þÕì ¸¢È¾¡?

a.¬ õ

b.þø ¨Ä

6. ±ó¾ ¿¢¨ ÄÂ¢ø ÅÄ¢ «¾¢¸Á¡¸ ¦¾¡¢¸¢ÈÐ?

a.¿¦ñ ¼ §¿Ãõ ¿¢ü Ì õ ¦À¡ØÐ

b.¯ð¸¡÷óÐ ±Øó¾¡¢ì Ì õ ¦À¡ØÐ

c.¿¼ì Ì õ ¦À¡ØÐ

7. ±ò¾¨ É ÀÊ¸û ²È ÓÊ¸¢ÈÐ?

a. 5 ÀÊ¸û

b. 10 ÀÊ¸û

c .²È ÓÊÂÅ¢ø ¨Ä

8.±ô¦À¡ØÐ ÅÄ¢ «¾¢¸Á¡¸ ¦¾¡¢¸¢ÈÐ?

a. À¸ø

b.þÃ×

9.ÅÄ¢Â¢ý ¸¡Ä «Ç×

a.¾ü§À¡¨¾Â ÅÄ¢

b.¿¡ûÀð¼ ÅÄ¢

10. ÓðÊÂ¢ý ±ó¾ À Ì ¾¢Â¢ø ÅÄ¢ þÕì ¸¢ÈÐ?

a. §ÁüÀ Ì ¾¢

b.¸¦ú À Ì ¾¢

c.Àì ¸Å¡ð Î À Ì ¾¢

d. ÓðÊ ÓØÅÐõ

11. ¿¦í ¸û ¯¼üÀÂ¢ü°¢ ¦°öÀÅÃ¡?

a.¬ õ

b.þø ¨Ä

வலி மற்றும் இயலாமை மூலம் சோதனை **கண்டுபிடிப்புகள்**

WESTERN ONTARIO AND MC MASTER INDEX

ÅÄÐ ÓðÊ ☐ þ¼Ð ÓðÊ ☐ þÃ ñ Î ÓðÊ¸Ùõ ☐

உழைப்பு	இல்லை	சற்று	இயல் பான	மிகவும்	தாங்க முடியாத
ÅÄ‹Â‹	**0**	**1**	**2**	**3**	**4**
1. ¿ý¼ìõ·¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
2. ÀÊ¸û ²Õ¾ø	**0**	**1**	**2**	**3**	**4**
3. þÃ×	**0**	**1**	**2**	**3**	**4**
4. µö×	**0**	**1**	**2**	**3**	**4**
5. À Ù à ì Ì õ	**0**	**1**	**2**	**3**	**4**
ÁÕòÐ¦À¡¾ø	**0**	**1**	**2**	**3**	**4**
1. À¸Ä‹ø ÁÕòÐ¦À¡¾ø	**0**	**1**	**2**	**3**	**4**
2.ÁÕòÐ¦À¡¾ø ÁüÈ¦ÉÃ¸Ä‹ø	**0**	**1**	**2**	**3**	**4**
¼ø ¨ÆôÒ	**0**	**1**	**2**	**3**	**4**
1. þ¨Ãí ì Ì õ ¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
2. ²Õõ¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
3. ¯ð¸¡÷óÐ ±Øó¾¡‹ì Ì õ ¦À¡ØÐ	**0**	**1**	**2**	**3**	**4**
4.±Øó¾¡‹ì Ì õ ¦À¡ØÐ	**0**	**1**	**2**	**3**	**4**
5. Ì É‹óÐ	**0**	**1**	**2**	**3**	**4**
6.¾¨ÃÂ‹ø ¿ý¼ìõ·¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
7.¸¡¡‹ø²Õõ/ þ¨Ãí ì Ì õ ¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
8.¸¨¼¸Ö Ì ¦°Öøõ¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
9. „¡ì Š,« É¾ø	**0**	**1**	**2**	**3**	**4**
10. À Î ¨¸öý ¦À¡úÐ	**0**	**1**	**2**	**3**	**4**

11. „ ¡ì Š ± Î ¾Ä ý ¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
12 À Î ¨ ¸Âöø ±Øó¾¡ì Ì õ ¦À¡ØÐ	**0**	**1**	**2**	**3**	**4**
13. Ì Ä ì Ì õ ¦À¡úÐ	**0**	**1**	**2**	**3**	**4**
14. . ¯ ð ¸¡÷óÐ	**0**	**1**	**2**	**3**	**4**
15. ¯ ð ¸¡÷óÐ ±Øó¾¡ì Ì õ ¦À¡ØÐ	**0**	**1**	**2**	**3**	**4**
16.À Ù à ì Ì õ §Å ¨ Ä	**0**	**1**	**2**	**3**	**4**
17. உடல் உழைப்பு தேவைப்படாத	**0**	**1**	**2**	**3**	**4**

TOTAL SCORE :- _____/96 = _____%

Sl.No	Age	Gender	Religion	Marital History	Previous nature of job	Educational Status	Source of income	Food Habits	Smoker	Alcoholism	Other habits	Previous history of sports involvement	On any Medication	BMI	Gait	Do you walk with support
1	2	2	1	1	3	3	1	1	1	1	1	1	1	3	2	3
2	4	2	1	2	1	3	1	3	1	1	1	2	1	1	3	3
3	4	1	1	2	1	4	1	1	2	1	1	1	1	3	2	3
4	4	2	1	2	3	3	2	1	1	1	1	2	2	3	2	3
5	2	2	1	1	3	3	2	1	1	1	1	1	1	1	2	3
6	4	2	1	1	1	3	2	3	1	1	1	1	2	3	2	1
7	4	1	1	1	1	3	2	3	1	2	1	2	1	1	2	3
8	2	2	1	3	3	4	2	3	1	1	1	2	1	3	3	2
9	4	2	1	2	3	4	2	2	1	1	2	1	1	1	2	3
10	4	2	1	1	1	3	2	3	1	1	1	1	2	2	1	3
11	4	2	1	1	1	4	1	3	1	1	2	2	1	3	1	2
12	4	2	1	3	1	3	1	3	1	2	2	1	2	2	1	3
13	4	1	1	1	3	4	1	2	1	2	1	2	1	1	1	3
14	2	2	1	3	3	3	1	3	2	1	1	1	1	1	2	1
15	4	2	1	3	3	3	1	1	1	2	2	2	1	3	2	3
16	4	2	1	1	3	3	2	1	1	2	1	2	1	1	2	1
17	1	1	1	3	3	4	1	2	2	1	1	1	2	1	1	2
18	1	2	1	3	1	4	1	3	1	2	1	2	1	3	3	3
19	3	1	1	3	1	4	1	3	1	1	1	2	2	2	3	3
20	4	2	1	1	2	3	2	2	1	1	1	1	1	1	2	1
21	2	1	1	3	2	3	2	1	1	1	1	2	1	3	2	1
22	2	1	1	1	2	2	3	2	1	2	1	2	1	3	1	1
23	3	2	1	3	2	3	1	3	1	2	1	1	2	2	3	1
24	4	1	1	1	2	3	1	3	1	1	1	2	2	3	2	3
25	4	2	2	1	2	3	3	3	1	1	1	2	1	2	1	1
26	1	2	1	1	3	4	1	1	1	1	1	2	2	2	3	1
27	4	2	2	1	2	2	2	2	2	1	1	1	2	2	1	2
28	3	2	3	1	2	1	2	1	1	1	1	1	2	2	1	1
29	3	2	1	1	2	3	1	3	2	1	1	1	2	2	2	1
30	3	2	1	3	3	2	2	1	1	1	1	1	2	2	1	3
	3	8	27	16	9	1	15	10	25	22	26	15	17	9	10	11
	6	22	2	4	9	3	13	6	5	8	4	15	13	10	14	4
	5	0	1	10	12	17	2	14	0	0	0	0	0	11	6	15
	16	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0

In which Knee is the pain felt	Do you have swelling of knee	When is the pain felt most	How many stairs can you climb	Duration of pain	Where is the pain exactly felt on the knee	Do you involve in physical activity	pretest	prescore	posttest	postscore
1	1	3	4	1	1	2	72	3	20	1
2	2	3	3	1	3	2	75	4	25	2
2	2	1	3	2	2	1	60	3	23	1
1	2	2	1	2	4	2	73	3	25	2
1	1	2	1	1	1	1	77	4	26	2
1	1	3	2	1	1	2	93	4	24	1
2	1	4	1	1	1	2	72	3	20	1
2	1	2	2	2	4	2	49	3	21	1
2	1	1	1	2	4	2	44	2	23	1
2	2	1	2	2	3	2	53	3	21	1
1	1	4	4	1	2	2	52	3	26	2
1	1	1	2	1	3	2	67	3	24	1
1	1	1	2	1	4	2	78	4	22	1
3	1	1	2	1	4	1	68	3	24	1
2	1	1	1	2	1	1	64	3	20	1
1	2	2	2	2	1	2	58	3	22	1
1	2	2	3	2	2	1	67	3	23	1
1	1	1	1	1	4	2	50	3	21	1
3	1	2	4	2	2	2	96	4	23	1
3	1	4	4	2	1	2	57	3	23	1
3	1	2	2	2	2	2	68	3	22	1
3	2	1	1	1	2	2	64	3	24	1
2	2	2	1	2	4	2	75	4	24	1
3	1	2	2	1	4	2	68	3	25	2
3	1	2	2	1	4	2	76	4	25	2
1	2	2	2	1	2	2	64	3	25	2
1	1	2	4	2	2	1	59	3	20	1
3	1	3	4	1	4	2	54	3	24	1
3	1	1	4	2	4	2	72	3	23	1
3	1	1	2	2	4	2	79	4	24	1
12	21	11	8	15	7	6		0		23
8	9	12	12	15	8	24		1		7
10	0	4	3	0	3	0		21		0
0	0	3	7	0	12	0		8		0

Sl. No	Age	Gender	Religion	Marital History	Previous nature of job	Educational Status	Source of income	Food Habits	Smoker	Alcoholism	Other habits	Previous history of sports involvement	On any Medication	BMI	Gait	Do you walk with support	In which Knee is the pain felt
1	2	2	1	1	3	3	1	1	1	1	1	1	3	3	2	3	1
2	4	2	1	2	1	3	1	3	1	1	1	2	1	1	3	3	2
3	4	1	1	2	1	4	1	1	2	1	1	1	1	3	2	3	2
4	4	2	1	2	3	3	2	1	1	1	1	2	2	3	2	3	1
5	2	2	1	1	3	3	2	1	1	1	1	1	1	1	2	3	1
6	4	2	1	1	1	3	2	3	1	1	1	1	2	3	2	1	1
7	4	1	1	1	1	3	2	3	1	2	1	2	1	1	2	3	2
8	2	2	1	3	3	4	2	3	1	1	1	2	1	3	3	2	2
9	4	2	1	2	3	4	2	2	1	1	2	1	1	1	2	3	2
10	4	2	1	1	1	3	2	3	1	1	1	1	4	2	1	3	2
11	4	2	1	1	1	4	1	3	1	1	2	2	1	3	1	2	1
12	4	2	1	3	1	3	1	3	1	2	2	1	4	2	1	3	1
13	4	1	1	1	3	4	1	2	1	2	1	2	1	1	1	3	1
14	2	2	1	3	3	3	1	3	2	1	1	1	1	1	2	1	3
15	4	2	1	3	3	3	1	1	1	2	2	2	3	3	2	3	2
16	4	2	1	1	3	3	2	1	1	2	1	2	3	1	2	1	1
17	1	1	1	3	3	4	1	2	2	1	1	1	4	1	1	2	1
18	1	2	1	3	1	4	1	3	1	2	1	2	3	3	3	3	1
19	3	1	1	3	1	4	1	3	1	1	1	2	4	2	3	3	3
20	4	2	1	1	2	3	2	2	1	1	1	1	1	1	2	1	3
21	2	1	1	3	2	3	2	1	1	1	1	2	3	3	2	1	3
22	2	1	1	1	2	2	3	2	1	2	1	2	3	3	1	1	3
23	3	2	1	3	2	3	1	3	1	2	1	1	1	2	3	1	2
24	4	1	1	1	2	3	1	3	1	1	1	2	4	3	2	3	3
25	4	2	2	1	2	3	3	3	1	1	1	2	3	2	1	1	3
26	1	2	1	1	3	4	1	1	1	1	1	2	2	2	3	1	1
27	4	2	2	1	2	2	2	2	2	1	1	1	3	2	1	2	1
28	3	2	3	1	2	1	2	1	1	1	1	1	2	2	1	1	3
29	3	2	1	1	2	3	1	3	2	1	1	1	2	2	2	1	3
30	3	2	1	3	3	2	2	1	1	1	1	1	3	2	1	3	3

Do you have swelling of knee	When is the pain felt most	How many stairs can you climb	Duration of pain	Where is the pain exactly felt on the knee	Do you involve in physical activity	pretest	prescore	posttest	postscore
1	3	4	1	1	2	72	3	20	1
2	3	3	1	3	2	75	4	25	2
2	1	3	2	2	1	60	3	23	1
2	2	1	2	4	2	73	3	25	2
1	2	1	1	1	1	77	4	26	2
1	3	2	1	1	2	93	4	24	1
1	4	1	1	1	2	72	3	20	1
1	2	2	2	4	2	49	3	21	1
1	1	1	2	4	2	44	2	23	1
2	1	2	2	3	2	53	3	21	1
1	4	4	1	2	2	52	3	26	2
1	1	2	1	3	2	67	3	24	1
1	1	2	1	4	2	78	4	22	1
1	1	2	1	4	1	68	3	24	1
1	1	1	2	1	1	64	3	20	1
2	2	2	2	1	2	58	3	22	1
2	2	3	2	2	1	67	3	23	1
1	1	1	1	4	2	50	3	21	1
1	2	4	2	2	2	96	4	23	1
1	4	4	2	1	2	57	3	23	1
1	2	2	2	2	2	68	3	22	1
2	1	1	1	2	2	64	3	24	1
2	2	1	2	4	2	75	4	24	1
1	2	2	1	4	2	68	3	25	2
1	2	2	1	4	2	76	4	25	2
2	2	2	1	2	2	64	3	25	2
1	2	4	2	2	1	59	3	20	1
1	3	4	1	4	2	54	3	24	1
1	1	4	2	4	2	72	3	23	1
1	1	2	2	4	2	79	4	24	1

PHOTOS

PRE-TEST ASSESSMENT THE RESEARCHER COLLECTING THE DATAS

THE RESEARCHER ASSESSING THE RANGE OF MOTION PRE-TEST ASSESSMENT

THE RESEARCHER APPLING MUSTARD PLASTER ON KNEE

POST TEST ASSESSMENT