

**DISSERTATION ON**  
**“A STUDY TO ASSESS THE EFFECTIVENESS OF**  
**APPLICATION OF MUSTARD PLASTER ON KNEE PAIN**  
**AMONG 50 -60 YEARS OF WOMEN IN SELECTED RURAL**  
**COMMUNITY AT CHENNAI”.**

**MSc. (NURSING) DEGREE EXAMINATION**  
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## **CERTIFICATE**

This is to certify that this dissertation titled **“A study to assess the effectiveness of application of mustard plaster on knee pain among 50-60 years women in selected rural community at medavakkam”**.is a bonafide work done by **Mrs.MaheswariM.MSc. (N) II Year Student**, College of Nursing, Madras Medical College, Chennai – 600003 submitted to **The Tamilnadu Dr.M.G.R. Medical University, Chennai-32**, in Partial fulfillment of the requirements for the award of Degree of Master **of Science in Nursing, Branch - IV, Community Health Nursing** under our guidance and supervision during the academic period from **2014 – 2016**.

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“As we express our gratitude, we must never forget that the higher appreciation is not to utter words, but to live by them”

John FitzGerald Kennedy

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# **ABSTRACT**

## **TITLE**

A Study to assess the effectiveness of application of mustard plaster on knee pain among 50-60 years of women in selected rural area at Chennai.

Knee pain is one of the common problem seen in the older people especially women. Knee pain is one of common complaint for which the clients seeks the help from the physician .More ever old age consists of more degenerative changes in their body.

## **Need for the study:**

The prevalence of osteo arthritis increase with age. Osteo arthritis is one of the most prevalent conditions resulting disability particularly in elderly population especially in women Mustard has been used for centuries for medicinal purposes—and researchers have recently come upon new applications. Mustard plaster or mustard paste spread inside a protective dressing. This helps in reliving knee pain.

## **Objectives:**

The main objectives of the study was determine the effectiveness of mustard plaster application by comparing the level of knee pain in control and experimental group among 50-60 years of women.

## **Methodology:**

**Research approach:** quantitative approach

**Research design:** pre-test and post- test control design

**Study settings:**The study was conducted in rural streets at medavakkam

**Study population:** Women (50-60years) with knee pain

**Sampling technique:** simple random sampling by lottery method

**Sample size:** 30 members for control group, 30 members for experimental group

**Data collection procedure:** mustard powder 10 gm mixed with lukewarm water and make it to a paste and applied in to a double piece of cloth and applied in to affected area for 10 minutes for 5 days. At end of the 6<sup>th</sup> day pain level assessed by oxford knee score.

**Data entry and analysis:** the data were analyzed by descriptive statistics such as mean, standard deviation, frequency and percentage for demographic variables and inferential statistics like chi-square test, paired t-test, independent 't' test were used to analyse the clinical variables.

### **Result and Discussion:**

The collected data was analyzed using descriptive and inferential statistics. Mean, median, chi-square, paired t test, proportion were the tests used for analyzing the results. Statistical significance was calculated under 95% CI. Clients in the experimental group had 13.7% of reduction in pain levels as compared to the clients in the control group who had 1.3% of pain reduction. The association of the study is analyzed by paired t test  $t=18.819$ ,  $p=0.001$  it is statistically significant. The clients in the experimental group felt that mustard plaster application relieves pain and it has a soothing and relaxing effect.

### **Conclusion**

Knee osteoarthritis sufficiently severe to consider joint replacement. Healthcare provision in primary care needs to focus on this broader group to impact on community levels of pain and disability. Implementation of complementary therapy in pain reduction can be done in a larger group.



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## **ABBREVIATIONS**

DF	Degree of Freedom
SD	Standard Deviation
CI	Confidence Interval
H	Hypothesis
MSc (N)	Master of Science in Nursing
No	Number
$\chi^2$	Chi square
WHO	World Health Organization

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# CHAPTER I

## INTRODUCTION

**“Everybody wants happiness nobody wants pain”**

**But you can’t have a rainbow without a little rain”**

Muscular skeletal pain encompasses a wide spectrum of disorders from simple ligamentous injuries to intra articular disorders. (e.g.) osteoarthritis, and rheumatoid arthritis, muscle pain syndromes. Knee joint is particularly vulnerable to damage and pain because it takes the full weight of our body and any extra force when we are run or jump. It appears that knee pain of some kind is a common complaint in middle-aged and mature women, with varying possible causes leading to varying types of pain.

Pain is defined as an unpleasant sensation occurring in varying degrees of severity as a consequence of injury, disease, or emotional disorder. But the pain is more than unpleasant sensations. Pain is ultimately a perception, and a bodily state. Despite its unpleasantness, pain is a critical component of the body’s defence system. It is part of a rapid warning and defence relay instructing the motor neurons of the central nervous system to minimize detected physical harm.

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in term of such damage - international association of pain. It is part of a rapid warning relay instructing the central nervous system to initiate motor neurons in order to minimize detected physical harm. Pain intensity may range from slight through severe to agonizing, it is experienced as having qualities such as sharp, throbbing, dull, nauseating, burning and shooting

Pain can be classified as acute or chronic. The distinction between acute and chronic is not based on its duration of the sensation, but rather of the pain itself. The primary distinction is that an acute pain serves to protect one, e.g. after an injury, whereas chronic pain does not serve this or any other



purpose and is the diseases of pain. The different types of pain respond differently to the various pain medications. Somatic and visceral pain are easier to treat than neuropathic pain.

## **Knee pain**

Knee pain is a common musculoskeletal disorder affecting 80% of people at some point in their lives. In India it is the most common cause of job related disability and the second most common neurological ailment- only headache is more common.

A new study on knee pain patterns assessed periodically over 12 years in a representative UK population finds that nearly two-thirds (63%) of women aged 50 and over experience knee pain at least once, persistently, or intermittently over such a period. The authors found these patterns were more likely in women with higher BMI, with a previous knee injury, or whose scans showed they had osteoarthritis. From their responses the researchers classed the 489 participants who were still in the study at the end into one of four groups, depending on their pain characteristics: Asymptomatic, Persistent, Incident, and Intermittent.

Recent trends in nursing practise involves traditional and alternative therapies in alleviating pain. Black mustard contains chemicals that might initially reduce pain when applied to the skin. **Mustard plaster** is a poultice of mustard seed powder spread inside a protective dressing and applied to the body to stimulate healing. It can be used to warm muscle tissues and for chronic aches and pains. It was once part of conventional medical treatment. An enzymatic reaction in the wet mustard powder produces a chemical called Allylisothiocyanate, which is absorbed through the skin as a transdermal drug. It provides warmth and functions as a counterirritant, meaning that it stimulates nerve endings in the skin and thereby distracts the body from deeper-seated pain.

## **1.1 Need for study:**

**‘The art of life is the art of avoiding pain’**

**-William Hazlin**

The prevalence of osteo arthritis increase with age. Osteo arthritis is one of the most prevalent conditions resulting disability particularly in elderly population especially in women. It a common disease of aged population and one of the leading cause of disability. Osteo arthritis is a complex disease entity that is difficult to diagnose and define. Increasing knee pain due to age, trauma, weight, because repetition movements in particular squatting and kneeling are common risk factors. Old age, female gender overweight and obesity, knee injury, repetitive use of joints, bone density, muscle weakness, and joint laxity all play a roles in the development of joint osteoarthritis. Pain affecting the quality of life both physical and psychological parameters.

**Crook J, Rideout, E, Browne G in 1984** reported that almost all joint injuries and diseases produce a stiff, aching pain, often referred to as "arthritis" pain. The prevalence of persistent pain increases with age. In the old age, physiological aging process produces many changes in our body. These changes produce health problems and disabilities. The knees are the largest and the most complicated joints of our body. The incident rate of knee pain was 21.2% and 27.3% in men and women, respectively, female sex was a risk factor for incident grade >2 osteo arthritis. Knee pain was a risk factor for incident of osteo arthritis.

Over the course of the disease progression, joints undergo degeneration of articular cartilage, osteophyte formation, and subchondral bone sclerosis. Nerve fibres localize densely within the bone, and chronic pain is thought to arise from sensitized nociceptors that become exposed due to the erosion of articular cartilage.

Mathur.A. 2007 reported that home health service, entailing home visits to detect health problem and also a community based health center for the aged for educational and preventive activity will be initiated. This will be integrated with the national rural health mission and an allocation made specifically for geriatric care. The accredited social health activist (ASHA) will be trained in geriatric care and the outpatient medical service, which serves as the base for home health service.

Mustard has been used for centuries for medicinal purposes—and researchers have recently come upon new applications. Mustard plaster or mustard paste spread inside a protective dressing. This helps in relieving knee pain. So the investigator select this study to implement a new home care management in practice.

## **1.2 Statement of the Problem**

“A study to assess the effectiveness of application of mustard plaster on knee pain among 50-60 years of women in selected rural community at Chennai”.

## **1.3 Objectives of the Study**

- To assess the level of knee pain before and after mustard plaster application in experimental group and control group among 50-60 years of women.
- To determine the effectiveness of mustard plaster application by comparing the level of knee pain in control and experimental group among 50-60 years of women.
- To determine the level of satisfaction in experimental group among 50-60 years of women regarding application of mustard plaster.
- To associate the certain demographic variables with women having knee pain

## **1.4 Operational definitions**

### **Effectiveness:**

It refers effectiveness refers to extent to which mustard plaster application achieves the desired effect in reducing knee pain in among 50-60 years of women.

### **Mustard:**

- Mustard is a condiment made from seeds of a mustard plant.
- Energy: 276kj, Carbohydrate: 8g, Fat: 3g, Protein: 4g
- Anticonesant: allylisothiocyanate (helps to reduce the knee pain)

### **Mustard plaster:**

It refers to Mustard powder 10 gm, add the Luke warm water to make a paste. The paste should be smooth and easily spreadable but not too thin so that it runs or is watery and spread it as a paste on a doubled piece of soft cloth. Apply the affected area for a maximum time of 10 minutes.

### **Knee pain**

Knee pain refers to pain that occurs in and around the knee joint. It can be caused by problems with the knee joint itself, or it can be caused by condition affected the soft tissues, ligaments, tendons, or bursa, that surrounded the knee.

## **1.5 Assumption**

1. Most of the women having knee pain
2. Mustard plaster relieves pain, inflammation, and congestion

### **1.6 Hypotheses:**

- H1- There is a significant difference between pre-test and post-test level of pain in 50-60 years of women undergoing mustard plaster application.
- H2- There is a significant association between selected demographic variables of women and degree of knee pain after the application of mustard plaster

### **1.7 Delimitations:**

- The study includes only women
- Data collection period for only four weeks
- The study participants are selected in only rural area

## CHAPTER II

### REVIEW OF LITERATURE

“A great literature is chiefly the product of inquiring minds in revolt against the immovable certainties of the notion.”

-H.L.MENKEN

Research and non-research literature related to the present study is reviewed and organised under the following headings.

- **2.1 Review of related literature**
- **2.2 Conceptual frame work**

#### **2.1 REVIEW OF RELATED LITERATURE.**

This review of literature was given under these following headings

- 2.1.1.** Literature related to the knee pain.
- 2.1.2** Literature related to the effects of mustard plaster
- 2.1.3.** Studies related to effects of Mustard plaster in knee pain

##### **2.1.1.Literature related to the knee pain**

*Dr. Ali M. Alshami, (2014) Jan; 8(1): 85–104.* conducted a study on Knee osteoarthritis related pain: a narrative review of diagnosis and treatment. For knee osteoarthritis, the highest diagnostic accuracy can be achieved by presence of pain and five or more clinical or laboratory criteria plus osteophytes. Some inconsistencies in the recommendations and findings were found between the clinical guidelines and systematic reviews. Generally, paracetamol, oral and topical non-steroidal anti-inflammatory drugs, opioids, corticosteroid injections and physical therapy techniques, such as therapeutic exercises, joint manual therapy and transcutaneous electrical nerve stimulation, can help reduce pain and improve function. Patient education programs and weight reduction for overweight patients are important to be considered.

**Reva C. Lawrence, et al.(2014)**Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. Prevalence estimates from these surveys were linked to 1990 US Bureau of the Census population data to calculate national estimates. We also estimated the expected frequency of arthritis in the year 2020. Results reveals that national estimates are provided, with important caveats regarding their interpretation, for self-reported arthritis and selected conditions. An estimated 15% (40 million) of Americans had some form or arthritis in 1995. By the year 2020, an estimated 18.2% (59.4 million) will be affected.

**G.Rutger Persson, (2014),** Rheumatoid arthritis and periodontitis inflammatory and infectious connections. Review of the literature, an association between oral disease/periodontitis and rheumatoid arthritis (RA) has been considered since the early 1820s. RA is considered as an autoimmune disease whereas periodontitis has an infectious etiology with a complex inflammatory response. Both diseases are chronic and may present with bursts of disease activity. Association studies have suggested odds ratios of having RA and periodontitis varying from 1.8:1 (95% CI: 1.0–3.2, NS) to 8:1 (95% CI: 2.9–22.1,  $p<0.001$ ). Genetic factors are driving the host responses in both RA and periodontitis.

**SardarBhawan Singh (2013)** conducted a study about the complex regional pain syndrome of the knee pressure algometric, goniometric measurements and knee outcome survey activities of daily living scale were used to document any changes. Patient was managed for a period of four sessions using graded sensitization therapy, TENS and mobilization with feedback shows marked improvement in range of movement (ROM), hypersensitivity, pain and functions results shows meticulous examination, early diagnosis and prompt treatment resulted in a quick improvement in the patient's condition.

**Kim Ij et Al. (2011)** conducted a study to investigate the prevalence of knee pain and its influence on physical function and quality of life (QOL). 504 Community residents of Chuncheon, aged >50 yrs. Self-reported QOL and function were assessed using the Western Ontario MacMaster Universities Osteoarthritis (WOMAC) index and short form (SF-12). The prevalence of knee pain was 46.2 % (32.2% in men and 58.0% in women) and increased in age in women. In conclusion, the prevalence of knee pain is high (32.2% in men and 58.0% in women) in this elderly community population in Korea. Independent of knee OA and other confounding factors, subjects with the knee pain have more than 5-fold increase in the risk of belonging to the worst lower extremity function compared to subjects without knee pain.

**Nguyen Us, Et Al. (2011)** conducted a study to assess whether age, obesity, and change in radiographic knee osteoarthritis, explains the trend in knee pain and osteoarthritis. NHANES participants were asked about pain in and around the knee on most days. In the FOA Study, participants were asked about knee pain and had bilateral weight-bearing anteroposterior knee radiography to define radiographic knee osteoarthritis. Age and BMI adjusted prevalence of knee pain increased by about 65% in NHANES from 1974 to 1994 among non-Hispanic white and Mexican American men and women among Afro American woman. In the FOA study, the age- and BMI-adjusted prevalence of knee pain and symptomatic knee osteoarthritis approximately doubled in women and tripled in men over 20 years.

**Marakis et al. 2009** conducted a study to investigate the risk of radiographic knee osteoarthritis (OA) and lumbar spondylosis associated with occupation activity in elderly Japanese subjects in 147 participants age  $\geq$  65 years (531 men and 940 women) living in mountain and sea coast communities were analysed. This study states that sitting on a chair is a significant protective factor against both radiographic knee OA and lumbar spondylosis in Japanese subjects. An occupational activity that includes heavy lifting appears to have a greater effect on knee than OA lumbar spondylosis.



**Harris Hayes et al. (2008)** conducted a study to assess the effectiveness in diagnosis and management of patient with knee pain using the movement system impairment classification system. Patient was educated to modify the provoking functional activities by resting the abnormal motions and alignment of the lower extremity. The patient reported a cessation of pain and improvement in their functional activities that occurred with connection of the knee alignment movement pattern. Results shows diagnosis specific treatment resulted in a cessation of the patient's pain and improved ability to perform functional activities.

**Marks R (2007)** conducted a study to identify the prevalence of overweight among community dwelling adults diagnosed as having knee osteoarthritis (OA) and the relationship between the weight status of these individuals, selected disease related outcomes and disease progression. The BMIs of 82 women and 18 men with unilateral or bilateral knee OA were examined on a single occasion along with data on physical morbidities, pain and function and subjected to correlation analyses BMIs from two additional samples, one that included 16 women with and without knee OA and one that included 24 women and 6 men with knee joint OA that required surgery for the subsequent onset of hip OA, were also assessed. The results shows high body mass is present in most adults with knee OA.

**AndriantoroAa, et al. (2006)** conducted a study to assess the prevalence of symptomatic knee, hand and hip osteoarthritis (or) study was conducted on the total adult population of 7 communities and on 2100 out of 5686 randomly selected subjects in an additional 2 communities results shows symptomatic knee, hand and hip OA is common in the general adult population of Greece, showing a female preponderance and a prevalence increasing with age female sex and age are risk factors for all sites of OA.

**Kacar, et al.(2005)** conducted a cross sectional study to estimate the prevalence and risk factors of symptomatic knee and distal interpharyngeal (DIP) Joint osteoarthritis (OA) in the elderly urban population of Antalya, Turkey. The prevalence of Symptomatic knee OA was determined as 14.8% in population aged 50 years or over. Advanced age, female, sex, and type of residence were found to be associated with knee on results shown that advanced age, II and type of factors are risk factors.

**Webb et Al (2004)** conducted a study for the opportunities for prevention of 'clinically significant knee pain'. A cross sectional survey of three general practice population was conducted. Adults (n=5752) were mailed a screening questionnaire (phase-I). Those reporting predominant or isolated knee pain were sent a detailed questionnaire. (Phase-I). with a further sub sample invited for clinical examination (phase-III). The attributable impact of overweight fraction estimate for raised body mass index (BMI) was 36 percent (27-44 percent)-the population was greater than of being obese. The high population impact of being overweight (BMI25-29) or obese (BMI30 or more) has implications for primary prevention. The estimates of previous healthcare usage, and of levels of met and unmet need, are useful for healthcare planning.

**CortiMc et Al. (2003)** Reveals Osteoarthritis (OA), the most common form of arthritis, is a major contributor to functional impairment and reduced independence in older adults. The etiology of OA is multifactorial, and several local and systemic risk factors have been identified. Differences in the prevalence of OA may be attributable to both genetic and life style factors. This review focuses on the functional impact of the disease, describes geographic differences in prevalence rates, discusses disease definition criteria, and summarizes the most common risk factors, including age, associated with the risk of OA.

**Gibson T, et al. (2001)** reviewed the prevalence of radiographic and symptomatic knee osteoarthritis (OA) in a population – based sample of elderly subjects in Beijing. Subjects undergone a home interview and a hospital examination including knee radiographs obtained during weight bearing results shown that older Chinese women have a higher prevalence of OA than woman in Farmington Massachusetts. More- over, being overweight may affect knee joint impact rates and pain incrementally. Having high body weights may heighten the risk for bilateral knee joint, as well as hip joint. – OA...The results shows the prevalence K/L grade  $\geq 2$  knee OA

**Hameed K, et al. (1996)** conducted a study to assess the frequency of knee pain amongst the poor and affluent in Pakistan. The frequency of joint symptoms has determined almost 2022 affluent and 2210 poor adults in Karachi, Pakistan. Results shown joint pan was significant ( $P = 0.025$ ) more common amongst the affluent (6.6%) compared with the poor (5%)and this was the due to greater frequency of knee pain in the richer community (3% vs 1.8%  $P = 0.008$ ) IV/4. The prevalence increased with age and was more common in females.

**Alisa Wilson, &Hsing-Ting Yu(1966)**, Prevalence and outcomes of anaemia in rheumatoid arthritis. Anaemia is a common comorbidity in individuals with rheumatoid arthritis (RA). In fact, anaemia of the type characterized by low serum iron concentrations in conjunction with adequate iron stores is frequently associated with RA and has served as a model for anaemia of chronic disease. These results suggest that (1) patients with RA who have anaemia are likely to have more severe joint disease and (2) if the anaemia is successfully treated, the joint disease will likely respond to treatment as well. Whether improvements in QOL and/or joint symptoms occur with improvement of anaemia, independent of other signs of an overall response to RA therapy, remains to be determined.

### **2.1.2 Literature related to the effects of mustard plaster.**

***HakanYabanoglu et al. (2012)*** conducted a study on Phytocontact Dermatitis due to Mustard Seed Mimicking Burn Injury: 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 equal parts of flour and 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. This case report is about a patient with second-degree burn, occurred when a mixture including mustard seed was exposed to her skin in the pain therapy of the osteoarthritis in her left knee. While in this type of burns our experience is limited, we think that conservative approach should be first choice of treatment

***DatsuKalip Reuben et al. (2011)*** determined the phytochemical constituents of aqueous extracts of shoots and leaves of *Salvadora persica* and root bark of *Terminalia avicenioides* and compared their anthelmintic efficacies against those of commercially available anthelmintic (albendazole and levamisole). The preliminary phytochemical screening of the extracts revealed the presence of tannins, flavonoids, saponins, sterols and terpenes and reducing sugars in all the extracts. The anthelmintic study showed that all the extracts exhibit in vitro anthelmintic activities against strongyline nematodes in a concentration dependent fashion and such effects were significant

***Sofrata A H, et al. (2008)*** studied in vitro antibacterial effect of miswak pieces without extraction. The antibacterial effect was found most pronounced on *P. gingivalis*, *A. actinomycetemcomitans*, and *H. influenza*, less on *Strep. Mutans*, and least on *L. acidophilus*. Miswak embedded in agar, or suspended above the agar plate, had strong antibacterial effects against all bacteria tested. The antibacterial effect of suspended miswak pieces suggested the presence of volatile active antibacterial compounds.

***Aldini E Z et al. (2007)*** investigated and compared the efficacy of natural toothbrush or miswak in the prevention of dental caries with the efficacy of ordinary toothbrush and toothpaste. The data collected at the end of the study showed that the risk of dental caries for each tooth in the control group was 9.35 times more than the case group

***Nawan A et al. (2007)*** evaluated the in-vitro and in-vivo antimicrobial effects of an alcoholic extract of *Salvadorapersica* solution as a root canal irrigant and compared it with the currently used root canal irrigants (5.25% sodium hypochlorite, 0.2% chlorhexidine and normal saline). Results revealed that 15% alcoholic extract of *Salvadorapersica* had significant antimicrobial effect which was not significantly different from sodium hypochlorite and chlorhexidine and significantly different from normal saline

***Mohammad et al. (2006)*** investigated the cytotoxic potential of *Salvadorapersica* on gingival and other periodontal structures, using the agar overlay method. Results showed no cytotoxic effect by a freshly cut and freshly used miswak. However, the same plant used after 24 h does contain harmful components. The cytotoxicity in this study became evident only after 24 h because the agar overlay method depends on the diffusion of the medicament to the agar material

***Almas & Ahmad (2005)*** compared the antimicrobial activity of eight commercially available mouthrinses and 50% miswak extract against seven microorganisms. Corsodyl, Alprox, Oral-B advantage, Florosept, Sensodyne, Aqua fresh mint, Betadine, and Emoform mouthrinses were used, while 50% aqueous extract of miswak (*S. persica*) was used against *Strep. Faecalis*, *Strep. Pyogenis*, *Strep. Mutans*, *C. albicans*, *Staph. Aureus*, and *Staph. Epidermidis*. Mouthrinses containing chlorhexidine (CHX) had maximum antibacterial activity, while cetylpyridinium chloride mouthrinses had moderate, and miswak extract had low antibacterial activity

### **2.1.3 Studies related to effects of Mustard plaster in knee pain**

***Hemavathy V, et al. (2015) ISSN 2278 – 0211***, was conducted A Study to Assess the Effectiveness of Mustard Plaster Application in Reduction of Knee Joint Pain among Patient with Osteoarthritis Kattankolathur. Qualitative research setting was at Sivananda Gurukulam Old age home in kattankolathur, Chennai. Sample size of 30 osteoarthritis patients selected by non-probability purposive sampling technique. RESULT: In pretest out of 30 samples majority of them have severe joint pain 15 (50%) and 10(33%) of them were having moderate knee pain and 5(17%) have mild pain and none of them having no pain In posttest out of 30 samples majority of them got relieved from knee joint pain 8(27%) and 18(60%) of them were having mild knee pain and 4(13%) have moderate pain and none of them have severe and extreme pain. CONCLUSION: The application of mustard plaster on knee joint pain among osteoarthritis patients in Sivananda Gurukulam, kattankolathur in Chennai is effective.

***Janice Carson (2014)***, conducted a study on Mustard Plaster – Arthritis Back Pain Relief and other joint pain relief. The active ingredient in mustard seeds which helps provide arthritis back pain relief as well as other arthritic joint pain is allyl-isothiocyanate. It is a counterirritant, meaning that when applied to an inflamed area it causes blood vessels to dilate, thus increasing blood flow to the affected area so that toxins can be more readily removed. For arthritis back pain relief, this means increased blood flow to the affected area so that pain relievers, whether topical or oral, pharmaceutical or herbal, can be more readily absorbed. Mustard poultices have been reported for centuries as having pain relieving qualities often sought by patients looking for arthritis back pain relief, knee pain relief, or relief of other arthritic pain.

***Department of Paediatrics, Ryhov County Hospital, Jönköping, Sweden (2009)*** Epidemiological studies of chronic arthritis in childhood can provide clues to genetic determinants of disease manifestations and environmental triggers. Available data are difficult to compare, however,

because of the heterogeneity of the disease, differences in the classification criteria used for definition and inclusion, and differences in source populations and case ascertainment. Nevertheless, when the data are interpreted according to the methodologies used, geographical and ethnic differences can be found with regard to occurrence rates, age at onset, subgroup distribution and immunological markers. They use mustard oil for reducing pain in arthritis .and find a very good effectiveness.

***Yannis Alamanos, et al, (2006)***,Incidence and Prevalence of Rheumatoid Arthritis, Based on the 1987 American College of Rheumatology Criteria.We conducted a Medline search between January 1988 and December 2005. Studies reporting the incidence and prevalence of RA in adult populations (16 to 20 years and over), based on 1987 ACR criteria, were eligible for inclusion. We examined the geographical differences of prevalence and incidence rates using the Mann–Whitney and the Kruskal–Wallis tests. The occurrence of RA varies among countries and areas of the world. A decreasing trend has been observed in countries characterized by high rates of RA incidence and prevalence. However, the relatively small number of studies for most areas of the world and the lack of incidence studies for the developing countries limits the understanding of worldwide RA epidemiology.

***Jin-Tao Liu, et al. (2013)*** Golden plaster for pain therapy in patients with knee osteoarthritis: study protocol for a multicentre randomized, double-blind, placebo-controlled trialDespite considerable study, there is no generally effective treatment for patients who suffer from OA. In some contexts, various complementary and alternative medical treatments have been administered for OA in clinical practices .The quality and small sample sizes of the few trials that have been conducted have made it difficult to reach firm conclusions about these treatments. Well-designed randomized controlled trials are needed to examine the efficacy of TCM treatments for OA. The biggest advantage of the present trial is an external placebo control. The purpose of this study will be to

evaluate the basic clinical efficacy and safety data for the golden plaster in the treatment of patients with knee OA

**Web med Reviews (2012)**, There is not enough information available to know how black mustard might work for medical conditions. Black mustard contains chemicals that might initially reduce pain when applied to the skin. But contact with the skin for too long might cause skin irritation and burning. Some people make a paste by mixing ground black mustard seed with warm water. They pack the paste in cloth and apply the cloth directly to the skin as a “mustard plaster.” This preparation is used for treating pneumonia, pain and swelling (inflammation) of the lining of the lungs (pleurisy), arthritis, lower (lumbago), and feet. Black mustard oil is used for the common cold, painful joints and muscles (rheumatism), and arthritis.

**Ali et al. (2002)** evaluated nineteen plant species, used traditionally in Sudan against malaria and similar tropical diseases. Different extracts of *S. persica* against *Falciparum* NF54 strain were found to possess antiplasmodial activity.

**Mansour et al. (1996)** evaluated the extract of root and branches of *S. persica* for analgesic activity in mice. It was found that the drug possesses a relatively moderate analgesic effect which might be due to interaction with the central and/or peripheral opiate system.

**Ezmiril S T et al. (1979)** reported that the extract of stem of *S. persica* possess anti-inflammatory activity. Which help in reduces the pain in various part of our body, specifically in joint pains and inflammation.



## 2.2 CONCEPTUAL FRAME WORK

### **Context, Input, Process and Product Evaluation (CIPP) Model.**

The CIPP Model is a comprehensive framework for guiding formative and Summative evaluations of projects, programs, personnel, products, institutions, and systems. The **CIPP** Model was developed by Daniel Leroy Stufflebeam and colleagues in 1966. The model is configured for use in internal evaluations conducted by an organizations evaluators; self-evaluations conducted by project teams or individual service providers, and contracted or mandated external evaluations. Applications have spanned various disciplines and service areas, including education, housing and community development.

The model's core concepts are denoted by the acronym CIPP, which stands for evaluations of an entity's context, inputs, processes, and products.

**Context evaluations** assess needs, problems, assets and opportunities to define goals and priorities.

**Input evaluations** assess alternative approaches, competing action plans and budgets for their feasibility and potential cost-effectiveness to meet targeted

Needs and achieve goals. Process evaluations assess the implementation of plans.

**Product evaluations** identify and assess outcomes.

In this study, the

#### **Context evaluations:**

**Context** process includes the demographic variables like age, religion, family income, family type, food habit and education level, pain duration, duration of illness, etc.

**Input evaluations:**

It includes the resources used in this present study, Pre intervention assessment was done on level of pain. In the **Input** the preparation of mustard plaster applications is also included.

**Process evaluations**

Process includes the transformation of plaster application and development of desirable attitude and skill in practice regarding the pain management.

**Product evaluation**

It refers to the outcome of the study, the **product** is change in reduction of pain after 5 days intervention of mustard plaster application.

**Feedback evaluation**

It refers to the information sent backward from the product evaluation to the input and process in order to gain understanding and modify or accept the strategies

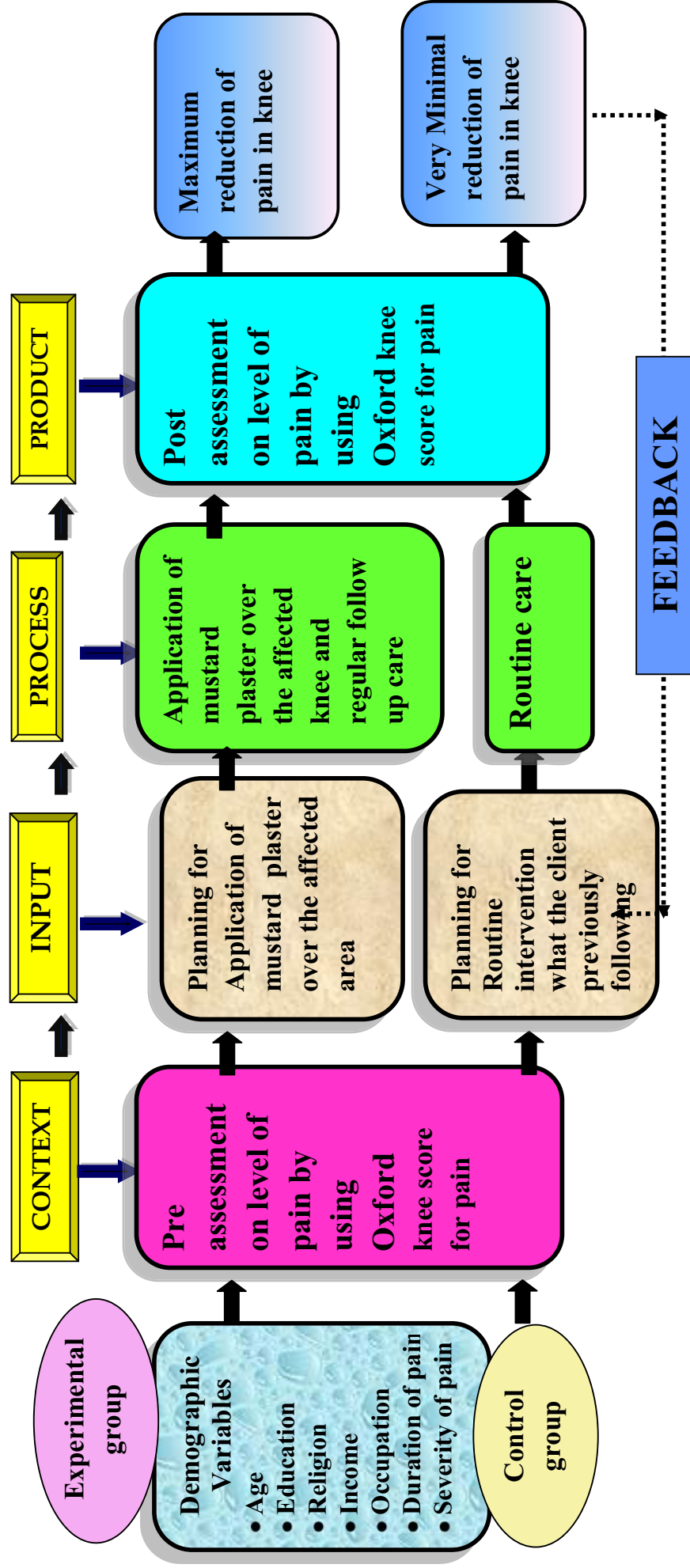


Figure 2.1: Conceptual Framework based on Modified Daniel, Stufflebeam's Evaluation (CIPP) Model

## **CHAPTER-III**

### **RESEARCH METHODOLOGY**

This chapter includes the research design, the setting of the study and sampling technique. It further deals with the development of tool, procedure for data collection and plan for data analysis.

#### **3.1 Research Approach:**

A research approach guide the researcher in the natures of the data to be collected and the method of analysis. To accomplish the objectives of the current study quantitative research approach was chosen by investigator. This study aims at assessing the effectiveness of mustard plaster to relieving knee pain.

#### **3.2 Data collection period:**

The duration of data collection was from 16.7.2015 to 15.8.2015. (Four weeks).

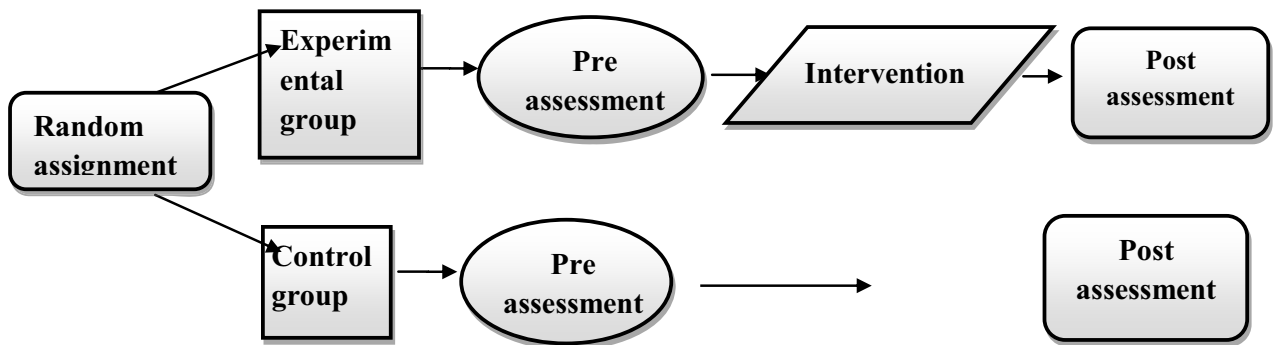
#### **3.3 Study settings:**

The study was conducted in rural area of Medavakkam, Chennai, 42Kms away from the College of Nursing, Madras Medical College, Chennai, which comes under the Panchayat union of Perumbakkam, Chennai. The Centre covering the total population of 1, 03,060. Totally there are 12 streets and it has 9 zones. 12streets were selected by simple random sampling using the lottery method to conduct the present study. The streets which were selected to conduct the present study are vanathurai 1<sup>st</sup> street to 12<sup>th</sup> street. The setting was selected based on the feasibility of conducting the study, availability of sampling and proximity of setting to the investigator.

#### **3.4 Study Design:**

The research design selected for the present study is an experimental research design. **Pre-test post-test control design.** In this study the subjects are randomly assigned to either the experimental or the control group. The effect of the dependent variable on the both groups is seen before the treatment.

Later, the intervention is carried out in experimental group only, and after interventions, Observation of the dependent variable is made for the both groups to examine the effect of the manipulation of the independent variable on the dependent variable.



### 3.5 Study Population:

Population is the entire aggregate of cases that meet a designed set of criteria. In this present study population are subjects who are having knee pain. The accessible population for the present study is subjects having knee pain residing at Medavakkam, Kalaingar Nagar. The total clients with knee pain from the selected streets in Medavakkam were 98.

### 3.6 Sample Size:

Sample consist a total number of 60 subjects with nonspecific knee pain residing in medavakkam area who were selected from 10streets of Medavakkam namely kalaingnarnagar.

### 3.7 Sampling criterion:

The sample was selected based on the following inclusion and exclusion criteria.

#### 3.7.1Inclusion Criteria:

- The women clients in the age group of 50-60 years
- The womenclients who are all having a knee pain
- The womenclients who are all ambulant

- The women clients willing to participate in the study.
- The women clients who are available during the data collection.
- The women clients who can understand and speak in Tamil

### **3.7.2 Exclusion Criteria:**

- The women clients not having a knee pain.
- The women clients who are non-ambulant.
- The women clients having inflammation of joints.
- The women clients who are not available during the data collection.
- The women having any knee surgeries.

### **3.8 Sampling Technique:**

Sampling technique used for the present study to select the sample by simple random technique by lottery method. The investigator conducted a survey in the kалаignarnagar to identify the total number of subjects with nonspecific knee pain. In kалаignarnagar area 12 streets were surveyed. Then 5 streets selected for experimental group. 5 streets selected for control group and the total number of female with knee pain was 98. Each subject in particular street had been numbered and samples selected by simple random sampling by a lottery method in each street. The required number of knee pain subjects was selected as the sample according to the inclusion criteria.

### **3.9 Research Variables:**

- **Independent Variable:** Mustard powder with lukewarm water
- **Dependent Variable:** Pain Perception among women in knee pain

### **3.10 Development and Description of Tool:**

The tools for the study had four sections.

### **3.10.1 Development of the Tool:**

The tool has been developed after extensive review of literature and discussion with experts in order to develop guidelines for providing mustard plaster and its duration.

### **3.10.2 Description of the Tool:**

#### **Section-A**

Had questions for collection of demographic data. It was developed by the researcher. It had 8 questions with multiple options. The study participants had to tick the appropriate boxes. It had questions related to age, education, occupation, monthly income, religion, dietary pattern, marital status, and total number of family members.

#### **Section-B**

It had 3 questions related to anthropometric measurements.

#### **Section-C**

It had 10 questions related to knee pain

#### **Section-D**

Oxford knee score. It is a standardized tool. The scoring key is given below.

**Table 3.1: Grading For the Oxford Knee Score**

<b>Score</b>	<b>Description</b>
<b>Score 0 To 19</b>	May indicate severe knee arthritis. It is likely that you may well require some form of surgical intervention.
<b>Score 20 To 29</b>	May indicate moderate to severe knee arthritis. See your family physician for an assessment and x-ray.
<b>Score 30 To 39</b>	May indicate mild to moderate knee arthritis.
<b>Score 40 To 48</b>	May indicate satisfactory joint function

### **3.10.3 Content Validity:**

The content validity of the tool was validated by one medical expert, and community health nursing expert, and one statistical expert. The experts suggestions were incorporated and the tool was finalized and used by investigator for the main study.

### **3.11 Ethical Consideration:**

The study objectives, intervention, and data collection procedures were approved by the research and ethics committee of Madras Medical College, Chennai.

### **3.12 Pilot Study:**

The pilot study was conducted at selected rural area at Medavakkam, Chennai, by obtaining prior permission from the authorities and conducted with ten elderly people, who fulfilled the inclusion criteria. The subjects who were used for the pilot study conducted were excluded for the main study. The data related to the variables were collected. The pre and post degree of pain level was assessed before and after muster plaster application. Results were analyzed. The investigator found that the instrument was feasible to use and further no modifications were needed before the actual implementation of the study.

### **3.13 Reliability:**

The reliability of the tool was established by an inter rater reliability method. The obtained reliability coefficient was high ( $r = 0.87$ ).

### **3.14 Data Collection Procedure:**

The study was conducted in selected rural streets of medavakkam, Chennai. After obtaining permission from the deputy director of health services, Chennai. Zonal officer, and medical officer of primary health Centre. A self-introduction was given by the investigator and the informed written consent was obtained from the 50-60 years of women and the purpose of the study was



explained to the participants. The objectives and purpose of the study were explained and confidentiality was maintained. The freedom was given to the clients to leave the study at her will without assigning any reason. No routine care was altered and withheld. Confidentiality of the subject's information was maintained.

The data collection procedure was done and the time taken for data collection from each patients was 10-15 minutes and 5- 10 minutes for pain scoring scale for each women and the investigator selected 60 samples (30 participants in experimental group, and 30 in control group) by simple random sampling technique using lottery method based on the inclusion and exclusion criteria. Pre-test of pain level was assessed by oxford knee score for both the group and then for the experimental group only receiving mustard plaster application in affected knee, morning/daily in person for 5 days. Post assessment was conducted on the 6<sup>th</sup> day for both experimental and control group.

**Table.3.2: Intervention protocol**

S.No	Protocol	Experimental group	Control group
1.	Place	Clients home	Clients home
2.	Intervention tool	<ul style="list-style-type: none"> <li>➤ Structured questionnaire</li> <li>➤ Mustard plaster application (mustard powder 10 gm with Luke warm water and make it in to a paste)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Structured questionnaire</li> <li>➤ Routine intervention</li> </ul>
3	Duration	5 days	5 days
4	Frequency	Morning/ daily	Morning/ daily
5.	Time	8am-10 am	10 am-12 pm
6.	Administered by	Investigator	_____

**Preparation of mustard plaster:**

Mustard powder 10 gm, with lukewarm water to make a paste. The paste should be smooth and easily spreadable but not too thin so that it runs or is watery and spread it as a paste on a doubled piece of soft cloth. Apply the affected area for a maximum time of 10 minutes in daily for 5 days.

**3.15 Data Entry and Analysis**

The data will be analyzed appropriate statistical tests.

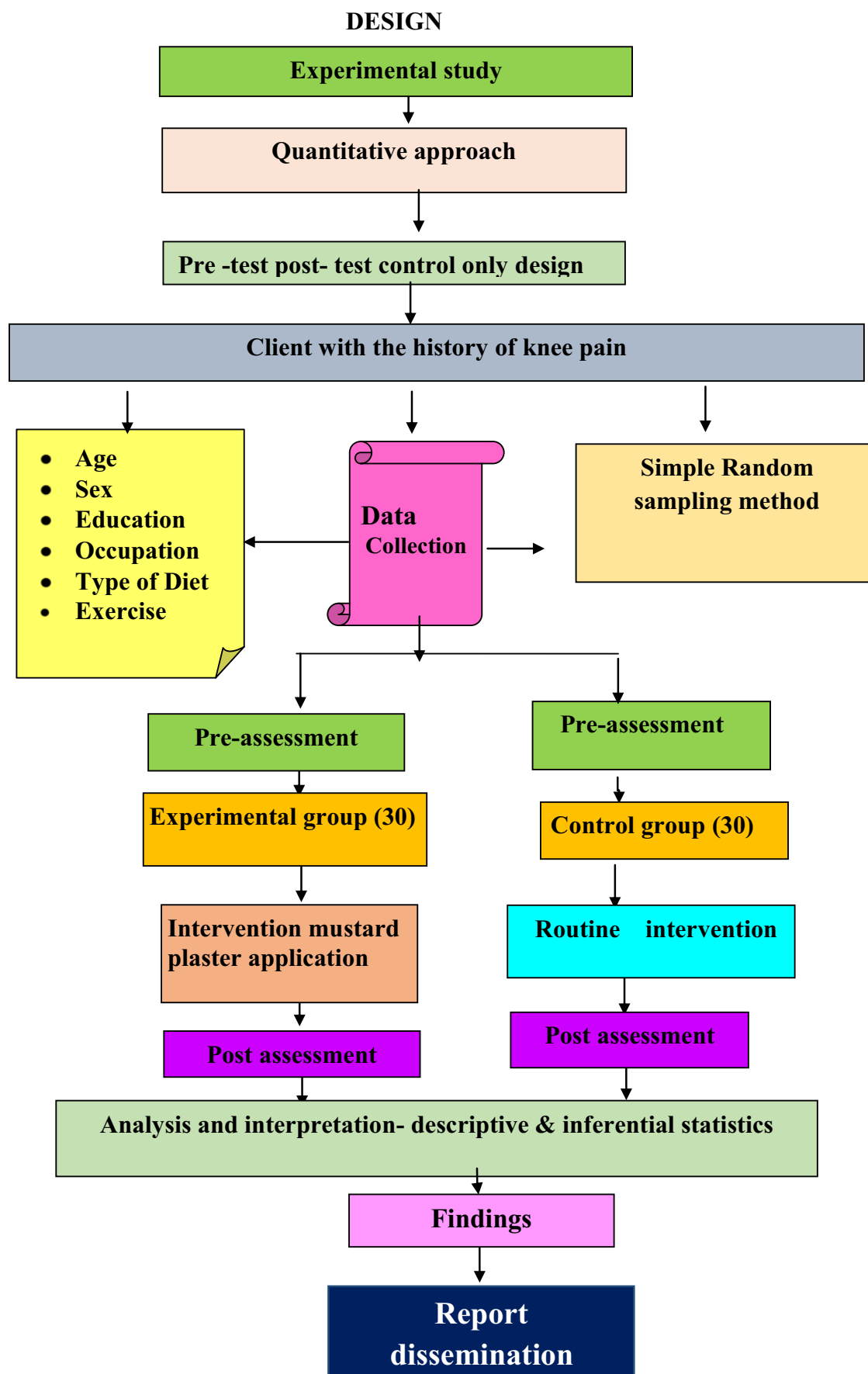
After the data collection, the collected data were organized, tabulated, summarized and analyzed. The data were analyzed according to objectives of the study using descriptive and inferential statistics.

1. Analysis of the frequency and percentage distribution of the demographic data.
2. Hypothesis related to the effectiveness of mustard plaster therapy reducing the pain perception was tested using student paired “t” test, mean and standard deviation
3. student independent “t ” were used to find out the association between the level of pain perception and selected demographic variables (age, occupation, education, exercise)

**Schematic representation of the study:**

An experimental approach was adopted. The study was conducted at medavakkam, Chennai. Simple random sampling was chosen where lottery method was used to assign the subjects 30 in control and 30 in experimental group. Survey method was used to assess the prevalence of knee pain. After which knee pain symptoms were assessed in control and experimental group using oxford knee score. The collected data were tabulated and analyzed using descriptive and inferential statistics

**FIGURE 3.1 SCHEMATIC REPRESENTATION OF RESEARCH**



## **CHAPTER –IV**

### **DATA ANALYSIS AND INTERPRETATION**

This chapter deals with the statistical analysis and interpretation of the data collected. Analysis is a method for rendering quantitative, meaningful and intelligible information. The research problem can be studied and tested including the relationship between the variables.

The data deals with the demographic variables, pre and post-test assessment of pain by oxford knee pain scale .the study is to “A study to assess the effectiveness of application of mustard plaster on knee pain among 50-60 years of women in selected rural area at chennai.

#### **Organization of Data:**

1. Section I - Distribution of subjects according to their demographic profiles and pain history.
2. Section II- Pre and post assessment of knee pain level in experimental group.
3. Section III- Pre and post assessment of knee pain level in Control group
4. Section IV - Comparison of pre and post assessment score of knee pain, and Effectiveness of the study.
5. Section V -Association between effectiveness of mustard plaster with selected demographic variables.

## **Statistical Analysis**

- Demographic variables in categorical / dichotomous were given in frequencies with their percentages.
- Pain score was given in mean and standard deviation.
- Difference between experimental and control was analysed using student independent t-test.
- Difference between pre assessment and post assessment was analysed using student dependent t-test
- Differences between pre and post assessment score was analysed using mean difference with 95% Confidence interval and proportion with 95% confidence interval.
- $P < 0.05$  was considered statistically significant.

**Section I -frequency and percentage distribution of demographic variables of women with knee pain**

**Table 4.1: Distribution of Demographic Profile**

Demographic variables		Experiment group		Control group		Chi square
		frequency	In %	Frequency	In %	
Age	50-55 years	11	36.7	14	46.7	$\chi^2=0.617$ p =0.432
	56-60 years	19	63.3	16	53.3	
Education	Illiterate	6	20.0	6	20.0	$\chi^2=4.195$ p =0.522
	Primary education	5	16.7	9	30.0	
	High school	10	33.3	9	30.0	
	Higher secondary	5	16.7	5	16.7	
	Diploma	3	10.0	-	-	
	Graduate	1	3.3	1	3.3	
Occupation	Home maker	17	56.7	21	70.0	$\chi^2=1.154$ p =0.764
	Labour	7	23.3	5	16.7	
	Self employed	3	10.0	2	6.7	
	Business	3	10.0	2	6.7	
Income	<Rs.1589	-	-	-	-	$\chi^2=1.460$ p =0.482
	Rs.1590-4726	11	36.7	7	23.3	
	Rs.4727-7877	12	40.0	16	53.3	
	Rs.7878-11816	7	23.3	7	23.3	
Religion	Hindu	25	83.3	26	86.7	$\chi^2=0.220$ p =0.896
	Muslim	3	10.0	2	6.7	
	Christian	2	6.7	2	6.7	
	Others	-	-	-	-	
Diet	Vegetarian	6	20.0	10	33.3	$\chi^2=1.364$ p =0.243
	Non-vegetarian	24	80.0	20	66.7	
Marital status	Married	23	76.7	16	53.3	$\chi^2=5.256$ p =0.154
	Unmarried	1	3.3	1	3.3	
	Divorced	0	0	3	10.0	
	Widow	6	20.0	10	33.3	
Family members	<2	1	3.3	1	3.3	$\chi^2=0.096$ p =0.992
	2-3	9	30.0	10	33.3	
	4-5	12	40.0	11	36.7	
	>6	8	26.7	8	26.7	

\* Significant at  $P \leq 0.05$

\*\* highly significant at  $P \leq 0.01$

\*\*\* Very high significant at  $P \leq 0.001$

- There is no significant variation and difference between the experimental and control group
- The demographic information of elderly women those who were participated for the following study on “A study to assess the effectiveness of application of mustard plaster on knee pain among 50-60 years of women in selected rural area at medavakkam”
- This above table shows that most of the study participants are **age** between 50-55 yrs. both in experimental (36.7%) and in control (46.7%) group. p. In 56-60yrs 53.3% were in control group and 63.3% were in experimental group.
- Regarding **Educational status** 20% in both experimental and control group participants were uneducated. Only few percentage 3.3% in experimental and 6.6% in control were completed their diploma education. About 16.7% in experimental and 30% in control group studied up to High school level, about 33.3% in experimental and 30% in control group studied up to higher secondary level.
- The **occupational status** of the study participants explains most of the subjects in experimental (56.7%) and in control (70%) were home makers.
- **Income status** of the participants reveals that around 36.7% in experimental and 23.37% in control group were having family income between Rs 1590 – Rs 4726. Around 40% in experimental and 53.3% in control group were belongs to the income status from Rs 4727 – 7877.
- Most of the study participants was Hindu community (83.3% in experimental and 86.7% in control group) and the higher percentage of participants were belongs to mixed **dietary pattern** (66.7% in control and 80% in experimental group).
- Very less amount of participants are unmarried (3.3%), most the study subjects were married (76.7% in experimental and 53.3% in control.
- Majority of the participants have 4-5 **members in their family** i.e. 40% in experimental and 36.7% control.

**Table: 4.2 Distribution of anthropometric measurements**

Anthropometric measurements		Experiment group		Control group		Chi square
		frequency	In %	Frequency	In %	
Height	146-150 cm	17	56.7	1	3.3	$\chi^2=1.253$ p =0.740
	151-155 cm	8	26.7	10	33.3	
	156-160 cm	4	13.3	11	36.7	
	161-165 cm	1	3.3	8	26.7	
Weight	46-50 kg	7	23.3	2	6.7	$\chi^2=5.075$ p =0.166
	51-55 kg	8	26.7	15	50.0	
	56-60 kg	13	43.3	11	36.7	
	>60 kg	2	6.7	2	6.7	
BMI	Under weight	-	-	-	-	$\chi^2=0.300$ p =0.584
	Normal	19	63.3	21	70.0	
	Over weight	11	36.7	9	30.0	
	Obese	-	-	-	-	

\* Significant at  $P \leq 0.05$  ,\*\* highly significant at  $P \leq 0.01$  ,\*\*\* Very high significant at  $P \leq 0.001$

The common height of the study participants comes in between 146-150 cm in experimental group (56.7%). Most of them were in normal weight in both group 63.3% in experimental and 70% in control group



**TABLE: 4. 3- DISTRIBUTION OF CLINICALVARIABLES OF WOMEN WITH KNEE PAIN**

Knee pain variables		Experiment group		Control group		Chi square
		frequency	In %	frequency	In %	
Duration of pain	3 months	6	20.0	8	26.7	$\chi^2=2.626$ p =0.453
	6 months	9	30.0	13	43.3	
	1 year	11	36.7	6	20.0	
	>1 year	4	13.3	3	10.0	
Type of pain	Sharp	15	50.0	11	36.7	$\chi^2=7.376$ p =0.061
	Dull	1	3.3	5	16.7	
	Burning	2	6.7	7	23.3	
	Pricking	12	40.0	7	23.3	
Remedy for pain	Ointments	13	43.3	13	43.3	$\chi^2=0.159$ p =0.984
	Hot water fomentation	2	6.7	2	6.7	
	Drugs	11	36.7	10	33.3	
	Exercise	4	13.3	5	16.7	
Drugs	T. Paracetamol	8	26.7	6	20.0	$\chi^2=3.229$ p =0.358
	T.Voveran	2	6.7	0	0	
	T.Brufen	2	6.7	1	3.3	
	Nil	18	60.0	23	76.7	
Severity of pain	Walking	7	23.3	9	33.3	$\chi^2=1.472$ p =0.689
	Sitting	5	16.7	5	23.3	
	House hold work	10	33.3	6	13.3	
	Every time	8	26.7	10	33.3	
Other illness	DM	6	20.0	10	33.3	$\chi^2=3.436$ p =0.329
	HT	5	16.7	7	23.3	
	Asthma	3	10.0	4	13.3	
	Nil	16	53.3	9	30.0	
Other treatment	Ayurveda	5	16.7	8	26.7	$\chi^2=1.736$ p =0.629
	Siddha	3	10.0	4	13.3	
	Acupuncture	3	10.0	4	13.3	
	Nil	19	63.3	14	46.7	
No of children	Nil	2	6.7	2	6.7	$\chi^2=2.589$ p =0.460
	1	15	50.0	18	60.0	
	2	12	40.0	7	23.3	
	>3	1	3.3	3	10.0	
Activity	Able to do ADL	6	20.0	12	40.0	$\chi^2=5.000$ p =0.172
	Able to do with assistant	13	43.3	13	43.3	
	Mild restriction in doing	9	30.0	3	10.0	
	Severe restriction	2	6.7	2	6.7	
Opinion about mustard	Cooking	12	40.0	15	50.0	$\chi^2=1.292$ p =0.731
	Medicinal use	8	26.7	5	16.7	
	Pain reducing agent	3	10.0	2	6.7	
	Nothing	7	23.3	8	26.7	

\* Significant  $P \leq 0.05$  \*\* highly significant  $P \leq 0.01$  \*\*\* Very high significant at  $P \leq 0.001$

- There is no significant variation and difference between the experimental and control group
- The table reveals 6.7% of them in experimental and 20% in control group have pain for one year. 43.3% in experimental and 30% in control have pain for past six months. 36.7% in experimental and 20% in control have pain more than one year . About 50 % of the study subjects in experimental and 36.6 % in control group have sharp pain, 40% in experimental and 23.3% in control group members have prickling pain.
- Majority of the participants in both group are using ointment for relieving pain 43.3%. 36.7 (Experimental), and 33.3% (Control) of participants are using pain killer drugs to minimize the pain.
- About 26.7% in experimental and 20% in control group subjects are using Tab.Paracetamol for getting relived from pain. 6.7% in experimental group were using Tab.voveran and Tab. Brufen for their relief.
- On 38.3% in experimental and 13.3% in control group subjects have increasing in pain level during house hold activities. About 26.7% in experimental and 33.3% in control group members have pain anytime. About 23.3% in experimental and 33.3 % in control group members having pain during walking.
- Some of the study participants were following traditional treatment like Siddha (Exp-10% Control – 13.3%), Ayurveda (Exp-16.7%, control – 26.7%), majority of the subjects are not following any mode of treatment (63.3%- Experimental, 46.7-Control).
- Majority of the study participants are having 1-2 children Experimental (50%), Control (60%).
- About half of the study participants believe that mustard is only for cooking purposes (experimental -40%, Control -50%).

**Section II - Pre and post assessment of knee pain level in experimental group**

**Table 4.4 Experiment group (pre-test- post-test)**

S.no	Experiment	N	Mean	SD	't' test
1.	Pre-test	30	32.43	2.932	t =-26.248 df=29 p=0.001***
2.	Post test	30	46.50	2.030	

\* Significant at  $P \leq 0.05$

\*\* highly significant at  $P \leq 0.01$

\*\*\* Very high significant at  $P \leq 0.001$

The pre and post assessment of pain level among the study participants in Experimental group it reveals that the mean score of pre-test 32.43, and mean score of post-test 46.50 shows there is a marked reduction of pain level among the elderly women. The SD value is also statistically significant.  $P=0.001$  is  $>0.05$  proves the study values are statistically significant

The difference between pre and post-test among experimental group participants. They explains more reduction of pain level

### Section III - Pre and post assessment of knee pain level in control group

**Table 4.5 Control group (pre-test-post –test)**

S.no	Control	N	Mean	SD	't' test
1.	Pre-test	30	31.57	1.794	t=-4.732 df=29 p=0.001***
2.	Post-test	30	33.13	2.097	

\* Significant at P=0.05

\*\* highly significant at P=0.01

\*\*\* Very high significant at P=0.001

The pre and post assessment of pain level among the study participants in control group it reveals that the mean score of pre- test 31.57 and mean score of post-test 33.13 shows there is a marked reduction of pain level among the women. The SD value is also statistically significant. P= 0.001 is >0.05 proves the study values are statistically significant

The difference between pre and post-test among the control group participants. They show only a very minimal reduction of pain level

**Section IV - Comparison of pre and post assessment score of knee pain  
and Effectiveness of the study.**

**Table 4.6 Effectiveness of the study**

S .no	Score	Experimental group		control group		Chi-square
		frequency	In %	frequency	In %	
1.	No pain (Increase 16&>)	10	33.3	0	0.0	$\chi^2=60.00$ $p=0.001^{***}$
2.	Mild ( increase score 11-15)	14	46.7	0	0.0	
3.	Moderate (Increase score 6- 10)	6	20	0	0.0	
4.	Severe(Increase score1-5)	0	0.0	20	66.7	
5.	Unbearable No increase score	0	0.0	10	33.3	

\* Significant at  $P \leq 0.05$

\*\* highly significant at  $P \leq 0.01$

\*\*\* Very high significant at  $P \leq 0.001$

The effectiveness of the study pain level among the women both group I and group II. In experimental group, 33.3% (no 10) of them having no pain, 46.7% (no 14) of them having mild pain, 20% (no 6) of them having moderate pain, (0.0%) none of them having severe and unbearable pain .In control group, 0.0% (0) none of them having no pain, mild and moderate. 66.7% (no 20) of them having severe pain, 33.3% (no 10) of them having unbearable pain.

**Table 4.7 Mean difference of mustard plaster on knee pain among experimental and control group**

Pain difference	N	SD	Mean difference	Paired t test	P
Experiment	30	3.188	13.67	18.819	0.001***
Control	30	1.629	1.37		

\* Significant at  $P \leq 0.05$ , \*\* highly significant at  $P \leq 0.01$ , \*\*\* Very high significant at  $P \leq 0.001$

It is effectiveness of study. It exhibits that the mean difference value between pre and post assessment in experimental group is 13.67 and it is only 1.37 in control group, it shows the effectiveness of mustard plaster in reducing knee pain among old age women

The association of the study is analysed by paired t test  $t=18.819$ ,  $p=0.001$  it is statistically significant...

**Table 4.8 shows the effectiveness of mustard plaster (Percentage %)**

Group	Pain score	Mean score	Mean difference with CI	Mean difference with 95%
Experiment	Pre-test	-32.43	14.07 (12.91-15.23)	30.26% (27.7%-32.75%)
	Post-test	46.50		
Control	Pre-test	31.57	1.56 (0.96-2.16)	4.7% (2.9%-6.5%)
	Post-test	33.13		

The effectiveness of mustard plaster on knee pain the mean difference is 14.07 in experimental group, this was calculated with 95%CI and the above table shows there is 30.26 % of pain reduction when compare to control group (4.7%).

**Section V: Table 4.9: Association between level of mustard plaster and their variables (Experimental)**

Demographic variables		Score level(increasing)						Total	Chi-square
		6-10		11-15		>16			
		Frequency	In %	Frequency	In %	Frequency	In %		
Age	50-55yrs.	2	6.7	7	23.3	2	6.7	11	$\chi^2=2.297$ P=0.317
	56-60yrs	4	13.3	7	23.3	8	26.7	19	
Education	No formal education	2	6.7	1	3.3	3	10	6	$\chi^2=12.343$ P=0.263
	Primary education	0	0	4	28.6	1	3.3	5	
	High school	2	6.7	5	16.7	3	10	10	
	Higher secondary	0	0	2	6.7	3	10	5	
	Diploma	1	3.3	2	6.7	0	0	3	
	Graduate	1	3.3	0	0	0	0	1	
Occupation	Home maker	3	10	7	23.3	7	23.3	17	$\chi^2=7.74$ P=0.257
	Labour	2	6.7	4	13.3	1	3.3	7	
	Self employed	1	3.3	0	0	2	6.7	3	
	Business	0	0	3	10	0	0	3	
Income	>1589	0	0	0	0	0	0	0	$\chi^2=2.521$ P=0.641
	Rs. 1590-4726	3	10	5	16.7	3	10	11	
	Rs. 4727-7877	1	3.3	7	23.3	4	13.3	12	
	Rs. 7878-11816	2	6.7	2	6.7	3	10.0	7	
Religion	Hindu	5	16.7	10	33.3	10	33.3	25	$\chi^2=4.381$ P=0.357
	Muslim	1	3.3	2	6.7	0	0	3	
	Christian	0	0	2	6.7	0	0	2	
	Others	0	0	0	0	0	0	0	
Diet	Vegetarian	1	3.3	5	16.7	0	0	6	$\chi^2=5.00$ P=0.02*
	Non-vegetarian	5	16.7	9	30.0	10	33.3	24	
Marital status	Married	4	13.3	11	36.7	8	26.7	23	$\chi^2=2.00$ P=0.735
	Unmarried	0	0	1	3.3	0	0	1	
	Divorce	0	0	0	0	0	0	0	
	Widow	2	6.7	2	6.7	2	6.7	6	
Members	<2	0	0	0	0	1	3.3	1	$\chi^2=7.627$ P=0.267
	2-3	2	6.7	6	20	1	3.3	9	
	4-5	3	10	6	20	3	10	12	
	>6	1	3.3	2	6.7	5	16.7	8	

\* Significant at  $P \leq 0.05$  , \*\* highly significant at  $P \leq 0.01$  , \*\*\* very high significant at  $P \leq 0.001$

There is a statistical significant association between the participants those who take non-vegetarian had more reduction in their pain level ( $p \leq 0.02$  with CI at 95%)

**Table 4.10: Association between level of mustard plaster and their variables (Experimental)**

Anthropometric measurements		Score level(increasing)						Total	Chi-square
		6-10		11-15		>16			
		Frequency	In %	Frequency	In %	Frequency	In %		
Height	146-150cm	5	16.7	7	23.3	5	16.7	17	$\chi^2=4.905$ P=0.556
	151-155cm	1	3.3	5	16.7	2	6.7	8	
	156-160cm	0	0	2	6.7	2	6.7	4	
	161-165cm	0	0	0	0	1	3.3	1	
Weight	46-50kg	2	6.7	2	6.7	3	10	7	$\chi^2=3.323$ P=0.767
	51-55kg	2	6.7	5	16.7	1	3.3	8	
	56-60kg	2	6.7	6	20.	5	16.7	13	
	>60kg	0	0	1	3.3	1	3.3	2	
BMI	Under weight	0	0	0	0	0	0	0	$\chi^2=0.82$ P=0.960
	Normal	4	13.3	9	30	6	20	19	
	Over weight	2	6.7	5	16.7	4	13.3	11	
	Obese	0	0	0	0	0	0	0	

\* Significant at  $P \leq 0.05$

\*\* highly significant at  $P \leq 0.01$

\*\*\* Very high significant at  $P \leq 0.001$



**Table4.11: Association between level of mustard plaster and their Pain variables (Experimental)**

Knee pain variables		Score level (increasing)						Total	Chi square
		6-10		11-15		>16			
		Frequenc y	In %	Frequency	In %	Frequency	In %		
Duration	3 months	1	3.3	3	10	2	6.7	6	$\chi^2=2.385$ P=0.882
	6 months	3	10	4	13.3	2	6.7	9	
	1 year	2	6.7	5	16.7	4	13.3	11	
	>1 year	0	0	2	6.7	2	6.7	4	
Type of pain	Sharp	4	13.3	9	30	2	6.7	15	$\chi^2=9.800$ P=0.133
	Dull	0	0	0	0	1	3.3	1	
	Burning	1	3.3	1	3.3	0	0	2	
	Pricking	1	3.3	4	13.3	7	23.3	12	
Remedy of pain	Ointments	2	6.7	8	26.7	3	10	13	$\chi^2=6.785$ P=0.341
	Hot water fomentation	1	3.3	1	3.3	0	0	2	
	Drugs	2	6.7	5	16.7	4	13.3	11	
	Exercise	1	3.3	0	0	3	10	4	
Drugs	T. Paracetamol	0	0	6	20	2	6.7	8	$\chi^2=6.492$ P=0.370
	T. Voveran	0	0	1	3.3	1	3.3	2	
	T.Brufen	1	3.3	0	0	1	3.3	2	
	Nil	5	16.7	7	23.3	6	20	18	
Severity of pain	Walking	1	3.3	5	16.7	1	3.3	7	$\chi^2=7.139$ P=0.308
	Sitting	1	3.3	2	6.7	2	6.7	5	
	House hold work	2	6.7	2	6.7	6	20	10	
	Every time	2	6.7	5	16.7	1	3.3	8	
Other illness	Diabetes mellitus	2	6.7	1	3.3	3	10	6	$\chi^2=10.26$ p=0.03*
	Hypertension	0	0	5	35.7	0	0	5	
	Asthma	1	3.3	2	6.7	0	0	3	
	Nil	3	10.0	6	20.0	7	23.3	16	
Other treatment	Ayurveda	0	0	2	6.7	3	10	5	$\chi^2=4.014$ p=0.675
	Siddha	1	3.3	1	3.3	1	3.3	3	
	Acupuncture	0	0	2	6.7	1	3.3	3	
	Nil	5	16.7	9	30	5	16.7	19	
No of children	Nil	0	0	2	6.7	0	0	2	$\chi^2=11.2$ p=0.03*
	1	6	20	6	20	3	10.0	15	
	2	0	0	5	16.7	7	23.3	12	
	>3	0	0	1	3.3	0	0	1	
Activity	Able to do ADL	1	3.3	2	6.7	3	10	6	$\chi^2=2.784$ p=0.835
	Able to do with assistant	2	6.7	7	23.3	4	13.3	13	
	Mild restriction	3	10	4	13.3	2	6.7	9	
	Severe restriction	0	0	1	3.3	1	3.3	2	
Opinion	Cooking	2	6.7	4	13.3	6	20	12	$\chi^2=6.629$ p=0.356
	Medicinal use	1	3.3	6	20	1	3.3	8	
	Pain reducing agent	1	3.3	2	6.7	0	0	3	
	Nothing	2	6.7	2	6.7	3	10	7	

\* Significant at  $P \leq 0.05$ , \*\* highly significant at  $P \leq 0.01$ , \*\*\* Very high significant at  $P \leq 0.001$

There is a statistical significant association between the clinical variables like, the participants those who are not having any other illness ( $p \leq 0.04$ ) other than knee pain, and those who have only one child ( $p \leq 0.08$  with CI at 95%) have more reduction of knee pain

**Table 4. 12: Association between level of mustard plaster and their variables (control)**

Demographic variables		Score level( increasing)				Total	Chi-square
		No increase		Increase 1-5			
		Frequency	In %	frequenc y	In %		
Age	50-55 yrs.	3	10	11	36.7	14	$\chi^2=1.674$ p=0.183
	56-60 yrs.	7	23.3	9	30	16	
Education	No formal education	3	10	3	10	6	$\chi^2=3.650$ p=0.455
	Primary education	3	10	6	20	9	
	High school	2	6.7	7	23.3	9	
	Higher secondary	1	3.3	4	13.3	5	
	Diploma	0	0	0	0	0	
	Graduate	1	3.3	0	0	1	
Occupation	Home maker	7	23.3	14	46.7	21	$\chi^2=0.900$ p=0.825
	Labour	1	3.3	4	13.3	5	
	Self employed	1	3.3	1	3.3	2	
	Business	1	3.3	1	3.3	2	
Income	<Rs.1589	0	0	0	0	0	$\chi^2=0.388$ p=0.823
	Rs.1590-4726	2	6.7	5	16.7	7	
	Rs.4727-7877	5	16.7	11	36.7	16	
	Rs.7878-11816	3	10	4	13.3	7	
Religion	Hindu	10	33.3	16	53.3	26	$\chi^2=2.308$ p=0.315
	Muslim	0	0	2	6.7	2	
	Christian	0	0	2	6.7	2	
	Others	0	0	0	0	0	
Diet	Vegetarian	3	10	7	23.3	10	$\chi^2=1.75$ p=0.560
	Non- vegetarian	7	23.3	13	43.3	20	
Marital status	Married	4	13.3	12	40	16	$\chi^2=2.250$ p=0.522
	Un married	0	0	1	3.3	1	
	Divorced	1	3.3	2	6.7	3	
	Widow	5	16.7	5	16.7	10	
Members	<2	1	3.3	0	0	1	$\chi^2=3.982$ p=0.263
	2-3	2	6.7	8	26.7	10	
	4-5	3	10	8	26.7	11	
	>6	4	13.3	4	13.3	8	

\* Significant at  $P \leq 0.05$

\*\* highly significant at  $P \leq 0.01$

\*\*\* Very high significant at  $P \leq 0.001$

There is no evidence of statistical significance

**Table 4. 13 Association between level of mustard plaster and their anthropometric measurements (control)**

Anthropometric measurements		Score level( increasing)				Total	Chi-square
		No increase		Increase 1-5			
		Frequency	In %	frequency	In %		
Height	146-150cm	4	13.3	12	40	16	$\chi^2=1.200$ p=0.548
	151-155 cm	4	13.3	6	20	10	
	156-160 cm	2	6.7	2	6.7	4	
	>160 cm	0	0	0	0	0	
Weight	46-50kg	0	0	2	6.7	2	$\chi^2=7.745$ <b>p=0.06*</b>
	51-55 kg	3	10	12	40.0	15	
	56-60 kg	7	23.3	4	13.3	11	
	>60 kg	0	0	2	6.7	2	
BMI	Under weight	0	0	0	0	0	$\chi^2=2.714$ p=0331
	Normal	6	20	15	50	21	
	Over weight	4	13.3	5	16.7	9	
	<b>obese</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

\* Significant at  $P \leq 0.05$

\*\* highly significant at  $P \leq 0.01$

\*\*\* Very high significant at  $P \leq 0.001$

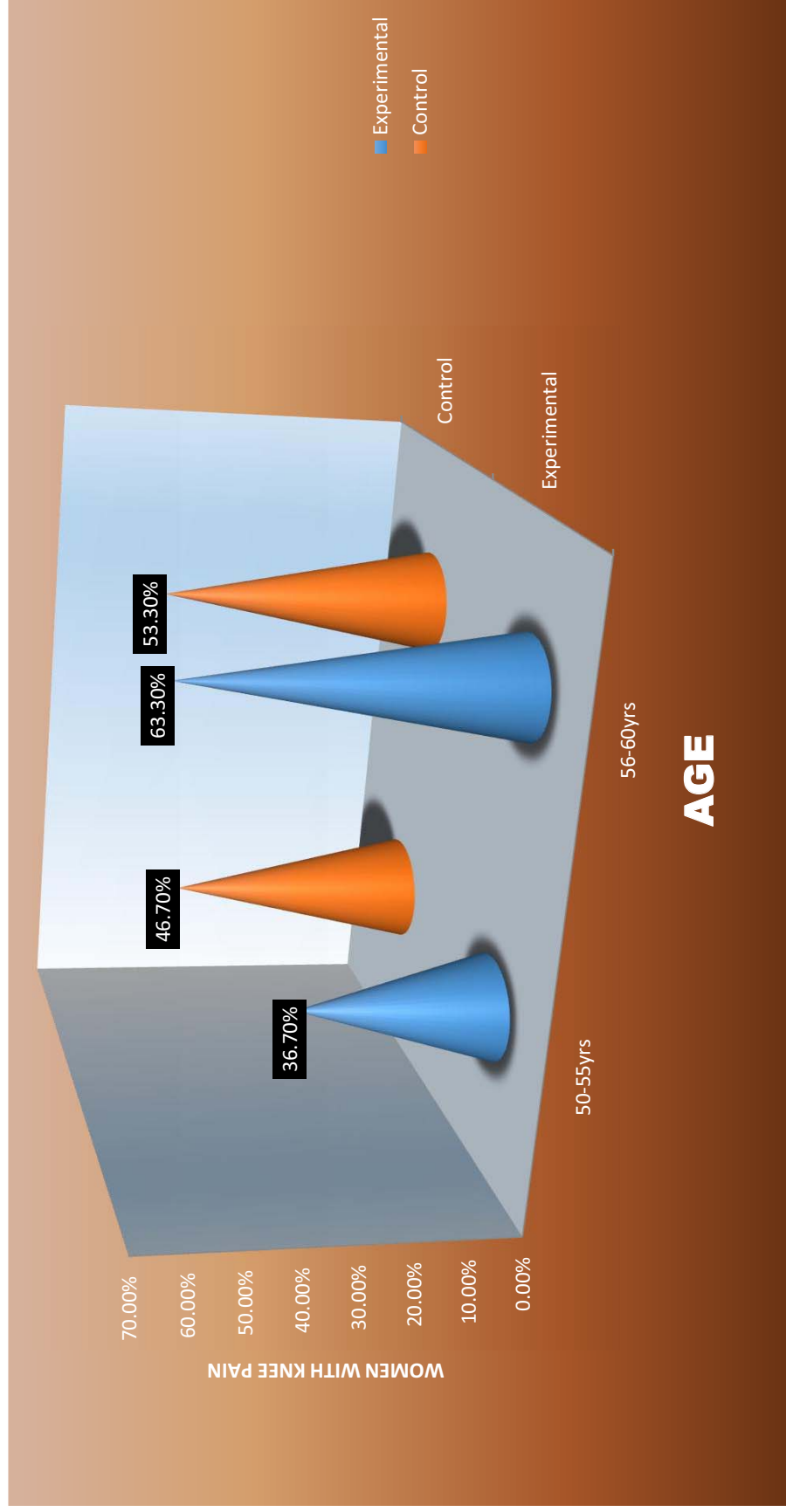
Among the study participants those have weight between the 50-55kg are ( $\chi^2=7.745$ , **p=0.06\***) statistically significant association with the reduction of knee pain at  $p \leq 0.05$  with CI 95%

**Table4. 14: Association between level of mustard plaster and their knee pain variables (control)**

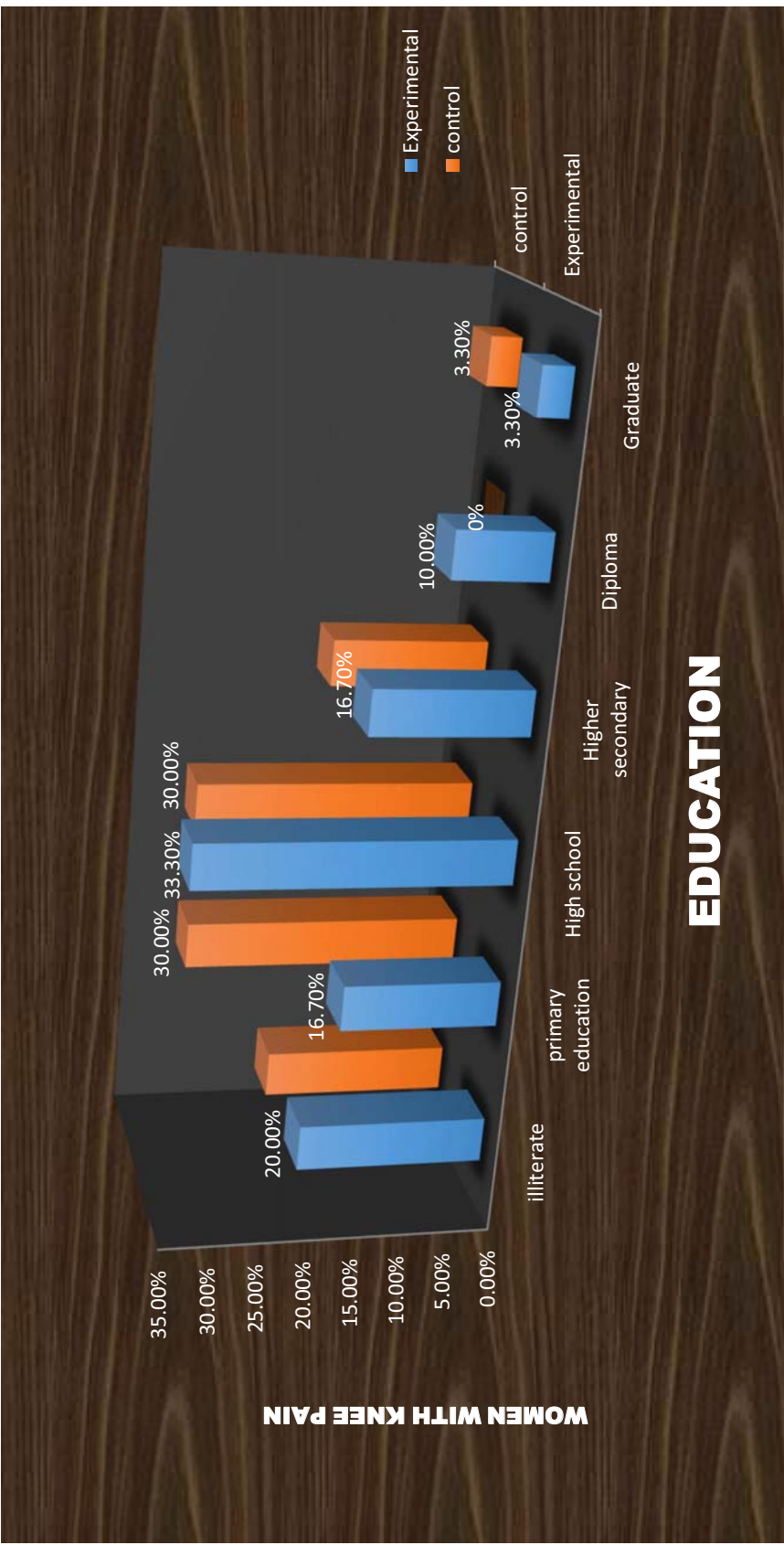
Demographic variables		Score level(increasing)				Total	Chi-square
		No increase		Increase1-5			
		Frequency	In %	Frequency	In %		
Duration of pain	3 months	1	3.3	7	23.3	8	$\chi^2=8.466$ p= <b>0.04</b> *
	6 months	8	26.7	5	16.7	13	
	1 year	1	3.3	5	16.7	6	
	>1 year	0	0	3	10.0	3	
Type of pain	Sharp	4	13.3	7	23.3	11	$\chi^2=0.803$ p=0.849
	Dull	1	3.3	4	13.3	5	
	Burning	2	6.7	5	16.7	7	
	Pricking	3	10	4	13.3	7	
Remedy for pain	Ointments	5	16.7	8	26.7	13	$\chi^2=1.754$ p=0.625
	Hot water fomentation	0	0	2	6.7	2	
	Drugs	4	13.3	6	20	10	
	Exercise	1	3.3	4	13.3	5	
Drugs	T. paracetamol	3	10	3	10	6	$\chi^2=1.337$ p=0.512
	T. Voveran	0	0	0	0	0	
	T. Brufen	0	0	1	3.3	1	
	Nil	7	23.3	16	53.3	23	
Severity of pain	Walking	2	6.7	7	23.3	9	$\chi^2=8.600$ p= <b>0.03</b> *
	Sitting	4	13.3	1	3.3	5	
	House hold work	0	0	6	20.0	6	
	Every time	4	13.3	6	20.0	10	
Other illness	Diabetes mellitus	4	13.3	6	20	10	$\chi^2=0.396$ p=0.941
	Hyper tension	2	6.7	5	16.7	7	
	Asthma	1	3.3	3	10	4	
	Nil	3	10	6	20	9	
Other treatment	Ayurveda	3	10	5	16.7	8	$\chi^2=1.955$ p=0.582
	Siddha	2	6.7	2	6.7	4	
	Acupuncture	2	6.7	2	6.7	4	
	Nil	3	10	11	36.7	14	
Number of children	Nil	1	3.3	1	3.3	2	$\chi^2=2.036$ p=0.565
	1	6	20	12	40	18	
	2	3	10	4	13.7	7	
	>3	0	0	3	10	3	
Activity	Able to do ADL	5	16.7	7	23.3	12	$\chi^2=1.413$ p=0.702
	Able to do with assistant	4	13.3	9	30	13	
	Mild restriction	1	3.3	2	6.7	3	
	Severe restriction	0	0	2	6.7	2	
Opinion about mustard	Cooking	5	16.7	10	33.3	15	$\chi^2=2.850$ p=0.415
	Medicinal use	3	10	2	6.7	5	
	Pain reducing agent	0	0	2	6.7	2	
	Nothing	2	6.7	6	20	8	

\* Significant at  $P \leq 0.05$  \*\* highly significant at  $P \leq 0.01$  \*\*\* very high significant at  $P \leq 0.001$

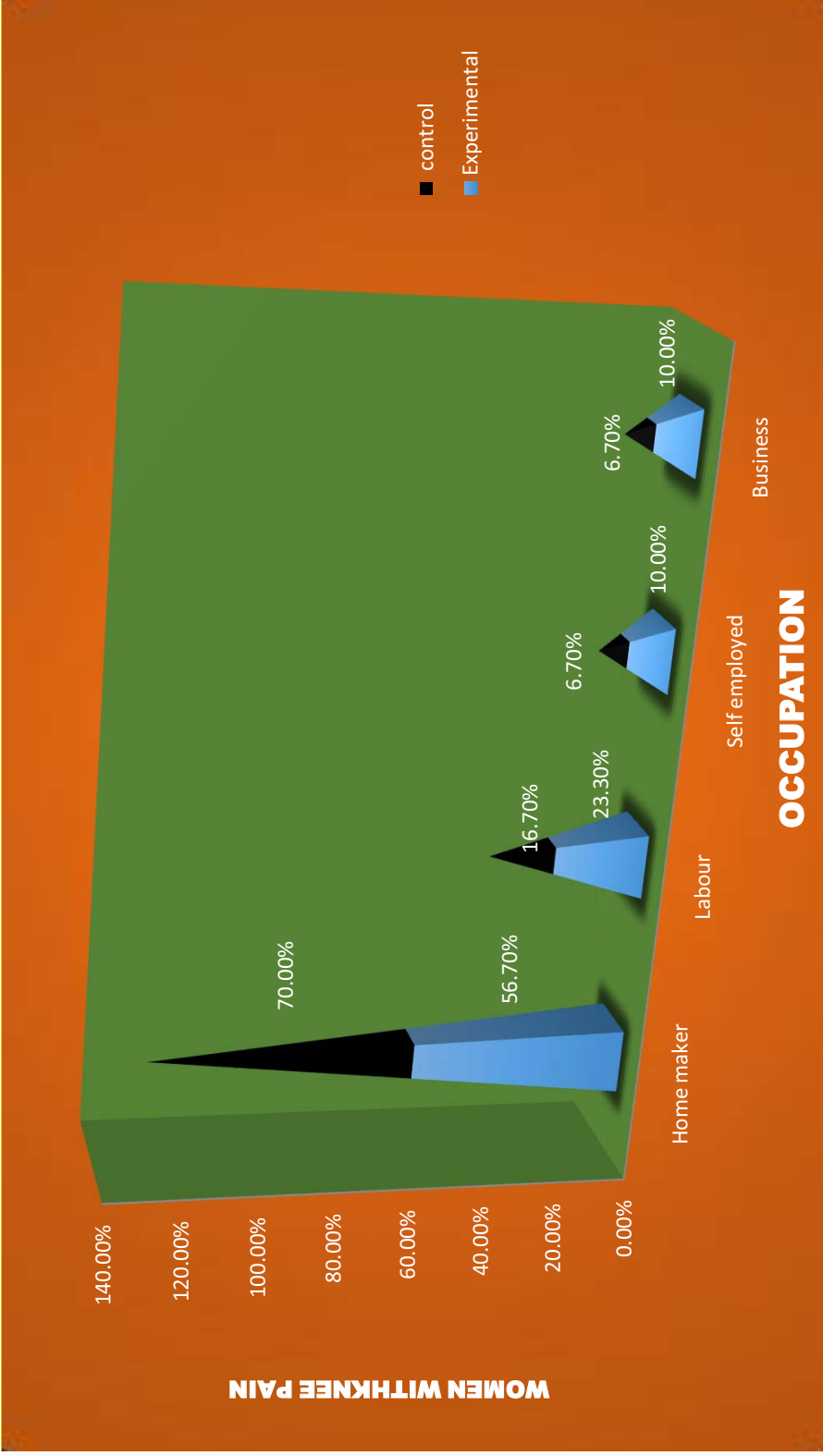
There is a statistical significance with the clinical variables like duration of knee pain for 6 months ( $p \leq 0.04$ ) and those who have pain during walking ( $p \leq 0.03$ ) had more reduction of knee pain.



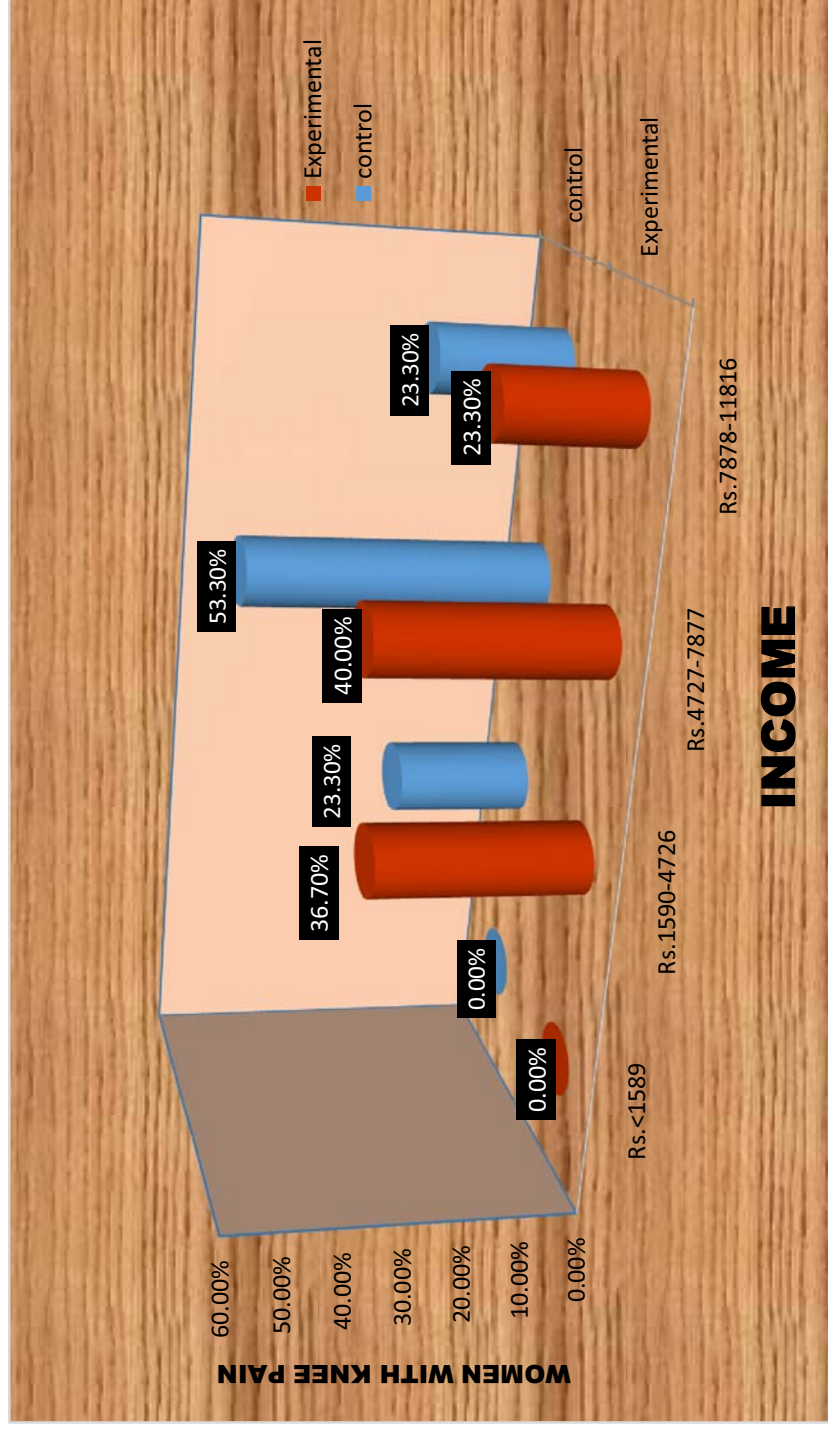
**Figure 4.1: Age wise distribution of women with knee pain.**



**Figure 4.2: Educational status Wise distribution of women with knee pain.**

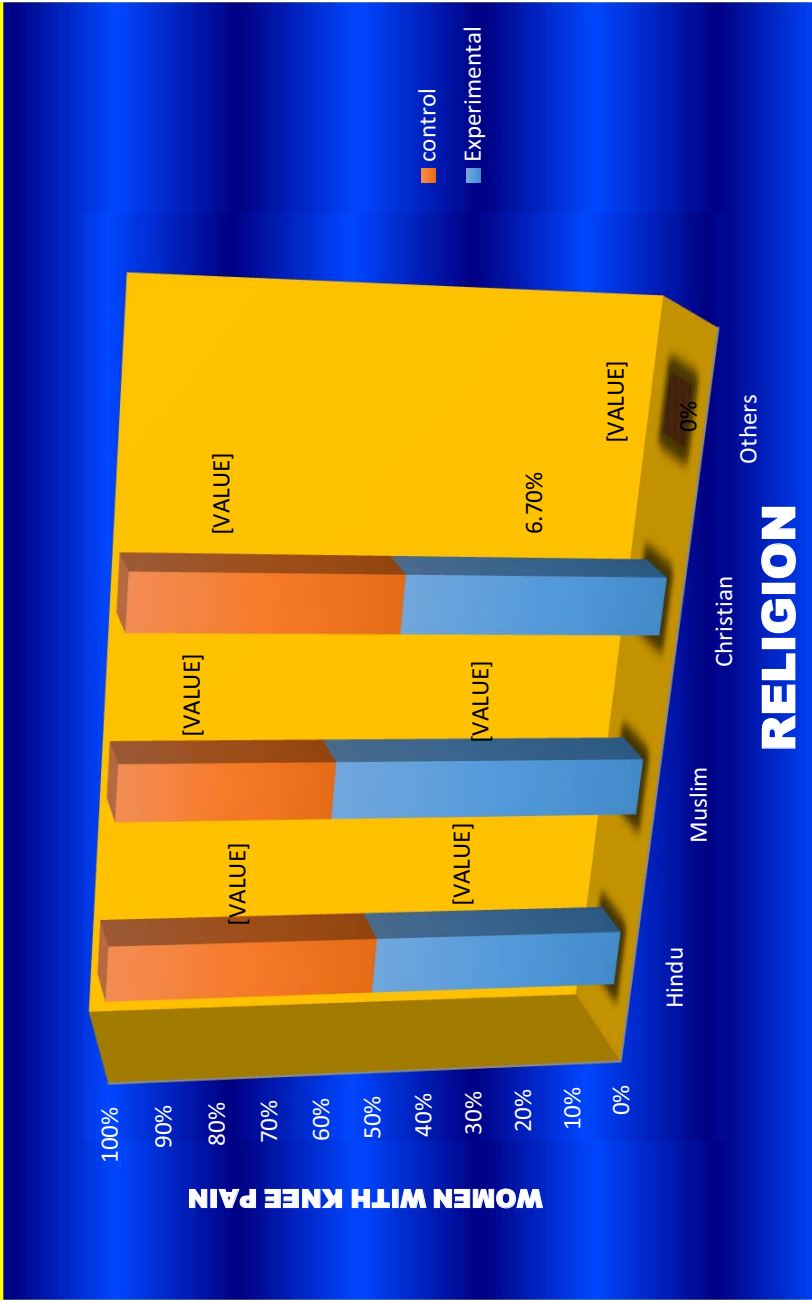


**Figure 4.3: occupation wise distribution of women with knee pain.**



**Figure 4.4: Income Wise distribution of women with knee pain**

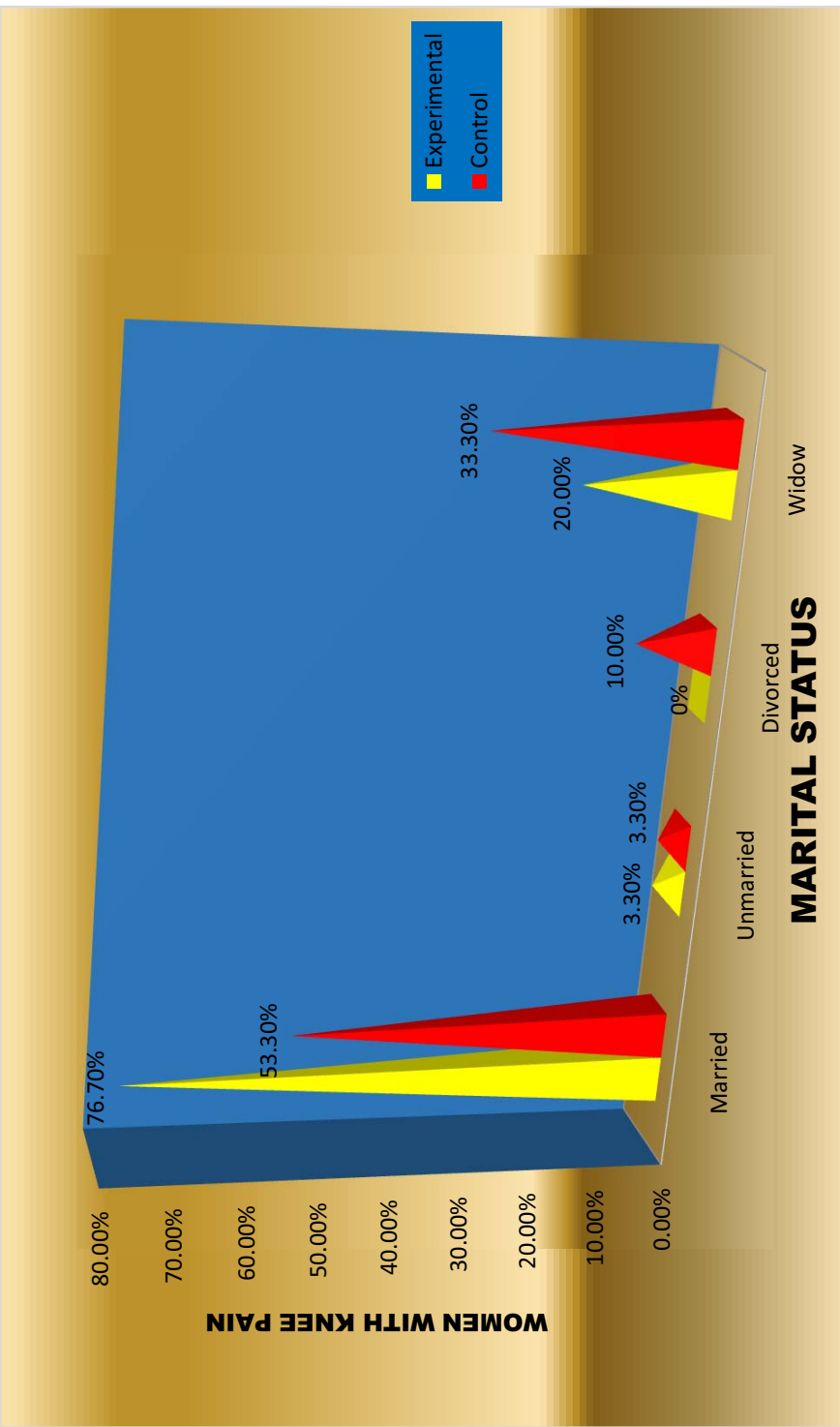




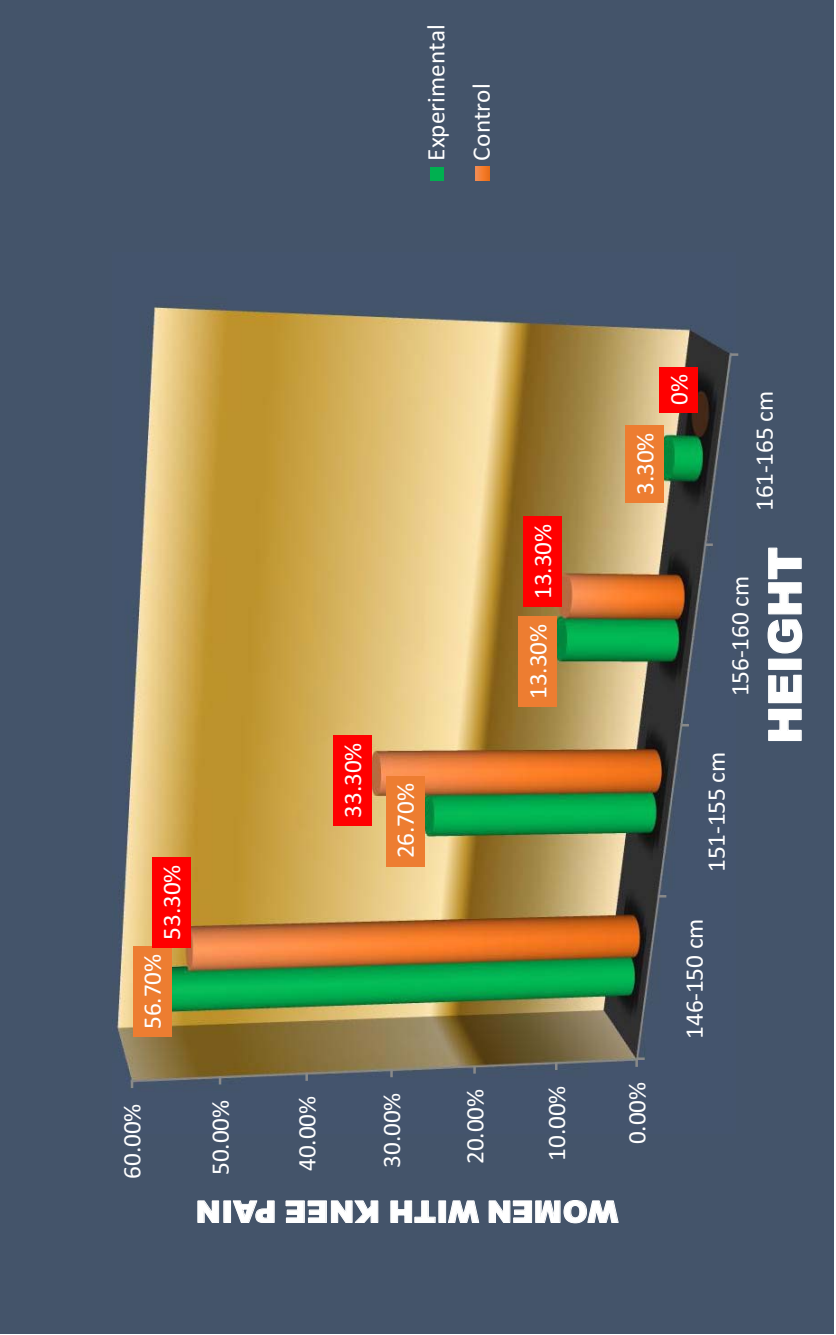
**Figure 4.5: Religion wise distribution of women with knee pain.**



**Figure 4.6: Diet wise distribution of women with knee pain.**



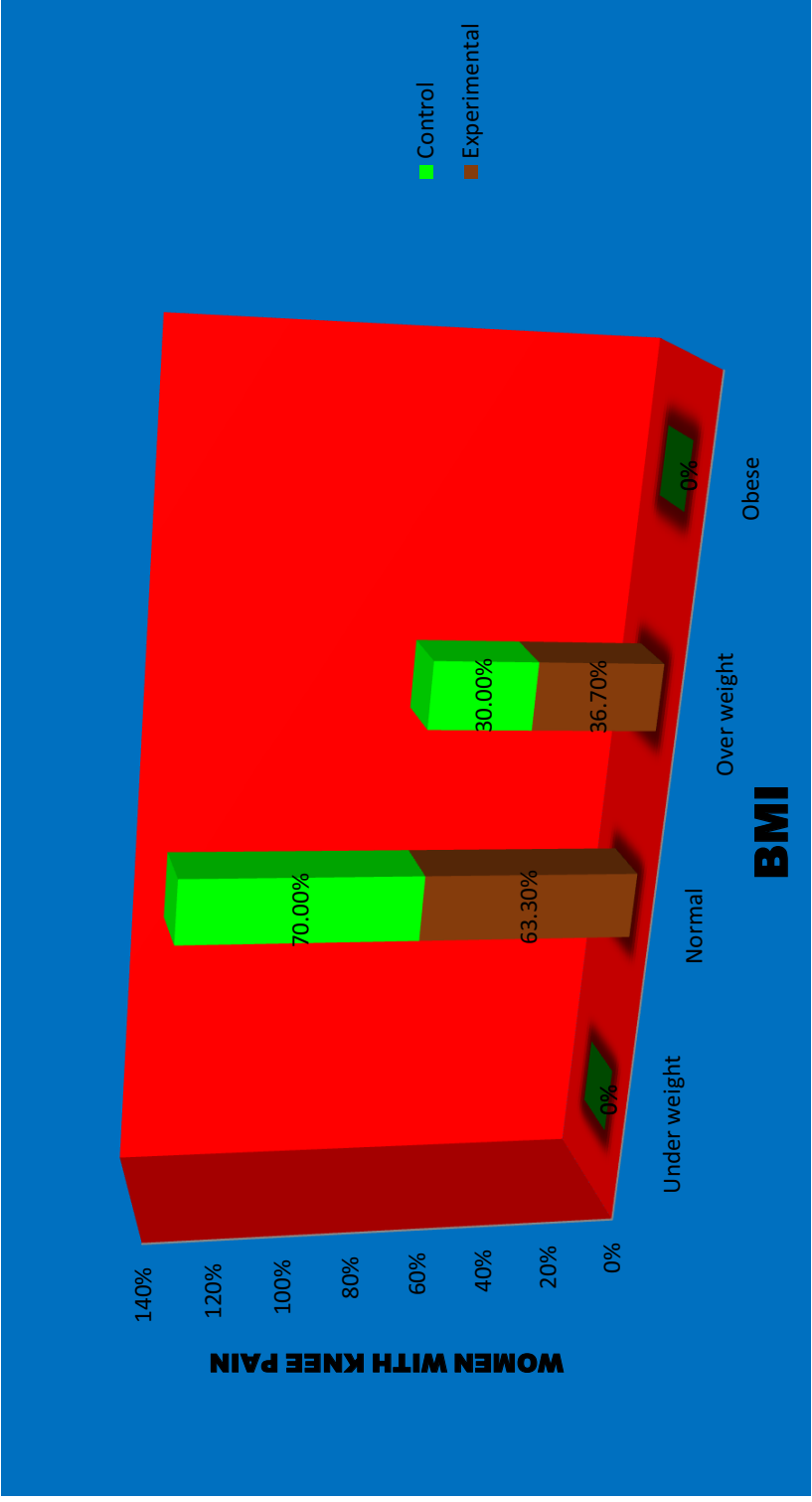
**Figure 4.7: Marital status of women with knee pain**



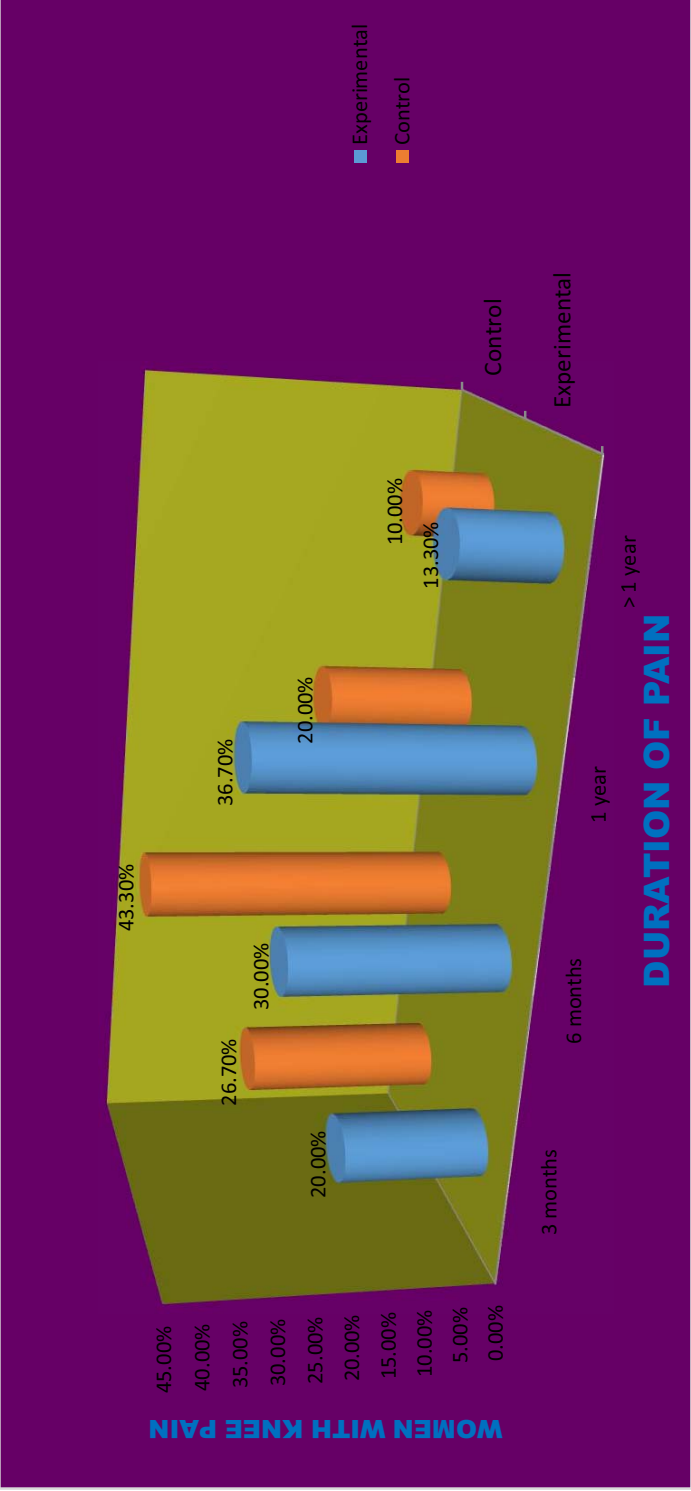
**Figure 4.8: Height Wise distribution of women with knee pain**



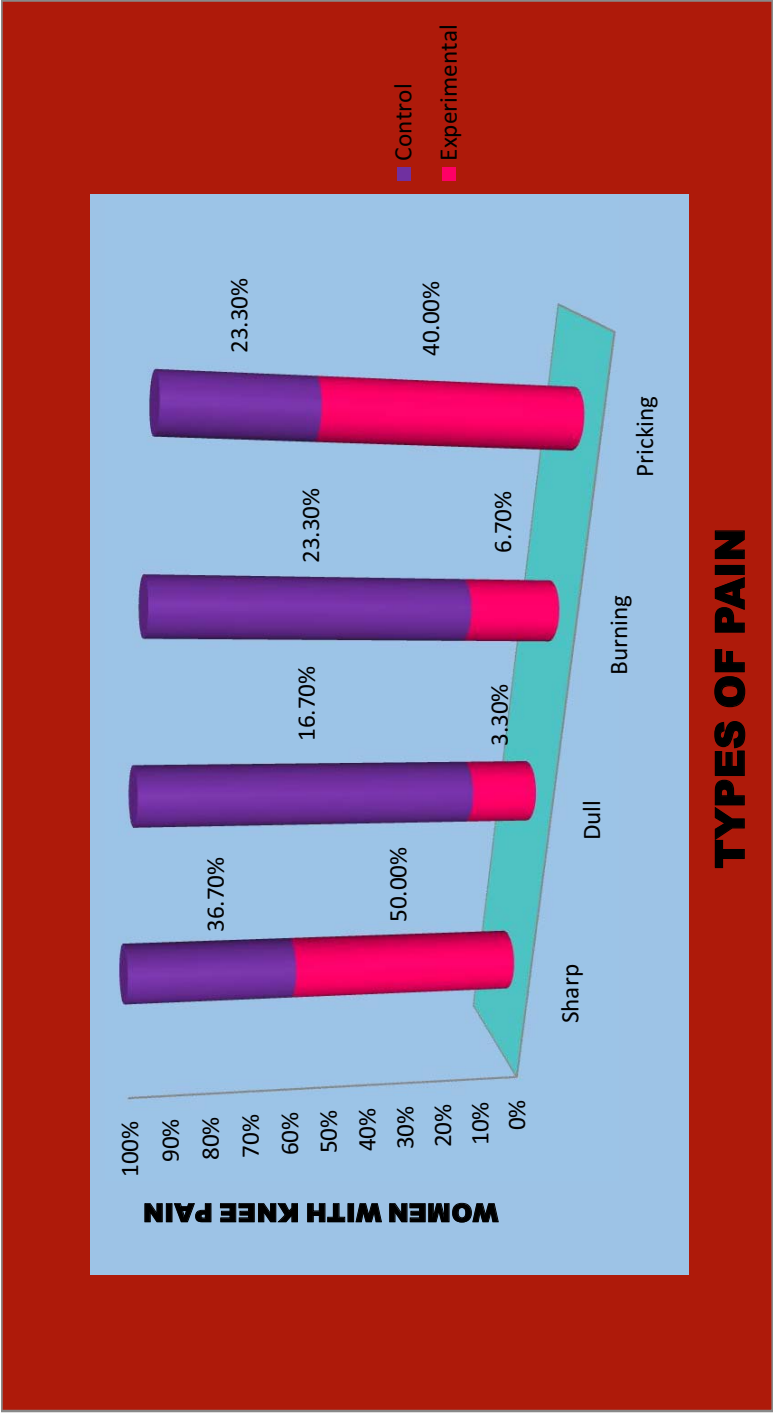
**Figure 4.9: Weight wise distribution of women with knee pain**



**Figure 4.10: BMI wise distribution of women with knee pain**

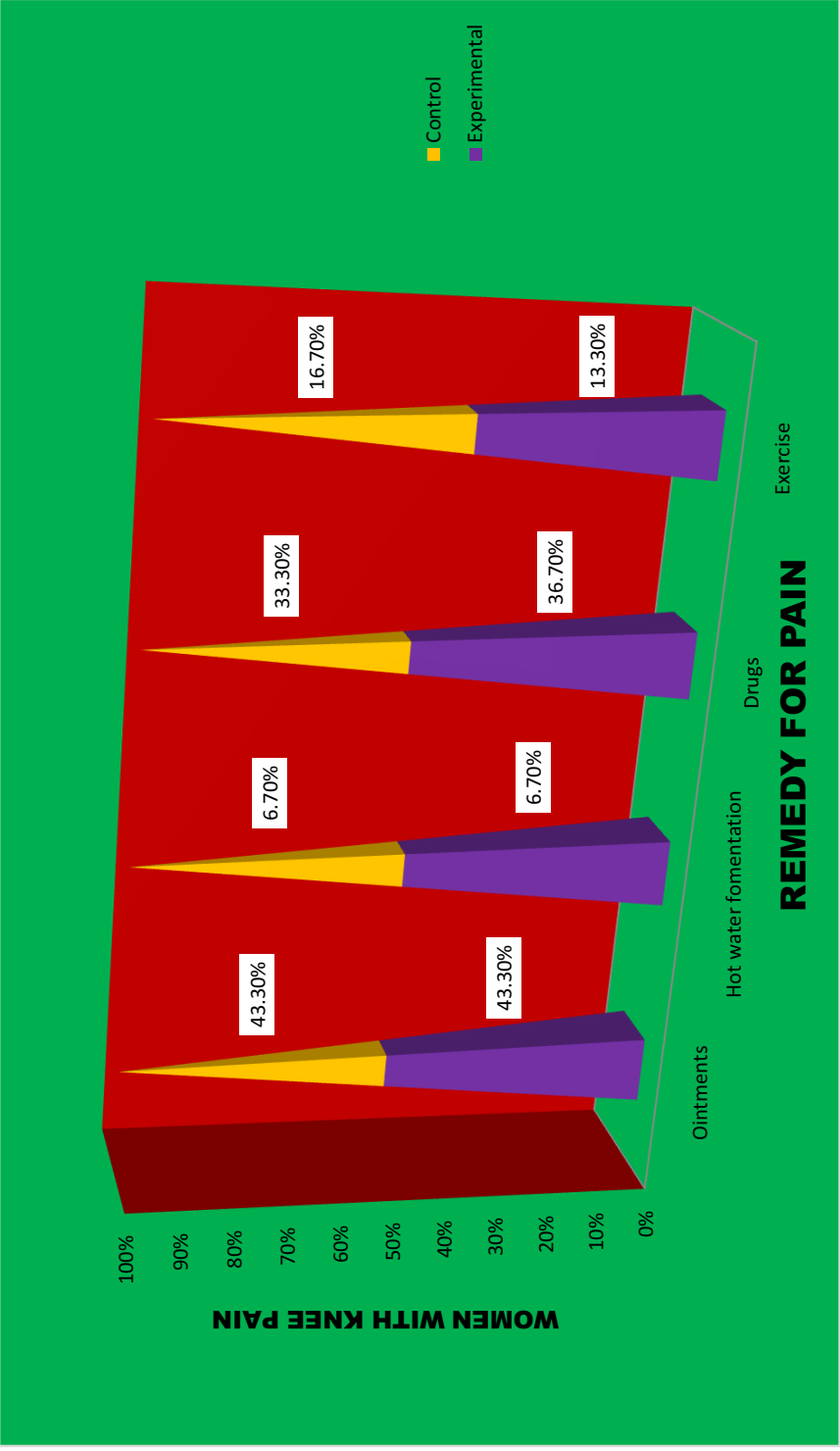


**Figure 4.11: Duration of pain distribution of women with knee pain.**

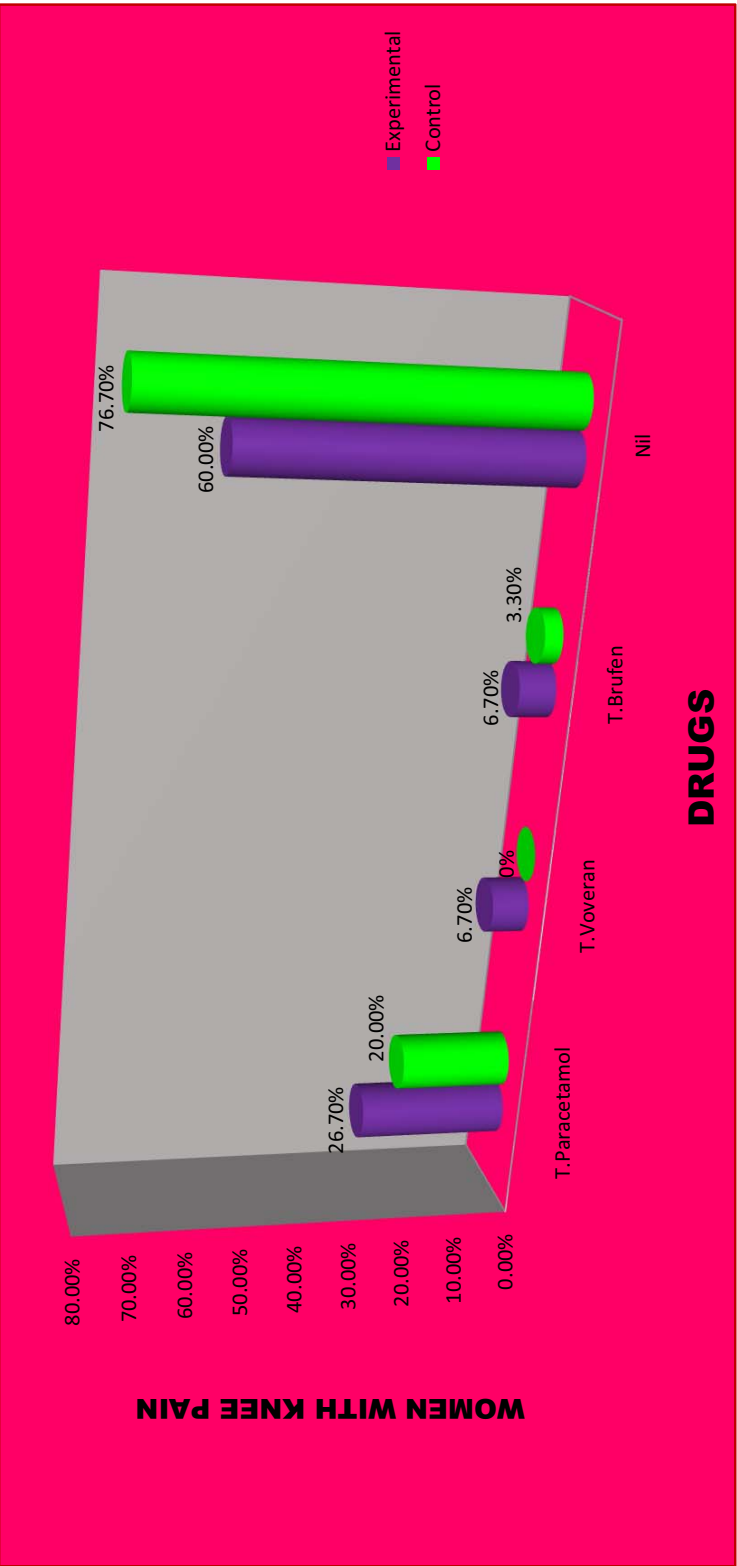


**Figure 4.12: Types of pain wise distribution of women with knee pain.**

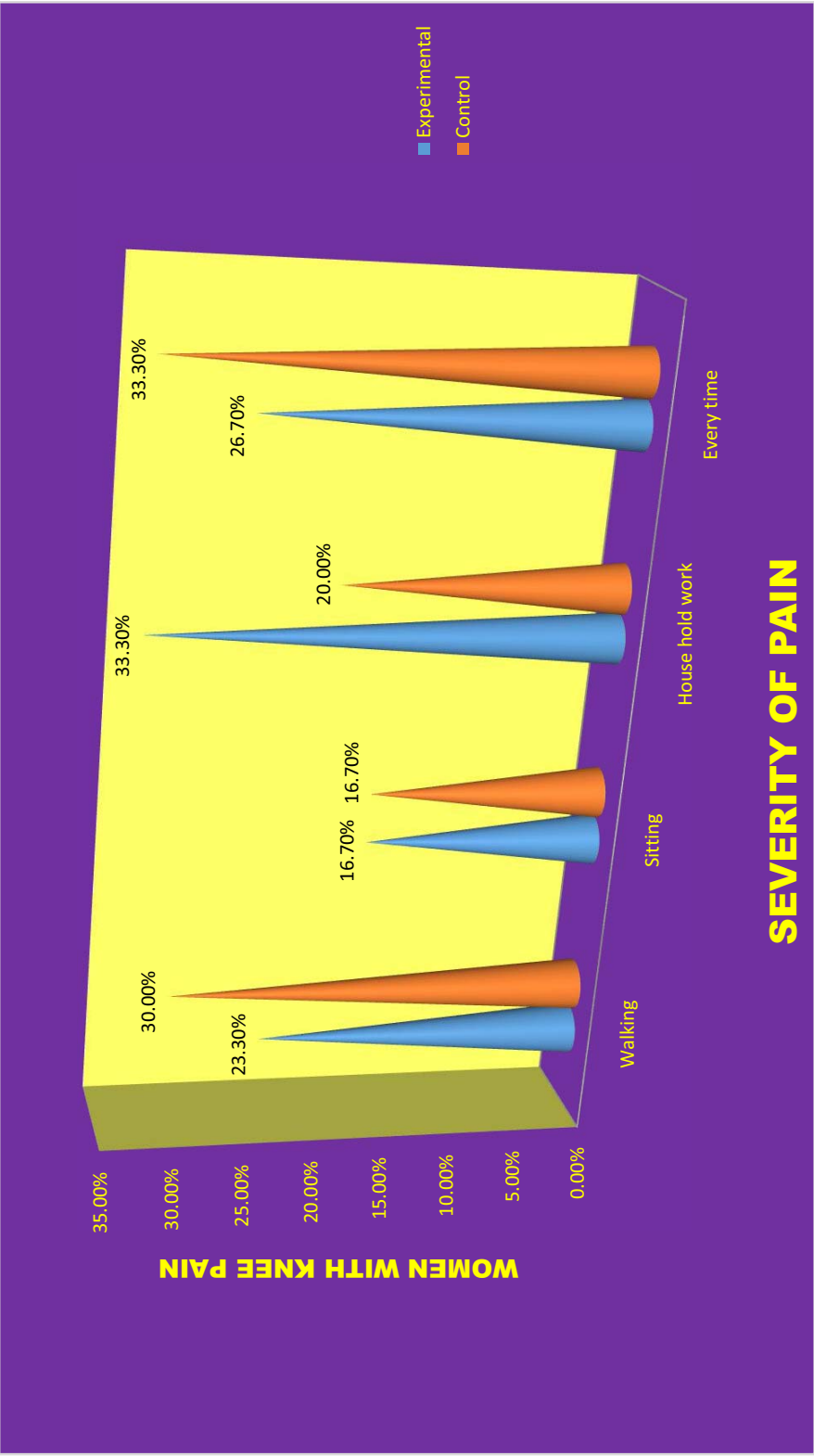




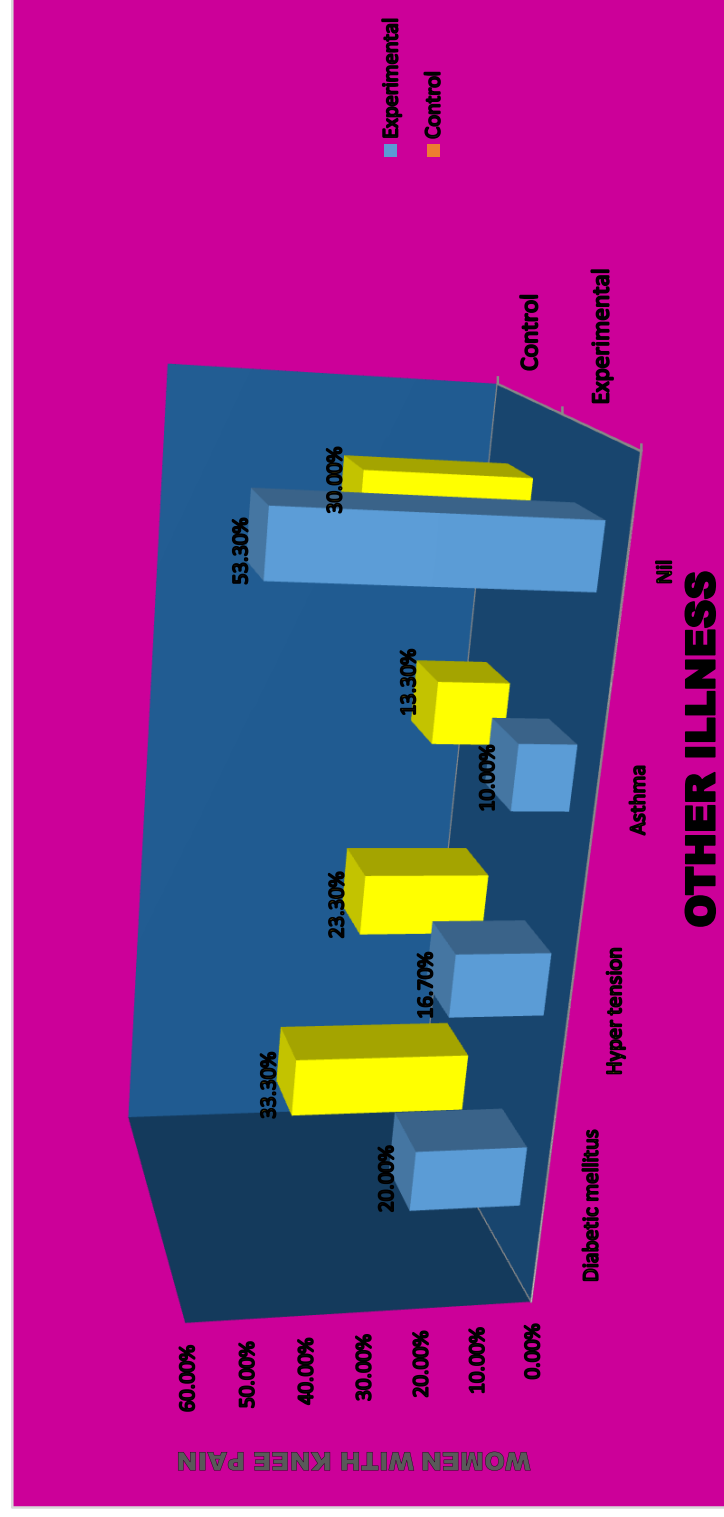
**Figure 4.13: Remedy for pain distribution of women with knee pain.**



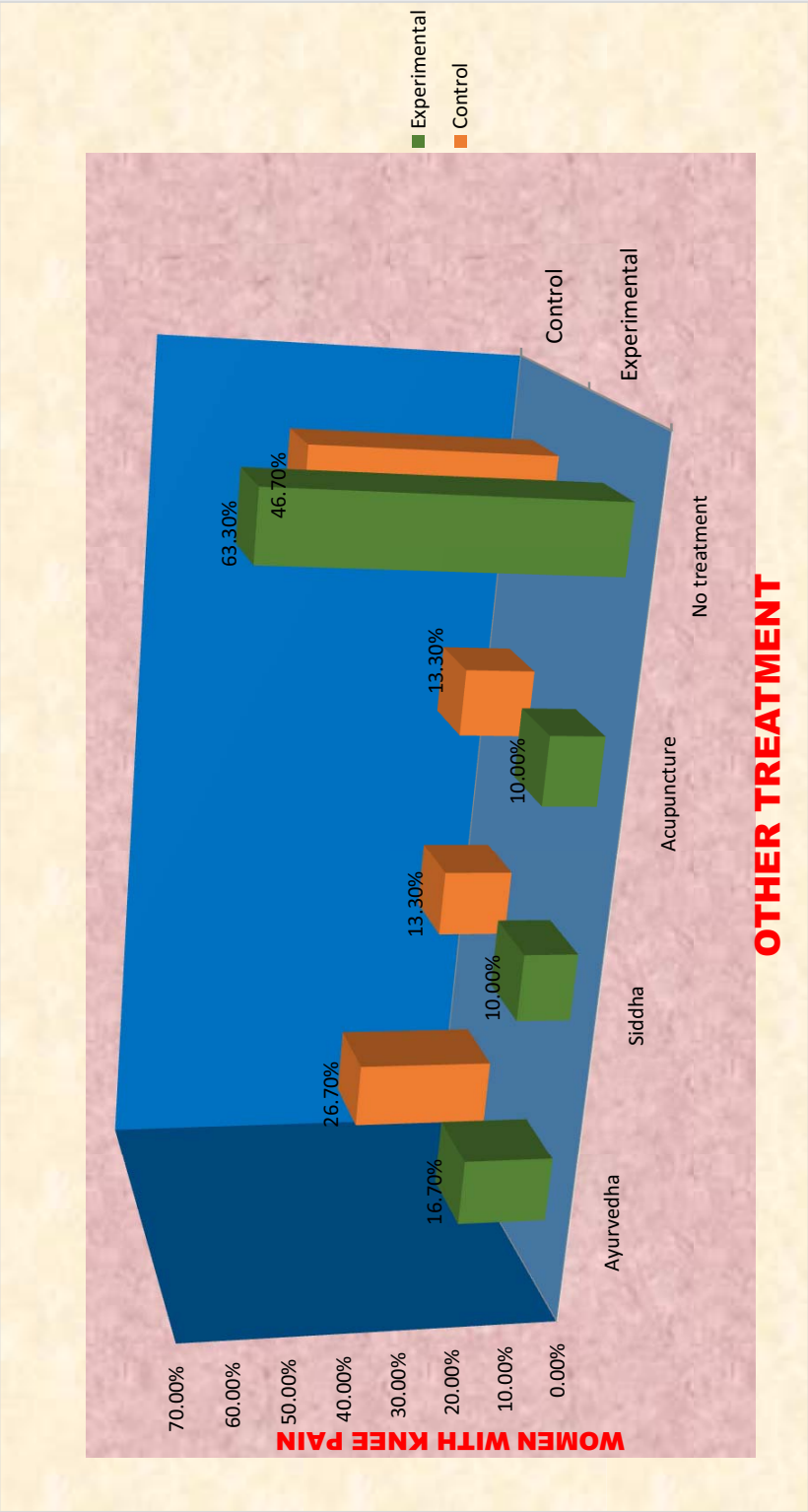
**Figure 4.14 Drugs wise distribution of women with knee pain.**



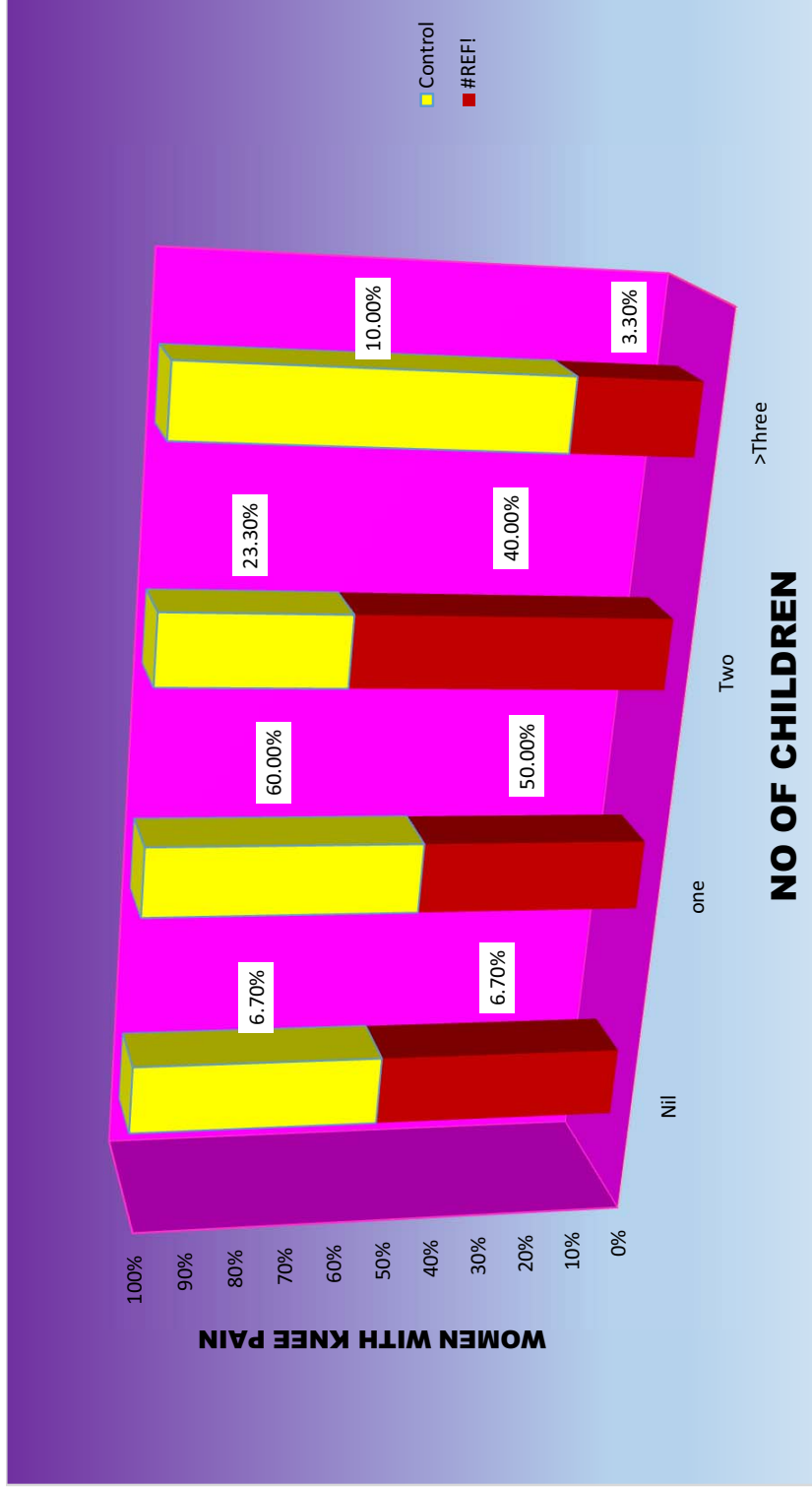
**Figure 4.15: Severity of pain wise distribution of women with knee pain.**



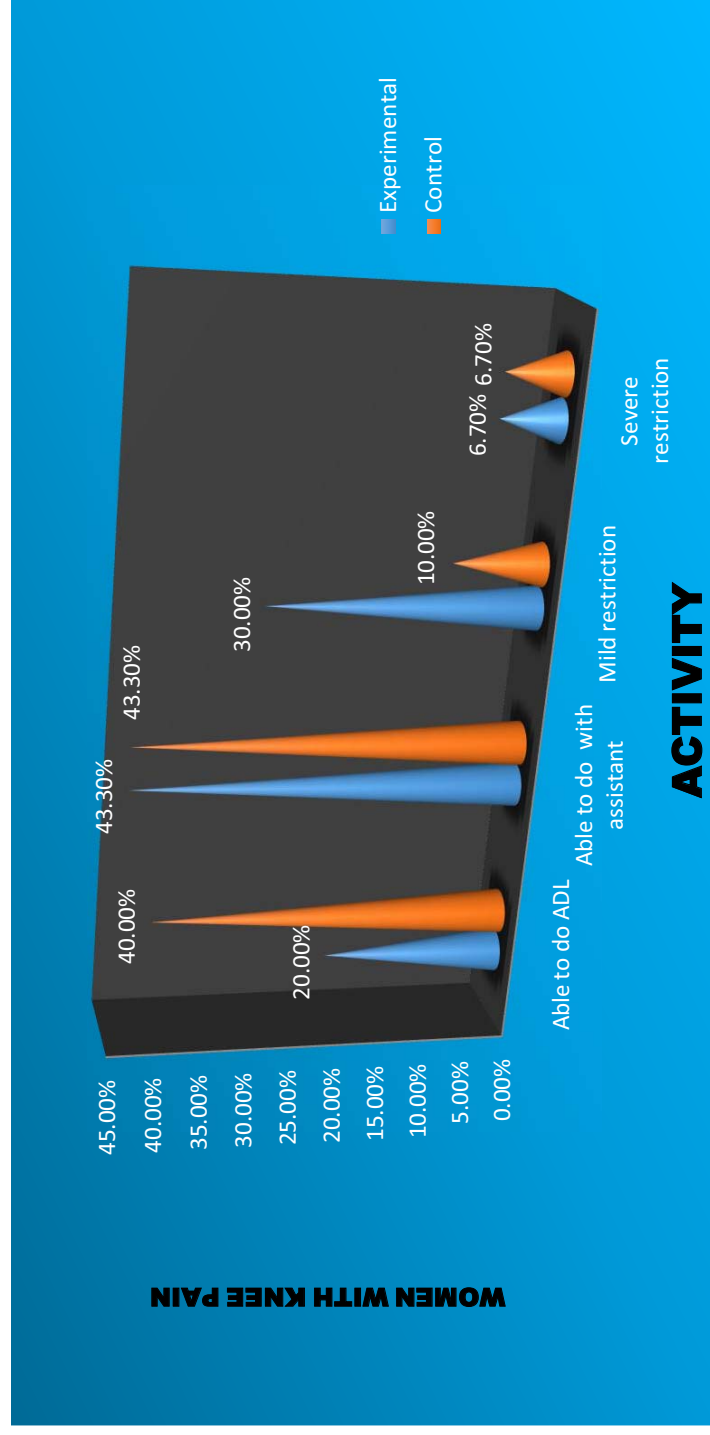
**Figure 4.16: Other illness wise distribution of women with knee pain.**



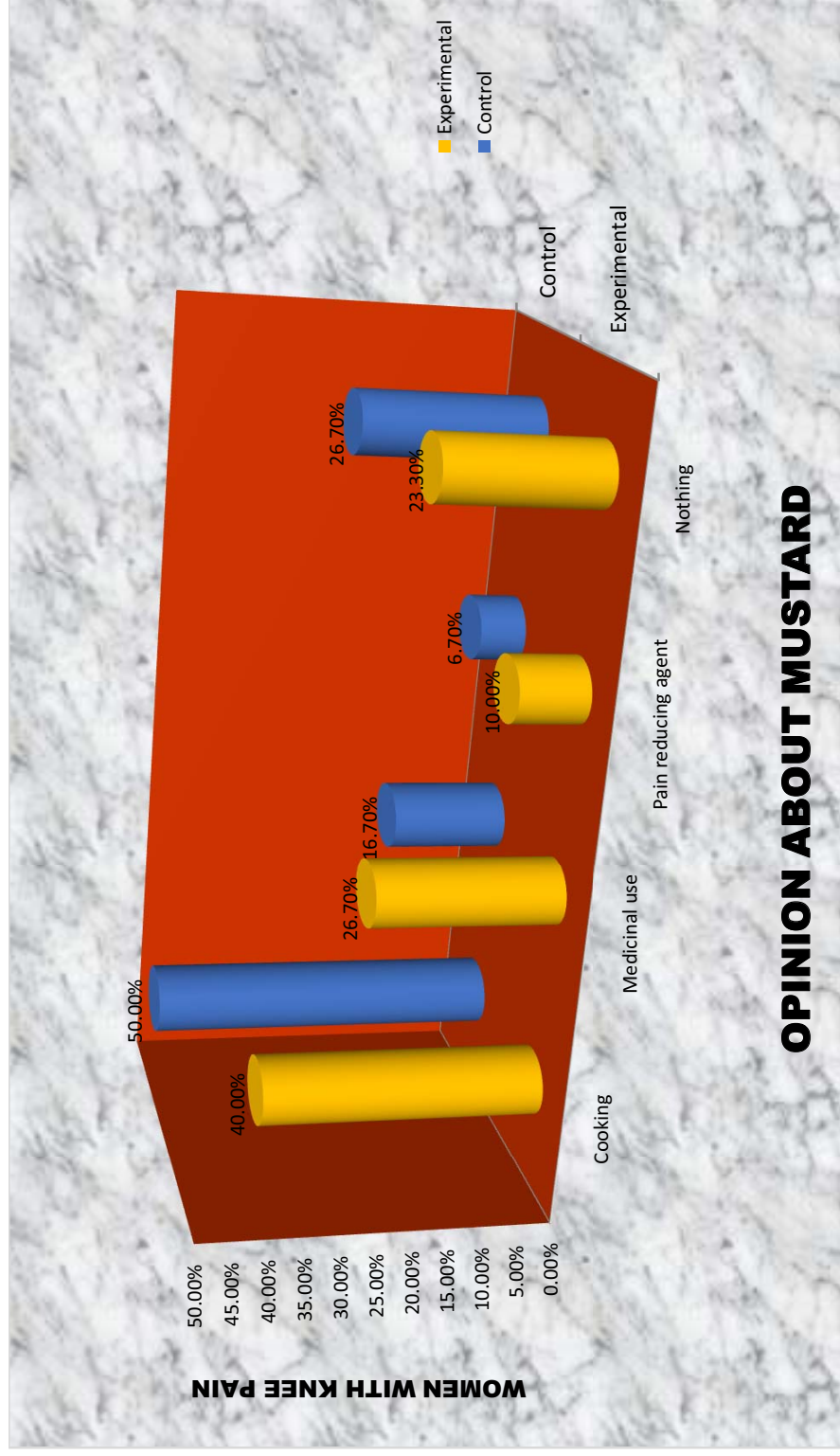
**Figure 4.17: Other Treatment Wise distribution of women with knee pain.**



**Figure 4.18:No of children Wise distribution of women with knee pain.**

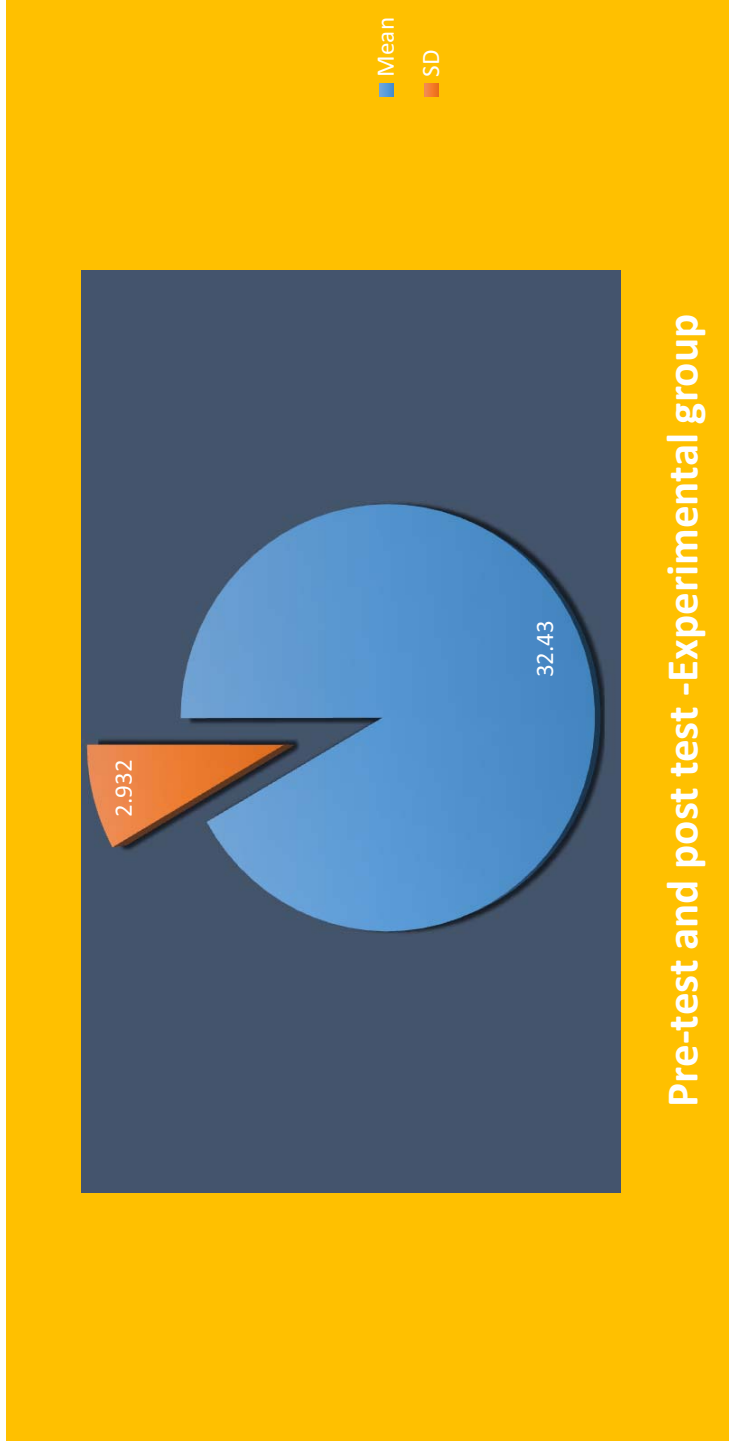


**Figure 4.19: Activity wise distribution of women with knee pain.**

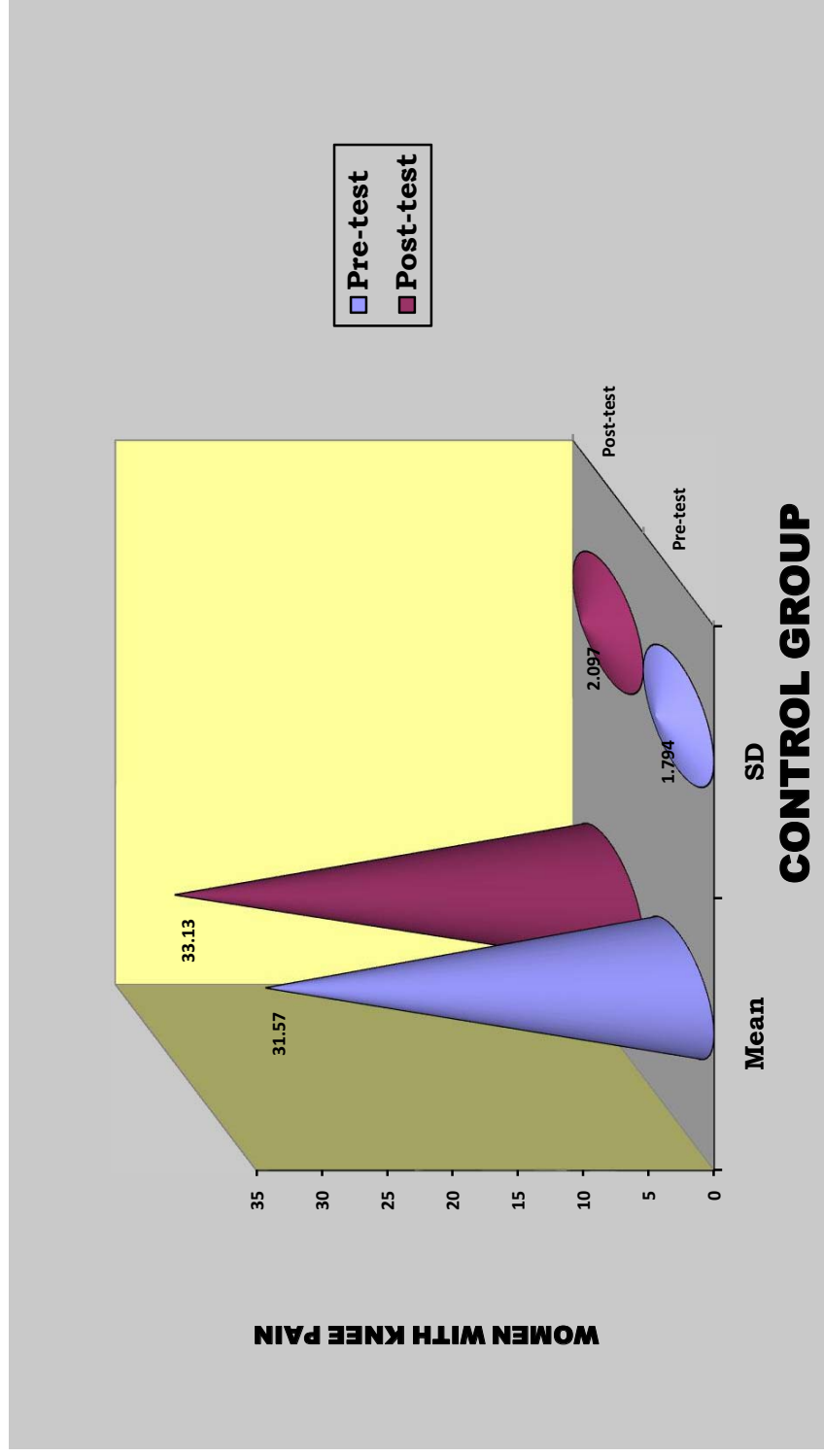


**Figure 4.20: Women's with the opinion by mustard**

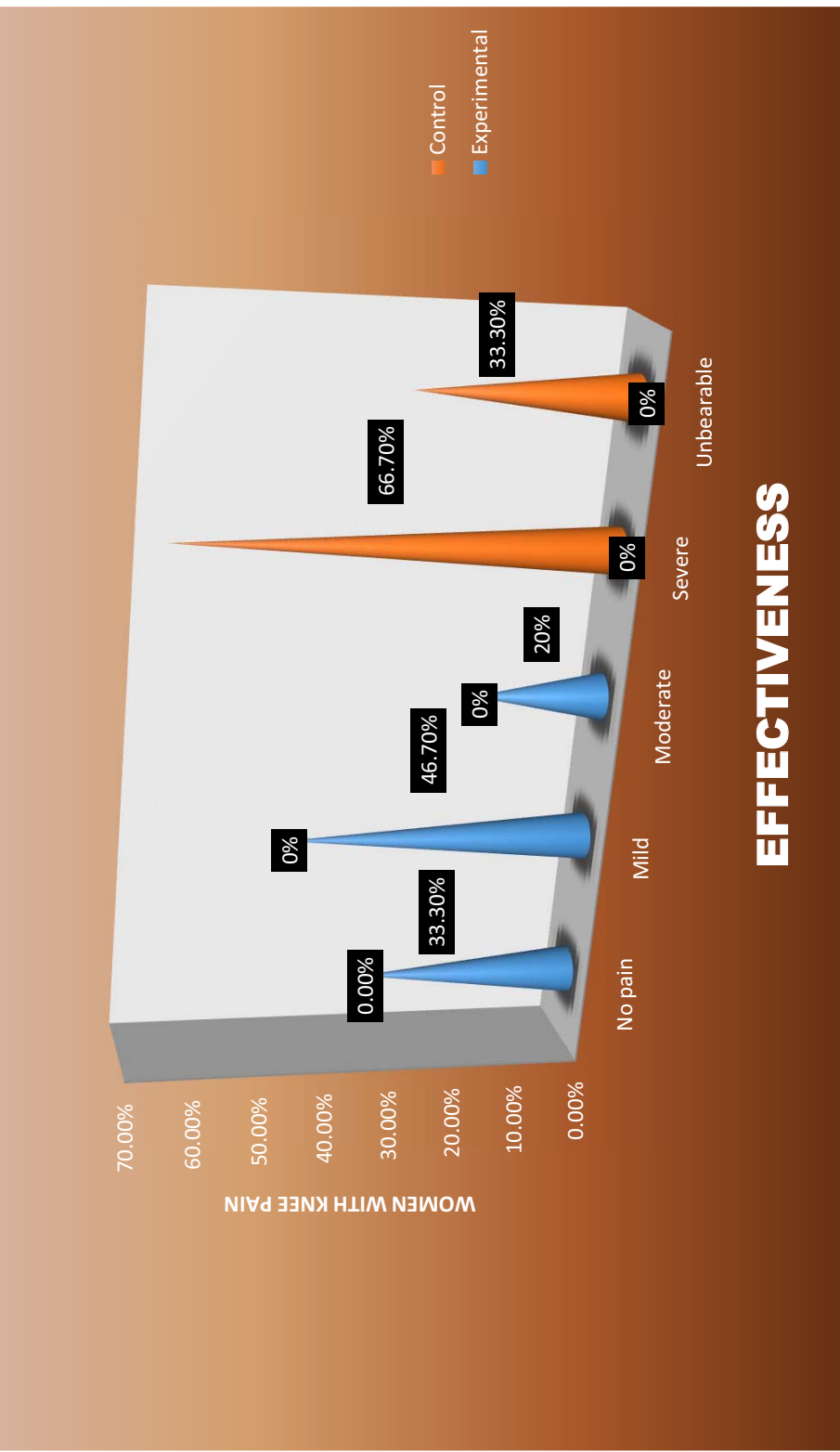




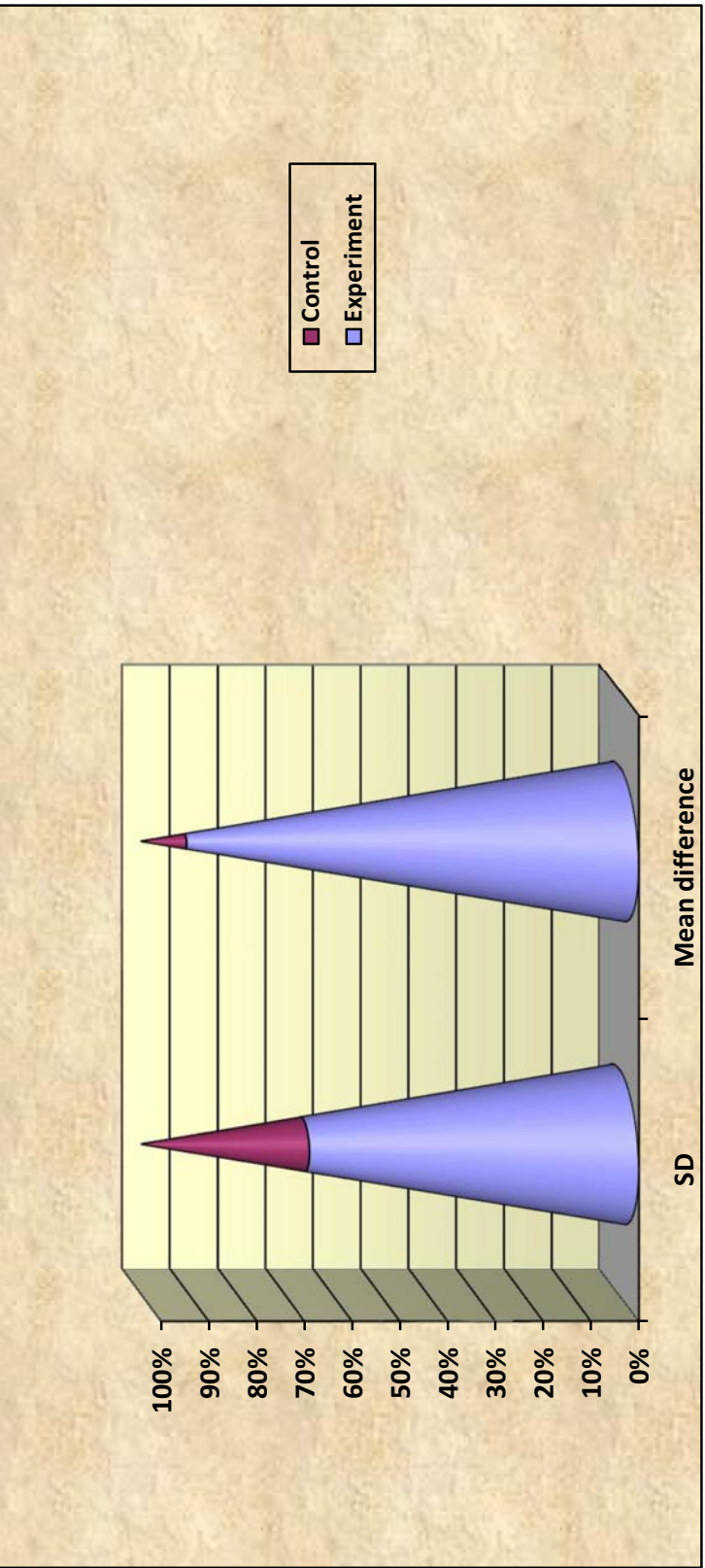
**Figure 4.2.1: pre and post assessment mean score and SD in experimental group**



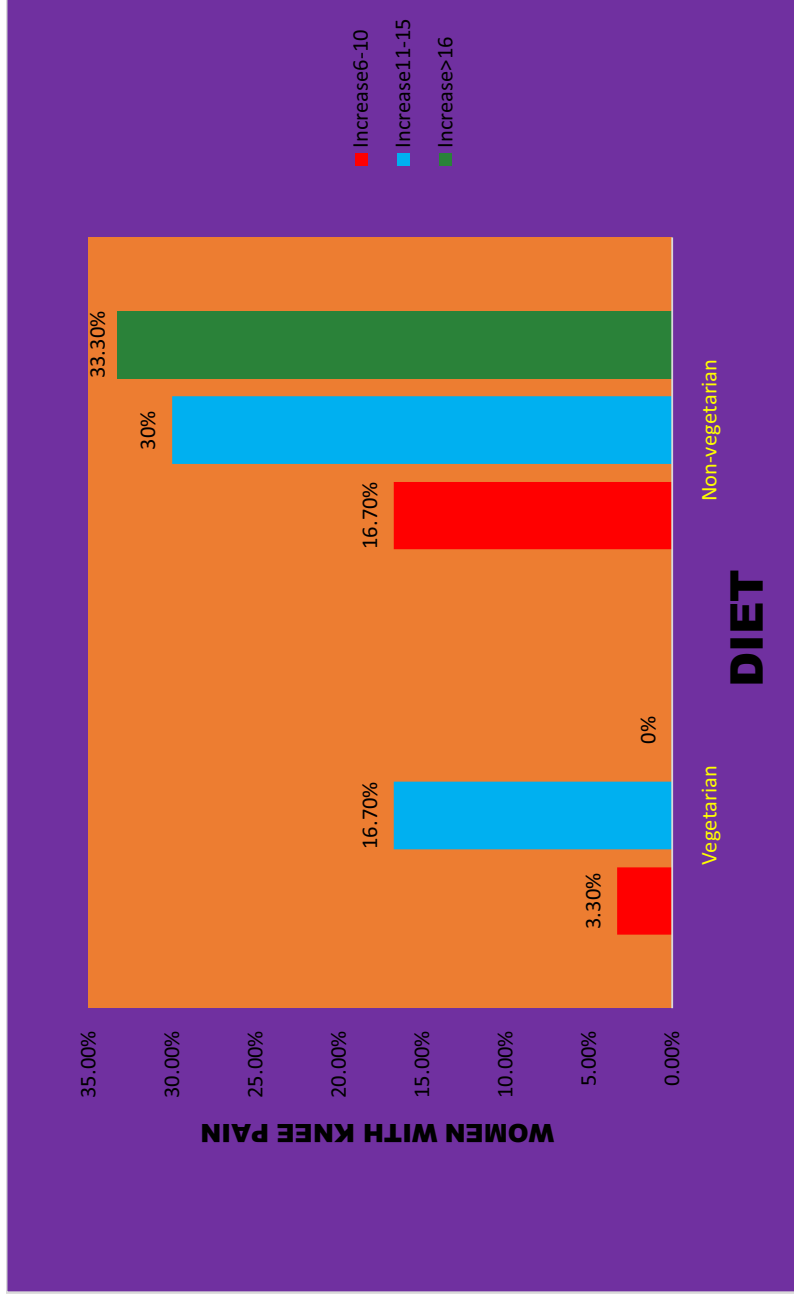
**Figure 4.22: pre and post assessment score in control group**



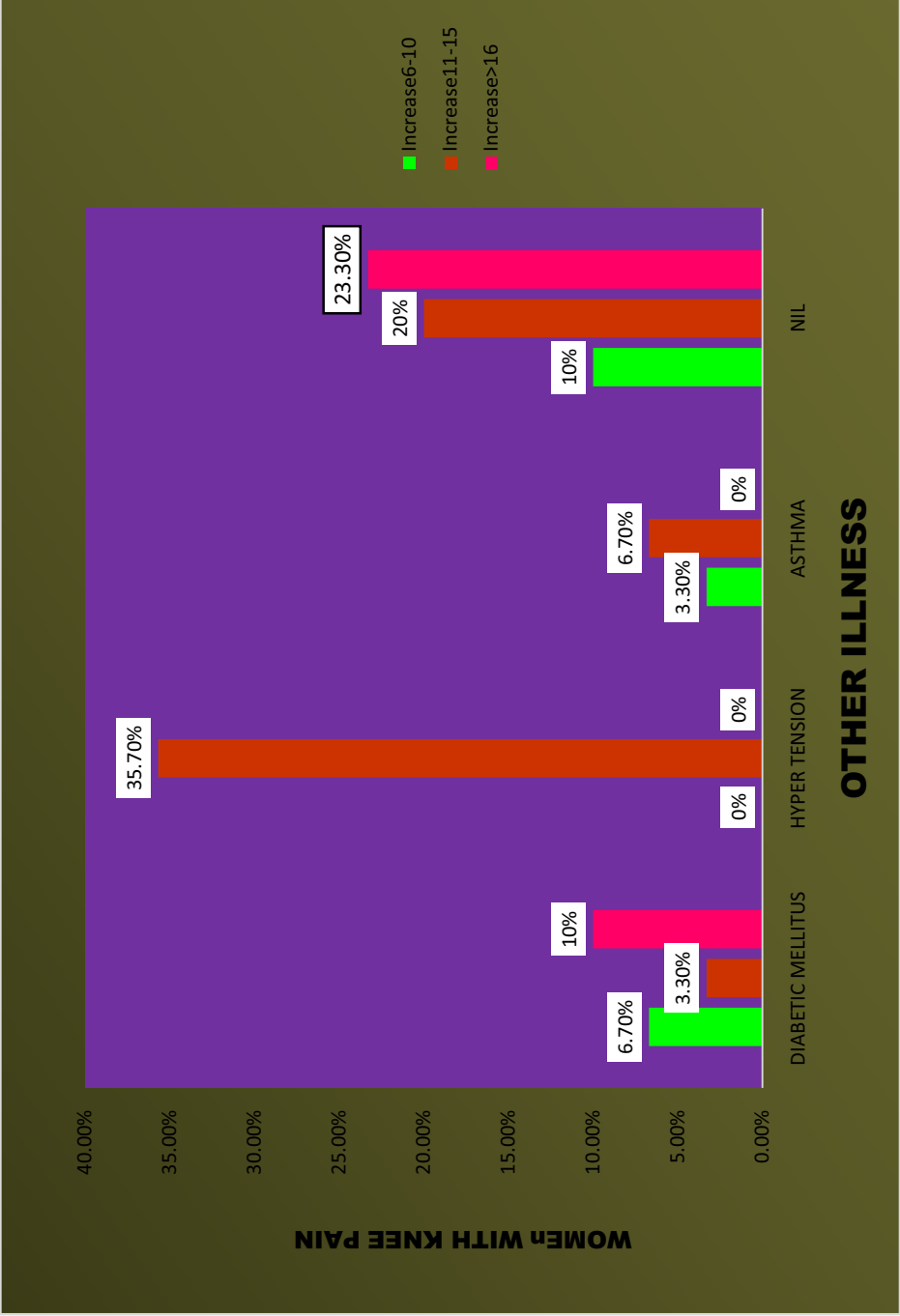
**Figure 4.23: Effectiveness in experimental and control group**



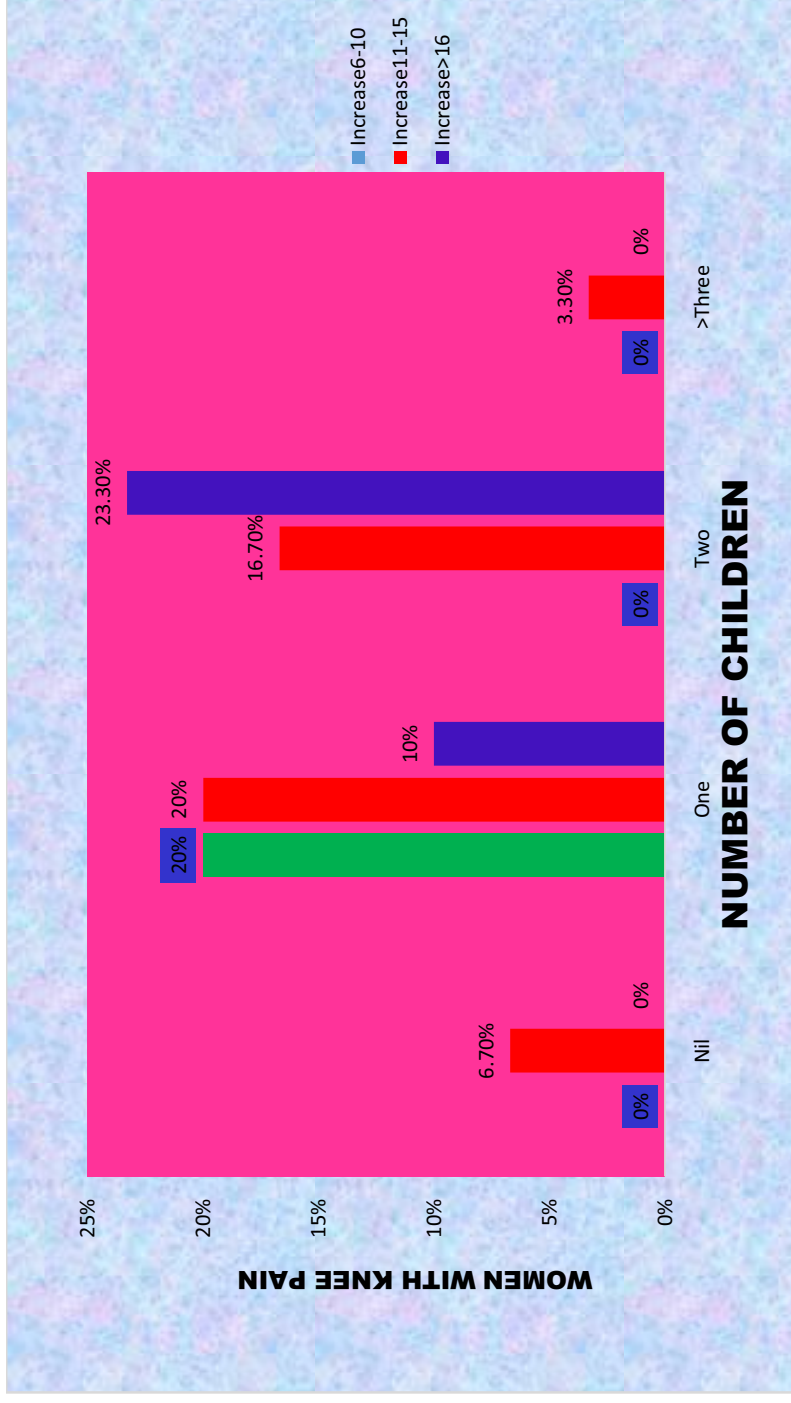
**Figure 4.24 Effectiveness of the study**



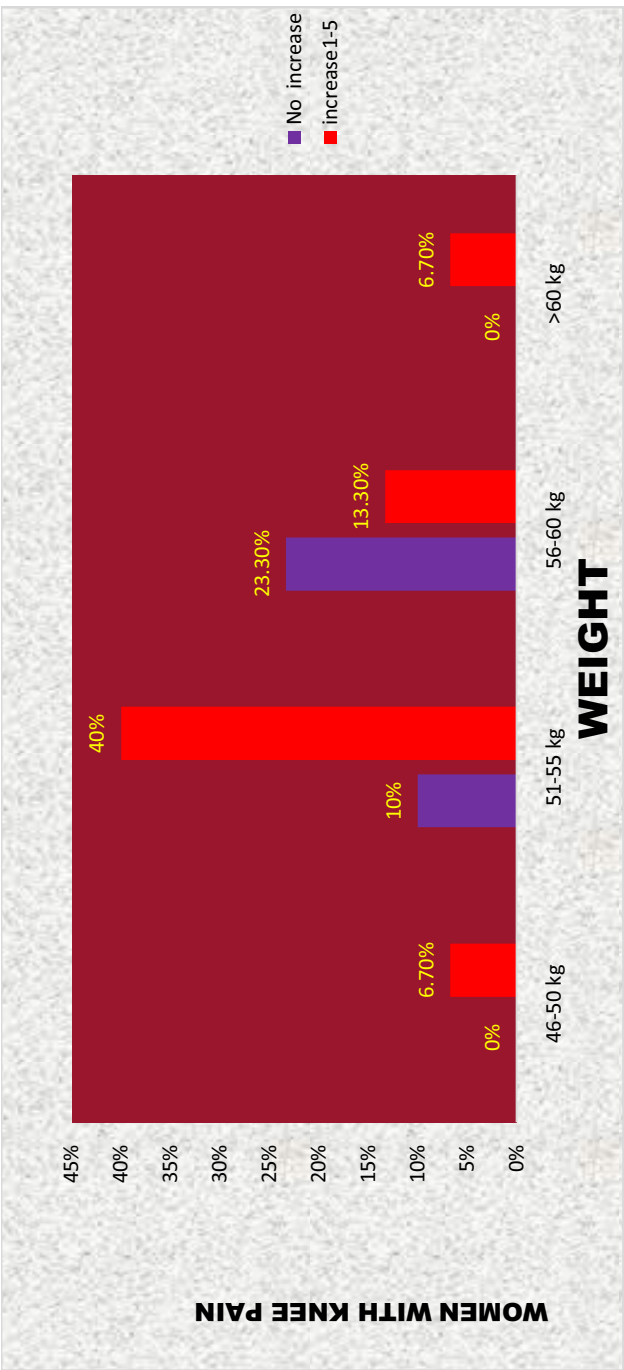
**Figure 4.25: Association between the pain reduction and diet pattern in Experimental group**



**Figure 4.26: Association between level of pain reduction other illness of the women in Experimental group.**

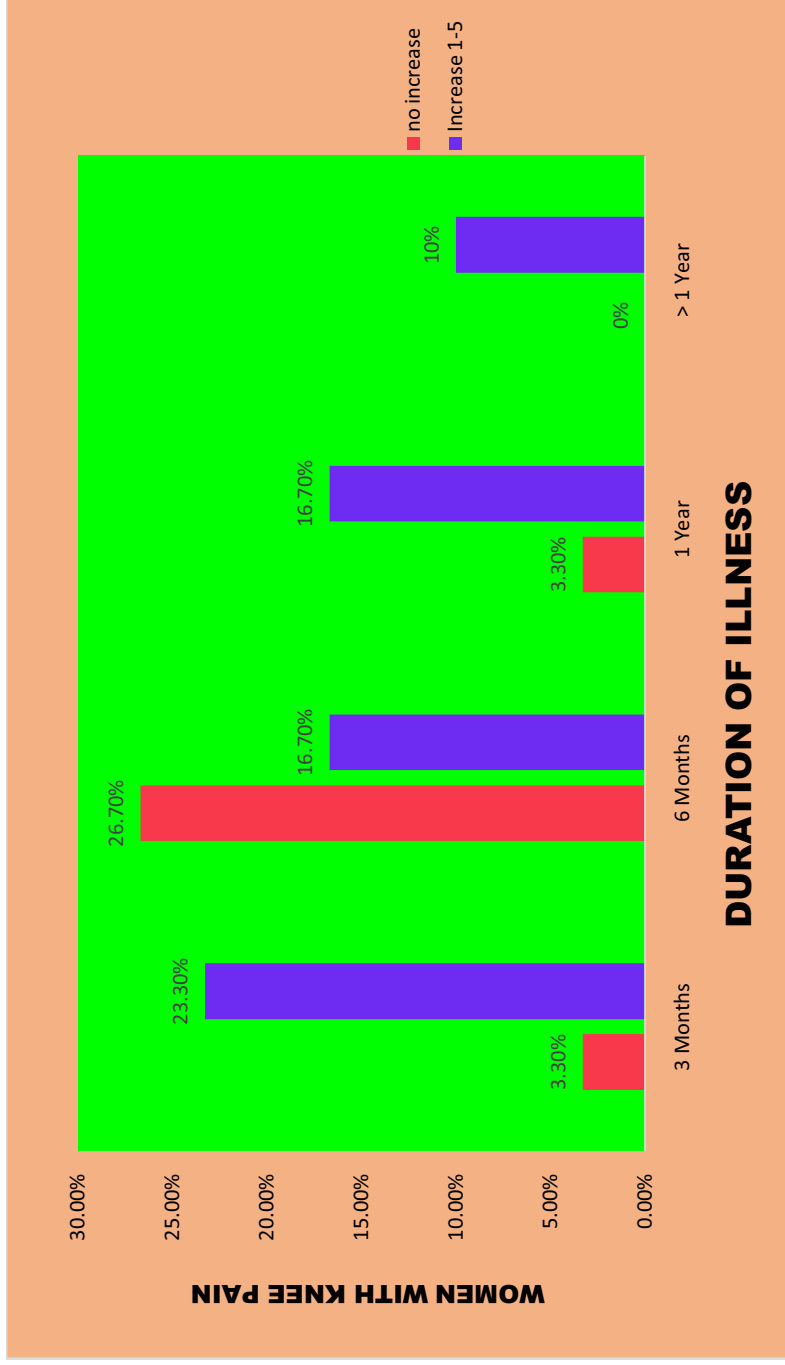


**Figure 4.27: Association between level of pain reduction and number of children in experimental group**

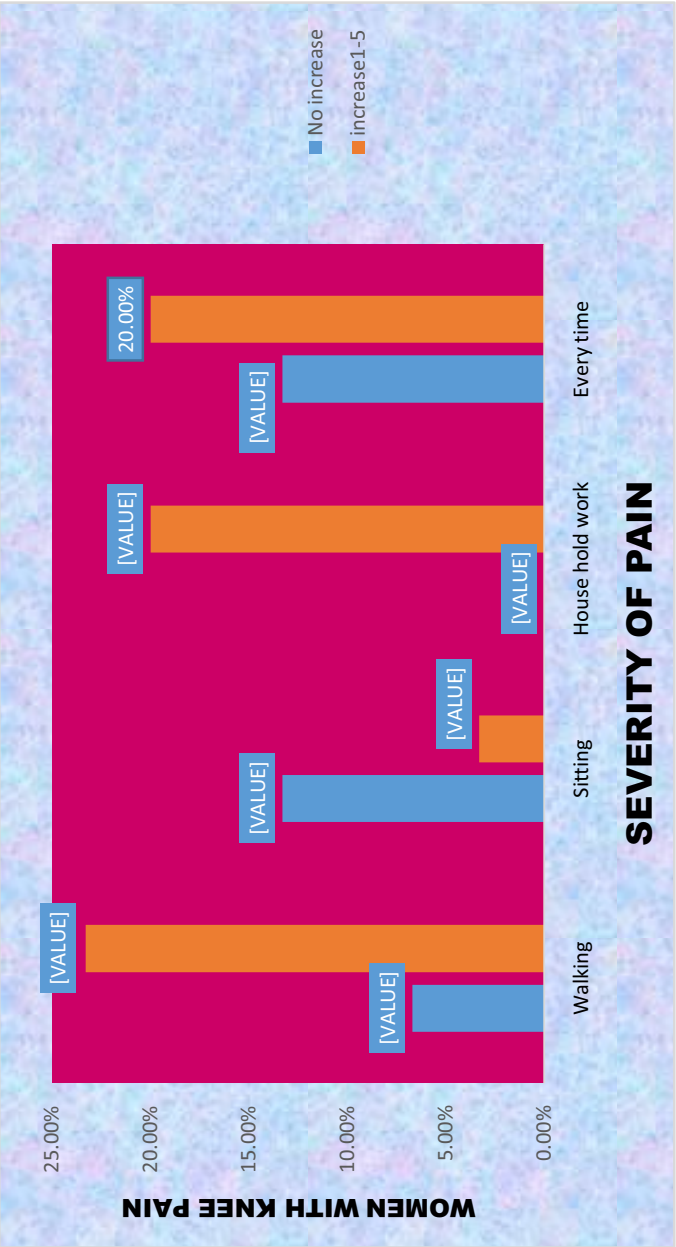


**Figure 4.28:Association between level of pain reduction and weight of the women in control group.**





**Figure4.29: Association between the pain reduction and duration of illness in control group**



**Figure4.30: Association between the pain reduction and Severity in control group**

## **CHAPTER V**

### **SUMMARY OF RESULTS**

This chapter deals with the major findings of this study, it includes percentage, proportion and statistical analysis of all the demographic variables, pain history variables, pre assessment and post assessment of knee pain, effectiveness, comparison of pre and post-test, and effectiveness of mustard plaster in knee pain.

#### **Demographic Variables**

The demographic information of elderly women those who were participated for the following study on “A study to assess the effectiveness of application of mustard plaster on knee pain among 50-60 years of women in selected rural area at medavakkam”

- ❖ This above table shows that most of the study participants are aged between 50-55 yrs. both in experimental (36.7%) and in control (46.7%) group. In 56-60yrs 53.3% were in control group and 63.3% were in experimental group.
- ❖ Regarding educational status 20% in both experimental and control group participants were uneducated. Only few percentage 3.3% in experimental and 6.6% in control were completed their diploma education. About 16.7% in experimental and 30% in control group studied up to High school level, about 33.3% in experimental and 30% in control group studied up to higher secondary level.
- ❖ The occupational status of the study participants explains most of the subjects in experimental (56.7%) and in control (70%) were home makers.
- ❖ Income status of the participants reveals that around 36.7% in experimental and 23.37% in control group were having family income between Rs 1590 – Rs 4726. Around 40% in experimental and 53.3% in control group were belongs to the income status from Rs 4727 – 7877.

- ❖ Most of the study participants was Hindu community (83.3% in experimental and 86.7% in control group) and the higher percentage of participants were belongs to mixed dietary pattern (66.7% in control and 80% in experimental group).
- ❖ Very less amount of participants are unmarried (3.3%), most the study subjects were married (76.7% in experimental and 53.3% in control).
- ❖ Majority of the participants have 4-5 members in their family i.e. 40% in experimental and 36.7% control. The common height of the study participants comes in between 146-150 cm in experimental group (56.7%). Most of them were in normal weight in both groups.

#### **Pain History:**

- ❖ The table reveals 6.7% of them in experimental and 20% in control group have pain for one year. 43.3% in experimental and 30% in control have pain for past six months. 36.7% in experimental and 20% in control have pain more than one year
- ❖ About 50 % of the study subjects in experimental and 36.6 % in control group have sharp pain, 40% in experimental and 23.3% in control group members have prickling pain.
- ❖ Majority of the participants in both group are using ointment for reliving pain 43.3%. 36.7 (Experimental), and 33.3% (Control) of participants are using pain killer drugs to minimize the pain.
- ❖ On 26.7% in experimental and 20% in control group subjects are using Tab. Paracetamol for getting relived from pain. 6.7% in experimental group were using Tab. voveran and Tab. Brufen for their relief.
- ❖ About 38.3% in experimental and 13.3% in control group subjects have increasing in pain level during house hold activities. About 26.7% in experimental and 33.3% in control group members have pain anytime. About 23.3% in experimental and 33.3 % in control group members having pain during walking.
- ❖ Majority of them are not having any other illness like Asthma, TB etc...

- ❖ Some of the study participants were following traditional treatment like Siddha (Exp-10% Control – 13.3%), Ayurveda (Exp-16.7%, control – 26.7%), majority of the subjects are not following any mode of treatment (63.3%- Experimental, 46.7-Control).
- ❖ Majority of the study participants are having 1-2 children Experimental (50%), Control (60%).
- ❖ About half of the study participants believe that mustard is only for cooking purposes (experimental -40%, Control -50%).

### **Pre and post assessment of knee pain level in experimental group**

In this we are discussing about the difference between pre and post assessment of pain level among the study participants in Experimental group it reveals that the mean score of post-test 46.50 shows there is a marked reduction of pain level among the elderly women. The SD value is also statistically significant.  $P = 0.001$  is  $>0.05$  proves the study values are statistically significant.

### **Pre and post assessment of knee pain level in control group**

The difference between pre and post-test among the control group participants. They show only a very minimal reduction of pain level.

### **Comparison of pre and post assessment score of knee pain and Effectiveness of the study.**

This shows the effectiveness of the study pain level among the women both group I and group II. In experimental group, 33.3% (10) of them having no pain, 46.7% (14) of them having mild pain, 20% (6) of them having moderate pain, (0.0%) none of them having severe and unbearable pain. In control group, 0.0% (0) none of them having no pain, mild and moderate. 66.7% (20) of them having severe pain, 33.3% (10) of them having unbearable pain.

### **Mean difference of mustard plaster on knee pain among experimental and control group**

In the effectiveness of study. It exhibits that the mean difference value between pre and post assessment in experimental group is 13.67 and it is only 1.37 in control group, it shows the effectiveness of mustard plaster in reducing knee pain among old age women. The association of the study is analyzed by paired t test  $t=18.819$ ,  $p=0.001$  it is statistically significant.

### **The effectiveness of mustard plaster.**

This shows the effectiveness of mustard plaster on knee pain the mean difference is 14.07 in experimental group, this was calculated with 95%CI and the above table shows there is 30.26 % of pain reduction when compare to control group (4.7%).

### **Association between level of mustard plaster and their demographic variables (Experimental group)**

The association between level of pain reduction and their demographic variables. The effectiveness of the study and demographic variables of experimental group. It shows that the dietary habit  $\chi^2=5.00$   $P=0.02$ , of the study participants are significant in pain reduction.

### **Association between mustard plaster and their clinical variables (Experimental group)**

Those study participants are not having other illness  $\chi^2=10.26$ ,  $p=0.04$ , and the participants those who have 1 child  $\chi^2=11.26$ ,  $p=0.03$  have marked increase scores and shows statistically Significant.

### **Association between level of mustard plaster and their demographic and knee pain variables (control group)**

In this study there was no significant relationship between demographic variables and pain reduction. There is a significant relationship between knee pain variables and effectiveness of mustard plaster.

## **CHAPTER VI**

### **DISCUSSION**

Knee pain is the condition which brings the women to the physician, frequently. It is one of the common condition that affects the women particularly elders. Medicines can be used to a certain extent. A number of complimentary therapies are used in the treatment of knee pain.

Nowadays our Government also initiated and implementing AYUSH in all the district hospitals and PHC's in order to improve our Indian system of medicine which is very useful and have more practical home care methods for alleviating pain and minor ailments. Since mustard has a very good analgesic property, easily available, and it's cost effective the investigator used mustard plaster in reducing knee pain among elderly women residing at Medavakkam.

The synergic effects of the Mustard plaster application has a greater impact and effectiveness in the reduction of knee pain in elderly women and this research confirms the same.

This chapter deals with the findings based on the interpretation from the statistical analysis. The findings are supported by the review of literature. The purpose of the study was to assess the effectiveness of mustard plaster among old age women with knee pain.

This discussion about the study findings is presented in this chapter is to arrive at a conclusion based on the objectives, the related literature and hypothesis.

## **Objective 1:**

**To assess the level of knee pain before and after mustard plaster application in experimental group and control group among 50-60 years of women.** It reveals 6.7% of them in experimental and 20% in control group have pain for one year. 43.3% in experimental and 30% in control have pain for past six months. 36.7% in experimental and 20% in control have pain more than one year

About 50 % of the study subjects in experimental and 36.6 % in control group have sharp pain, 40% in experimental and 23.3% in control group members have pricking pain.

This above results was supported by Reva C. Lawrence, Charles G. Helmick, Frank C. Arnett, et.al 2014 **Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States.** Prevalence estimates from these surveys were linked to 1990 US Bureau of the Census population data to calculate national estimates. We also estimated the expected frequency of arthritis in the year 2020. Results reveals that national estimates are provided, with important caveats regarding their interpretation, for self-reported arthritis and selected conditions. An estimated 15% (40 million) of Americans had some form of arthritis in 1995. By the year 2020, an estimated 18.2% (59.4 million) will be affected

## **Objective 2:**

**To determine the effectiveness of mustard plaster application by comparing the level of knee pain in control and experimental group among 50-60 years of women.**

This was done using the tool oxford knee pain scale. The data findings shows that mean pain score in the pre-test is 32.43 among the experimental group and it was 31.57 among control group. The mean reduction pain score in the post-test was 46.50 among experimental group and it was 33.13 among



control group. On an average, in the experimental group. Women were having 13.7% of pain reduction in pain, whereas on an average, in control group women were having 1.64% of reduction in pain. This prove that mustard plaster was very effective in reduction knee pain in the study. Differences between pre-test and post-test score was analysed using proportion with 95% CI and mean difference with 95% CI. It shows the effectiveness of **mustard plaster on knee pain reduction.**

This findings is also supported by the study conducted by **Jin-Tao et al. (2013)**. Golden plaster for pain therapy in patients with knee osteoarthritis: study protocol for a multi Centre randomized, double-blind, placebo-controlled trial. Despite considerable study, there is no generally effective treatment for patients who suffer from OA. In some contexts, various complementary and alternative medical treatments have been administered for OA in clinical practices. The quality and small sample sizes of the few trials that have been conducted have made it difficult to reach firm conclusions about these treatments. Well-designed randomized controlled trials are needed to examine the efficacy of TCM treatments for OA. The biggest advantage of the present trial is an external placebo control. The purpose of this study will be to evaluate the basic clinical efficacy and safety data for the golden plaster in the treatment of patients with knee OA

In the pre assessment there is no significant difference between experimental and control, but in post-test it was observed significant difference between experimental and control group.

On an average, in experimental group, elderly women had 13.7% Reduction of pain. On an average in control group, women had 1.3% Reduction of pain.

### **Objective 3:**

**To determine the level of satisfaction in experimental group among 50-60 years of women regarding application of mustard plaster.**

In the effectiveness of mustard plaster on knee pain the mean difference is 14.07 in experimental group, this was calculated with 95%CI and the above table shows there is 30.26 % of pain reduction when compared to control group (4.7%). Old age women have reduction of pain level up to 13.7% in experimental group when compared with the control group.

### **Objective 4:**

**To associate the certain demographic variables with women having knee pain**

In experimental group, there is a statistically significant association between the participants those who take non-vegetarian had more reduction in their pain level ( $p \leq 0.02$  with CI at 95%)

In experimental group, there is a statistically significant association between the clinical variables like, the participants those who are not having any other illness ( $p \leq 0.04$ ) other than knee pain, and those who have only one child ( $p \leq 0.08$  with CI at 95%) have more reduction of knee pain

Among the study participants those who have weight between 50-55kg are statistically significant association with the reduction of knee pain at  $p \leq 0.05$  with CI 95% in control group

There is a statistical significance with the clinical variables like duration of knee pain for 6 months ( $p \leq 0.04$ ) and those who have pain during walking ( $p \leq 0.03$ ) had more reduction of knee pain in control group

## **Hypotheses:**

H1- There is a significant difference between pre-test and post-test level of pain in 50-60 years of women undergoing mustard plaster application.

In experimental group mean value of pre-test pain score is 32.43 and the control 31.57 and in experimental group the post -test pain score is 46.50 and in control is 33.13. Hence the hypothesis is accepted.

H2- There is a significant association between selected demographic variables of women and degree of knee pain after the application of mustard plaster

The participants those who are non-vegetarian having more reduction in pain level  $P \leq 0.02$ . It is statistically significant. There is also a marked reduction in the group of participants those who are not having other illness ( $P \leq 0.04$  and those who have only one child  $p \leq 0.02$  have more reduction of knee pain. Hence the hypothesis accepted

## **CHAPTER- VII**

### **CONCLUSION AND RECOMMENDATION**

An experimental study with pre-test, post-test control group research design was used to evaluate the effectiveness of mustard plaster to reduce pain level among women with knee pain. Mustard is cost effective easily available can be used by all people daily and improves the general well-being of the Clients.

#### **7.1 Summary of the Study**

A person from this world has to become old as years go. Many physical and psychological changes took place during this old age .Knee pain occupies a valuable place in bringing the woman to the physician. It will be surprise to hear that they were free from musculoskeletal disorder. Many researchers found non-pharmacological intervention are found to be effective in relieving the knee pain on the evidence of many studies, this study was undertaken to determine the effectiveness of mustard plaster on reducing knee pain level among women.

#### **Major findings of the study**

With regard to the demographic variables of clients with the knee pain.

- It shows that most of the study participants are aged between 50-55 yrs. both in experimental (36.7%) and in control (46.7%) group. p. In 56-60yrs 53.3% were in control group and 63.3% were in experimental group.
- Regarding educational status 20% in both experimental and control group participants were uneducated. Only few percentage 3.3% in experimental and 6.6% in control were completed their diploma education.

- The occupational status of the study participants explains most of the subjects in experimental (56.7%) and in control (70%) were home makers.
- Income status of the participants reveals that around 36.7% in experimental and 23.37% in control group were having family income between Rs 1590 – Rs 4726. Around 40% in experimental and 53.3% in control group were belongs to the income status from Rs 4727 – 7877.
- Most of the study participants was Hindu community (83.3% in experimental and 86.7% in control group) and the higher percentage of participants were belongs to mixed dietary pattern (66.7% in control and 80% in experimental group).
- Very less amount of participants are unmarried (3.3%), most the study subjects were married (76.7% in experimental and 53.3% in control).
- Majority of the participants have 4-5 members in their family i.e. 40% in experimental and 36.7% control. The common height of the study participants comes in between 146-150 cm in experimental group (56.7%). Most of them were in normal weight in both groups.

According to the pain assessment.

- It reveals 6.7% of them in experimental and 20% in control group have pain for one year. 43.3% in experimental and 30% in control have pain for past six months. 36.7% in experimental and 20% in control have pain more than one year
- About 50 % of the study subjects in experimental and 36.6 % in control group have sharp pain, 40% in experimental and 23.3% in control group members have prickling pain.
- Majority of the participants in both group are using ointment for reliving pain 43.3%. 36.7 (Experimental), and 33.3% (Control) of participants are using pain killer drugs to minimize the pain.
- About 26.7% in experimental and 20% in control group subjects are using Tab. Paracetamol for getting relived from pain. 6.7% in experimental group were using Tab .voveran and Tab. Brufen for their relief.

- On 38.3% in experimental and 13.3% in control group subjects have increasing in pain level during house hold activities. About 26.7% in experimental and 33.3% in control group members have pain anytime. About 23.3% in experimental and 33.3 % in control group members having pain during walking.
- Majority of them are not having any other illness like Asthma, TB etc...
- Some of the study participants were following traditional treatment like Siddha (Exp-10% Control – 13.3%), Ayurveda (Exp-16.7%, control – 26.7%), majority of the subjects are not following any mode of treatment (63.3%- Experimental, 46.7-Control).
- Majority of the study participants are having 1-2 children Experimental (50%), Control (60%).
- About half of the study participants believe that mustard is only for cooking purposes (experimental -40%, Control -50%).

#### **Regarding the pre and post assessment in experimental and control group**

The pre and post assessment of pain level among the study participants in Experimental group it reveals that the mean score of post-test 46.50 shows there is a marked reduction of pain level among the elderly women. The SD value is also statistically significant.  $P= 0.001$  is  $>0.05$  proves the study values are statistically significant.

The effectiveness of the study it shows that among the experimental group the pain reduction score exhibits that the level of pain reduction in (46.7%) of clients is between 11-15 pain scores, and there is also about 33.3% of clients have reduction of pain level up to 16 & < level.

The mean difference value between pre and post assessment in experimental group is 13.67 and it is only 1.37 in control group, it shows the effectiveness of mustard plaster in reducing knee pain among old age women

The association of the study is analyzed by paired t test  $t=18.819$ ,  $p=0.001$  it is statistically significant. Experiment group elderly women are reduced 13.7% of pain score, whereas control group women are reduced 1.3% pain score. Differences between pretest and post test score was analyzed using proportion with 95% CI and mean difference with 95% CI. It shows the effectiveness of **mustard plaster**

## **7.2 Implications:**

Knee pain is one of most common orthopedic disorder in our daily life and women are having more prevalence especially the older group. Pain causes discomfort and it interrupts the normal daily activity of living.

The findings of the study support that application of mustard plaster is very safe, cost-effective and has good analgesic effect which reduces pain. The findings of the study have several implications in the following fields.

### **7.2.1 Implication for nursing practice:**

1. The findings of the study proved the fact that mustard plaster can be used to reduce the pain of elderly women.
2. The study findings will help the nursing personnel to include mustard plaster as a nursing intervention in the management of knee pain.
3. A protocol steps on implementation of the mustard plaster application can be developed and can be used in all nursing care settings.

### **7.2.2. Implication for nursing administration:**

1. Periodic conference, seminar, symposium can be arranged for nursing personnel regarding care of clients with knee pain.
2. Routine in-service education can be conducted to update their knowledge regarding various home based traditional practices and therapies included Indian system of medicine.

3. This study recommends the nursing faculties to organise basic massage techniques training programme as one part of Nursing in service education.

#### **7.2.3 Implication for nursing education:**

1. The study has proved that the application of mustard plaster has effect in reducing the knee pain in the old age women.
2. To practice this, nursing personnel need to have enough knowledge, desirable attitude and skill about mustard plaster application.
3. These finding would help nursing faculty to give importance for mustard plaster and its various benefits as a nursing intervention in the management of knee pain and motivate the nursing students to use this intervention in the management of these patients.
4. These findings also helps the nurses to learn and practice various alternative therapies which they can include in their regular patient care especially in pain management.

#### **7.2.4 Implication in nursing research:**

1. One of the aims of nursing research is to expand and broaden the scope of nursing. Findings of this study will provide baseline data about the pain perception after the mustard plaster. Hence it can be used for further studies in this area.
2. This study also brings an idea for doing more studies at different settings which is culturally acceptable.



### **7.3 Limitations:**

The study was limited to knee pain clients and women, the study was confined to a small number respondents and shorter period that limits the generalization

### **7.4 Recommendations:**

1. A Similar kind of study can be conducted for a larger group to generate the findings.
2. The same study can be conducted among different age group.
3. The study can be conducted in various settings (old age homes) where old people are more.
4. A longitudinal study can be conducted to assess the effect of mustard plaster in reducing knee pain.
5. The same study can be also conducted in males.
6. The effectiveness of the mustard plaster can be tested for other types of pain. (Back pain, Neck pain).
7. The same study can be conducted more than four weeks.

## **CONCLUSION**

The following conclusions were drawn from the study:-

- There was a significant difference in the difference in the mean perception score of the clients with knee pain before and after mustard plaster application.
- There was an association between the levels of pain perception of the clients with the selected demographic variables justifications for understandings this study was to reduce the knee pain with the clients by mustard plaster application and to determine its effectiveness .so that this can be used for clients with knee pain to promote their health and also comfort.

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## **ELECTRONIC VERSION**

1. <http://www.pain.com>
2. <http://www.nursingtimes.net.com>
3. <http://www.ijtmb.org>
4. <http://www.messageonline.com>
5. <http://www.google.com>
6. <http://www.pubmed.com>
7. <http://www.medscape.com>
8. <http://www.higewire.com>
9. <http://www.medline.com>
10. <http://www.painclinic.com>

**INSTITUTIONAL ETHICS COMMITTEE**  
**MADRAS MEDICAL COLLEGE, CHENNAI-3**

EC Reg No.ECR/270/Inst./TN/2013  
Telephone No. 044 25305301  
Fax : 044 25363970

**CERTIFICATE OF APPROVAL**

To  
Mrs. MAHESWARI. M  
M.Sc., (Nursing)  
College of Nursing  
Madras Medical College,  
Chennai - 600 003.

Dear Mrs. MAHESWARI. M,


The Institutional Ethics Committee has considered your request and approved your study titled **A STUDY TO ASSESS THE EFFECTIVENESS ON APPLICATION OF MUSTARD PLASTER ON KNEE PAIN AMONG 50-60YEARS OF WOMEN IN SELECTED RURAL COMMUNITY AT MEDAVAKKAM. No.16102014.**

The following members of Ethics Committee were present in the meeting held on 21.10.2014 conducted at Madras Medical College, Chennai-3.

- |   |                      |
|---|----------------------|
| 1. Dr.C.Rajendran, M.D.,  | : Chairperson        |
| 2. Dr.R.Vimala, M.D., Dean, MMC, Ch-3   | : Deputy Chairperson |
| 3. Prof.B.Kalaiselvi, M.D., Vice-Principal, MMC, Ch-3                           | : Member Secretary   |
| 4. Prof.R.Nandhini, M.D., Inst.of Pharmacology, MMC                             | : Member             |
| 5. Prof.K.Ramadevi, Director i/c, Inst.of Biochemistry, MMC                     | : Member             |
| 6. Prof.Saraswathy, M.D., Director, Pathology, MMC, Ch-3                        | : Member             |
| 7. Prof.S.G.Sivachidambaram, M.D., Director i/c, Inst.of Internal Medicine, MMC | : Member             |
| 8. Dr.Raghumani, M.S., Professor of Surgery, MMC                                | : Member             |
| 9. Thiru S.Rameshkumar, Administrative Officer                                  | : Lay Person         |
| 10. Thiru S.Govindasamy, B.A., B.L.,  | : Lawyer             |
| 11. Tmt.Arnold Saulina, M.A., MSW.,   | : Social Scientist   |

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

  
Member Secretary, Ethics Committee

### CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the tool constructed by Ms. M.MAHESHWARI, M.Sc. Nursing II year, College of Nursing, Madras Medical College which is to be used in her study titled **"A STUDY TO AESS THE EFFECTIVENESS ON APPLICATION OF MUSTARD PLASTER ON KNEE PAIN AMONG 50-60 YEARS OF WOMEN IN SELECTED RURAL AREA AT MEDAVAKKAM"** has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide. Then she can proceed to do the research.

  
SIGNATURE WITH SEAL

Director  
Institute of Community Medicine  
Madras Medical College, RGGGH  
Chennai - 600 003

NAME : Dr. Joy Patricia Pushpani M.D.  
DESIGNATION: Professor and H.O.D of community Medicine  
COLLEGE : Madras Medical college, Chennai-03.

PLACE: Chennai-03.

DATE: 13.07.15

### CERTIFICATE FOR CONTENT VALIDITY

This is to certify that the tool constructed by Ms.M.Maheswari, M.Sc. Nursing II year, College of Nursing, Madras Medical College which is to be used in her study titled **"A study to assess the effectiveness on application of mustard plaster on knee pain among 50-60 of years women in selected rural community at medavakkam"** has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide. Then she can proceed to do the research.

*V. Ebyladas*

SIGNATURE WITH SEAL

NAME : EBI GOLDA MARY. V

DESIGNATION: READER.

COLLEGE : MADHA COLLEGE OF NURSING



PLACE: KUNRATHUR

DATE: 17-7-2015

பொருள் - பணித்தொகுதி - பொது ககாதாரம் - சென்னை மருத்துவக் கல்லூரியில் 2 ஆம் ஆண்டு பயிலும் மாணவிகள் - மேடவாக்கம் ஆரம்ப ககாதார நிலையத்தில் - மூட்டு வலி, உயர்ந்த அழுத்தம், நீரழிவு நோய், மற்றும் மூட்டு வலியினை நுண்துளை மருத்துவம் (Accupuncture) மூலம் குணப்படுத்துவது - திட்ட செயல்புரிய (Project work) அனுமதியளிக்க கோரியது - அனுமதி வழங்குவது - சம்மந்தமாக.

பார்வை - 1. அரசாணை (டி) எண்.648 ககாதாரம் மற்றும் குடும்ப நலத் துறை (MCA1) நாள் 02.06.2009.

2. செல்வி.எம்.மகேஸ்வரி M.Sc. (Nursing) II nd year மாணவி சென்னை மருத்துவக் கல்லூரி விண்ணப்ப நாள் 01.07.2015.

3. செல்வி.ஜி.கதா M.Sc. (Nursing) II nd year மாணவி சென்னை மருத்துவக் கல்லூரி விண்ணப்ப நாள் 01.07.2015.

4. திருமதி.கே.என்.கோமதி M.Sc. (Nursing) II nd year மாணவி சென்னை மருத்துவக் கல்லூரி விண்ணப்ப நாள் 01.07.2015.

5. செல்வி. இளஞ்செல்வி. M.Sc. (Nursing) II nd year மாணவி சென்னை மருத்துவக் கல்லூரி விண்ணப்ப நாள் 01.07.2015.

=====

பார்வையில் கண்டுள்ள விண்ணப்பங்களில், சென்னை மருத்துவக் கல்லூரியில், M.Sc.(Nursing) II nd year பயிலும் கீழ்க்குறிப்பிட்டுள்ள மாணவிகள் அவர்களுக்கெதிரே குறிப்பிடப்பட்டுள்ள பொருள் குறித்து 13.07.2015 முதல் 12.08.2015 வரை ஆய்வுப்பணி மேற்கொள்ள அனுமதி வழங்க கோரியுள்ளார்கள்.

வ.எண்.	மாணவி பெயர்	கல்லூரியின் பெயர்	ஆய்வுப்பணி மேற்கொள்ளவுள்ள பொருள்
01.	செல்வி.எம்.மகேஸ்வரி M.Sc. (Nursing) II nd year	சென்னை மருத்துவக்கல்லூரி	50-60 வயது மதிக்கத்தக்க பெண்மணிகளுக்கு ஏற்படும் மூட்டுவலியினை கடுகு பூக்க மூலம் குணப்படுத்துவது குறித்து
02.	செல்வி.ஜி.கதா M.Sc. (Nursing) II nd year	சென்னை மருத்துவக்கல்லூரி	உயர் ரத்த அழுத்தத்தினை வெள்ளரிக்காய் மூலம் குணப்படுத்துவது குறித்து
03.	திருமதி.கே.என்.கோமதி M.Sc. (Nursing) II nd year	சென்னை மருத்துவக்கல்லூரி	நீரழிவு நோயினை கருவேப்பிலை மூலம் குணப்படுத்துவது குறித்து
04.	செல்வி. இளஞ்செல்வி M.Sc. (Nursing) II nd year	சென்னை மருத்துவக்கல்லூரி	மூத்தவர்களுக்கு ஏற்படும் மூட்டு வலியினை நுண்துளை மருத்துவம் (Accupuncture) மூலம் குணப்படுத்துவது குறித்து

பார்வை 1ல் கண்டுள்ள அரசாணையில் துணை இயக்குநருக்கு வழங்கப்பட்டுள்ள அதிகாரத்தின் பேரில் சம்மந்தப்பட்ட மாணவிகளுக்கு ஆய்வுப்பணி தொடங்குவதற்கான அனுமதி வழங்கப்படுகிறது.

மேடவாக்கம் ஆரம்ப ககாதார நிலையத்தின் அன்றாடப் பணிகளுக்கு இடையூறு ஏற்படா வண்ணம் அவர்களது ஆய்வுப்பணிகளை நிறைவேற்ற வேண்டுமென பணிக்கப்படுகிறார்கள். மேற்கூறப்பட்ட பணியினை நிறைவு செய்த விவரத்தினை துணை இயக்குநர் அவர்களிடம் தெரிவிக்க வேண்டுமெனவும் கேட்டுக்கொள்ளப்படுகிறார்கள்.



எனவே மேடவாக்கம் ஆரம்ப சுகாதார நிலைய முதன்மை குடிமை மருத்துவ அலுவலர் மேற்குறிப்பிடப்பட்டுள்ள நபர்கள் தங்களது நிலையத்தில் ஒருமாத காலம் ஆய்வுப் பணிகளை மேற்கொள்ளவுள்ளதால், ஆரம்ப சுகாதார நிலைய அலுவல்களுக்கு இடையூறு ஏற்படா வண்ணம் செயல்பட வேண்டும் என்றும், இப்பொருள் குறித்து எவ்வித தகவல்களும் பத்திரிக்கை மற்றும் ஊடகங்களில் வெளியிடக்கூடாதெனவும் தெரிவிக்கப்படுகிறது.

*[Handwritten signature]*

துணை இயக்குநர் சுகாதாரப்பணிகள்  
சைதாப்பேட்டை காஞ்சிபுரம் மாவட்டம்.

பெறுநர்

- 1) செல்வி.எம்.மகேஸ்வரி M.Sc. (Nursing) II nd year மாணவி )( சென்னை மருத்துவக் கல்லூரி முதல்வர்
- 2) செல்வி.ஜி.சுதா M.Sc. (Nursing) II nd year மாணவி )( மூலமாக.
- 3) திருமதி.கே.என்.கோமதி M.Sc. (Nursing) II nd year மாணவி )(
- 4) செல்வி. இளஞ்செல்வி. M.Sc. (Nursing) II nd year மாணவி )(

நகல் :-

முதல்வர் சென்னை மருத்துவக் கல்லூரி சென்னை - 600 003.  
முதன்மை குடிமை மருத்துவ அலுவலர் ஆரம்ப சுகாதார நிலையம் மேடவாக்கம்.

## TOOLS FOR DATA COLLECTION

### SECTION –A

#### INSTRUCTION:

- ❖ Please be frank and free in answering the question.
- ❖ Read each item carefully and answer all the questions.
- ❖ Answers will be used only for research purpose and will be confidential.
- ❖ Please put a tic mark at the appropriate option.

#### SOCIO DEMOGRAPHIC DATA:

1) Age in years \_\_\_\_\_

2) Education

a) No formal education

☐

b) Primary school

☐

c) High school

☐

d) Higher secondary

☐

e) Diploma

☐

f) Graduate

☐

3) Occupation

a) Home maker

☐

b) Labour

☐

c) Self-employee

☐

d) Business

☐

4) Family income

a) < Rs.1589

b) Rs.1590-4726

c) Rs.4727-7877

d) 7878-11816

5) Religion

a) Hindu

b) Muslim

c) Christian

d) Others

6) Dietary pattern

a) Vegetarian

b) Non-vegetarian

7) Marital status

a) Married

b) Unmarried

c) Divorced

d) Widow



8) Total members in your family

a) 1

b) 2

c) 3

d) >3

## **PART –II STRUCTURED QUESTIONNAIRE**

### **SECTION –B –ANTHROPOMETRIC MEASUREMENT**

9) Height

a) 146cm-150cm

b) 151cm-155cm

c) 156cm-160cm

d) 161cm-165cm

10) Weight

a) 46kg-50 kg

b) 51kg-55 kg

c) 56kg-60 kg

d) >65 kg

11) Body mass index

a) Underweight

b) Normal

c) Over weight

d) Obese

## SECTION-C KNEE PAIN

1) How long do you have knee pain?

a) 3 months

b) 6 months

c) 1 year

d) >1 year

2) What is the type of pain you will have?

a) Sharp.

b) Dull

c) Burning

d) Pricking.

3) What is the commonest remedy you follow during pain?

a) External application of ointments

b) Drugs

c) Hot water fomentation

d) Exercise.

4) What is the choice of medicine you will take during knee pain?

a) Tab. Paracetamol.

b) Tab. Voveran

C) Tab. Brufen

d) Nil

5) When do you have feel severe pain?

a) Walking

b) Sitting

c) House hold work

d) Every time

6) Do you have any other illness?

a) Diabetes mellitus

b) Hypertension

c) Asthma

d) Nil

7) Have you been any other treatment?

a) Ayurveda

b) Siddha

c) Acupuncture

d) No other treatment

8) How many children you have?

a) Nil

b) 1

c) 2

d)>3

9) Level of restriction in activity?

a) Able to do activity of daily life

b) Able to do activity of daily with assistant

c) Mild restriction in doing activity of daily life

d) Severe restriction

10) Are you have any opinion about mustard?

a) Cooking

b) Medicinal use

c) Pain reducing agent

d) Nothing

### OXFORD KNEE SCORE

1. How would you describe the pain you usually have in your knee?

a) None

b) Very mild

c) Mild

d) Moderate

e) Severe

2. Have you had any trouble washing and drying yourself (all over) because of your knee?

a) No trouble at all

b) Very little trouble

c) Moderate trouble

d) Extreme difficulty

e) Impossible to do

3. Have you had any trouble getting in and out of bus or using public transport because of your knee?

- a) No trouble at all
- b) Very little trouble
- c) Moderate trouble
- d) Extreme difficulty
- e) Impossible to do

4. For how long are you able to walk before the pain in your knee becomes severe?

- a) No pain>60 min
- b) 16-60 minutes
- c) 5-15 minutes
- d) Around the house only
- e) Not at all-severe on walking

5. After a meal how painful has it been for you to stand up from a floor because of your knee?

- a) Not at all painful
- b) Slightly painful
- c) Moderately pain
- d) Very painful
- e) Unbearable

6. Have you been limping when walking, because of your knee?

- a) Rarely /never
- b) Sometimes or just at first
- c) Often, not just at first
- d) Most of the time
- e) All of the time

7. Could you kneel down and get up again afterwards?

a) Yes, easily

b) With little difficulty

c) With moderate difficulty

d) With extreme difficulty

e) No, impossible

8. Are you troubled by pain in your knee at night in bed?

a) Not at all

b) Only one or two nights

c) Some nights

d) Most nights

e) Every night

9. How much has pain from your knee interfered with your usual work?

a) Not at all

b) A little bit

c) Moderately

d) Greatly

e) Totally

10. Have you felt that your knee might suddenly give away or let you  
down?

a) rarely /never

b) sometimes or just at first

c) often, not at first

d) most of the time

e) all the time

11. Could you do household shopping on your own?

a) Yes, easily

b) With little difficulty

c) With moderate difficulty

d) With extreme difficulty

e) No, impossible

12. Could you walk down a stairs?

a) Yes, easily

b) With little difficulty

c) With moderate difficulty

d) With extreme difficulty

e) No, impossible

#### **GRADING FOR THE OXFORD KNEE SCORE**

**SCORE 0 TO 19** =May indicate severe knee arthritis.it is likely that you may well require some form of surgical intervention.

**SCORE 20 TO 29** =May indicate moderate to severe knee arthritis. See your family physician for an assessment and x-ray.

**SCORE 30 TO 39** =May indicate mild to moderate knee arthritis.

**SCORE 40 TO 48** =May indicate satisfactory joint function.

வினாத்தாள்

பகுதி-அ

புள்ளி விவர ஆய்வு மாற்றுகு

மாதிரி எண்:

பெயர்:

விலாசம்:

1) வயது \_\_\_\_\_

2) கல்வித்தரம்

அ) முறையான கல்வி பயிலாதவர்

ஆ) ஆரம்பக்கல்வி

இ) உயர்க்கல்வி

ஈ) உயர் நிலைக்கல்வி

உ) பட்டயப்படிப்பு

ஊ) பட்டப்படிப்பு

3) தொழில்

அ) இல்லத்தரசி

ஆ) கூலித்தொழிலாளி

இ) சுயதொழில்

ஈ) தனியார் வேலை

4) குடும்ப மாதவருமானம்

அ) ரூ. <1589

ஆ) ரூ.1590-4726

இ) ரூ. 4727-7877

ஈ) ரூ.7878-11816

5) மதம்

அ) இந்து

ஆ) இஸ்லாம்

இ) கிறிஸ்துவர்

ஈ) மற்றவை



6) உணவுப்பழக்கம்

அ) சைவம்

ஆ) அசைவம்

7) திருமண நிலை

அ) திருமணமானவர்

ஆ) திருமணமாகாதவர்

இ) விவகாரத்தானவர்

ஈ) விதவை

8) குடும்பத்தில் உள்ள நபர்களின் எண்ணிக்கை

அ) 1

ஆ) 2

இ) 3

ஈ) >3

பகுதி-ஆ

9) உயரம்

அ) 146 செ.மீ-150 செ.மீ

ஆ) 151செ.மீ-155செ.மீ

இ) 156 செ.மீ-160 செ.மீ

ஈ) 161 செ.மீ-165 செ.மீ

10) எடை

அ) 46-50 கி.கி

ஆ) 51-55கி.கி

இ) 56-60 கி.கி

ஈ) >60 கி.கி

11) எடை உயர விகித குறியீடு

அ) குறைந்த எடை

ஆ) சரியான எடை

இ) அதிக எடை

ஈ) பருமனான உடல்

மூட்டு வலிக்கான வினாக்கள்

1) உங்களுக்கு எவ்வளவு நாட்களாக மூட்டு வலி உள்ளது?

அ) மூன்று மாதங்கள்

ஆ) ஆறு மாதங்கள்

இ) ஒரு வருடம்

ஈ) ஒரு வருடத்திற்கு மேல்

2) எந்த வகையான வலியை நீங்கள் உணர்வீர்கள்?

அ) கூர்மையான வலி

ஆ) மந்தமான வலி

இ) எரிச்சலூடன் கூடிய வலி

ஈ) குத்துவது போன்ற வலி

3) வலியின் போது எந்தவகையானவலி தீர்க்கும் முறையினை உபயோகிப்பீர்கள்?

அ) களிம்பினை தடவுதல்

ஆ) மாத்திரைகள்

இ) வெந்நீர் ஒத்தடம்

ஈ) உடற்பயிற்சி

4) மூட்டு வலியின் போது நீங்கள் எந்த வகையான மாத்திரைகளை உட்கொள்வீர்கள்?

அ) பாராசிட்டமால்

ஆ) வோவிரான்

இ) புரூபன்

ஈ) எதுவும் இல்லை

5) நீங்கள் எப்போது அதிகப்படியானவலியினை உணர்வீர்கள்?

அ) நடக்கும் போது

ஆ) அமரும் போது

இ) வீட்டு வேலைகள் செய்யும் போது

ஈ) அனைத்து நேரங்களிலும்

6) உங்களுக்கு கீழ்க்கண்டவற்றுள் நோய்கள் உண்டா?

அ) நீரிழிவு நோய்

☐

ஆ) இரத்தக் கொதிப்பு நோய்

☐

இ) ஆஸ்துமா நோய்

☐

ஈ) எதுவும் இல்லை

☐

7) நீங்கள் என்னென்ன சிகிச்சை முறைகளை உபயோகிப்பீர்கள்?

அ) ஆயுர் வேதம்

☐

ஆ) சித்த மருத்துவம்

☐

இ) அக்குபஞ்சர்

☐

ஈ) எந்த சிகிச்சை முறைகளும் இல்லை

☐

8) உங்களுக்கு எத்தனை குழந்தைகள் உள்ளனர்?

அ) இல்லை

☐

ஆ) 1

☐

இ) 2

☐

ஈ) >3

☐

9) வேலை செய்யும் அளவின் தன்மை

அ) அன்றாட வேலைகளை செய்ய முடியும்

☐

ஆ) அன்றாட வேலைகளை உதவியாளர்கள் மூலம் செய்ய முடியும்

☐

இ) அன்றாட வேலைகளை செய்வதில் சிறிது கடினம் இருக்கும்

☐

ஈ) மிகவும் கடினமாக இருக்கும்

☐

10) கடுகைப்பற்றி உங்களுடைய கருத்து என்ன?

அ) சமையல் செய்ய

☐

ஆ) மருத்துவ தன்மை

☐

இ) வலியை குறைக்கும் காரணி

☐

ஈ) எதுவுமில்லை

☐

ஆக்ஸ்போர்டு முழங்கால் மதிப்பெண்

1) உங்களால் எப்போதும் உணரப்படும் மூட்டு வலியின் தன்மையினை விவரிக்க?

அ) வலி இருக்காது

☐

ஆ) மிகச்சிறிதளவு

☐

இ) லேசான வலி

☐

ஈ) மிதமான வலி

☐

உ) அதிகமான வலி

☐

2) உங்களை சுத்தப்படுத்திக்கொள்ளும் போது மூட்டுப்பகுதியினால் ஏதேனும் பிரச்சனைகள் உண்டா?

அ) எதுவும் பிரச்சனைகள் இல்லை

☐

ஆ) மிகச்சிறிய பிரச்சனை இருக்கும்

☐

இ) மிதமான பிரச்சனை இருக்கும்

☐

ஈ) அதிகளவு கஷ்டமாக இருக்கும்

☐

உ) சாத்தியமற்றது

☐

3) உங்களுக்கு பொது வாகனங்களிலோ அல்லது பேருந்திலோ ஏறும் போது மற்றும் இறங்கும் போது மூட்டு வலி எவ்வாறு இருக்கும்?

அ) பிரச்சனை எதுவும் இல்லை

☐

ஆ) மிகச்சிறிய பிரச்சனை இருக்கும்

☐

இ) மிதமான பிரச்சனை இருக்கும்

☐

ஈ) அதிகமான வலி இருக்கும்

☐

உ) வாகனங்களில் ஏறவோ, இறங்கவோ முடியாது

☐

4) உங்களால் எவ்வளவு நேரம் மூட்டு பகுதியில் வலி இல்லாமல் நடப்பீர்கள்?

அ) 60 நிமிடத்திற்கு மேல்

☐

ஆ) 16-60 நிமிடங்கள்

☐

இ) 5-15 நிமிடங்கள்

☐

ஈ) வீட்டைச்சுற்றி மட்டும் நடக்க முடியும்

☐

உ) நடக்க ஆரம்பித்தாலே வலிக்கும்

☐

5) உணவு சாப்பிட்ட பிறகு தரையில் இருந்து எழும் போது மூட்டு வலி எவ்வாறு இருக்கும்?

அ) வலி இருக்காது

☐

ஆ) சிறிதளவு வலி இருக்கும்

☐

இ) மிதமான வலி இருக்கும்

☐

ஈ) அதிகமான வலி இருக்கும்

☐

உ) வலியை அளவிட முடியாது

☐

6) நடக்கும் போது வலியின் காரணமாக நொண்டி அடித்துச் செல்வீர்களா?

அ) எப்போதாவது மட்டும்

☐

ஆ) சில நேரங்களில்

☐

இ) அடிக்கடி

☐

ஈ) அதிகமான நேரங்களில்

☐

உ) எல்லா நேரங்களிலும்

☐

7) நீங்கள் மண்டியிட்டு பின்னர் எழுந்திருக்க முடியுமா?

அ) ஆமாம், முடியும்

☐

ஆ) சிறிது கஷ்டப்பட்டு செய்ய முடியும்

☐

இ) மிதமான கஷ்டத்துடன் செய்ய முடியும்

☐

ஈ) அதிகமான கஷ்டத்துடன் செய்ய முடியும்

☐

8) உங்களுக்கு மூட்டு வலியினால் இரவு நேரங்களில் படுக்கையில் உறங்க முடியாமல் கஷ்டப்படுவீர்கள்?

அ) இல்லை

☐

ஆ) ஒன்று (அ)இரண்டு இரவுகள்

☐

இ) சில இரவுகள்

☐

ஈ) பல இரவுகள்

☐

உ) எல்லா இரவுகளும்

☐

9) நீங்கள் சாதாரண வீட்டு வேலைகள் செய்யும் போது வலி எப்படி இருக்கும்?

அ) வலி இருக்காது

☐

ஆ) சிறிதளவு இருக்கும்

☐

இ) மிதமான வலி இருக்கும்

☐

ஈ) பெரிதும் வலி இருக்கும்

☐

உ) முற்றிலும் வலி இருக்கும்

☐

10) நீங்கள் நடக்கும் போது தீரென்று கீழே விழும் நிகழ்வு நடைபெற்றுள்ளதா?

அ) இல்லை

☐

ஆ) சில நேரங்களில்

☐

இ) அடிக்கடி

☐

ஈ) அதிகமான நேரங்களில்

☐

உ) எல்லா நேரங்களில்

☐

11) உங்களால் வீட்டிற்கு தேவையான பொருட்களை தனியாக சென்று வாங்கி வருவீர்களா?

அ) ஆமாம், முடியும்

☐

ஆ) சிறிது கஷ்டமாக இருக்கும்

☐

இ) மிதமான கஷ்டமாக இருக்கும்

☐

ஈ) அதிகமான கஷ்டமாக இருக்கும்

☐

உ) கடைக்கு சென்று வரமுடியாது

☐

12) உங்களால் படிக்கட்டுகளில் இறங்க முடியுமா?

அ) ஆமாம், முடியும்

☐

ஆ) சிறிது கஷ்டமாக இருக்கும்

☐

இ) மிதமான கஷ்டமாக இருக்கும்

☐

ஈ) அதிகப்படியான கஷ்டமாக இருக்கும்

☐

உ) படிக்கட்டுகளில் இறங்கவே முடியாது

☐

## ஆராய்ச்சி ஒப்புதல் படிவம்

### ஆராய்ச்சி தலைப்பு:

கடுகு பத்தினை பயன்படுத்தி வயதானவர்களுக்கு மூட்டு வலியை குறைப்பதற்கான திறனாய்வு

ஆய்வாளர் பெயர் : மகேஷ்வரி  
பங்கேற்பாளர் பெயர் :  
தேதி :  
வயது/ பால் :

- ஆய்வாளர் மேற்கொள்ளும் ஆராய்ச்சியில் பங்கேற்க யாருடைய கட்டாயமுமின்றி முழுமனதுடனும், சுயநினைவுடனும் சம்மதிக்கிறேன்.
- ஆய்வாளர் மேற்கொள்ள போகும் பரிசோதனைகளை மிக தெளிவாக விளக்கிக்கூறினார்.
- எனக்கு விருப்பமில்லாத பட்சத்தில் ஆராய்ச்சியிலிருந்து எந்நேரமும் விலகலாம் என்பதையும் ஆய்வாளர் மூலம் அறிந்து கொண்டேன்.
- இந்த ஆராய்ச்சி ஒப்புதல் கடிதத்தில் உள்ள விவரங்களை நன்கு புரிந்துக்கொண்டேன். எனது உரிமைகள் மற்றும் கடமைகள் ஆராய்ச்சியாளர் மூலம் விளக்கப்பட்டது.
- நான் ஆராய்ச்சியாளருடன் ஒத்துழைக்க சம்மதிக்கிறேன். எனக்கு எதேனும் உடல் நலகுறைவு ஏற்பட்டால் ஆராய்ச்சியாளரிடம் தெரிவிப்பேன்.
- நான் வேறு எந்த ஆராய்ச்சியிலும் தற்சமயம் இடம்பெறவில்லை என்பதை தெரிவித்துக்கொள்கிறேன். இந்த ஆராய்ச்சியின் தகவல்களை வெளியிட சம்மதிக்கிறேன். அப்படி வெளியிடும் போது என் அடையாளம் வெளிவராது என்பதை அறிவேன்.
- எனக்கு இந்த ஒப்புதல் கடிதத்தின் நகல் கொடுக்கப்பட்டது.

ஆய்வாளர் கையொப்பம்

பங்கேற்பாளர்கையொப்பம்

தேதி

தேதி

## ஆராய்ச்சி தகவல் தாள்

### ஆராய்ச்சி தலைப்பு:

கடுகு பத்தினை பயன்படுத்தி வயதானவர்களுக்கு மூட்டு வலியை குறைப்பதற்கான திறனாய்வு

ஆய்வாளர் பெயர் : மகேஷ்வரி  
பங்கேற்பாளர் பெயர் :  
தேதி :  
வயது/ பால் :

இந்த ஆய்வு சென்னையில் உள்ள மேடவாக்கத்தில் மேற்கொள்ளப்பட உள்ளது

ஆய்வாளர் மேற்கொள்ளும் ஆராய்ச்சியில் பங்கேற்க யாருடைய கட்டாயமின்றி முழுமனதுடனும் சம்மதிக்கலாம். இதில் பங்கேற்பதன் நோக்கம் இந்த ஆராய்ச்சியில் தகவல்களை தெரிந்து கொள்வதற்காகவும், அதனை பயன்படுத்துவதற்காக மட்டும் தான்.

எங்களுடைய அடிப்படை தகுதிகளில் நீங்கள் திருப்தியாக இருப்பதால் உங்களை இந்த ஆய்வில் பங்கேற்க அழைக்கின்றோம்.

### ஆராய்வின் நோக்கம் மற்றும் செயல்பாடு

- வயதான பெண்களுக்கு மூட்டு அழற்சியின் காரணமாக ஏற்படும் வலியினைக் குறைப்பதே இந்த ஆராய்ச்சியின் நோக்கமாகும்.
- வயதான காலடத்தில் பெண்களுக்கு ஏற்படும் வலியினை வலியின் அளவினை அளக்கும் அளவுகோல் கொண்டு அளக்கப்படும்.
- கடுகினை அரைத்து, அந்த மாவுடன் (10 மி.கி) மிதமான வெந்நீர் இட்டு கலந்து பசை போல் தயாரித்து, மெல்லிய துணியின் மேல் இட்டு வலி ஏற்படும் இடத்தில் பத்தினை போடப்படும்.
- ஆய்வாளர் ஐந்து நாட்கள் இந்த பத்தினை தொடர்ந்து 10 முதல் 15 நிமிடங்கள் போடுவதன் மூலம் வலி குறைவதை ஆக்ஸ்போர்டு முழங்கால் மதிப்பெண் அளவுகோல் கொண்டு அளவிடப்படும்.
- இதன் மூலம் மூட்டுப்பகுதியில் ஏற்படும் வலியினைக் குறைக்கலாம்.

ஆராய்ச்சியில் பங்கேற்கவில்லை என்றாலும், உங்களின் சராசரி வாழ்க்கை முறை, மருத்துவரின் ஆலோசனை மற்றும் சிகிச்சை முறையில் எந்தவித மாற்றமும் ஏற்படாது என்பதை தெரிவிக்கிறேன்.



இந்த ஆராய்ச்சியில் பங்கேற்க விருப்பம் இல்லை என்றால் உங்களின் விருப்பப்படி ஆராய்ச்சியில் இருந்து விலகிக்கொள்ளலாம் என்பதை தெரிவிக்கிறேன்.

இந்த ஆராய்ச்சியில் உங்களின் மருத்துவதகவல்களை பாதுகாப்பாக வைத்துக்கொள்கிறேன் என்பதை தெரிவிக்கிறேன்.

இந்த ஆராய்ச்சியின் தகவல்களை வெளியிடும் போது,உங்களைப் பற்றிய அடையாளங்கள் வெளிவராது என்பதை உறுதி கூறுகிறேன்

ஆய்வாளர் கையொப்பம்

பங்கேற்பாளர்கையொப்பம்

தேதி

தேதி

