EFFECTIVENESS OF FOOT REFLEXOLOGY ON PAIN AMONG PATIENTS WITH OSTEOARTHRITIS IN SELECTED VILLAGES AT TIRUNELVELI.

DISSERTATION SUBMITTED TO

THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY

CHENNAI

IN PARTIAL FULFILLMENT FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

APRIL 2014

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BY

Ms. NISHA.V

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SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

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ABSTRACT

The Research Project, **"A Study to assess the effectiveness of foot reflexology on pain among patients with osteoarthritis in selected villages, at Tirunelveli".**It was conducted in partial fulfillment of the requirement for the Degree of Master of science in nursing atSri K. Ramachandran Naidu College of Nursing which was affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai during the year 2013-2014.

The Objectives of the study were:

- To assess the pretest and posttest level of pain among patients with osteoarthritis in experimental and control group.
- To find out the effectiveness of foot reflexology on pain among patients with osteoarthritis in experimental group.
- To compare the pretest and posttest level of pain among patients with osteoarthritis in experimental group.
- To associate the posttest level of pain among patients with osteoarthritis in experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits etc.

All Hypotheses were tested at 0.05 level of significant

- The mean posttest level of pain among experimental group was significantly lower than the mean posttest level of pain in the control group.
- The mean posttest level of pain was significantly lower than the mean pretest level of pain in the experimental group.

- There was asignificant association between posttest level of pain among experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits etc.

The framework of the study was based on the Modified Wiedenbach's Helping Art of Clinical Nursing Theory

Totally sixty patients were selected from the two villages. Thirty were selected to experimental group, thirty patients were selected to control group. The sample was selected based on the criteria for sample selection. According to purposive sampling technique the patients were selected to the experimental group and control group. The experimental group received foot reflexology for about 15 minutes for each foot, two times a day for continuous five days. Posttest was carried out for the experimental group and control group on fifth day by using Numerical pain rating scale.

The Research design was Quasi experimental – Pretest and Posttest control group design.The setting of the study was subbulapuram and kuvallaikanni villages at Tirunelveli.It was situated about 5kmsand 8kms from Sri.K.Ramachandran Naidu College of Nursing at Tirunelveli.

The descriptive and inferential statistics were used to analyze the data.

The significant Findings of the study were

On analysis of frequency and percentage distribution of demographic variables, majority of the patients 11 (36.66%) were between the age group of 56-65 years and 66-75 years among osteoarthritis patients in experimental group, whereas in the control group 11(36.66%) of subjects were between the age group of 66-75 years. With regard to sex classification, majority of patients 17 (56.66%) were female in the

experimental group, whereas in the control group male and females were 15(50%) of subjects.

With respect to education, majority of the patients 14 (46.66%) were having primaryeducation in the experimental group, whereas in the control group 13(43.33%) of subjects were having primary education. With regard to occupation, majority of patients 15 (50%) were belongs to moderate worker in the experimental group, whereas in the control group 14(46.66%) of subjects were belongs to moderate worker.

With regard to food habits, majority of patients 17(56.66%) of them were vegetarian, in the experimental group, whereas in the control group 16(53.33%) of subjects were non vegetarian. Regarding the body weight of osteoarthritis,majority of patients 15(50%) were normal body weight in the experimental group and 14(46.66%)were normal body weight in the control group.

Regarding the history of trauma, majority of patients, 17(56.66%) of them were do not have any history of trauma in the experimental group. whereas in the control group, majority of patients 16(53.33%) of them were have history of trauma. With regard to pain precipitating factors, majority of patients 13 (43.33%) were having pain at walking in the experimental group, whereas in the control group majority of patients, 16(53.33%) were having pain at walking.

With regard to joint involvement, majority of patients 13(43.33%) of them had weight bearing joints in the experimental group, whereas in the control group 20(66.66%) of subjects were had weight bearing joints

There was a significant difference between the mean score in the experimental group before and after the application of foot reflexology among the patients with osteoarthritis. Justification undertaken for this study was to givefoot reflexology for reduction of pain and to determine its effectiveness, so that foot reflexology can be used in future for all the osteoarthritis patients for health promotion.

On analysis of mean score of pain among experimental group was 0.43 and control group was 1.96 after interventions. Standard deviation after intervention among experimental group was 0.49 and control group was 0.56 and calculated “t” value was 5.62. It shows reduction of pain.

There was nosignificant association between the posttest level of pain in the experimental group with their demographic variables such as age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors. Obtained chi square value was significant at 0.05 level.

Based on the findings of the study, it is recommended that,

Based on the findings of the present study the following recommendations are made:

1. The similar study can be conducted with large samples for better generalisation.
2. The study can be conducted to assess the knowledge and practice of nurses with regard to foot reflexology for control of pain in patients with osteoarthritis.
3. A comparative study can be conducted by using foot reflexology versus acupressure on reduction of pain among osteoarthritis patients.
4. The similar study can be conducted in the hospital setting.

5. The same study can be repeated by using the true experimental design.

As a nurse working in hospital has a vital role to provide effective nursing care for the patients. The nurses are need to develop their knowledge and skills in management of osteoarthritis by accurately measuring the level of pain, and providing care to the osteoarthritis patients, and to use wide variety of interventions in order to control the level of pain in such patients.

CONCLUSION

The key conclusion that there was a significant difference on the level ofpain among patients with osteoarthritis who received foot reflexology. It was easy to apply and potentially risk free intervention. Thus an application of foot reflexology was effective to control the level of painamong osteoarthritis patients.

CHAPTER I

INTRODUCTION

"***PAIN IS UNCOMFORTABLE FEELING THAT EVEN A TINY AMOUNT OF IT ISENOUGH TO RUIN ENJOYMENT***"

-WILL ROGER

BACKGROUND OF THE STUDY

Pain is a complex, multidimensional experience. For many people, it is a major problem that causes suffering and reduces quality of life. Acute and chronic pain is major health problems that affect millions of people. Acute pain is the most common reason for health care visits. Specific conditions for which patients seek health care include musculoskeletal, gastrointestinal pain, angina and injuries. Millions of people are affected with back pain, arthritis and migraine head ache, which are the most causes of chronic pain. Consequences of untreated pain include unnecessary suffering, physical, psychological dysfunction, impaired recovery of acute illness and sleep disturbances. Many studies document inadequate pain management across care settings and patient populations. For example, families report that over 24% of dying persons did not receive any enough help with pain relief. So the nurses have a central role in pain assessment and management. **(Lewis 2011)**

The phrase "fifth vital sign" usually refers to pain, as perceived by the patient on a pain scale of 0–10. Pain is the fifth vital signs to emphasize its significance to increase awareness among health care professionals.**(Wikipedia 2013)**

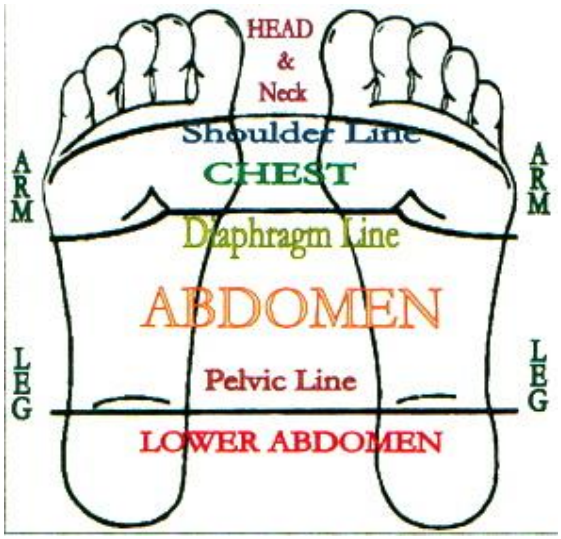
Over 35 years ago, Margo McCaffery,a nurse and pioneer in pain management, defined pain as, "whatever the person experiencing the pain says it as, existing whenever the person says it does".

Gate control theory states that, nerve fibers that contribute to pain transmission coverage at a site in the dorsal horn of the spinal cord. This site is through to act as a gating mechanism that determines which impulses will be blocked and which will be transmitted to the thalamus. If the gate is closed, the signal is stopped before it reaches the brain, where perception of pain is not occurs. If the gate is open, the signal will continue on through the spinothalamic tract to the cortex and the client will feel the pain. Whether the gate is opened or closed is influenced by impulses from peripheral nerves and nerve signals that descent from the brain.**(ShebeerP.Basheer 2012)**

Reflexology is a natural, holistic therapy based on the discovery that there are points on the feet and hands which correspond to organs and systems of the body.For thousands of years, techniques similar to reflexology have been used in Egypt and China. A technique called "zone therapy" was developed in the early 20th century by an American physician named William Fitzgerald. Dr. Fitzgerald suggested that maps of the foot could be used to diagnose and treat medical conditions. He divided the body into 10 zones and labelled what he believed to be the corresponding parts of the foot. He proposed that gentle pressure on the foot could bring relief to the corresponding zone.

In the 1930s, Eunice Ingham, a nurse and physiotherapist, further developed these maps to include specific reflex points. Zone therapy was renamed reflexology. Reflexology charts are diagrams of the feet with corresponding parts of the body. The right foot corresponds to the right side of the body, and the left foot corresponds to the left side.

Modern reflexologists use Ingham's methods, or similar techniques developed by the reflexologist Laura Norman. Massage therapists, chiropractors, podiatrists, physical therapists, and nurses may also use reflexology.



FootReflexologyis an extended form of touch which results in mutual energy exchange. It soothes pain and produces relaxation. It is the most widely used complementary therapy in nursing practice. It is one of the way nurses use to communicate caring to patient and touch is central to the nurses role in healing. It increase pain thresholds and there by modifies an individual perception of pain. **(Walter Last 2008)**

The name Osteoarthritis comes from three Greek words meaning bone, joint, and inflammation. Osteoarthritis is the most common form of arthritis. Osteoarthritis mostly affects cartilage, the hard but slippery tissue that covers the ends of bones where they meet to form a joint. Healthy cartilage allows bones to glide over one another. It also absorbs energy from the shock of physical movement. In osteoarthritis, the surface layer of cartilage breaks and wears away. This allows bones under the cartilage to rub together, causing pain, swelling, and loss of motion of the joint. Over time, the joint may lose its normal shape. Also, small deposits of bone

called osteophytes or bone spurs may grow on the edges of the joint. Bits of bone or cartilage can break off and float inside the joint space. This causes more pain and damage. People with osteoarthritis usually have joint pain and stiffness.**(Lewis 2011)**

Osteoarthritis (OA) is the most common type of arthritis or degenerative joint disease.It is a leading cause of chronic disability. Age is the strongest predictor of the disease and therefore increasing age and extended life expectancy will result in a greater occurrence of the disease. Osteoarthritis mostly often affects middle-aged and older people, involving the neck, lower back, knees, hips and fingers, although younger people may be affected as a result of injury or overuse. It is the major cause of morbidity and disability in the elderly. Epidemiological radiographic assessment studies shows that 80% of male and female population will be affected. Women are generally affected at a younger age than men. Patients with Osteoarthritis experience pain and loss of function especially in early morning almost for 30 minutes. The basic activities of everyday life, such as walking, running, housework, and the ability to exercise are impacted greatly for many Osteoarthritis sufferers. 72% respondents report being limited in doing everyday or routine things**. (Brunner 2009)**

At present, there is no cure for Osteoarthritis. The management of Osteoarthritis is broadly divided into non-pharmacological, pharmacological, and surgical treatments. Surgical management is generally reserved for failed medical management where functional disability affects a patient's quality of life. Pharmacological management includes control of pain and improvement in function and quality of life while limiting drug toxicity. Experts in this field suggest that appropriate therapy for Osteoarthritis combines one or more pharmacological agents with exercise, weight loss and physical therapy (non-pharmacological therapy).

Surgical management of Osteoarthritis may include the replacement of a damaged joint with an artificial part or appliance, surgical fusion of spinal bones, scraping or removal of damaged bone from the joint or the removal of a piece of bone in order to realign the bone. Depending on the location of the affected joint, patients with Osteoarthritis may be advised to use neck braces or collars, crutches, canes, hip braces, knee supports, bed boards or elevated chair and toilet seats.(**Rheumatology for nurses 2008)**

NEED FOR THE STUDY

Global statistics reveals over 100 million people worldwide suffers from osteoarthritis. As per World health Organization Osteoarthritis is the fourth leading cause of death. Up to 40% people over 70 years of age suffers by Osteoarthritis of the knee. Almost 80% of patients with osteoarthritis have some degree of limitation of movement and 25% cannot perform their major daily activities of life. (**Indian academy of arthritis, 2009)**

Rheumatoid arthritis within a decade of its onset leads to work disability defined as a total cessation of employment in between 51% and 59% of patients. Low back pain has reached epidemic proportions being reported by about 80% of people at sometime. (**Braundtland, 2008)**

Cross-sectional study was carried out in an urban resettlement colony in South Delhi to study the prevalence of knee osteoarthritis in women aged ≥40 years and treatment seeking behaviour of women suffering from osteoarthritis. Osteoarthritis was diagnosed by using clinical criteria given by American College of Rheumatology for diagnosis of Idiopathic Osteoarthritis of knee joints. A total 260 women were interviewed out of which 123 (47.3%) women were found to be suffering from knee osteoarthritis. Prevalence of osteoarthritis found to be increased with age. Less than

half of those with osteoarthritis underwent treatment. With this high prevalence of osteoarthritis, there is need to spread awareness about the disease, its prevention, and rehabilitation in the community. (**Felson, 2009)**

About 13% of women and 10% of men aged 60 years and older have symptomatic knee Osteoarthritis. The proportions of people affected with symptomatic knee Osteoarthritis is likely to increase due to the aging of the population and the rate of obesity or overweight in the general population. During a one year period, 25% of people over 55 years may demonstrate persistent episode of knee pain, in which about one in six have to consult their general practitioner about it in the same time period. About 10% of people aged over 55years have painful disabling knee Osteoarthritis of whom one quarter is severely disabled. (**Daley bulletin, 2011)**

In Indian Rheumatism Association reported that, Osteoarthritis of the knees was dramatically more common in Tamilnadu. Incidence of knee Osteoarthritis studies in Tamilnadu shown that approximately 80% of male and female are affected with Osteoarthritis. In the midlife Osteoarthritis was surveyed among the middle aged people 45-60 years among the subjects 75.8% were recorded as having pain and disability due to arthritis in Tamilnadu. (**Tomoyuki, 2003)**

During the practice in the field of nursing the investigator found that many clients attending the health camp had various degree of Osteoarthritis with severe pain and limitations in mobility. The clients expressed that they need an intervention to relieve pain and improve their ability status. The investigator had come across from the various therapies that Foot Reflexology has a beneficial effect in reducing joint pain and improving the mobility status.Pain has a subjective feeling and also a fearful condition, it is extremely important for the nurses to assess, intervene, and

evaluateeach clients discomfort on an individual basis. This has been a driving force for the investigator to conduct study on Osteoarthritis.

STATEMENT OF THE PROBLEM

A Study to assess the effectiveness of foot reflexology on pain among patients with osteoarthritis in selected villagesatTirunelveli.

OBJECTIVES OF THE STUDY

- To assess the pretest and posttest level of pain among patients with osteoarthritis in experimental and control group.
- To find out the effectiveness of foot reflexology on pain among patients with osteoarthritis in experimental group.
- To compare the pretest and posttest level of pain among patients with osteoarthritis in experimental group.
- To associate the posttest level of pain among patients with osteoarthritis in experimental and control group with their selected demographic variableslikeage, sex, education, occupation, food habits etc.

HYPOTHESES:

All Hypotheses weretested at 0.05 level of siginificant

- The mean posttest level of pain among experimental group will be significantly lower than the mean posttest level of pain in the control group.
- The mean posttest level of pain will be significantly lower than the mean pretestlevel of pain in the experimental group.
- There will bea significant association between posttest level of pain among experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits etc.

OPERATIONAL DEFINITION

Assess:

It is a process of systematically andcontinuouslycollecting,validating,andcommunicating the patient data regarding the perception of pain by using numerical pain rating scale.

Effectiveness:

In this study, it refers to the extent to which foot reflexology have impact on the reduction of pain shown by the osteoarthritis patients which is measured by numerical pain rating scale.

Foot Reflexology:

It refers to the application of pressureto the lower arch of the feet of osteoarthritis patient for 30minutes duration twice a day for 5 days, 15 minutes in each foot.Based on a system of zones and reflex areas as per reflexology foot chart, the investigator selected lower arch of each feet as a reflex point and foot reflexology was administered by the investigator who has undergone a basic training in reflexology.Foot reflexology technique includes finger walking, thumb walking, toe rotation, slide and press and hooking method.The investigator was used only hooking method.Hooking method means,pressing sharply in the reflex point and quickly withdraw using a hooking motion.

Pain:

Pain refers to the unpleasant experience perceived by the osteoarthritis patients, which is measured by the scores rated by them in a numerical pain rating scale.

Osteoarthritis patients:

It refers to the patients with the complaints of symptoms of osteoarthritis such as joint pain, swelling in the legs, warmthness, redness, etc. They were assessed by using observational checklist.

ASSUMPTIONS

- Perception of pain is differ from patient to patient.
- Osteoarthritis patients may have joint pain.
- Reflexology is one of the best measure to reduce pain in patient with osteoarthritis.
- Females may have poor pain tolerance than males.

DELIMITATIONS

- The study is delimited to 4weeks period of time.
- The study is delimited to selected villages in Tirunelveli.
- The study is delimited to those who are willing to participate.
- The study is delimited to age group of 45 to 75 years.

PROJECTED OUTCOME

1. The finding of the study will help the nurse to plan and usefootreflexologyin reducing pain among osteoarthritis patients.
2. Foot reflexology will reduce the pain and thereby improving the comfort and feeling of pleasant to the patient.
3. The findings of the study will help the nurse to plan the educational program on Osteoarthritis.

CONCEPTUAL FRAMEWORK

The conceptual framework is a set of interrelated concepts that are assemble together in some rational scheme, in virtue of their relevance to a common theme. Conceptual framework helps to stimulate research and extensive knowledge.**(Polit, 1990).**

The conceptual framework for research study presents the measure on which the purpose of study is based. The framework provides the perspective from which the investigator views the problems. The study is based on the concept that the effectiveness of foot Reflexology on reduces the pain among patients with Osteoarthritis. The investigator adopted the modified Ernestine Wiedenbach's helping art of clinical nursing theory as a base for developing conceptual framework.

Ernestine Wiedenbach's proposes helping art of clinical nursing theory in 1964 for nursing, which describes a desired situation and a way to attain it. It directs action towards the explicit goal. This theory has 3 factors.

- Central purpose
- Prescription
- Realities

CENTRAL PURPOSE:

In this study, the central purpose is to reduce the level pain among patients with Osteoarthritis.

PRESCRIPTIONS:

The application of Foot Reflexology will reduce the level of pain among patients with Osteoarthritis.

REALITIES:

The five realities are identified by Wiedenbach are agent, recipient, goal, means, activities and framework

Agent: The agent is one who has personal attributes, capacities, capabilities, commitment and competence to provide demonstration. In this study the researcher is the agent. It refers to plan for providing Foot Reflexology to the Osteoarthritis patients.

Recipient: The recipient is the patients who had received the investigator intervention.In this study,Osteoarthritispatients who receive Foot Reflexology were the recipients.

Goal: The goal is to direct actions and suggests that the reason for taking those actions. In this study goal is to reduce the level of pain after the application of Foot Reflexology among the Osteoarthritis patients.

Means: The means are the activities used by the investigator to achieve the goal. In this study application of Foot Reflexology with a purpose of reducing the level of pain.

Framework: The framework refers to the facilities in which nursing is practiced. In this study framework refers to Subbulapuram village and kuvallaikkanni village.

The conceptualization of nursing according to this theory consists of three steps as follows.

- **Step I :** Identifying the need for help.
- **Step II** : Ministering the need for help.
- **Step III** : Validating the need for help.

Step I: Identifying the need for help.

This step involves determining the need for help. The Osteoarthritis patients were identified based on the inclusive and exclusive criteria. Purposive sampling technique was used to select the samples. Assess the level of pain by using Numerical pain rating scale in both the groups.

Step II: Ministering the need for help.

This refers to the provision of needed help. In my study after the selection of samples the investigator applied Foot Reflexology to the Osteoarthritis patients in the experimental group for the period of 30 minutes twice a day for 5 days and the control group not received the intervention.

Step III: Validating the need for help.

The validation was done by doing the post test in the fifth day of application of Foot Reflexology by using the Numerical pain rating scale in both the experimental and control group. Osteoarthritis were categorized by mild, moderate and severe Osteoarthritis and pain were categorized by four views that No pain, mild, moderate, and severe pain.

It is accomplished by means of after rendering Foot Reflexology application and it is followed by analysis of data findings.

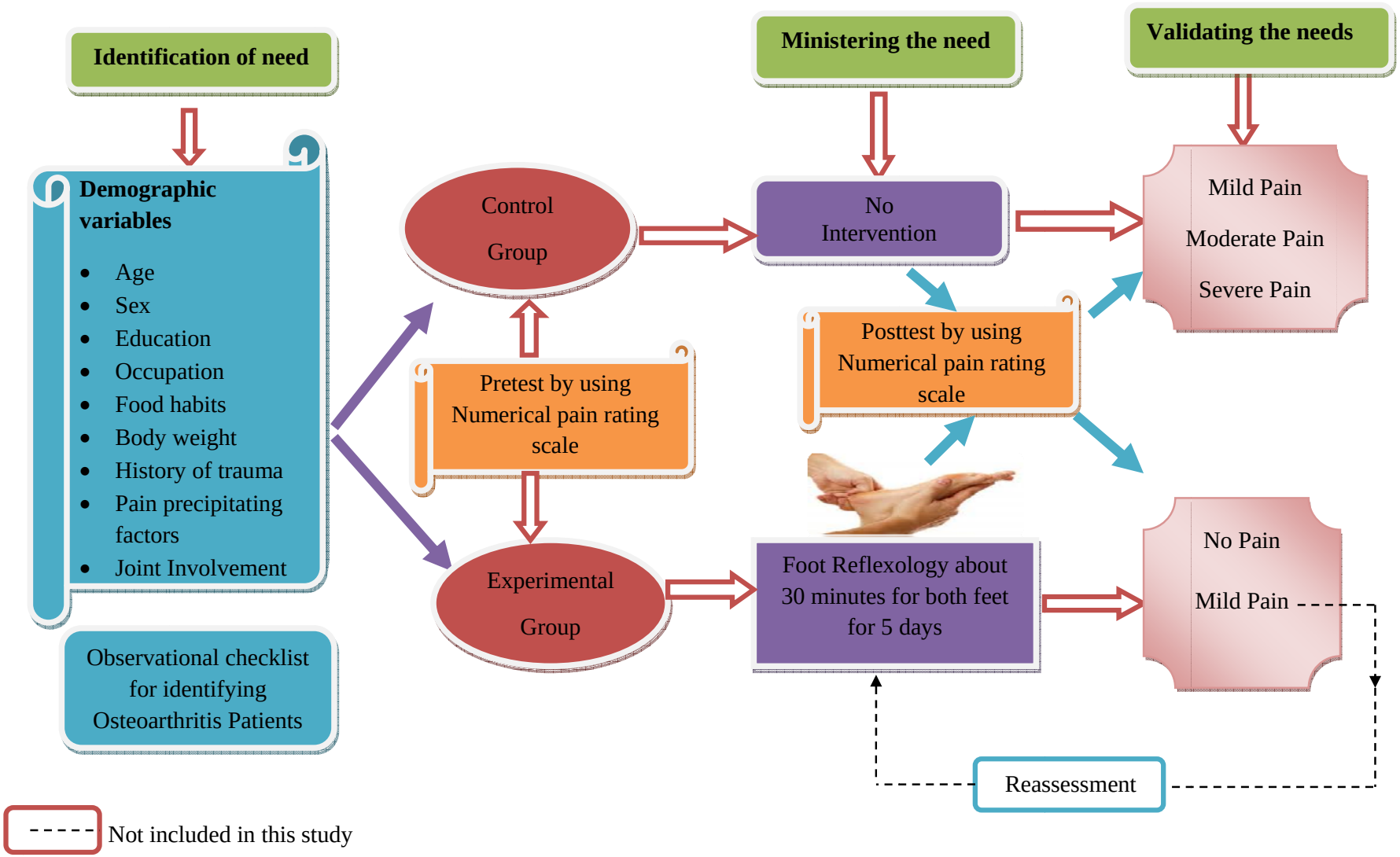


Figure 1: Modified Ernestine Widenbach Helping Art of Clinical Nursing Theory Model (1964)

CHAPTER II

REVIEW OF LITERATURE

Review of literature is defined as a critical summary of review on a topic of interest, often prepared to put a research problem in contest (**Polit& Beck, 2006**).

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

ORGANISATION OFREVIEW OF LITERATURE:

Section A: Studies related to prevalence and risk factors of Osteoarthritis.

Section B: Literature related to the foot reflexology.

Section C: Studies related to foot reflexology on Osteoarthritis.

Section D: Studiesrelated to foot reflexology on other conditions.

SECTION A: STUDIES RELATED TO PREVALENCE AND RISK FACTORS OF OSTEOARTHRITIS:

Pereira.D, Peleteriro et al, (2011)conducted study about incidence and prevalence of Osteoarthritis in North America. Prevalence estimates were combined through meta-analysis and between-study heterogeneity was quantified. Self-reported, radiographic grading and symptomatic findings were used to find out the Osteoarthritis patients (clinical plus radiographic) Seventy-two papers were reviewed (nine on incidence and 63 on prevalence)included all age groups. The resultshowed that Osteoarthritis of the knee tends to be more prevalent in women than in men independently of the Osteoarthritis, but no gender differences were found in hip and hand Osteoarthritis.

Jordan (2010) conducted a population based study to estimate the prevalence of Osteoarthritis in North California, They have selected the African American of Caucasian's aged 74 years. Totally 3018 participants have been selected conveniently, Kellagren and Lawrence radiographic grading was used, The result showed that 28% had knee Osteoarthritis 16% had symptomatic Osteoarthritis 8% had severe Osteoarthritis, increased prevalence in older individual especially among women.

Sun Y Brenner et al (2009)conducted study about Incidence and prevalence of osteoarthritis (OA) of the hip and knee in the general population. They make analysis 29 studies from 14 countries and 4 ethnic groups. (Prevalence rate are 0.5% to 36%). They selected after age 50yrs in women.Radio graphic gradingwas used. The result showed that Osteoarthritis(OA) of the hip is higher in men than in women, and OA was found to be higher in Caucasian than non-Caucasian populations at the hip but not the knee joint. Among patients with radio graphically defined OA at the hip, joint pain seems to be more common in women than in men. In contrast, the frequency of joint pain in persons with radio graphically defined OA of the knee is about the same in women and men.

Bearma et al(2008) conducted a study to find out the risk factors of osteoarthritis that affects middle aged and elderly people among African. Totally 386 clients with the age group of 40-60 years were involved in this study. Interviews were carried out, it suggests that the physical workload, high intensity sports activities, being overweight are risk factors for osteoarthritis. There is also a moderate to strong evidence that high levels of hyaluranic acid are prognostic factors for osteoarthritis.

Geater A. F et al (2007) conducted a population based survey to estimate the prevalence of Osteoarthritis in relation to the positions used by the clients, 288 women and 288 men more than 40 years from Southern Thailand have been studied.

Three common positions in floor activities squatting, side knee bending and kneeling were recorded, Multinomial logic regression analysis was used. The results showed that squatting and side lying positions had increased the relative risk of moderate to severe knee pain and radiographic knee Osteoarthritis.

Liew CM et al (2007)conducted a retrospective study to investigate the association between squatting and prevalence of knee Osteoarthritis. A random sample of seventy two beijing residents more than sixty years were enquired about duration of squatting at youth, knee radiographs were taken. Among the study subjects, 40% of the men and 68% of the women reported squatting one hour per day at youth. Prevalence oftibio femoral Osteoarthritis was found to be increased in both men and women who squatted more than 30 mts per day and youth compared to subjects who squatted less than 30 mts per day at youth.

WHO (2004)conducted a study to estimate the prevalence of osteoarthritis related knee replacement surgery in India, cross sectional survey was used to collect the data reports that there were 4,54,652 total knee replacement performed primarily for arthritis in India. Urban population survey study in Narayanpet, Pune under Bone and joint disease programme in 2003 showed that almost 6.4% of community suffered from osteoarthritis. A population survey study in village Blingwan, near pune under showed that 29% of community suffering from osteoarthritis and Tamilnadu government reveal that 18% of all working group are affected with arthritis 5% of all cases of cases of arthritis are having gout.

Gunither K.P, Stermer et al, (2003)conducted study about "Prevalence of generalised Osteoarthritis (GOA) in patients with advanced Hip and Knee Osteoarthritis**"**They selected 420 patients with hip OA and 389 patients with knee OA scheduled for unilateral total joint replacement in four hospital using radiographic

analysis (using Kellgren-Lawrence > or = grade 2 as case definition) participants were classified as having either unilateral or bilateral OA. The result showed that Patients with hip OA were younger (mean age 60.4 years) and less likely to be female (52.4%) than patients with knee OA (66.3 years and 72.5% respectively).

LITERATURE RELATED TO FOOT REFLEXOLOGY:

Reflexology Association of Canada (2013) A natural healing art based on the principle that there are reflexes in the feet, hands and ears and their referral areas within zone related areas, which correspond to every part, gland and organ of the body. Through application of pressure on these reflexes without the use of tools, crèmes or lotions, the feet being the primary area of application, reflexology relieves tension, improves circulation and helps promote the natural function of the related areas of the body. Reflexologists posit that the blockage of an energy field, invisible life force. Another tenet of reflexology is the belief that practitioners can relieve stress and pain in other parts of the body through the manipulation of the feet. One claimed explanation is that the pressure received in the feet may send signals that 'balance' the nervous system or release chemicals such as endorphins that reduce stress and pain.

Michael Keet (2012) Fitzgerald invented the ‘Hooking Technique’ or ‘Hook work’ of reflexology in which the practitioner makes a hook shape out of his/her thumb or index finger. This move is used to stimulate the crevice where a Reflex Point lies. The Hooking Method is used lightly and then pressure is exerted to stimulate deeply into the Reflex Point.

Carol Eustice(2009) Foot reflexology is an alternative, non-conventional treatment given by a reflexologist. According to the Reflexology Association of America, "It can be used with any medical or alternative therapy, or it can stand alone as an effective health maintenance technique. It is the systematic, manual stimulation

of the reflex maps located on the feet, hands and outer ears that resemble the shape of a human body. Pressure is applied using thumbs and fingers in small movements to stimulate an area far removed from the reflex point. It is believed to work through the nervous and subtle energy systems of the body".

Anne Williams (2008) Reflexology is a therapy based on belief that there are points on the feet, hands, and ears that stimulate the function of different parts of the body, including the glands and organs. While hands, ears, and feet can all be manipulated to improve health and well-being, it is the feet that receive the most attention. The feet are considered to be very important because of their rich supply of superficial nerve endings. Circulation tends to slow in the feet, as they are furthest from the heart, and clients often include foot pain or foot tiredness as a complaint on health intake forms. Reflexologists focus on working every surface of the foot to decrease muscle tension and pain, increase circulation, loosen the foot so that it is more flexible, and relax the body.

U K Reflexology Medicine (2007) Foot reflexology is the physical act of applying pressure to the feet with specific thumb, finger without the use of oil or lotion. It is also called zone therapy, based on the notion that each body part is represented on the feet and that pressing on specific areas on the feet can have therapeutic effects on other parts of the body. The body is divided into 10 longitudinal zones-five on each side of the body. Each organ or part of the body is represented on the feet, massaging or pressing each area can stimulate the flow of energy, blood, nutrients, and nerve impulses to the corresponding body zone and thereby relieve ailments in that zone. Each part of the foot represents a '" reflex area" that corresponds to specific organ or part of the body.

Lett (2007) Foot reflexology, although most commonly practiced in the community is now emerging as a choice for patients being cared for in mental health setting, maternity care and palliative care settings. It has been suggested in the nursing literature that the introduction of foot reflexology and other complementary therapies in healthcare settings, could be an ideal non-pharmacological way of managing difficult symptoms, such as pain and nausea as well as reducing stress and limiting anxiety. Aside from the patient feeling the benefits, relatives too appear to gain satisfaction from the provision of Foot reflexology.

Kughin(2005)presently there are various methods of treatment for different types of diseases, such as cancer, asthma, and multiple sclerosis, and alternative medicine is becoming more prevalent among people despite the advanced technology. Many people nowadays try to avoid the use of medications because of the side effects. This is why people are attracted to alternative therapy techniques, because they want an effective treatment that is not costly and does not cause any harm. There are over a hundred different types of alternative medicine and the number is still growing. A few examples are chiropractic, reflexology, hypnotherapy, reiki, ayurveda, kinesiology, homoeopathy, osteopathy, cranial therapy, various types of acupuncture, colour-therapy, massage, and sound therapy. Foot reflexology has been widely used in fields such as midwifery, orthopedics, neuroscience and palliative care.

Nancy N L (2004) Foot reflexology is provided in a palliative care setting it is essential that the patient is at the center of the treatment process because living and dying is ultimately a unique, intimate and personal journey. Foot reflexology can offer a means of relieving physical symptoms and of facilitating emotional and spiritual wellbeing, but requires the therapist to practice with awareness, sensitivity, intuition and adaptability. Foot reflexology cannot promise sustained improvements in physical

health but can provide therapeutic touch and the space and attention to support patients in connecting their mind, body and spirit. Foot reflexology can also be invaluable in helping careers to cope both before and after the death of their loved ones. It is vital that reflexologists acknowledge their contribution within the team of health professionals involved in caring for the person and the family and the need for practice to be based on contemporary evidence-based knowledge. Sensitivity and humility enable the practitioner in foot reflexology to provide holistic, individualized and appropriate care for people at perhaps the most difficult time of their lives.

Stephenson, Dalton (2003) More than two thirds of Americans with chronic pain is now using complementary and alternative therapies. One complementary and alternative therapy, foot reflexology, has a long history and has been found useful on a case-by-case basis. This article provides a review of the literature on the use of foot reflexology as a therapy in pain management. Although foot reflexology is widely used, systematic research is needed to examine its effectiveness. To date, however, only a few studies have focused on foot reflexology's use in pain management. Because foot reflexology is a noninvasive, nonpharmacological therapy, nurses are in a position to do research on and make decisions about its clinical effectiveness.

SECTION C: STUDIES RELATED TO FOOT REFLEXOLOGY ON OSTEOARTHRITIS

Langenberg (2012)conducted study an “Effectan foot reflexology and in placebo- foot massage on osteoarthritis joint pain an experimental pretest–posttestcontrolled clinical trial study was conducted to determine the effect of foot reflexology on self-reported osteoarthritis joint pain. A convenience 119 sample were randomly assigned to three groups (41 in treatment-foot reflexology, 39 in placebo-foot massage, and thirty nine in control-arthritis information).Pain was measured

before and after the 15-minute intervention by using Short Form McGill Pain Questionnaire. The effect may be explained by the gate control theory. A power analysis & multiple regressions were used to analyze the hypothesis. The study result shown that reflexology group had 8 to 18% improvement (less pain on all pain scales), compared with those in the massage group.

Habot (2011) conducted study on "effect of foot reflexology on wrist and hand pain among osteoarthritis patient" Twenty-two adults with wrist/hand osteoarthritis were randomly assigned to a foot reflexology therapy or a control group. The foot reflexology therapy group was got foot reflexology on the affected wrist/hand once a week for 4-weeks period and were also taught self-massage on the wrist/hand to do daily at home. The study result shown that the foot reflexology therapy group versus the control group had lower anxiety and depressed mood scores after the first and last sessions, reported less pain and greater grip strength after their sessions. The foot reflexology therapy group showed greater improvement than the control group on all of these measures across the study period.

Anukan (2010) The randomized clinical trial study conducted in 220 samples as 118 in control group and 102 in conventional medicine study group for 2 ½ to 3 months duration and then follow up period started to estimate the efficacy of foot reflexology in managing pain under 4 diseased conditions as mastalgia, osteoarthritis, neuropathy with type-II diabetic mellitus and lower limb pain involving intractable epilepsy. The efficiency of reflexology was determined by the improvement of pain score, quality of life and the other associated symptoms. The data collected prior to the therapy, intermittent and at the end of follow up period. The data were analyzed and statistically andcompared. The study result shown that at least two fold improvements in the pain management, quality of life and other symptoms. The

results conclude that reflexology in addition to or alone may offer a holistic therapy in pain management with least cost and insignificant side effects.

Kannadi (2008) A quasi experimental research design was used with two month follow-up to measure the effect of foot reflexology on pain and quality of life in thirty nine female adult osteoarthritis patients without deformity of bone or destruction of joints at osteoarthritis outpatient clinic at Zagazig University Hospitals. The patients with other chronic illness conditions such as diabetes, ischemic heart disease, chronic obstructive pulmonary disease, and stroke were excluded. Perceived pain and quality of life were assessed by using Bio-socio-demographic and disease characteristics, the osteoarthritis Quality of Life questionnaire, Numerical pain assessment Rating Scale questionnaire and Health assessment questionnaire. Eight week course of reflexology treatments were given. The study results revealed hands and foot reflexology improved patient's quality of life, pain and health status in the post-intervention and follow-up phase. These positive impacts are not affected by patient's age and duration of illness. Therefore, reflexology must be considered as a complementary treatment modality in osteoarthritis. It should be introduced to nursing and medical students, and in postgraduate staff development programs.

Gilman et al, (2007) conducted study a "effect of foot reflexology on pain among patient with knee osteoarthritis". In a randomized controlled trial, adults with Osteoarthritis of the knee were assigned either to treatment (twice-weekly sessions of foot reflexology for 1-4 weeks and once-weekly sessions for 5-8 weeks) or to control (delayed intervention) The study result shown that the group receiving foot reflexology therapy improved pain, stiffness, physical function domains, range of motion and time to walk 50 feet.

Mathew et al, (2005)an experimental study conducted to "examine the effects of foot reflexology on pain and depression among 41 middle- aged women with Osteoarthritis" in the Jinju city from March to May, 2005. The foot reflexology was applied to the experimental group 3 times a week for 4 weeks, 30 minutes each. For the data analysis, chi-square-test, t-test, paired t-test and repeated measures ANOVA were used. The study result shown that after foot reflexology, the experimental group shown significant improvement in pain (F=155.77, p=.000) and depression (F=20.00, p=.000). The results suggest that the footreflexology is effective in relieving of pain and depression. Therefore, it is necessary to develop foot reflexology as an independent nursing intervention.

Serawalhaera et al.,(2003) conducted study about "The effect of foot reflexology on joint pain in knee osteoarthritis patients". A quasi-experimental research method was used, a sample of thirty knee osteoarthritis patients with pain were selected by purposive method at the orthopaedic clinic, outpatient department of phrae hospital. In the experimental period patients received reflexology for 2 times per day for 5 days, and in the control period patients didn't receive reflexology for 5 days. The instrument for data collection were demographic data and information about knee osteoarthritis, the assessment of joint pain in patients with knee osteoarthritis, and daily record of joint pain, medication used and daily activities. The results of this study showed that the joint pain score in the experimental period after receiving reflexology was statistically significantly lower than during the control period. What this study revealed is that reflexology can be use as a complementary therapy to relieve joint pain and decrease drug used for pain relief.

SECTION: D

STUDIESRELATEDTO FOOT REFLEXOLOGY ON OTHER CONDITIONS:

Swapna (2010)conducted a study to assess the foot reflexology to relieve the post operative pain among the patients with abdominal surgeries. Two group pretest and posttest experimental group design was used among 40 samples. The calculated‘t’ value was 17.8 for the experimental group regarding pain. The result showed that foot reflexology had a significant effect on post operative pain among the patients with abdominal surgery in experimental group.

King and Sharma (2009)A Quasi-experimental study by using pre/post test crossover design conducted to test the effects of footreflexology on anxiety and pain in twenty three breast and lung cancer patients at a medical/oncology unit in the southeastern United States hospital. The majority of the sample were female, Caucasian, and 65 years or older and were receiving regularly scheduled opioids and adjuvant medications on the control and intervention day. Footreflexology done by a certified reflexologist for 30 minutes duration with a control condition for each patient (with at least a two-day break). No changes were made in patients' regular schedule or medications. After the footreflexology intervention, patients experienced a significant decrease in anxiety and pain.

Quattria, Zanini et al, (2009)examined the effectiveness of foot reflexology in hospitalized cancer patients undergoing second or third chemotherapy cycles. The study consisted of thirty patients being admitted to the oncology unit at a scientific research hospital in Italy. Only fifty of the thirty participants received foot reflexology. The subject’s self reports of anxiety (measured by spiel berger state-Trait Anxiety Inventory) were recorded before after and 24 hours after the intervention.

There was an average decrease of 7.9 points on the state anxiety scale in the treatment group and of 0.8 points in the control group ($p < 0.0001$). They concluded that foot reflexology can be considered a support treatment used in combination with traditional medical treatments and executed by an expert, qualified person to help cancer patients receiving chemotherapy feel better and also cope better with their disease.

Wilkinson, Lockchart et al., (2008) a quasi-experimental study was conducted to investigate the effect of foot reflexology on sternotomy pain among 19 coronary artery bypass graft surgery undergone patients'. The samples randomly divided into three groups of case, control and placebo. The reflexology group received a 10-minute right foot reflexology, twice a day with 6-hours interval for 2 days. The placebo group received a 10-minute left foot massage and the control group received no intervention. The pain was measured by using visual analogue scale. Results shown that average of pain intensity in the case group before and after the intervention were 6.4(±2.1) and 3.4(±5.1) respectively. The mean of pain intensity in control group before and after intervention was respectively 5.1(±1.7) and 5(±1.9). So Foot reflexology appears to be a useful method for reducing sternotomy pain in patients after coronary artery bypass graft surgery

Wang myoung, Parkshin et al., (2007) performed pilot study on the effect of an oriented self –help group program on living alone elder in rural areas. A one group pretest –posttest design was used. The subjects of the experimental group participated in the oriental self-help program, health program, health education, feet bathing in hot water, cupping therapy and foot reflexology. The obtained data were analyzed using Wilcox on signed rank test and Pearson correlation coefficients of SPSS. The level of blood triglyceride SGOT and glucose decreased significantly in the experimental

group compared to the control group. The scores of depression and stress decreased significance in the experimental group compared to the control group. The result of this research showed that the program is effective in improving physiological indexes partially and emotional indexes of the elderly.

Garrido-Ardila EM et al, (2007) a systematic review and meta-analysis were conducted to evaluate the effectiveness of foot reflexology on fatigue, sleep and pain. Electronic database and manual searches were conducted on all published studies reporting the effects of foot reflexology on fatigue, sleep, and pain. Forty four studies were eligible including fifty studies associated with fatigue, eighty with sleep, and eleven with pain. The effects of foot reflexology were analyzed by using Comprehensive Meta-Analysis Version 2.0. The homogeneity and the fail-safe N were calculated. Result shown that the effects on fatigue, sleep, and pain were not homogeneous and ranged from 0.63 to 5.29, 0.01 to 3.22, and 0.43 to 2.67, respectively. The weighted averages for fatigue, sleep, and pain were 1.43, 1.19, and 1.35, respectively. No population bias detected by fail-safe and funnel plot. Foot reflexology had a larger effect on fatigue and sleep and a smaller effect on pain.

Barbara and Kevin (2000-2007) eighty Foot Reflexology studies in Korea by showed that the application of reflexology work creates significant changes in health of individuals in all ages. Positive results were obtained following reflexology work for college students (premenstrual syndrome, dysmenorrhoea, constipation, anxiety, and depression) postpartum women, working women (fatigue and sleep) menopausal women, middle-aged women (incontinence, osteoarthritis) and the elderly (hypertension, sleep.) Significant results were reached for patients undergoing treatments for: cancer and chemotherapy, diabetes, hypertension, pneumoconiosis, and stroke.The therapy brings relief to a wide range of acute and chronic conditions,

and is suitable for all ages. Once your body is in-tune, it is wise to have regular treatments in order to help maintain health and well-being. An increasing number of people are using this safe, natural therapy as a way of relaxing, balancing and harmonizing the body.

Jeong, (2006)conducted an experimental study to evaluate the effect of foot reflexology on depression among six end stage renal disease clients at korea, three patients were assigned to the experimental group receiving foot reflexology and three patients were assigned to the control group receiving traditional Chinese medicine. The experimental group showed less depression following foot reflexology than control group and reveals that there is significance reduction in depression among end stage renal disease.

NielsBaekgaard and Vibe Hansen (2004) conducted a study at Glostrop hospital to identify the effectiveness of reflexology on acute pain among thirty patients with kidney stones, they were divided in to three groups, and Participants in the study were divided equally into three groups as reflexology group, placebo treatment and control group. If no pain relief was experienced within 5 minutes, the treatment would end for analgesic medications, but those who experienced a benefit within 5 minutes, treatment was continued for a further 10 minutes. The results showed that 9 out of the 10 patients in the reflexology group experiencedcomplete pain relief after the treatment over an hour and 5 of the patients pain was relieved for 4 hours. The researcher concluded that, reflexology treatment of acute ureterolithiasis has a pain relieving effect, and when compared to Baralgin (a commonly administered analgesic), the findings revealed that reflexology actually works faster at alleviating pain although the effects last for a shorter duration.

Park, (2004) conducted an experimental study to examine the effectiveness of foot reflexology on depression among thirty four clients with Hypertension. The reflexology was administered twice a week for six weeks and revealed that there was a significance decrease in level of depression in an experimental group. It was concluded that foot reflexology massage is effective in reducing depression and to reduce blood pressure clients with Hypertension.

Kang king kio, (2004) conducted a quasi experimental study to evaluate the effect of foot reflexology on depression among thirty nine middle aged women with urinary incontinence at korea. The foot reflexology was applied for 30 minutes; 3 times a week for 4 weeks and the results revealed that foot reflexology is effective in a reducing depression in urinary incontinence of middle aged women.

Slev-Ner, Gamus et al., (2003)conducted a randomized controlled clinical trial to evaluate the effect of foot reflexology on symptoms of multiple sclerosis. Seventy one Multiple sclerosis patients were randomized to either study or control group, to receive an 11-weeks treatment, reflexology treatment included manual pressure on specific points in the feet and massage of the calf area. The intensity of paresthesia, urinary symptoms, muscle strength and spasticity was assessed in a masked fashion. Significant improvement in the differences in mean scores of paresthesia (P = 0.01), urinary symptoms (P=0.03) and spasticity (P=0.03) was detected in the foot reflexology group. Improvement with borderline significance was observed in the differences in mean scores of muscle strength between the reflexology group and the controls (P=0.06). The patients receiving foot reflexology the symptoms are reduced compare than control group with Multiple Sclerosis.

CHAPTER III

RESEARCH METHODOLOGY

This chapter describes the methodology to evaluate the effectiveness of foot reflexology on reduction of pain among Osteoarthritis patients.

The chapter provides a brief description of the method adopted for the study. It includes research approach, research design, setting of the study, population, sample, sample size, sampling technique and criteria for selection of samples, development and description of interventions, pilot study, plan for data analysis and production of subjects.

RESEARCH APPROACH

Quantitative research approach was adopted for this study.

RESEARCH DESIGN

The research design used in this study was quasi experimental pretest andposttest with control group design.

The design represented below,

GROUP	PRETEST	INTERVENTION	POSTTEST
EXPERIMENTAL GROUP	O_1	X	O_2
CONTROL GROUP	O_1	-	O_2

Figure 2: Schematic Representation of Research Design.

KEYS:

O_1: Pretest level of pain among experimental group and control group.

O_2: Posttest level of pain among experimental group and control group.

X: Application of foot reflexology to the experimental group.

VARIABLES

Variables are characters that can have more than one value. The categories of variables discussed in the present study are, independent variable and dependent variable.

Independent variables

Foot Reflexology

Dependent variable

Level of pain among Osteoarthritis patients.

SETTING OF STUDY

The setting of the study refers to the area where the study was conducted. The study was conducted in two villages in Tirunelveli. In that,Subbulapuram was selected for experimental group and Kuvalaikanni village was selected for control group. This arrangement helped the investigator to carry out the intervention for the experimental group and also reduced the interruption from the control group. Total population ofSubbulapuramvillage is 6969. In that 2900 were males and 2069 were females. The investigator selected another village for the study was Kuvalaikanni. The total population of that village is 8551**.** In that, 3223 were males and 3328 were females. The distancesbetween the two villages from the college were 5 killo meters and 8 killo meters respectively. The peoples from both villagesgotthe health care facilities from karivalamvandhanalloor primary health centre.The primary health centre was providing the basic medical care facilities such as immunization, family planning, maternal child health care etc.

STUDY POPULATION

The population of the study was persons with Osteoarthritis, residing in Tirunelveli.

SAMPLE

The Osteoarthritis patients who are all having mild to moderate pain and age group between 45-75 years of age residing in Subbulapuram and Kuvalaikanni villages inTirunelveli.

SAMPLE SIZE

The Sample size for the study was 60. Among 60 samples, 30 persons were in experimental group and another 30 persons were in control group. The Samples were selected based on the inclusive criteria.

SAMPLING TECHNIQUE

The non probability purposive sampling technique was adopted for the study.

Step 1: The investigator was selectedsubbulapuramvillage for experimental group. Total population ofSubbulapuram village is 6969. In that 2900 were males and 2069 were females. Among them 256 samples were belongs to the age group of 45-75 years. The investigator gone to home to home survey and identified the patients with osteoarthritis by using observational checklist. Among them 30 patients who fulfil the inclusive criteria were selected for experimental group.

Step 2: The investigator was selected kuvalaikanni village for control group.Total population of kuvalaikanni village is 8551. In that 3223 were males and 3328 were females. Among them 327patients belongs to the age group of 45-75 years.The investigator gone to home to home survey and identified the patients with osteoarthritis by using observational checklist. Among them 30 patients who fulfil the inclusive criteria were selected for control group.

CRITERIA FOR SAMPLE SELECTION

The sample was collected on the basis of inclusive criteria.

INCLUSIVE CRITERIA

- ❖ Patient with age group of 45 to 75 years.
- ❖ Patient who is all having mild to moderate pain.
- ❖ Patient who are willing to participate in the study.
- ❖ Both male and female patients with Osteoarthritis.

EXCLUSIVE CRITERIA

- ❖ Patient with neurological disorders.
- ❖ Patient with skeletal deformities.(congenital abnormalities in feet)
- ❖ Osteoarthritis over vertebral column.
- ❖ Patients with severe pain.
- ❖ Patients with varicose vein.
- ❖ Patient who complicate with Osteoarthritis.
- ❖ Patient who having foot ulcer
- ❖ Patient those who are taking medication for Osteoarthritis.

RESEARCH TOOL AND TECHNIQUE

DEVELOPMENT AND DISCRIPTION OF TOOL:

Section- A:

It consists of observational checklist to find out the client's with Osteoarthritis.The observational checklist was developed by the investigator after reviewing the literature. The tool consists of 12 symptoms of Osteoarthritis. Based on

the presence of symptoms, patient was diagnosed as Osteoarthritis and categorized in to different levels of severity of Osteoarthritis (Mild, Moderate and Severe).

Section: B

It consists of demographic data of the patient with Osteoarthritis. It includes age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, joint involvement.

Section: C

The pain was assessed by using numerical pain rating scale. This is a standardized scale, the scale consists of numerical values from 0 to 10 which denotes the different levels of pain.

SCORING PROCEDURE:

SECTION- A:

Observational checklist for identifying osteoarthritis patients. Total score is 12. If symptom presence itscore 1, if symptom absent it score 0.

DESCRIPTION	SCORE
NEGLIGIBLE	0
MILD OSTEOARTHRITIS	1-5
MODERATEOSTEOARTHRITIS	6-9
SEVERE OSTEOARTHRITIS	10-12

SECTION-C:

Numerical pain rating scale to find out the level of pain among osteoarthritis patients**.** Total score is 10, based on the score the level of pain was categorized to Mild, Moderate, Severe and Worst pain.

DESCRIPTION	SCORE
NO PAIN	0
MILD PAIN	1 to 2
MODERATE PAIN	3 to 6
SEVERE PAIN	7 to 9
WORST PAIN	10

VALIDITY:

The content of the tool was established on the basis of opinion of nursing and medical experts in the field of medical surgical nursing.

RELIABILITY:

The researcher was used numerical pain rating scale. It is standardized and universally acceptable one.Reliability of observational checklist of osteoarthritis patients was established by test-retest method by using Karl Pearson's correlation coefficient. The reliability score was r=0.8 which showed a highly positive correlation of the tool. Hence the tool was considered reliable for preceding the main study.

INTERVENTION:

TECHNIQUE OR PROCEDURE

Reflexology is a science based on the premise that there are zones and reflex areas in the feet and hands which correspond to all glands, organs, parts and systems of the body. The physical act of applying pressure using thumb, finger and hand techniques

to these reflex areas results in the reduction of stress which promotes physiological changes in the body.**(Reflexology Association of America 2003)**

Through Foot Reflexology, by stimulating the reflex points 7000 nerves and 26 bones in the feet release blockages and rebalance the energy flow in the body. This brings the body back into natural equilibrium, which promotes the body's natural healing power. This is because the body contains an energy field, as invisible life force. (**Wagner 2004)**

- The purpose of reflexology was explained to the patient.
- Placed thepatient in convenient position. Placed the soft pillow under the head.
- Raised the feet over the hard pillow, allowing the heels to hang loose at the foot end of the bed.
- The investigator used hooking technique.
- The investigator warm up the palms by rubbing it against each other.
- The investigator was hold the foot with left hand and with the thumb of the right hand sharp pressure was given to the reflex point and the pressure was released quickly by using a hooking motion.
- Each time pressure was given for 90 seconds.
- The pressure was applied to the each foot for 15 minutes.

Foot reflexology was given gently for 30 minutes for 5 days for twice daily. The posttest was conducted after 5 days after the reflexology by using numerical pain rating scale as an subjective assessment scale in both experimental and control group

PILOT STUDY:

It is the rehearsal of the main study. The pilot study was conducted after obtaining formal permission from principal and ethical committee of

Sri.k.Ramachandran Naidu College of Nursing and HOD of Medical Surgical Nursing. The tool used for the main study was validated by the pilot study. The pilot was conducted in Paruvakudivillage atTirunelvelifrom 27/7/2013 to 31/7/2013. The number of samples were6 those who are fulfilling the inclusive criteria by using purposive sampling technique samples were selected. Among them 3 samples were selected for experimental group and 3 samples were selected for control group.

The investigator was selected the Osteoarthritis patients by using observational checklist. Rapport was established with the Osteoarthritis patients and a brief introduction about the study was given. Oral consent was obtained from the each Osteoarthritis patients and reassurance was provided that the collected data would be kept confidential.Demographic variables were collected by the interview method, and pretest level of pain was assessed by using numerical pain rating scale for both experimental and control group. Foot reflexology was given totheexperimental group for 30 minutes twice a day and no intervention was given for control group, after the 5^{th} dayposttest level of pain was assessed by numerical pain rating scale for both experimental and control group. The data analysis was done by using both inferential and descriptive statistics.

PROCEDUREFOR DATA COLLECTION:

The researcher got the permission from the principal and research ethical committee of Sri.k.Ramachandran Naidu College of Nursing and HOD of Medical Surgical Nursing. A formal permission from the medical officer from the Primary health centre at Karivallam. With the use of purposive sampling technique the investigator was selecting the samples. Data collection was conducted from 01-08-2013 to 31-08-2013.

The investigator was selected the Osteoarthritis patients by using observational checklist. During the data collection procedure the investigator was established rapport with Osteoarthritis patient. They assured that no physical or emotional harm would be done in the course of study. Based on inclusive criteria the samples were selected and 30 samples were allotted to experimental group and 30 samples were allotted to control group.

Data pertaining to the demographic variables were collected by interview method. The investigator was assessed the level of pain by using numerical pain rating scale. First the investigator was assessing the pretest level of pain. After this, the investigator was given foot reflexology 30 minutes morning and evening for 5 days among experimental group. At the end of the intervention the posttest was assessed by using numerical pain rating scale. No intervention was given for control group.

PLAN FOR DATA ANALYSIS:

The data was going to analyse according to objectives of study by descriptive and inferential statistics.

DESCRIPTIVE STATISTICS:

- Demographic variables was analysed by using frequency and percentage distribution.
- Frequency and percentage distribution was used to assess the level of the pain.
- Mean and standard deviation was used to assess the level of pain.

INFERENTIAL STATISTICS

- Paired “t” test was used to compare the pretest and postest level of pain among experimental group.

- Unpaired “t” test was used to compare posttest level of pain between experimental group and control group.
- Chi-square test was used to find out the association of posttest level of pain among experimental group and control group with their selected demographic variables.

PROTECTION OF HUMAN RIGHTS:

Research proposal was approved by the dissertation committee prior to the pilot study and the main study formal permission obtained from the principal, head of the department of Medical Surgical Nursing Sri.k.Ramachandran Naidu College of Nursing in Sankarankoil and PHC in Karivallum. The participant was informed that the response provided by them was kept confidential. The participants were assured that there will not be any harm caused to them during the course of study by participating in the study.

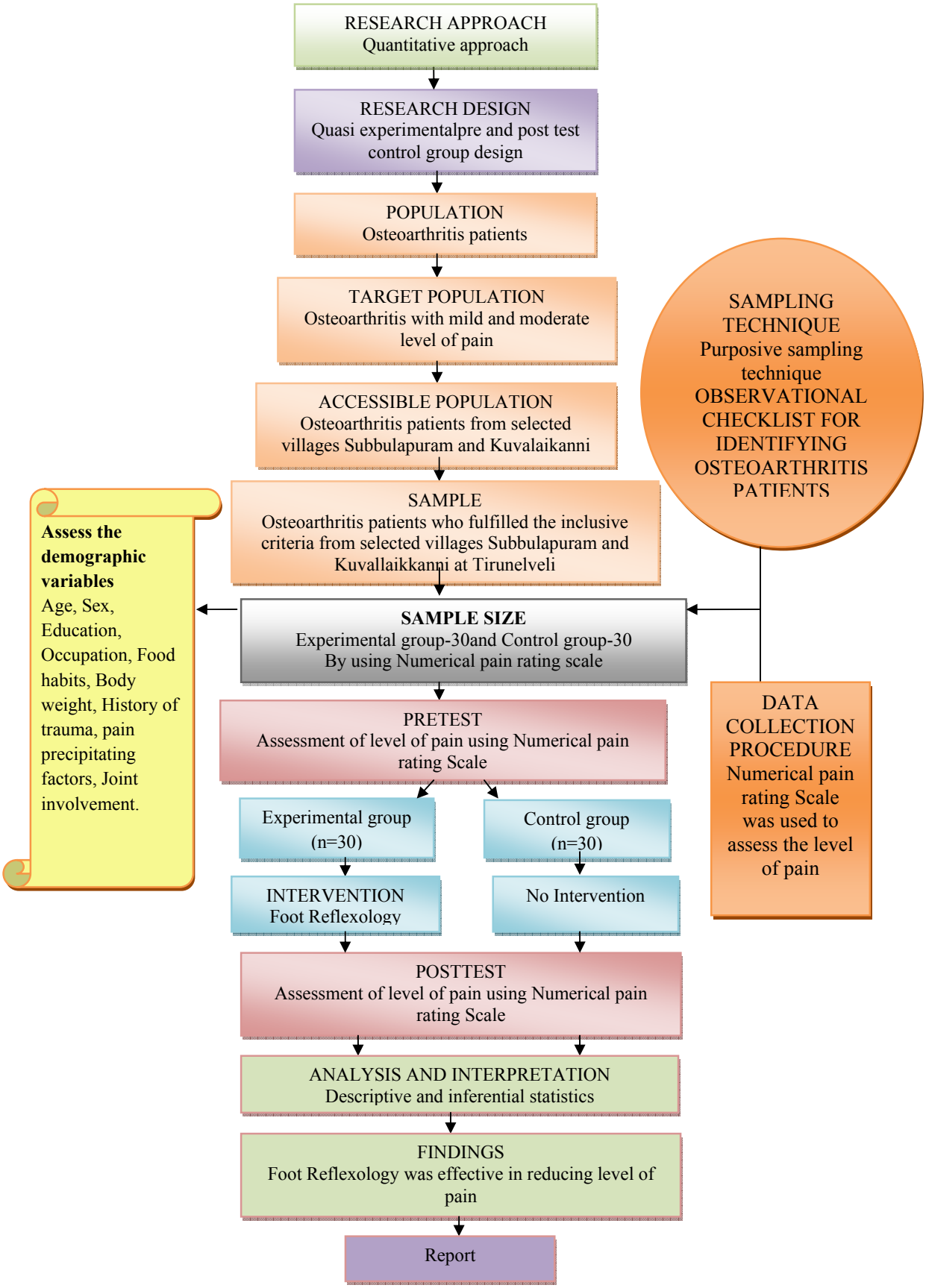


Figure 3: Schematic representation of research methodology

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

This Chapter deals with the analysis of the data and interpretation of the data collected from the samples to assess the effectiveness of foot reflexology in reduction of pain for patients with osteoarthritis.

Analysis is the method of organizing scrutinizing and sorting the data in such a way thatresearch questions can be answered **[Polit, Hungler (2009)]**

The purpose of analysis is to find out the effectiveness so that the relation of the problem can be tested.

The analysis and interpretation of data is based on data collection the results are computed by using descriptive (Frequency, percentage distribution mean and standard deviation) and inferential ('t'- test and chi square test) statistics. The data has been tabulated and organized as follows.

ORGANIZATION OF DATA

Section I

Description of demographic variables of the patients with osteoarthritis

Section II

Assessment of the level of pain among patients with osteoarthritis in the experimental and control group

- Assessment of pretest and posttest level of pain among experimental group.
- Assessment of pretest and posttestlevel of pain among control group.

Section III

Comparison of level of pain among patients with osteoarthritis in experimental group and control group.

- Comparison of posttest level of pain between the experimental and control group.
- Comparison of pretest and posttest level of pain among patients with osteoarthritis in experimental group.

Section IV

Association of posttest level of pain among patients with osteoarthritis in experimental and control group with their selected demographic variables

- Association of posttest level of pain among patients with osteoarthritis in experimental group with their selected demographic variables.
- Association of posttest level of pain among patients with osteoarthritis in control group with their selected demographic variables.

SECTION I

DATA ON DEMOGRAPHIC VARIABLES OF PATIENTS WITH OSTEOARTHRITIS

Table 1: Frequency and percentage distribution of the samples based on demographic variables such as age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, joint involvement.

(N=60)

S.No	Demographic variables	Experimental group		Control group	
		F	%	F	%
1	**Age**				
	a) 45-55 Years	8	26.6	10	33.3
	b) 56-65 Years	11	36.6	9	30
	c) 66-75 Years	11	36.6	11	36.6
2	**Sex**				
	a) Male	13	43.33	15	50
	b) Female	17	56.66	15	50
3	**Education**				
	a) Illiterate	6	20	7	23.33
	b) Primary	14	46.66	13	43.33
	c) Higher Secondary	6	20	7	23.33
	d) Graduate	4	13.33	3	10
4	**Occupation**				
	a) Sedentary Worker	6	20	7	23.33
	b) Moderate Worker	15	50	14	46.66
	c) Heavy Worker	9	30	9	30

5	**Food Habits**				
	a) Vegetarian	17	56.66	14	46.6
	b) Non vegetarian	13	43.3	16	53.3
6	**Body Weight**				
	a) Under Weight	8	26.66	3	10
	b) Normal Weight	15	50	14	46.66
	c) Over Weight	7	23.33	13	43.33
7	**History of Trauma**				
	a) Yes	13	43.3	16	53.3
	b) No	17	56.6	14	46.6
8	**Pain Precipitating Factors**				
	a) Pain at rest	2	6.66	3	10
	b) Pain at walking	13	43.33	16	53.33
	c) pain at long standing	10	33.33	9	30
	d) Pain at sleeping	5	16.66	2	6.66
9	**Joint Involvement**				
	a) Weight bearing joint	13	43.33	20	66.66
	b) Joints of fingers	7	23.33	1	3.33
	c) Joints of foots	10	33.33	9	30

Table 1 denotes the frequency and percentage distribution of the samples based on demographic variables such as age, sex, education,occupation, food habits, body weight,historyof trauma, pain precipitating factors, joint involvement.

While considering the age, in the experimental group out of 30 patients, 8(26.66%)were between the age group of 45-55 years, 11(36.66%) were belongs to 56-65years and 11(36.66%)were belongs to 66-75 years, whereas in the control group out of 30 patients 10(33.33%)were between the age group of 45-55years, 9(30%) belongs to 56-65years and 11(36.66%) patients belongs to 66-75years.

With regard to sex, in the experimental group, out of 30 patients, 13(43.33%) were males and 17(56.66%) were females, whereas in the control group out of 30 patients 15(50%) were males and remaining 15(50%) were females.

Based on the educational status, in the experimental group, out of 30 patients, 6(20%) were illiterate, 14(46.66%) had primary school education, 6(20%) had higher secondary school education, 4(13.33%) of them were graduate, whereas in the control group out of 30 patients, 7(23.33%) were illiterate, 13(43.33%) had primary school education, 7(23.33%) had highersecondary school education, 3(10%) of them were graduate.

Regarding the occupation, in the experimental group among 30 patients with osteoarthritis, 6(20%) were sedentary workers, 15(50%) were moderate workers, and 9(30%) were heavyworkers, whereas in the control group out of 30 patients, 7(23.33%) were sedentary workers, 14(46.66%) were moderate workers, 9(30%) were heavy workers.

With regard to food habits, in the experimental group out of 30 patients, 17(56.66%) were vegetarian and 13(43.33%) were non-vegetarian, whereas in the control group out of 30 patients 14(46.66%) were vegetarian and 16(53.33%) were non vegetarian.

Regarding the body weight of osteoarthritis patients, in the experimental group out of 30 patients, 8(26.66%) were under weight, 15(50%) of patients werenormal body weight, 7(23.33%) were over body weight, whereas in the control group out of 30 patients, 3(10%) were under weight, 14(46.66%)were normal body weight 13(43.33%) were over body weight.

Regarding the history of trauma in the experimental group out of 30 patients, 13 (43.33%) had history of trauma, 17(56.66%)didn’t have history of trauma, whereas

in the control group out of 30 patients, 16(53.33%) had history of trauma, 14(46.66%) didn't have history of trauma.

Regarding the pain precipitating factors, in the experimental group out of 30 patients, 2(6.66%) having pain at resting, 13(43.33%) of having pain at walking, 10(33.33%) having pain at long standing, 5(33.33%) having pain at sleeping, whereas in the control group out of 30 patients, 3(10%) having pain at resting, 16(53.33%) of having pain at walking, 9(30%) having pain at long standing, 2(6.66%) of them having pain at sleeping.

Regarding the joint involvement, in the experimental group out of 30 patients, 13(43.33%) had osteoarthritis in weight bearing joints, 7(23.33%) had osteoarthritis in joints of fingers, 10(33.33%) had osteoarthritis in joints of foots. Whereas in the control group out of 30 patients, 20(66.6%) had osteoarthritis in weight bearing joints, 1(3.33%) had osteoarthritis in joints of fingers, 9(30%) had osteoarthritis in joints of foots.

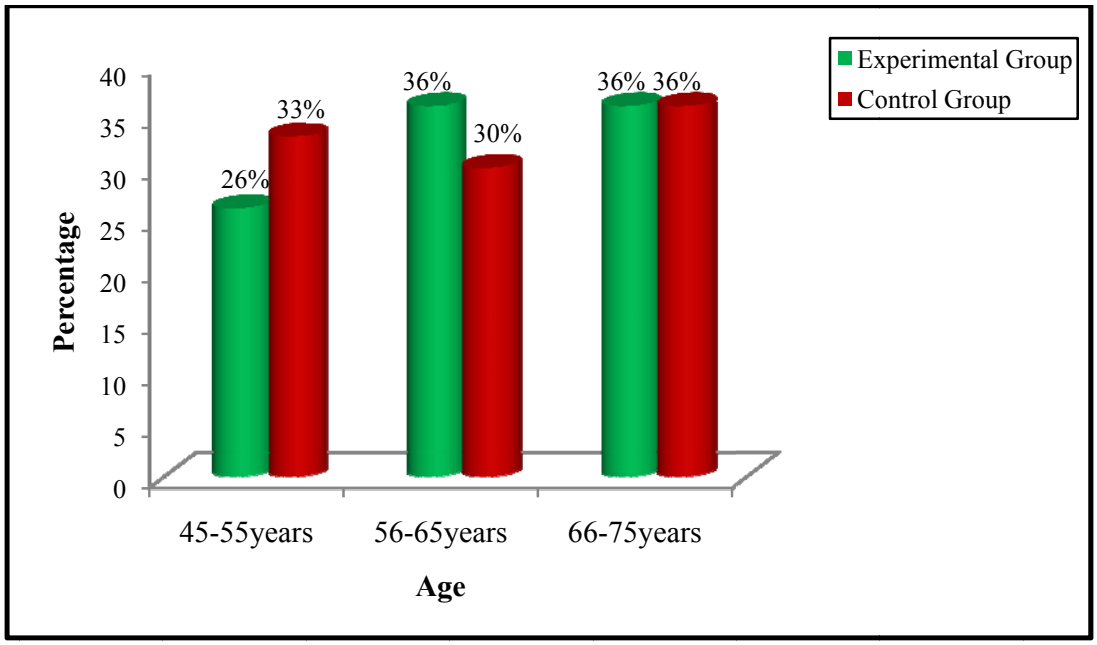


Figure 4:Percentagedistribution of demographic variables of age in experimental and control group

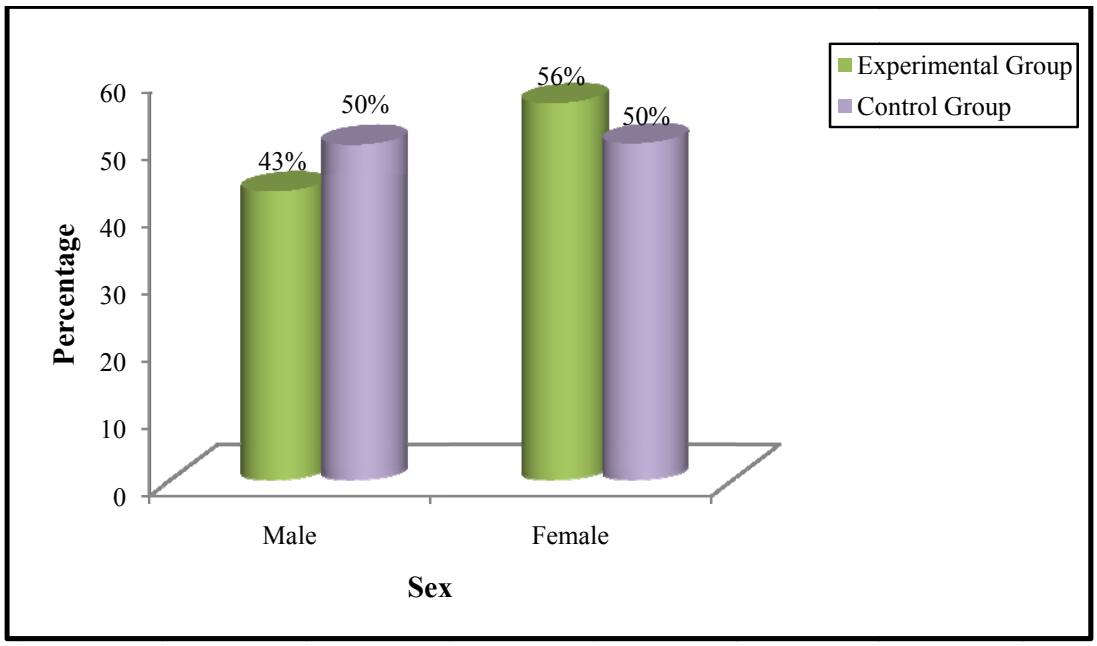


Figure 5: Percentagedistribution of demographic variables of Sex in experimental and Control group

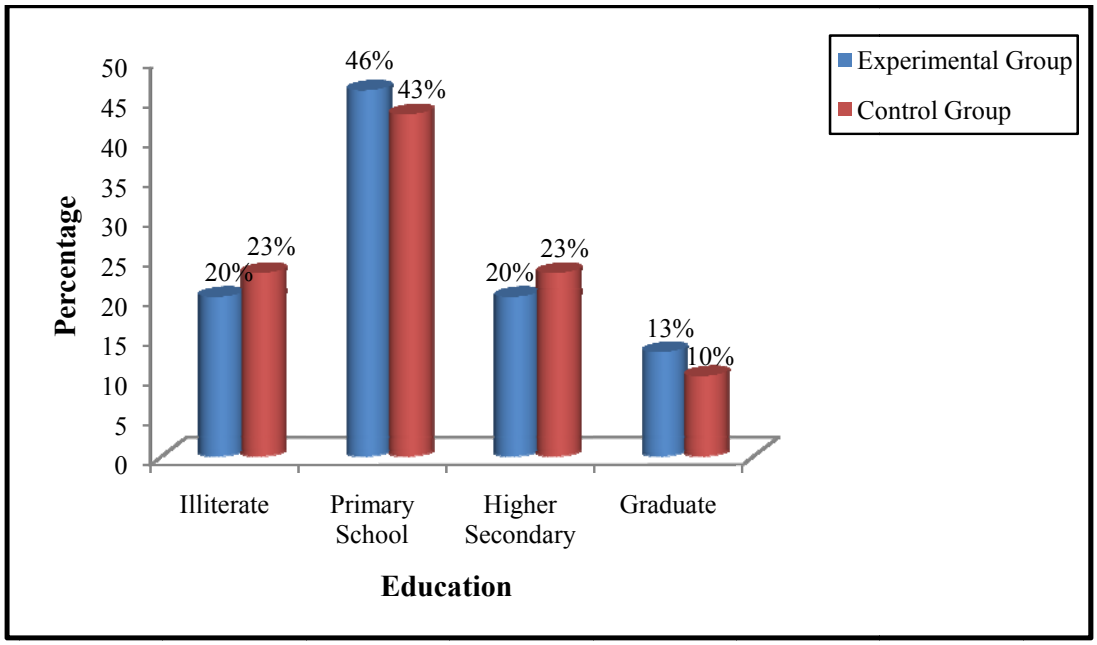


Figure 6: Percentagedistribution of demographic variables of education in experimental and Control group

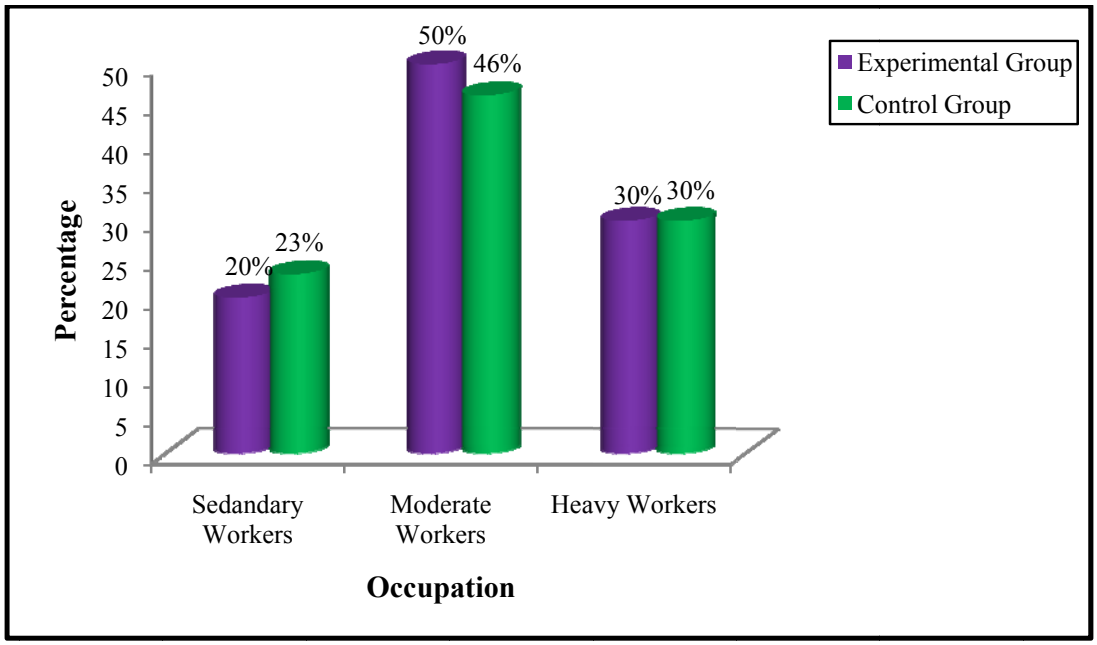


Figure 7: Percentagedistribution of demographic variables of occupation in experimental and Control group

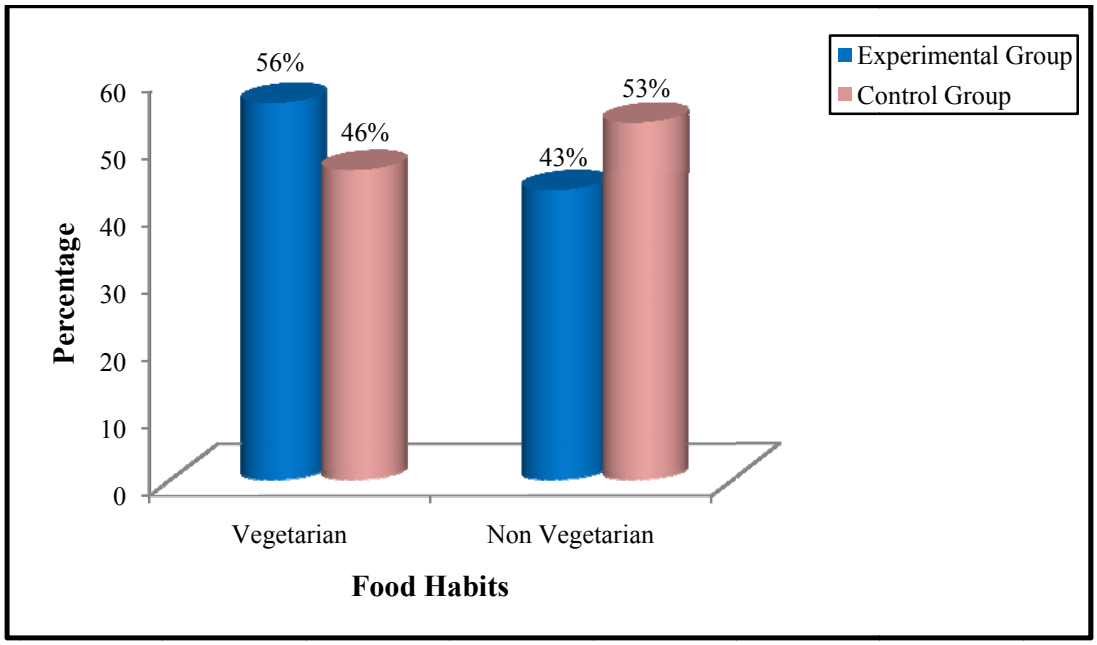


Figure 8: Percentagedistribution of demographic variables of food habits in experimental and Control group

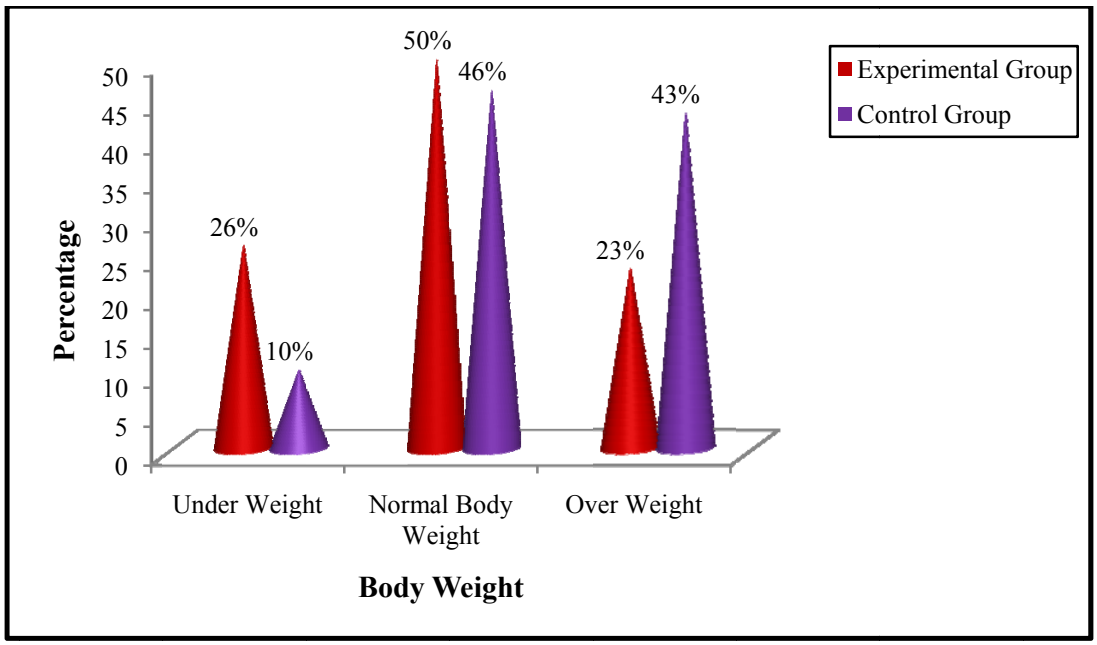


Figure 9: Percentagedistribution of demographic variables of body weight in experimental and Control group

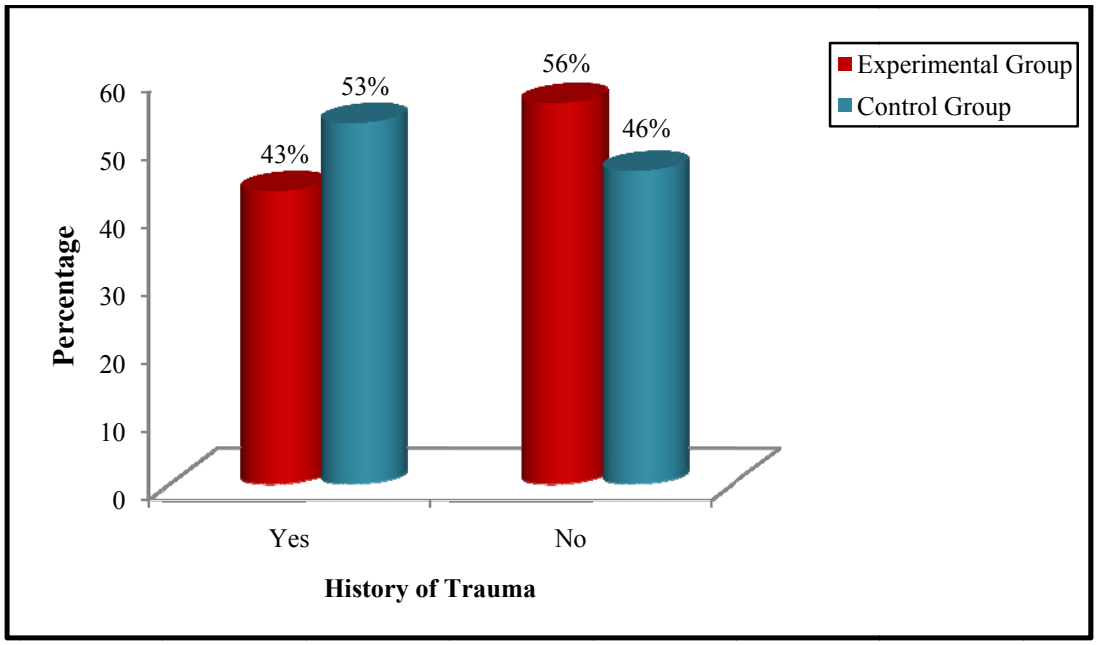


Figure 10: Percentagedistribution of demographic variables of history of trauma in experimental and Control group

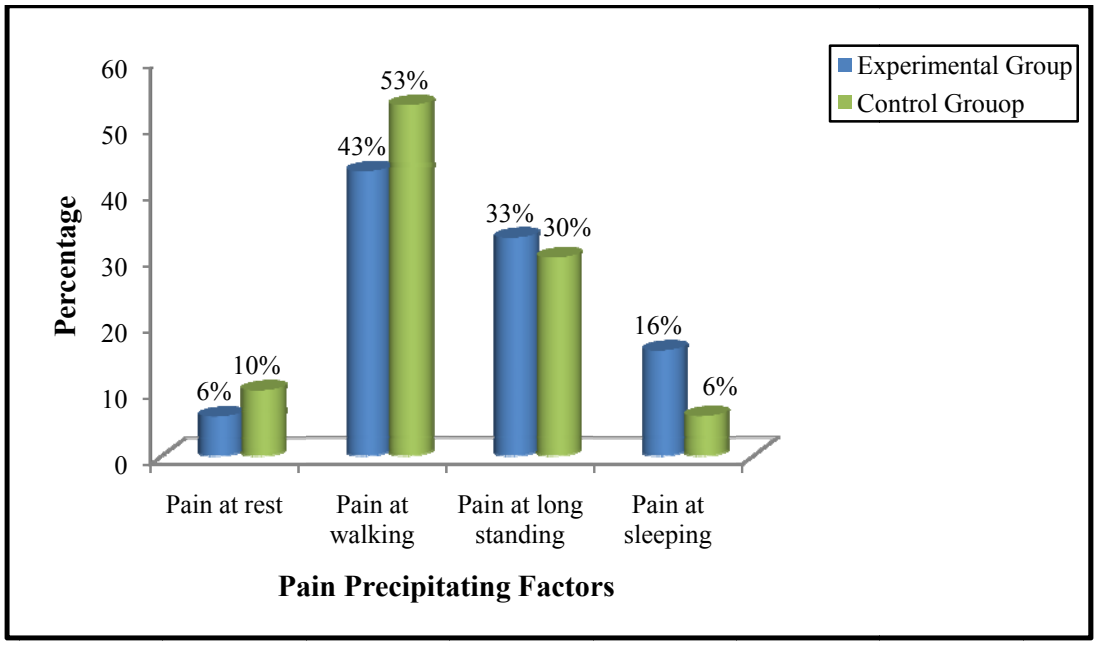


Figure 11:Percentagedistribution of demographic variables of pain Precipitating Factors in experimental and Control group

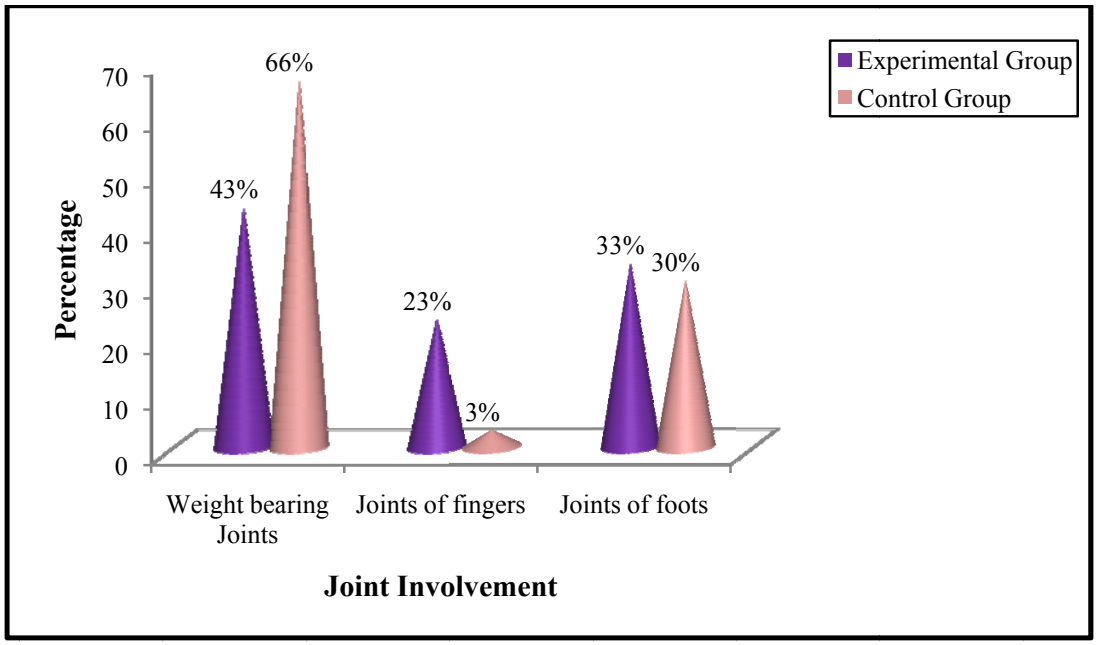


Figure 12: Percentagedistribution of demographic variables of joint involvement in experimental and Control group

SECTION II

ASSESSMENT OF THE LEVEL OF PAIN AMONG PATIENTS WITH OSTEOARTHRITIS IN EXPERIMENTAL AND CONTROL GROUP.

Table: 2 Assessment of pretestand posttest level of pain among experimental group.

(N=30)

S.No	Level of Pain	Pretest		Posttest	
		F	%	F	%
1	No Pain	-	-	17	56.6
2	Mild Pain	14	46.6	13	43.3
3	Moderate Pain	16	53.3	-	-
4	Severe Pain	-	-	-	-
5	Worst Pain	-	-	-	-

Table 2 reveals the frequency and percentage distribution of pretestand posttestlevel of pain among experimental group. It is evident from the above table that during pretest, none of the patients had no pain, 14(46.6%) of the patients had mild pain, 16(53.3%) of them had moderate pain, none of them had severe pain, and worst pain, where as in the posttestlevel of pain among the experimental group 17(56.6%) of the patients had no pain, 13(43.3%) of them had mild pain, none of them had moderate pain, none of them had severe pain and worst pain.

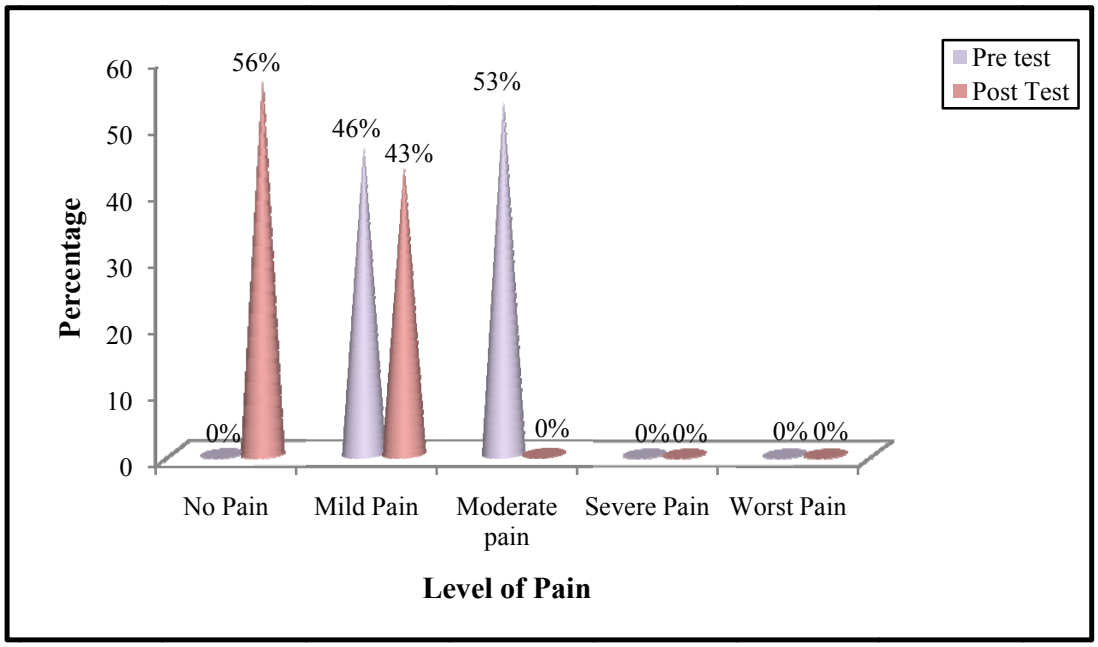


Figure 13: Percentage distribution of pretest and posttest level of pain

Among experimental group

Table 3: Assessment of pretest and posttestlevel of pain among control group

(N = 30)

S.No	Level of Pain	Pretest		Posttest	
		F	%	F	%
1	No Pain	-	-	-	-
2	Mild Pain	16	53.33	5	16.66
3	Moderate Pain	14	46.66	21	70
4	Severe Pain	-	-	4	13.33
5	Worst Pain	-	-	-	-

Table 3 shows the frequency and percentage distribution of pretest and posttestlevel of pain among control group from the above table it is revealed that in the pretestlevel of pain among the control group, none of them had no pain, 16(53.33%) of them had mild pain, 14(46.66%) of them had moderate pain, none of them had severe pain, and none of them had worst pain, whereas in the posttestlevel of pain among the control group, none of them had no pain, 5(16.6%) of them had mild pain, 21(70%) of them had moderate pain, 4(13.33%) of them had severe pain, and none of them had worst pain.

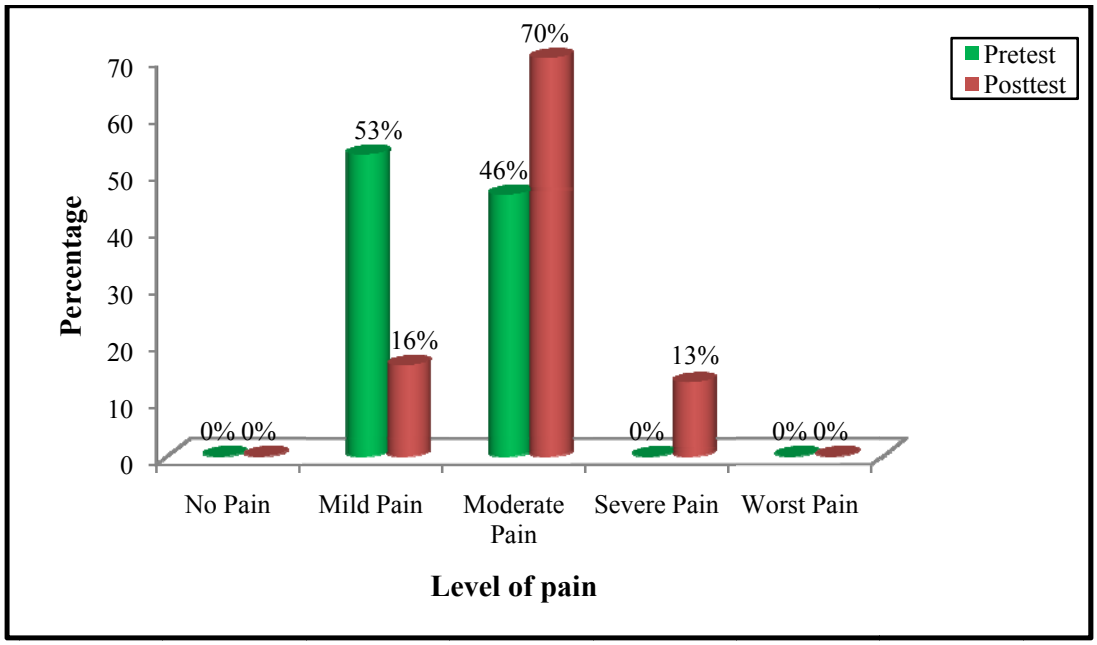


Figure 14: Percentage distribution of pretest and posttest level of Pain among control group.

SECTION III

COMPARISON OF LEVEL OF PAIN AMONG PATIENTS WITH OSTEOARTHRITIS INEXPERIMENTAL GROUP AND CONTROL GROUP

Table 4: Comparison of posttest level of pain between the experimental and control group

(N=60)

S.No	Group	Posttest		tValue
		Mean	Standard Deviation	
1	Experimental Group	0.43	0.49	5.62 S
2	Control Group	1.96	0.56	

S =Significance

Table 4 reveals the unpaired `t' test to compare the posttest level of pain between experimental and control group was found that the `t' value was 5.62, indicating that there was significant difference in posttest level of pain between the experimental and control group at $p<0.05$ level. Hence the stated hypothesis, "the mean posttest level of pain among experimental group will be significantly lower than the mean posttest level of pain in the control group" was accepted

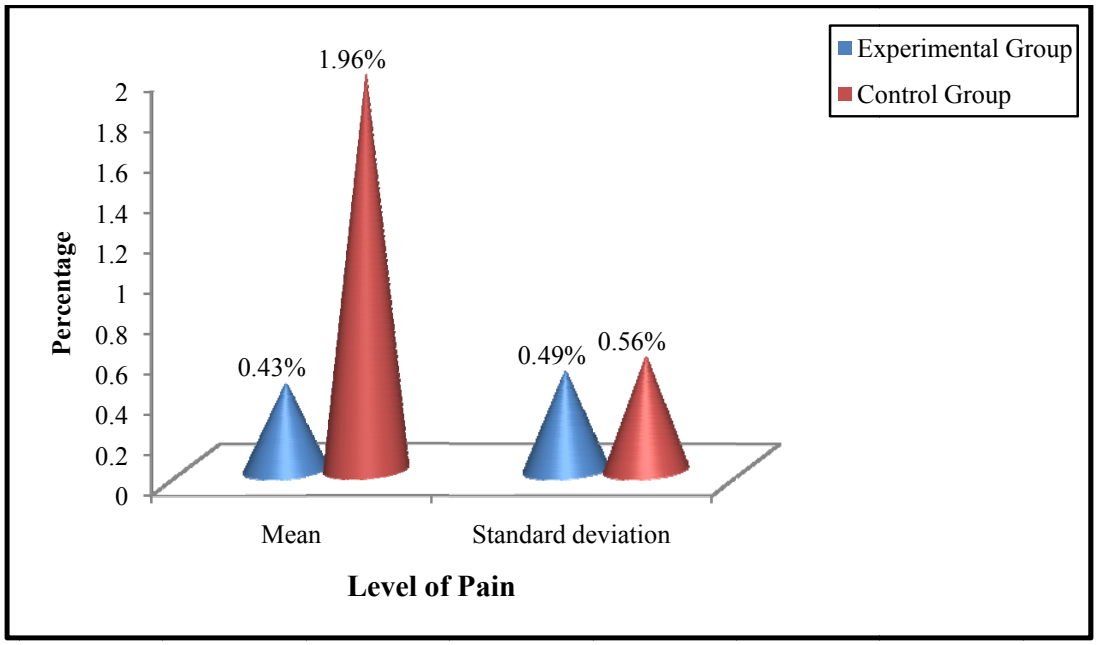


Figure 15: Mean and standard deviation of posttest level of pain among patients with osteoarthritis in experimental and control group

Table 5: Comparison of pretestand posttestlevel of pain among experimental Group

(N = 30)

S.No	Group	Pretest		Posttest		Paired Difference	t Value
		Mean	Standard Deviation	Mean	Standard Deviation		
1	Experimental Group	0.50	1.21	0.43	0.49	-1.1	5.64 S

S = Significance

Table 5 reveals the paired `t' test to compare the pretestand posttest level of painbetween experimental group was found that the't' value was 5.64 indicating that there was significant difference in pretest and posttest level of pain between the experimental at $p<0.05$ level. Hence the stated hypothesis, "the mean post test level of pain will be significantly lower than the meanpretest level of pain in experimental group" was accepted.

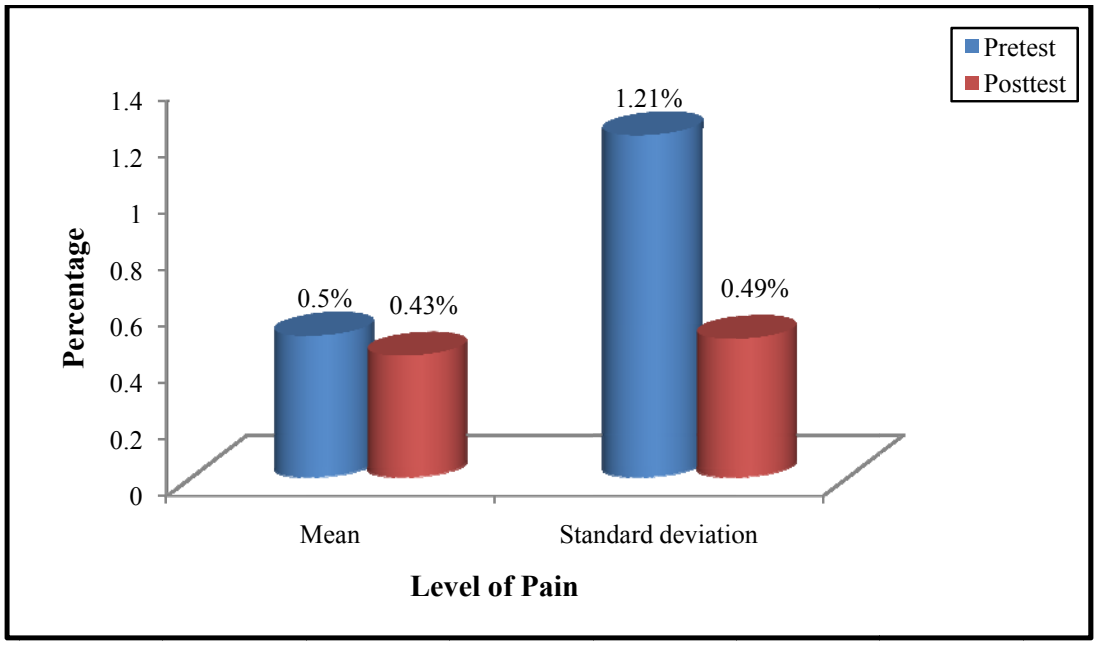


Figure 16: Mean and standard deviation of pretest and posttest level of pain among patients with osteoarthritis in experimental group.

SECTION V

ASSOCIATION OF POSTTEST LEVEL OF PAIN AMONG PATIENTS WITH OSTEOARTHRITIS IN EXPERIMENTAL AND CONTROL GROUP WITH THEIR SELECTED DEMOGRAPHIC VARIABLES.

Table 7: Association of posttest level of pain among patients with osteoarthritis in experimental group with their demographic variables.

(N=30)

S.No	Demographic Variables	Level of Pain										χ^2
		No Pain		Mild Pain		Moderate pain		Severe Pain		Worst Pain		
		F	%	F	%	F	%	F	%	F	%	
1	**Age**											1.679
	a)45-55 years	6	20	2	6.66	0	0	0	0	0	0	df=8
	b)56-65 years	6	20	5	16.66	0	0	0	0	0	0	NS
	c)66-75 years	5	16	6	20	0	0	0	0	0	0	
2	**Sex**											3.835
	a)Male	10	33.33	3	10	0	0	0	0	0	0	df=4
	b)Female	7	23.33	10	33.33	0	0	0	0	0	0	NS
3	**Education**											
	a)Illiterate	3	10	3	10	0	0	0	0	0	0	0.763
	b)Primary School	8	46.66	6	20	0	0	0	0	0	0	df=12
	c)Higher secondary	3	20	3	10	0	0	0	0	0	0	NS
	d)Graduate	3	13.33	1	3.33	0	0	0	0	0	0	
4	**Occupation**											1.218
	a)Sedentary worker	4	13.33	2	6.66	0	0	0	0	0	0	df=8
	b)Moderate worker	7	23.33	8	26.66	0	0	0	0	0	0	NS
	c) Heavy worker	6	20	3	10	0	0	0	0	0	0	

5	**Food Habits**											0.072
	a)Vegetarian	10	33.33	7	23.33	0	0	0	0	0	0	df=4
	b)Non Vegetarian	7	23.33	6	20	0	0	0	0	0	0	NS
6	**Body Weight**											0.177
	a)Under weight	5	16.66	3	10	0	0	0	0	0	0	df=8
	b)Normal weight	8	26.66	7	23.33	0	0	0	0	0	0	NS
	c)Over weight	4	13.33	3	10	0	0	0	0	0	0	
7	**History of Trauma**											1.03
	a)Yes	6	20	7	23.33	0	0	0	0	0	0	df=4
	b)No	11	36.66	6	20	0	0	0	0	0	0	NS
8	**Pain Precipitating Factors**											
	a)Pain at rest	1	3.3	1	3.33	0	0	0	0	0	0	4.623
	b)Pain at walking	6	20	7	23.33	0	0	0	0	0	0	df=12
	c)Pain-at-long standing	5	16.66	5	16.66	0	0	0	0	0	0	NS
	d)Pain at sleeping	5	16.66	0	0	0	0	0	0	0	0	
9	**Joint Involvement**											
	a)weight-bearing joint	4	13.33	9	30	0	0	0	0	0	0	8
	b)Joints of fingers	6	20	1	3.33	0	0	0	0	0	0	df=8
	c)Joints of foots	7	23.33	3	10	0	0	0	0	0	0	Ns

NS = Non Significant.

Table 7reveals the chi-square test to associate the posttest level of pain with the selected demographic variables like age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, joint involvement in the experimental group. While analyzing the statistical significance at ($P<0.05$) level it shows that there was no significant association of the posttest level of pain with the

selected demographic variablesat $P<0.05$ level. Hence the stated research hypothesis "there will be significant association between posttest level of pain among experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, joint involvement" was rejected.

Table8: Association of posttest level of pain among patients with osteoarthritis in control with their demographic variables.

(N =30)

S.No.	Demographic Variables	Level of Pain										χ^2
		No Pain		Mild Pain		Moderate pain		Severe Pain		Worst Pain		
		F	%	F	%	F	%	F	%	F	%	
1	**Age**											3.724
	a)45-55 years	0	0	3	10	7	23.33	0	0	0	0	df=8
	b)56-65 years	0	0	1	3.33	6	20	2	6.66	0	0	NS
	c)66-75 years	0	0	1	3.33	8	26.66	2	6.66	0	0	
2	**Sex**											1.628
	a)Male	0	0	3	10	9	30	3	10	0	0	df=4
	b)Female	0	0	2	6.66	12	40	1	3.33	0	0	NS
3	**Education**											
	a)Illiterate	0	0	1	3.33	4	13.33	2	6.66	0	0	4.243
	b)Primary School	0	0	1	3.33	11	36.66	1	3.33	0	0	df=12
	c)Higher secondary	0	0	1	3.33	5	16.66	1	3.33	0	0	NS
	d)Graduate	0	0	2	6.66	1	3.33	0	0	0	0	
4	**Occupation**											2.207
	a)Sedentary worker	0	0	1	3.33	6	20	0	0	0	0	df=8
	b)Moderate worker	0	0	2	6.66	10	33.33	2	6.66	0	0	NS
	c) Heavy worker	0	0	2	6.66	5	16.66	2	6.66	0	0	
5	**Food Habits**											1.117
	a)Vegetarian	0	0	2	6.66	11	36.66	1	3.33	0	0	df=4
	b)Non Vegetarian	0	0	3	10	10	16.66	3	10	0	0	NS

6	**Body Weight**											11.52
	a)Under weight	0	0	2	6.66	1	3.33	0	0	0	0	df=8
	b)Normal weight	0	0	2	6.66	8	26.66	4	13.33	0	0	NS
	c)Over weight	0	0	1	3.33	12	40	0	0	0	0	
7	**Historyof Trauma**											0.221
	a)Yes	0	0	3	10	11	36.66	2	6.66	0	0	df=4
	b)No	0	0	2	6.66	10	33.33	2	6.66	0	0	NS
8	**Pain Precipitating Factors**											2.289
	a)Pain at rest	0	0	1	3.33	2	6.66	0	0	0	0	df=12
	b)Pain at walking	0	0	3	10	10	33	3	10	0	0	NS
	c)Pain at long standing	0	0	1	3.33	7	23	1	3.33	0	0	
	c)Pain at sleeping	0	0	0	0	2	6.66	0	0	0	0	
9	**Joint Involvement**											
	a)weightbearing joint	0	0	4	13.33	13	43.33	3	10	0	0	1.767
	b)Joints of fingers	0	0	0	0	0	3.33	0	0	0	0	df=8
	c)Joints of foots	0	0	1	3.33	3.33	23.33	1	3.33	0	0	NS

NS = Non Significant.

Table 8reveals the chi-square test to associate the posttest level of pain with the selected demographic variables like age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, and joint involvement in the control group. While analyzing the statistical significance at ($P<0.05$) level it shows that there was no significant association of the posttest level of pain with the selected demographic variablesat $P<0.05$ level. Hence the stated research hypothesis "there was significant association between posttest level of pain among experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, joint involvement" was rejected.

CHAPTER V

DISCUSSION

This chapter deals with the discussion of the result of the data analysis to evaluate the effectiveness of foot reflexology on pain among patients with osteoarthritis.

The discussion is based on the objectives of the study and the hypotheses specified in the study.

MAJOR FINDINGS OF THE STUDY WERE,

1) On analysis of frequency and percentage distribution of demographic variables of patients with osteoarthritis shows that age, in the experimental group out of 30 patients, 8(26.66%)were between the age group of 45-55 years, 11(36.66%) were belongs to 56-65years and 11(36.66%)were belongs to 66-75 years, whereas in the control group out of 30 patients 10(33.33%)were between the age group of 45-55years, 9(30%) belongs to 56-65years and 11(36.66%) patients belongs to 66-75years.

2) With regard to sex, in the experimental group, out of 30 patients, 13(43.33%) were males and 17(56.66%) were females, whereas in the control group out of 30 patients 15(50%) were males and remaining 15(50%) were females.

3) Based on the educational status, in the experimental group, out of 30 patients, 6(20%) were illiterate, 14(46.66%) had primary school education, 6(20%) had higher secondary school education, 4(13.33%) of them were graduate, whereas in the control group out of 30 patients, 7(23.33%) were illiterate, 13(43.33%) had primary school education, 7(23.33%) had highersecondary school education, 3(10%) of them were graduate.

4) Regarding the occupation, in the experimental group among 30 patients with osteoarthritis, 6(20%) were sedentary workers, 15(50%) were moderate workers, and 9(30%) were heavyworkers, whereas in the control group out of 30 patients, 7(23.33%) were sedentary workers, 14(46.66%) were moderate workers, 9(30%) were heavy workers.

5)With regard to food habits, in the experimental group out of 30 patients, 17(56.66%) were vegetarian and 13(43.33%) were non-vegetarian, whereas in the control group out of 30 patients 14(46.66%) were vegetarian and 16(53.33%) were non vegetarian.

6) Regarding the body weight of osteoarthritis patients, in the experimental group out of 30 patients, 8(26.66%) were under weight, 15(50%) of patients werenormal body weight, 7(23.33%) were over body weight, whereas in the control group out of 30 patients, 3(10%) were under weight, 14(46.66%)were normal body weight 13(43.33%) were over body weight.

7) Regarding the history of trauma in the experimental group out of 30 patients, 13 (43.33%) had history of trauma, 17(56.66%)didn't have history of trauma, whereas in the control group out of 30 patients, 16(53.33%) had history of trauma, 14(46.66%) didn't have history of trauma.

8) Regarding the pain precipitating factors, in the experimental group out of 30 patients, 2(6.66%) having pain at resting, 13(43.33%) of having pain at walking, 10(33.33%) having pain at long standing, 5(33.33%) having pain at sleeping, whereas in the control group out of 30 patients, 3(10%) having pain at resting, 16(53.33%) of having pain at walking, 9(30%) having pain at long standing, 2(6.66%) of them having pain at sleeping.

9) Regarding the joint involvement, in the experimental group out of 30 patients, 13(43.33%) had osteoarthritis in weight bearing joints, 7(23.33%) had osteoarthritis in joints of fingers, 10(33.33%) had osteoarthritis in joints of foots. Whereas in the control group out of 30 patients, 20(66.66%) had osteoarthritis in weight bearing joints, 1(3.33%) had osteoarthritis in joints of fingers, 19(30%) had osteoarthritis in joints of foots.

10)On analysis of mean score of pain among experimental group was 0.43 and control group was 1.96 after interventions. Standard deviation after intervention among experimental group was 0.49 and control group was 0.56 and calculated "t" value was 5.62. It shows reduction of pain.

11) There was no significant association between the posttest level of pain in the experimental group with their demographic variables such as age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors. Obtained chi square value was significant at 0.05 level.

The first objective was to assess the pretest and posttest level of pain among patients with osteoarthritis in experimental and control group.

1) On analysis of frequency and percentage distribution of pretestand posttestlevel of pain among experimental group shows that, none of the patients had no pain, 14(46.6%) of the patients had mild pain, 16(53.3%) of them had moderate pain, none of them had severe pain, also had worst pain, where as in the posttestlevel of pain among the experimental group 17(56.6%) of the patients had no pain, 13(43.3%) of them had mild pain, none of them had moderate pain, none of them had severe pain and worst pain.

2)On analysis of frequency and percentage distribution of pretest and posttestlevel of pain among control group shows that, none of them had no pain,

16(53.33%) of them had mild pain, 14(46.66%) of them had moderate pain, none of them had severe pain, and none of them had worst pain, whereas in the posttestlevel of pain among the control group, none of them had no pain, 5(16.6%) of them had mild pain, 21(70%) of them had moderate pain, 4(13.33%) of them had severe pain, and none of them had worst pain.

The above result was supported by**Barbara& Kevin Kunz (2007)** conducted randomized, controlled study on effectiveness of foot reflexology on osteoarthritis among 48 older individuals. The study indicates that older adults experienced significant improvement in the level of pain and physical well-being. Elderly participants in the study experienced considerable improvement in their ability to perform activities of daily living, increased psychosocial well-being and reduced pain. **The second objective was to find out the effectiveness of foot reflexology on pain among patients with osteoarthritis in experimental and control group.**

On analysis ofunpaired `t' test to compare the posttest level of pain between experimental and control group was found that the `t' value was 5.62, indicating that there was significant difference in posttest level of pain between the experimental and control group at $p<0.05$ level. Hence the stated hypothesis, "the mean posttest level of pain among experimental group will be significantly lower than the mean posttest level of pain in the control group" was accepted

The above result was supported by**orthopedic clinic Boston hospital during July 2002 to February 2003.** A quasi Experimental with simple cross over design used to study the effect of foot reflexology on joint pain in knee osteoarthritis patients. 20 samples were selected by using purposive sampling technique during experimental period patients received reflexology for 1 hour per day for 7 days and in the control period patients did not received foot reflexology for 7 days. The

instruments used for data collection were demographic data, information about knee osteoarthritis, daily record of joint pain and daily activities. The data analyzed by using frequency, mean, standard deviation and ANOVA. The results of the study shown that the joint pain score in the experimental period after receiving reflexology was statistically lower than during the control period (P<.001). So the study revealed that reflexology can be used as a complementary therapy to relieve joint pain.

The third objective was to compare the posttest level of pain among patients with osteoarthritis in experimental group

On analysis ofpaired `t' test to compare the pretestand posttest level of painbetween experimental group was found that the 't' value was 5.64 indicating that there was significant difference in pretest and posttest level of pain between the experimental at p<0.05 level. Hence the stated hypothesis, "the mean posttest level of pain will be significantly lower than the meanpretest level of pain in experimental group" was accepted.

The above result was supported by **Oh &Ahn (2006)**conducted the effect of foot reflexology on women with osteoarthritis in Korea. The foot reflexology was applied to the experimental group 3 times a week for 4 weeks 30 minutes each. For the data analysis conducted to verify the homogenicity of pain. After foot reflexology, the subjects in experimental group shows significant improvement in pain (F=155.77, P=000) the results suggest that the foot reflexology is effective in relieving of pain.

The fourth objective was to associate the posttest level of pain among patients with osteoarthritis in experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits etc.

On analysis of chi-square test to associate the posttest level of pain with the selected demographic variables like age, sex, education, occupation, food habits, body

weight, history of trauma, pain precipitating factors, joint involvement in the experimental group. While analyzing the statistical significance at ($P<0.05$) level it shows that there was no significant association of the post test level of pain with the selected demographic variablesat $P<0.05$ level. Hence the stated research hypothesis "there will be significant association between posttest level of pain among experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, joint involvement" was rejected.

The above result was supported by **Stephenson N.L,Weinrich (2001)** conducted a quasi experimental study to assess the effect of foot reflexology on anxiety and pain in patients with osteoarthritis at the school of Nursing, East Carolina University. The samples consisted of 23 inpatients (age, sex, occupation, duration of illness etc) and the tool included pain and anxiety scales. Researchers noted a significantly reduced the level of anxiety and pain.

Hence, the research hypothesis (H_3) stated that "there is significant association between the level of pain among experimental and control group of osteoarthritis patients with selected demographic variables" was rejected.

From the above analysis and interpretations, the hypothesis (H_1), "Mean posttest level of pain among patients with osteoarthritis in experimental group was significantly lower than the mean posttest level of pain in control group"wasaccepted and the hypothesis (H_3) "There was significant association between the posttest level of painamong patients with osteoarthritis in experimental and control group with their selected demographic variables such as age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, joint involvement"was rejected.

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATION, LIMITATIONS AND RECOMMENDATIONS

This chapter deals with summary, findings, conclusion, implications, limitations and recommendations, which creates a base for evidence based practice.

SUMMARY

Health is the level of functional and (or) metabolic efficiency of a living being. In humans, it is the general condition of a person in the mind, body and spirit, usually meaning to be free from illness, injury or pain .The **World Health Organization (1946)** defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"

Illness (sometimes referred to as ill-health or ailment) is a state of poor health. Illness is sometimes considered another word for disease. An impairment of the normal state of a human being that interrupts or modifies its vital functions is known as disease. It includes communicable and non communicable disease**.(WHO 1949)**

Foot reflexology is extremely safe, simple and effective method. Reflexology is sometimes referred to as zone therapy**.**The principle of reflexology is founded on the understanding of how the nerves work and what they mean to human body. Feet contain “reflex buttons” which are connected to all organ and glands. When these reflex centers are stimulated, they instantly send a surge of new vigor to the part of the body they are connected to and with no side effects.Benefit’sof the reflexology treatment include increased circulation, relaxation and release of tension, nausea, relieve of pain, stiffness, headache, stress, asthma, constipation, sinusitis and migraine.

Osteoarthritis is the most common form of arthritis. Osteoarthritis mostly affects cartilage, the hard but slippery tissue that covers the ends of bones where they meet to form a joint. Healthy cartilage allows bones to glide over one another. It also absorbs energy from the shock of physical movement. In osteoarthritis, the surface layer of cartilage breaks and wears away. This allows bones under the cartilage to rub together, causing pain, swelling, and loss of motion of the joint. Over time, the joint may lose its normal shape. Also, small deposits of bone called osteophytes or bone spurs may grow on the edges of the joint. Bits of bone or cartilage can break off and float inside the joint space. This causes more pain and damage. People with osteoarthritis usually have joint pain and stiffness.

Osteoarthritis mostly often affects middle-aged and older people, involving the neck, lower back, knees, hips and fingers.It is the major cause of morbidity and disability in the elderly.Epidemiological radiographic assessment studies shows that 80% of male and female population will be affected. Women are generally affected at a younger age than men.

The study was undertaken to assess the effectiveness of foot reflexology on pain among patients with osteoarthritis in selected villages at Tirunelveli.

The Objectives of the study were:

- Toassess the pretest and posttest level of pain among patients with osteoarthritis in experimental and control group.
- To find out the effectiveness of foot reflexology on pain among patients with osteoarthritis in experimental group.
- To compare the pretest and posttest level of pain among patients with osteoarthritis in experimental group.

- To associate the posttest level of pain among patients with osteoarthritis in experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits, body weight etc.

All Hypotheses formulated were:

- The mean posttest level of pain among experimental group was significantly lower than the mean posttest level of pain in the control group.
- The mean posttest level of pain was significantly lower than the mean pretestlevel of pain in the experimental group.
- There was significant association between posttest level of pain among experimental and control group with their selected demographic variables like age, sex, education, occupation, food habits etc.

The assumptions of the study were:

- Perception of pain is differ from patient to patient.
- Osteoarthritis patients may have joint pain.
- Reflexology is one of the best measure to reduce pain in patient with osteoarthritis.
- Females may have poor pain tolerance than males.

The review of literature collected for the study provided a strong basis for the study. It provided the basis for creating conceptual frame work and formation of tool. It was categorized under three headings.

Section A: Studies related to prevalence and risk factors of Osteoarthritis.

Section B: Literature related to the foot reflexology.

Section C: Studies related to foot reflexology on Osteoarthritis.

Section D: Studiesrelated to foot reflexology on other conditions.

The conceptual frame work of this study was based on Modified Ernestine Wiedenbach's helping art of clinical nursing theory and it provided a complete frame work for achieving the central purpose of the study. The research methodology adopted for the study was quasi experimental pretest and posttestwithcontrol group design.

The Study was conducted in Subbulapuram and kuvalaikkanni villages. The total population of the village were 6969 and 8551 .The Sample size for the study was 60, 30 persons were in experimental group another 30 persons were in control group. The samples were selected based on the inclusive criteria by using purposive sampling technique.

Pilot study was conducted at Paruvakudivillage in Tirunelveli and the findings revealed that the tool was feasible, reliable and practicable to proceed with the main study.

The content validity of the tool was established by four experts from the medical surgical nursing department, one medical expert.

The main study was conducted in Subbulapuram and kuvalaikkannivillages at Tirunelveli. The total sample size was sixty samples who fulfilled the inclusive criteria were selected to experimental group (n = 30) and in control group (n=30) by purposive sampling technique. The collected data was analyzed and interpreted based on the objectives using descriptive and inferential statistics.

There was no association between the level of pain and age, sex, education, occupation, food habits, body weight, history of trauma, pain precipitating factors, and joint involvement in the experimental group. Obtained chi square value was significant at 0.05 levels.

CONCLUSION

Thisstudy assessed the effectiveness of foot reflexology on pain among patients with osteoarthritis. The study findings revealed that there was a significant association on the level of pain after application of foot reflexology in the experimental group. On the basis of the study, the researcher concluded that application of foot reflexology has a significant effect on pain. Foot reflexology is an effective, easy to apply and potentially risk free intervention.

IMPLICATION

Investigator has derived from the study the following implications that are of vital concern in the field of nursing practice, nursing education, nursing administration and nursing research.

NURSINGPRACTICE

- The nurses have a vital role in providing safe andeffective nursing care to enhance pain control among patients with osteoarthritis.
- This can be facilitated by motivating the nurses to have an in depth knowledge in physiological considerations in pain control.
- Develop skill in providing efficient nursing care for controlling pain,teach the samples about the effectiveness of foot reflexology for controlling pain.
- Nurses need to practice evidence based approach while giving care to the osteoarthritis patients.

NURSINGEDUCATION

Before nurses enter into their practice, they need to have strong foundation in terms of education. Nurse educator not only have a role to educate the student but also to educate the staff nurses in order to prepare them and update their knowledge, to enhance the application of theory in to practice. The education in the clinical area should be provided in the form of:

1. Incorporate foot reflexology therapy in the curriculum of nursing with clinical experience.
2. To motivate students to follow the foot reflexology in control of pain in osteoarthritis patients.
3. Update the knowledge of staff nurse with in-service education programs emphasizing various measures in reduction of pain control level.
4. Make use of available studies related to osteoarthritis and its management.

NURSING ADMINISTRATION

1. Conduct in-service education programs and continuing education programs for effective management for osteoarthritis patient.
2. Collaborate with governing bodies for the formulation of standard policies and protocols to emphasize nursing care for osteoarthritis client.
3. Provide more opportunities for nurses to attend training programs in foot reflexologytherapy on osteoarthritis.
    - Conduct in-service education programs and continuing education programs on osteoarthritis and its control.
    - Arrange and conduct workshops, conferences, seminars on foot reflexology therapy on osteoarthritis control.

NURSING RESEARCH

1. Nurse researcher can disseminate the findings of the studies through conference, seminar and publishing in professional journals to the Medical Surgical staff.
2. Nurse researcher can encourage conducting further researches related to foot reflexology intervention prior to venipuncture.
3. The findings of the research study would help in building and strengthening the body of knowledge.
4. As a nurse researcher, promote more research on effective measures in control of pain.
5. Evidence based nursing practice must take higher profile in order to increase the knowledge about foot reflexology intervention on osteoarthritis and its control.

LIMITATION

During the period of study the limitations faced by the investigator were as follows,

1. Only limited literatures and studies were obtained from the Indian context.
2. Due to time constraints, the investigator was unable to take larger samples for the study.

RECOMMENDATIONS

Based on the findings of the present study the following recommendations are made:

1. The similar study can be conducted with large samples for better generalisation.

2. The study can be conducted to assess the knowledge and practice of nurses with regard to foot reflexology for control of pain in patients with osteoarthritis.
3. A comparative study can be conducted by using foot reflexology versus acupressure on reduction of pain among osteoarthritis patients.
4. The similar study can be conducted in the hospital setting.
5. The same study can be repeated by using the true experimental design.

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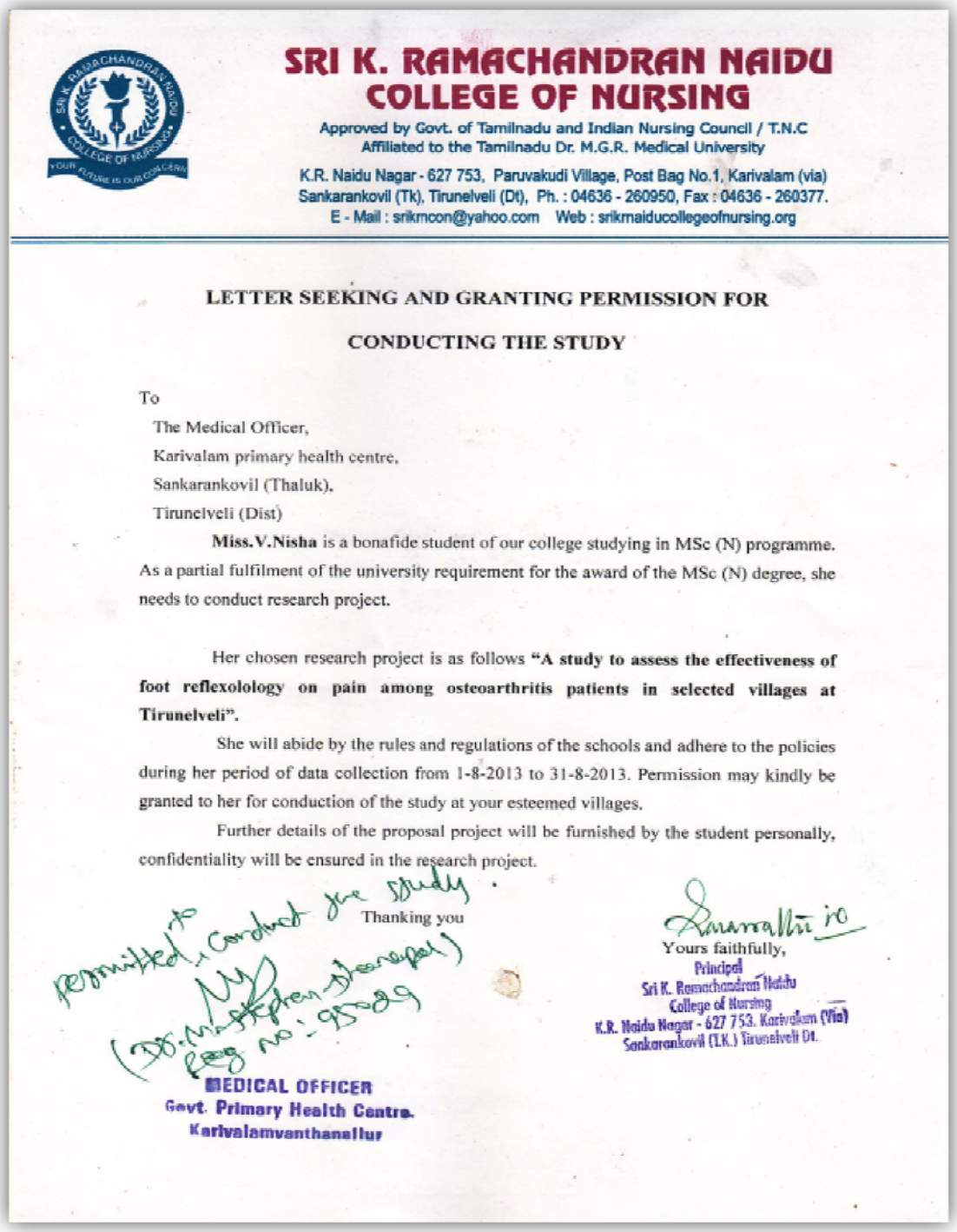
APPENDIX-A

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE STUDY



SRI K. RAMACHANDRAN NAIDU COLLEGE OF NURSING

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E - Mail : srikmcon@yahoo.com Web : srikmaiducollegeofnursing.org

LETTER SEEKING AND GRANTING PERMISSION FOR

CONDUCTING THE STUDY

To

The Medical Officer,
Karivalam primary health centre,
Sankarankovil (Thaluk),
Tirunelveli (Dist)

Miss.V.Nisha is a bonafide student of our college studying in MSc (N) programme. As a partial fulfilment of the university requirement for the award of the MSc (N) degree, she needs to conduct research project.

Her chosen research project is as follows **"A study to assess the effectiveness of foot reflexolology on pain among osteoarthritis patients in selected villages at Tirunelveli".**

She will abide by the rules and regulations of the schools and adhere to the policies during her period of data collection from 1-8-2013 to 31-8-2013. Permission may kindly be granted to her for conduction of the study at your esteemed villages.

Further details of the proposal project will be furnished by the student personally, confidentiality will be ensured in the research project.

Thanking you

Yours faithfully,

Principal
Sri K. Ramachandran Naidu
College of Nursing
K.R. Naidu Nagar - 627 753. Karivalam (Via)
Sankarankovil (T.K.) Tirunelveli Dt.

Permitted to Conduct the Study

(Dr. M. Stephen Dhanapal)
Reg no: 95089

MEDICAL OFFICER
Govt. Primary Health Centre.
Karivalamvanthanallur

APPENDIX –B

LETTER SEEKING EXPERTS OPINION FOR THE VALIDITY OF TOOL

From

V.Nisha,

M.Sc (N) II year,

Sri.K.Ramachandran Naidu College of Nursing,

Sankarankovil (Tk), Tirunelveli (Dt).

To

Respected Sir/Madam,

Subject: Request for opinion and suggestions of expert for establishing content validity of research tool.

I am IIndyearof M.sc Nursing student studying (Medical and Surgical Nursing) at Sri.K.Ramachandran Naidu College of Nursing.Sankarankovil, TamilnaduDr.MGRMedical University working on dissertation titled,**"A study to assess the effectiveness of foot reflexology on pain among patients with osteoarthritis in selected villages in Tirunelveli".**to be submitted to Dr.M.G.R.Medical University, in partial fulfilment of university requirement for award of master of nursing degree. I humbly request you to kindly validate the tool and give your valuable suggestions. Your prompt opinions and suggestions will be appreciated.

Thanking you,

Place: Yours faithfully,

Date: (V.Nisha)

Enclosures:

- Content validation certificate
- Statement of problem, objectives of the study, operational definitions, methodology
- Research tool
- Criteria check list for validation of tool.

APPENDIX – C

LIST OF EXPERTS FOR CONTENT VALIDITY

MEDICAL EXPERTS

Dr.R.RajaGopalan,MBBS,
Karivalam Primary Health Centre,
Sankarankovil (Thaluk),
Tirunelveli (Dist).

NURSING EXPERTS

Mrs.JerlinPriya,
Principal in medical surgical nursing,
Annammal College Of Nursing,
Kuzhithurai,Kanyakumari dist.-629 802.

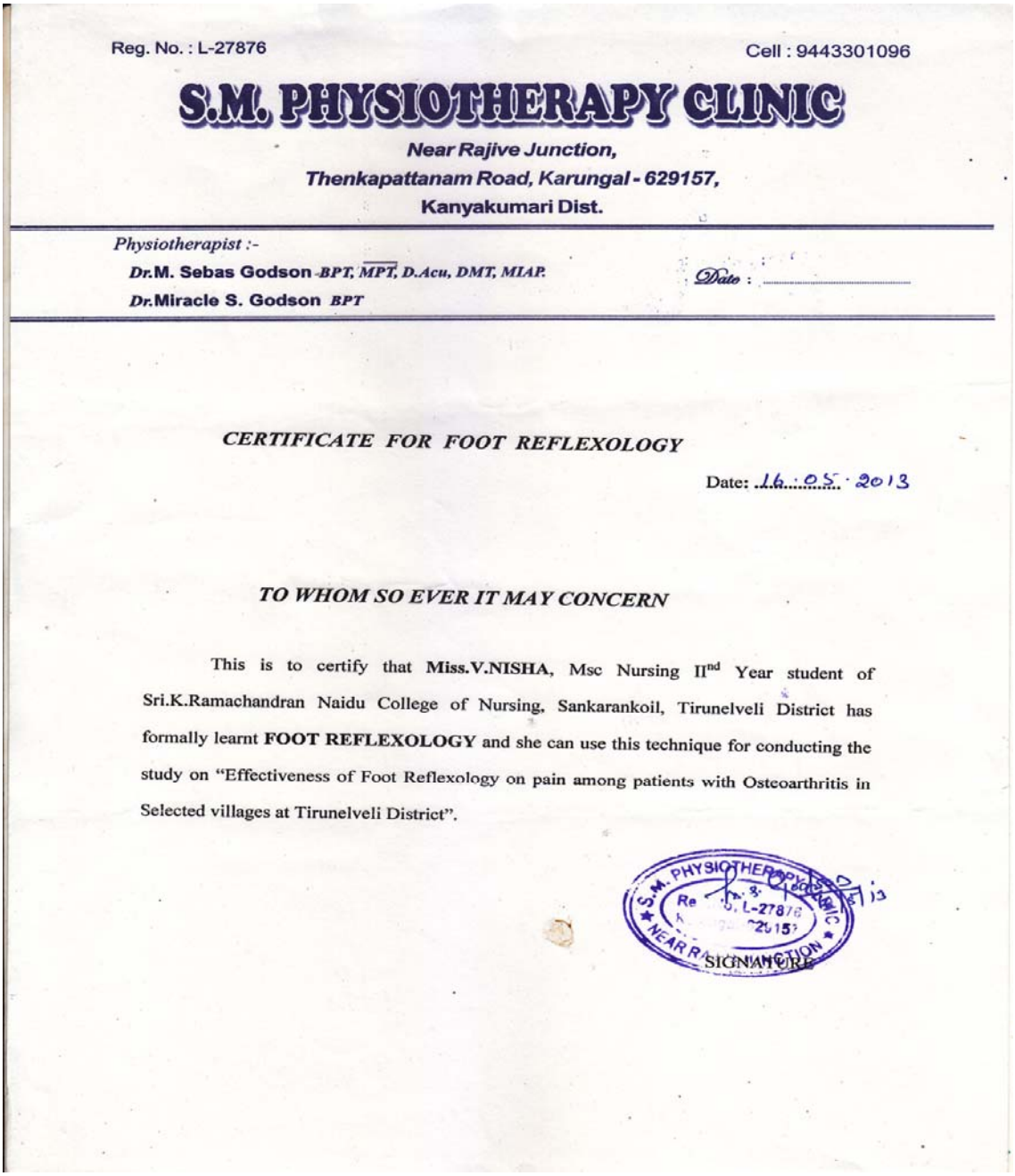
Mrs. Jaya Thangaselvi,
Professor in medical surgical nursing,
C.S.I.JeyarajAnnapakium College Of Nursing,
Passumalai, Madurai -4.

Mrs. Sharmila rani,
Professor in medical surgical nursing,
Christian College Of Nursing,
Neyyoor, Kanyakumari dist.-629 802.

Mrs. Tamil selvi,
Professor in medical surgical nursing,
St. Bishop’s College Of Nursing,
Erode.

APPENDIX-D

CERTIFICATE OF FOOT REFLEXOLOGY TRAINING



Reg. No. : L-27876 Cell : 9443301096

S.M. PHYSIOTHERAPY CLINIC

Near Rajive Junction,
Thenkapattanam Road, Karungal - 629157,
Kanyakumari Dist.

Physiotherapist :-
*Dr.*M. Sebas Godson *BPT, MPT, D.Acu, DMT, MIAP.*
*Dr.*Miracle S. Godson *BPT*

Date : .....

CERTIFICATE FOR FOOT REFLEXOLOGY

Date: 16.05.2013

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Miss.V.NISHA**, Msc Nursing II[nd] Year student of Sri.K.Ramachandran Naidu College of Nursing, Sankarankoil, Tirunelveli District has formally learnt **FOOT REFLEXOLOGY** and she can use this technique for conducting the study on "Effectiveness of Foot Reflexology on pain among patients with Osteoarthritis in Selected villages at Tirunelveli District".

S.M. PHYSIOTHERAPY CLINIC Reg. No. L-27876 2015 NEAR RAJIVE JUNCTION

SIGNATURE

APPENDIX-E

CERTIFICATE OF ENGLISH EDITING

APPENDIX-E

CERTIFICATE OF ENGLISH EDITION

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Ms.Nisha.V,** II year, M.sc Nursing student of Sri.K.Ramachandran Naidu college of Nursing, Sankarankoil (Tk), Tirunelveli District, has done a dissertation study on "**EFFECTIVENESS OF FOOT REFLEXOLOGY ON PAIN AMONG PATIENTS WITH OSTEOARTHRITIS IN SELECTED VILLAGES AT TIRUNELVELI DISTRICT."** April 2014, this study was edited for English language appropriateness.

Eugene Raj. M M.A; B.Ed.]

Signature

MATHUNAM MATRIC & HR. SEC. SCHOOL • SARUNGAL • 628 151 •

APPENDIX –F

INFORMED CONSENT

Good Morning,

I, **Ms. V.Nisha,** M.sc Nursing II Year student of Sri.K.Ramachandran Naidu College of Nursing, conducting a study**"A study to assess the effectiveness of foot reflexololology on pain among osteoarthritis patients in selected villages at Tirunelveli"** a partial fulfillment of the requirement for the degree of M.Sc Nursing under The Tamil Nadu Dr. M.G.R Medical University. The osteoarthritispatients will be given 15 minutes for each foot reflexology for 5 days. Level of pain will be assessed by using numerial pain rating scale in the fifth week after the intervention.

I assure you that information obtained will be kept confidential. So, I request you to kindly co operate with me and participate in this study by giving your frank and voluntary consent.

Thank you.

APPENDIX – G

COPY OF THE TOOL FOR DATA COLLECTION

SECTION: A

It consists of observational checklist to identify the Osteoarthritis Patients.

S.NO	CONTENT	PRESENT	ABSENT
1.	Swelling over the joint		
2.	Warmthness over the joint		
3.	Tenderness over the wound		
4.	Redness around the joints		
5.	Pain over the joint		
6.	Muscle wasting around the joint		
7.	Difficult to move the joint		
8.	Nodules formation		
9.	Crunching or cracking sensation on the wound		
10.	Gait impairment		
11.	Impaired Physical activity		
12.	Bowleg appearance		

SCORING KEY

0 : Negligible

1 – 5 : Mild Osteoarthritis

6 – 9 : Moderate Osteoarthritis

10 – 12 : Severe Osteoarthritis

SECTION-B

DEVELOPMENT AND DISCRIPTION OF TOOL

DEMOGRAPHIC VARIABLES

1. AGE

A) 45 – 55 yrs

B) 56 – 65 yrs

C) 66 – 75 yrs

2. SEX

A) Male

B) Female

3. EDUCATION

A) Illiterate

B) Primary

C) Higher secondary

D) Graduate

4. OCCUPATION

A)Sedentary worker

B) Moderate worker

C) Heavy worker

5.FOOD HABITS

A) Vegetarian

B) Non Vegetarian

6. BODY WEIGHT

A) Under Weight

B) Normal Weight

C) Over Weight

7. HISTIORY OF TRAUMA

A) Yes

B) No

8. PAIN PRECIPITATING FACTORS

A) Pain at resting

B) Pain at walking

C) Pain at long standing

D) Pain at sleeping

9. JOINT INVOLVE MENT

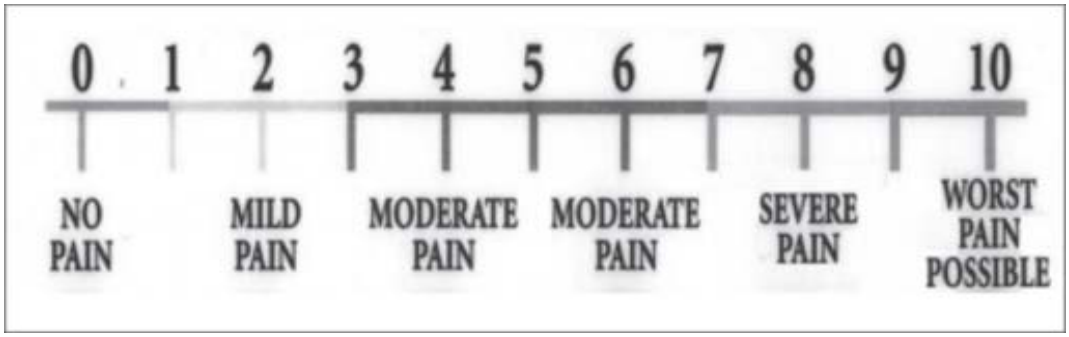
A) Weight bearing joints

B) Joints of fingers

C) Joints of foots

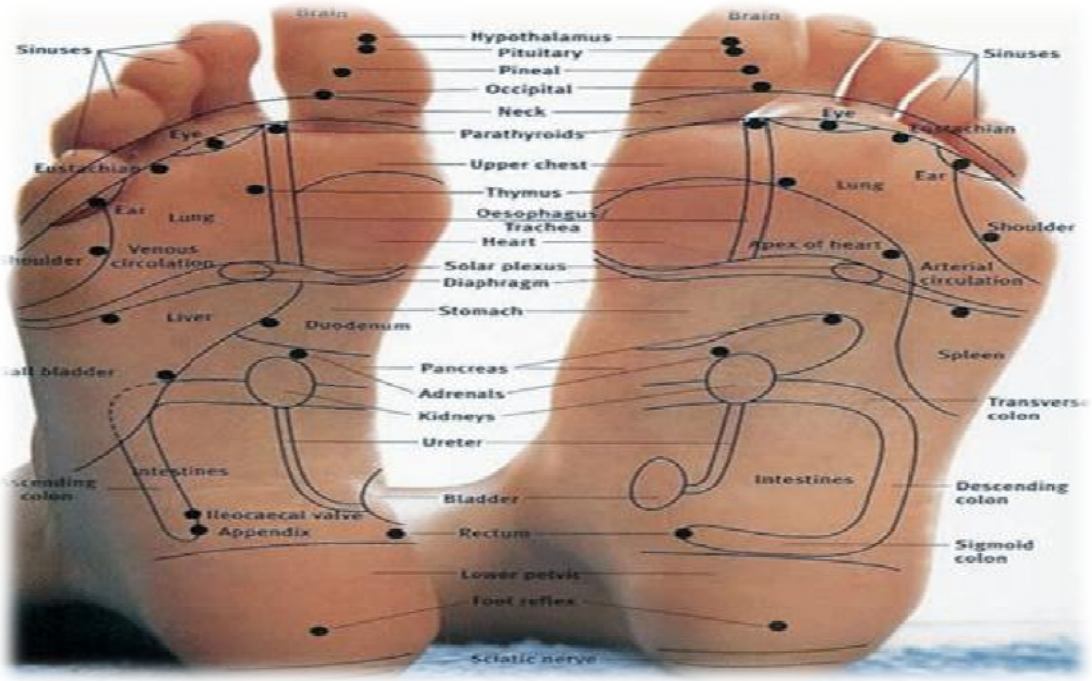
SECTION: C

NUMERICAL PAIN RATING SCALE

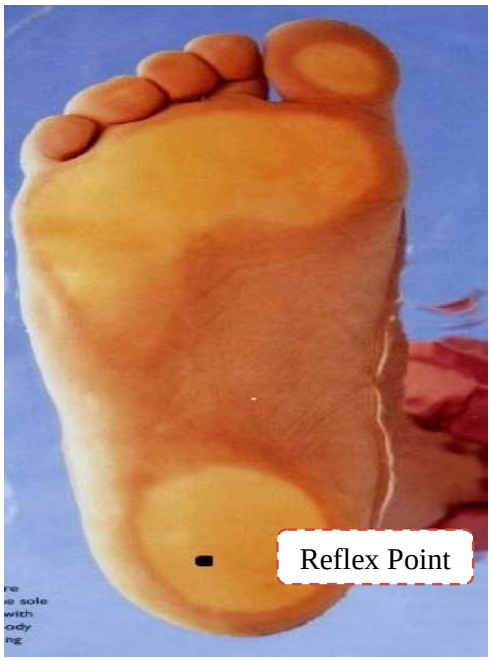


SCORING	RATE
NO PAIN	0
MILD PAIN	1 to 2
MODERATE PAIN	3 to 6
SEVERE PAIN	7 to 9
WORST PAIN	10

INTERVENTION



FOOT REFLEXOLOGY CHART



REFLEX POINT

HOOKING METHOD