

**EFFECTIVENESS OF REFLEXOLOGY UPON JOINT PAIN IN
ARTHRALGIA PATIENTS AT SELECTED OLD AGE HOMES**

BY

P. SUPRAJA

**A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R.MEDICAL
UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN NURSING**

APRIL 2013

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ARTHRALGIA PATIENTS AT SELECTED OLD AGE HOMES**

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DECLARATION

I hereby declare that the present dissertation entitled “**Effectiveness of Reflexology upon Joint Pain in Arthralgia Patients at Selected Old Age Homes**” is the outcome of the original research work undertaken and carried out by me under the guidance of **Dr. Latha Venkatesan**, M.Sc (N)., M.Phil (N)., Ph.D (N)., Principal, Apollo College of Nursing, **Mrs. Sasikala.D**, M.Sc (N)., Reader, Apollo College of Nursing, Chennai. I also declare that the material of this has not found in any way, the basis for the award of any degree or diploma in this university or any other university.

II Year M.Sc (N)

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“Gratitude can never be adequately expressed in words, but this is only the perception which makes the words flow from ones heart”.

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SYNOPSIS

An Experimental Study to Assess the Effectiveness of Reflexology upon Joint Pain in Arthralgia Patients at Selected Old Age Homes, Chennai.

Objectives of the Study

1. To assess the level of joint pain before and after reflexology in control and experimental groups of arthralgia patients.
2. To assesses the effectiveness of reflexology by comparing the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
3. To determine the level of satisfaction regarding reflexology in experimental group of arthralgia patients.
4. To find out the association between selected demographic variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
5. To find out the association between selected clinical variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.

The conceptual framework of the present study is based on king's goal attainment theory. The study variables, reflexology and level of joint pain among arthralgia clients were formulated. The level of significance selected was $p < 0.05$. An extensive review of literature guided by experts formed the foundation to the development of tool.

An experimental approach was used to achieve the objectives of the study. The present study was conducted in SV old age home (control & experimental). The samples (60) were randomly (systematic random sampling) selected and assigned to control (30) and experimental (30) groups.

The investigator used a demographic variable proforma, a clinical variable proforma, pain scale (0 -10 numerical pain rating scale) and a rating scale on the level of satisfaction on reflexology. The data collection tools were validated and reliability was established. After checking the researchability and feasibility by conducting pilot study, the data for the main study was collected. The collected data was tabulated and analyzed using descriptive and inferential statistics like mean, standard deviation, paired 't' test and chi – square.

Majority Findings of the Study

Demographic variables of arthralgia patients

The study findings reveal that significant number of the arthralgia patients were in the age group of 70 – 80 years (43%, 47%), most of them were female (73%, 45%), majority were belonging to nuclear family (87%, 60%), were Hindus (100%, 87%), and residing in urban area (53%, 50%), majority of them were widows (63%, 56%), and were educated (63%, 40%), were un employed (83.33%, 66.7%) and among employed most of them were heavy workers (50% ,43%) in control and experimental group respectively.

Clinical variables of arthralgia patients

The majority of the arthralgia patients had injury (47% ,60%) , had under gone surgeries (57%, 50%), most of the patients had joint stiffness (55%, 45%), half of them

with period of illness for more than 10 years (50% ,33.33%),and for all the patients clinical diagnosis is made through radiological investigation (100%,63.3%), few were on analgesic treatment (37%,53%), and few were taking non pharmacological treatment like exercise (37%,36.66%), most of the patients have the co – morbid illness (57% ,33%), for the duration more than 5 -10 years (60%,50%) in control and experimental groups respectively.

Level of joint pain among arthralgia clients

In the control group there was no significant difference in the joint pain levels before (M = 6.46, SD =2.10) & after therapy (M = 8, SD =0.91).In contrast, in experimental group the joint pain levels after therapy (M =7.4, SD = 0.55) was lower than the level of pain before therapy (M =3, SD = 0.5). The difference was found to be statistically significant (t=27.7) at $p < 0.001$, which attributes to effectiveness of reflexology.

Association between selected demographic variables with the level of joint pain of arthralgia patients

There was a significant association between the age of the patient ($\chi^2 = 7.62$, df = 3), ($p < 0.05$) in experimental, ($\chi^2 = 22.49$, df = 3), ($p < 0.001$) in control, religion ($\chi^2 = 19.37$, df = 3) ,(p < 0.1) in control, ($\chi^2 = 18$, df = 3), (p < 0.1) in experimental, marital status($\chi^2 = 10.42$, df =3), (p<0.1) in experimental , ($\chi^2 = 12.44$, df =4), (p<0.1) in control and educational qualification ($\chi^2 = 10.61$, df =3), (p<0.05) in control with the level of joint pain in control and experimental groups of patients. And there was no significant association between the other selected demographic variables with the level of joint pain

among arthralgia clients in control and experimental group before and after reflexology. Hence the null hypothesis H_02 is partially rejected.

Association between selected clinical variables with the level of joint pain of arthralgia patients

There was a significant association between the selected clinical variables such as duration of treatment ($\chi^2 = 3.95, df = 1$), ($p < 0.05$) route of administration, ($\chi^2 = 14.68, df = 2$), ($p < 0.001$), presence of co morbid illness ($\chi^2 = 10.84, df = 1$), ($p < 0.1$), treatment of co morbid illness ($\chi^2 = 21.15, df = 1$), ($p < 0.001$) with the level of joint pain in control and experimental groups of patients, but there was no association between the other clinical variables and the level of joint pain among arthralgia patients in control and experimental group. Hence the null hypothesis H_03 is partially rejected.

Level of satisfaction on reflexology

All the participants in experimental group (100%) expressed high level of satisfaction regarding reflexology.

Recommendations

- A similar study can be undertaken on a large scale for a more valid generalization.
- A comparative study can be conducted to assess the effectiveness of the alternative and complementary therapies.
- The study can be conducted in different settings.
- A similar study can be conducted by using cross – over design.
- A Meta Analysis Study can be conducted to have a more valid information.

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Chapter I
Introduction

CHAPTER I

INTRODUCTION

Background of the Study

Health is social, emotional, mental, spiritual and biological fitness of the individual. It is a positive concept emphasizing the social and personal resources, as well as physical capacities and also considered as a process towards the achievement of individual's potential. In promoting good health of an individual, health care providers deliver systematic activities to prevent or cure health problems, which led to increase in old age population.

The average age of people in many developing country is increasing, as in India, old age people those who are above 50 years are generally considered old. Those are currently 580 million old people aged 60 and above in the world, and of these 355 million live in the developing countries. According to the 2001 census, in India it was estimated that the elderly population was about 7.7 percent (77 million) and this will cross 100 million by the year 2016. India has thus acquired the label of "an ageing nation" with 7.7% of its population being more than 60 years old and obviously the problems. As the age increases, the health problems and degenerative changes also increase. These problems of aged are caused by the many changes in the musculoskeletal system .The number of muscle fibers decreases, muscles and tones become smaller and weaker causing various health problems and degenerative changes. Because of all this, the older person's movements also become cautious as it is border to work and maintain balance.

The health problems associated with the aging are long term illness, physical problems and emotional aspects. The problems associated with the long term illness are degenerative diseases of loco motor system, respiratory illness, genitourinary problems etc. including cataract, glaucoma, nerve deafness, failure of special senses. Besides, there are many problems associated with mental outlook.

Among the many health problems and degenerative diseases encountered by the aged, the joint pains are more common, global statistics reveals that 100 million people worldwide suffer from the joint pains (arthralgia). According to recent census in 2008; about 78,314,013 people are affected with the arthralgia and the knee joint pain is the most common pain. The risk of knee joint pain is about 40% for women and 13% for men. The numbers of sufferers could rise from 1.7 million in 1990 to 6.3 million by 2050. It is estimated that 71% of elderly people are suffering from knee joint pain. The knee joint pain is caused by injuries to the structures of the knee, as it is the most vulnerable to injury, because it bears the walking and standing. The complexity of the design of the knee joint makes it prone to injuries. The types of pain sensations that are experienced depend on the structures that have been injured. Knee joint pain can be caused by different types of arthritis, trauma, and dengue fever aseptic necrosis etc.

Any damage or discomfort of knee joint affects an individual very badly. The person will be restricted to perform every physical action previously performed. It is followed by dejection or depression .pain and inability to perform the activities will even push them to self isolation, more so in the case aged people.

In order to manage pain and the functional disability of arthralgia, various treatment modalities are used which include pharmacological management of administering acetaminophen, NSAIDS therapy, nonpharmacological measures of rest and joint protection by assistive devices such as cane, walkers, heat and cold application, weight reduction programmes and, exercises and the additional alternatives measures such as herbs, nutritional supplements and movement therapies.

Among these non pharmacological measures are often simple, safe and relatively inexpensive. These include cutaneous stimulation strategies such as relaxation and breathing techniques, imagery distraction, music therapy, hydro therapy, aroma therapy, massaging technique, accupressure, reflexology etc. Reflexology is the complementary therapy, based on touch, stimulates the skin and activates the larger diameter fibers and thus provide for natural healing. The advantage of reflexography is that it can be performed anywhere, requires no special equipment and does not interfere with the patient's privacy.

Reflexology is a healing art. There are certain reflex points in the feet and hands that are straight way connected with the body. The therapist creatively uses hands to apply pressure on reflex points. By working on these points, he can release blockages in the body and restore balance and increase energy flow. In this process, by stimulating nerves and encouraging the flow of blood not only the sensation of pain is balanced but also the source of the pain is relieved. Through regular reflexology treatment, the body will be able to heal by itself, restore, rebalance and relax the body and mind to bring about good health. Nurses, while planning care for patients with chronic pain, need to consider the reflexology as a complementary therapy which can relieve anxiety,

promote comfort, and reduce or alleviate pain. After all, ultimate purpose of any therapy is to promote well – being.

The art of reflexology dates back to ancient Egypt, India, and China. In 1913, Fitzgerald introduced it to the west as “zone therapy”. He noted that reflex areas on the feet and hands are linked to other areas and organs of the body with in the same zone. He divided the body into ten zones and decided which section of the foot controlled each zone. Among the many complementary therapies, foot reflexology can be easily done by a nurse after getting proper training, hands on skill and less equipment is needed to implementation is easier compared to other therapies.

In India, only a few studies on effectiveness of reflexology upon joint pains suffered by elderly are available, which shows the less importance given to this problem.

Need for the Study

As the people age, they are exposed to different life experiences. The accumulation of these differences makes older people more diverse than any other age group. In elderly people, there are many recognizable physical changes occurring in the body like obesity, knee joint pain, and osteoporosis are more common in the elderly. Knee joint pain has been a major health concern of the old people. It is affecting 7 – 13 % of them, and also becoming chronic. The pain in them does not have react localization. It may be present in associated areas also, such as bones, muscles and back. Although severity of chronic knee joint pain may vary from one individual to another, it does not affect physiological functions and emotions leading to diminished quality, Of

overall studies conducted in different parts of the world reported prevalence rates of chronic pain ranging from 12% to 80%, the prevalence was greater in developing countries and lower, but still problematically high in more developed countries. The life time prevalence of pain among senior citizen was estimated between 59 percent to 90 percent, more women than men reported temporary and persistent pain. The data from India shows that an estimated number of annual knee joint pain visits to a physician in the hospitals is 4 million. In U.S. the prevalence of knee pain was found in 11.2% of the sample.

There are many treatments offered to reduce knee joint pain. Among them reflexology is the present trend which is most sought after reflexology promotes healing by stimulating the nerves in the body and encouraging the flow of blood. In the process, reflexology not only quells the sensation of pain, but relieves the source of the pain as well.

Reflexology, a therapy primarily applied to the feet, is listed under ‘body-based’ therapies that rely on the structures and systems of the body, making adjustments to them to heal symptoms and medical problems. Growing research shows the benefits of reflexology for a wide variety of health concerns that include cancer, high blood pressure, phantom limb pain, migraines, fibromyalgia, PMS, menopause, anxiety and use in nursing and palliative care. Reflexology has always been to optimize the health of the whole person – mind, body and spirit.

Reflexology works with the pattern of our body's energy flow and reflexology massage relies on the co-operation of natural forces with the body to aid the process of healing. By massaging the reflexes of the feet an increase in the blood circulation takes

place. Tension is relaxed throughout the nervous system. This releases the strain under which the body is suffering, which restores the normal energy flow, thus helping to bring the body back to the normal balance necessary for good health. The role of reflexology is to aid the body in attaining balance in all its functions in every system.

Reflex point stimulation helps in reducing various types of pain, it is cost effective, there is no need for assistance, requires no special equipment, does not interfere with patients privacy and also reduces the use of drugs for acute and chronic pain. Hence the researcher is interested in conducting this study using reflex point stimulation in reducing joint pain in senior citizen.

Although reflexology is widely used, systematic research is needed to examine its effectiveness. To date, however, only a few studies have focused on reflexology's use in pain management. Because reflexology is a noninvasive, non pharmacological therapy, nurses are in a position to do research on and make decisions about its clinical effectiveness.

Considering this, the researcher was interested to investigate the effects of reflexology on joint pain among elderly. The evidence of this research can be disseminated and utilized in various settings to achieve its maximum benefits.

Statement of the Problem

An Experimental Study to Assess the Effectiveness of Reflexology upon Joint Pain in Arthralgia Patients at Selected Old Age Homes, Chennai.

Objectives of the Study

1. To assess the level of joint pain before and after reflexology in control and experimental groups of arthralgia patients.
2. To assess the effectiveness of reflexology by comparing the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
3. To determine the level of satisfaction regarding reflexology in experimental group of arthralgia patients.
4. To find out the association between selected demographic variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
5. To find out the association between selected clinical variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.

Operational Definitions

Effectiveness:

In this study it refers to the extent of reduction in pain after reflex point stimulation provided by the investigator which is assessed by comparing the level of pain in control and experimental group of arthralgia patients, before and after reflexology.

Reflexology:

In this study reflexology refers to applying pressure or strokes to the plantar surface of the foot from toes to heel with the researcher's fingers for 10 – 15 minutes second hourly for four times a day at the pressure points.

Joint pain:

In this study it refers to intensity of pain expressed by senior citizen in the joint which is assessed by numerical pain rating scale.

Arthralgia patients:

It refers to the persons who are having joint pain due to any of the joint problems assessed by numerical pain rating scale.

Old age homes:

In this study it refers to an institution providing professional care in the setting similar to their residence for the elderly people who are aged 65 years or more.

Level of satisfaction:

In this study level of satisfaction refers to reflexology satisfactory levels of experimental group of arthralgia patients as measured by rating scale on assessment of satisfaction on reflexology developed by investigator.

Assumptions

The study assumes that:

- Old age is characterized by degenerative changes in musculo skeletal system.
- Majority of the elderly people suffer with joint pain due to degenerative changes.
- Prolonged pain will lead to poor psychological and socio cultural disturbances.
- The arthralgia patient needs some sort of pain relief.
- Pain is manageable.

- Meeting comfort needs of arthralgia patients is an important function of the nurse.
- Various non pharmacological methods are followed for pain relief.
- Reflexology is one of non pharmacological method that can be used for pain relief.
- Reflexology stimulates the products of natural endorphins in our body.
- Endorphins interact with the opiate receptors in the brain and reduce our perception of pain among arthralgia patients.

Null Hypotheses

The null hypotheses stated are:

- H₀1** There will be no significant difference in the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
- H₀2** There will be no significant association between selected demographic variables and level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
- H₀3** There will be no significant association between selected clinical variables and level of joint pain before and after reflexology in control and experimental group of arthralgia patients.

Delimitations

The study was limited to arthralgia patients, who were admitted in old age homes Chennai, who

- had mild and moderate level of pain.
- were willing to participate in the study.

- were admitted during data collection period.
- could understand and speak Tamil /Telugu/ English / Hindi.

Conceptual Framework for the Study

Conceptual framework for a particular study is the abstract, logical structure that enables the researcher to link the findings to nursing body of knowledge. Conceptual framework formulates the thinking process, so that others may need and know the framework of references, basic to research problem. The framework is built from a set of concepts linked to plan or existing systems of methods, behavior, functions and objects.

It is developed from an existing theory of interest and proposing relationship among them. The model gives direction for planning research design, data collection and interpretations of findings. It helps the researcher to know what data needs to be collected and given elevation to an entire research process.

The present study is aims to assess the effectiveness of reflexology upon joint pain. Conceptual framework for present is based on **king's goal attainment theory**. According to Imogene king, nursing is defined as a process of action, reaction and interaction by where nurse and clients share information about their perception. Through perception and communication they identify problems, through which they set goals and take necessary actions.

Kings goal attainment theory is based on the concepts of personal, interpersonal and social system including perception, judgment, action, reaction, interaction and transaction.

Perception

A person imports energy from the environment and transforms, processes and stores it. The study assumes that there is interpersonal relationship between nurse, investigator and participants. Nurse investigator perceives that there is a need of administration of reflexology based on pretest level of pain among patients. But in this the investigator assumes that reflexology will have effect in reducing the pain. So the nurse investigator perceives that there is a need of administration of reflexology based on pretest level of pain among patients. A patient perceives that there is a need of administration of reflexology for relieving his/her pain level and after reflexology there will be reduction of pain level.

Judgment

Analyzes the area of action to be carried out. In this study the nurse researcher judges the reflexology helps to reduce the joint pain among patients. On the other hand the patients will express the need for taking reflexology upon joint pain. So the both the investigator and clients are need to take a decision on reflexology.

Action

Individual experts the perceived energy, as demonstrated by observable behavior by taking mental or physical action. Nurse researcher takes action to prepare for reflexology following judgment. The participants take action by making themselves ready for taking reflexology. So the administration of the reflexology is the action which is taken by the investigator.

Reaction

Reaction means developing action and acting on perceived choices for goal attainment. The action of both researcher and participants will lead to reaction. The clients will show willingness and cooperation to take reflexology in pretest.

Interaction

Interaction refers to verbal and non-verbal behavior between an individual and the environment or among two or more individual. It involves goal directed perception and communication. Actions lead to interaction when the nurse researcher administers reflexology to reduce level of joint pain. The interpersonal exchange of information between the investigator and the client during the administration of reflexology.

Transaction

Imogene king says that transaction is transmission of information between two individual who naturally identify goals and the means to achieve them. The process of transformation of information from one individual to another individual. In this study the clients will share the effectiveness of the treatment to the other individuals who are suffering with this problem.

Feedback

The outcome may be either satisfactory or unsatisfactory reducing the level of pain after post test. Satisfactory improvement indicates that reflexology is effective. The unsatisfactory improvement in reducing the level of joint pain leads to re-agreement of prior situation by the nurse researcher where the total process is recycled. Satisfactory level of the reflexology is assessed by using satisfactory rating scale on reflexology developed by the investigator.

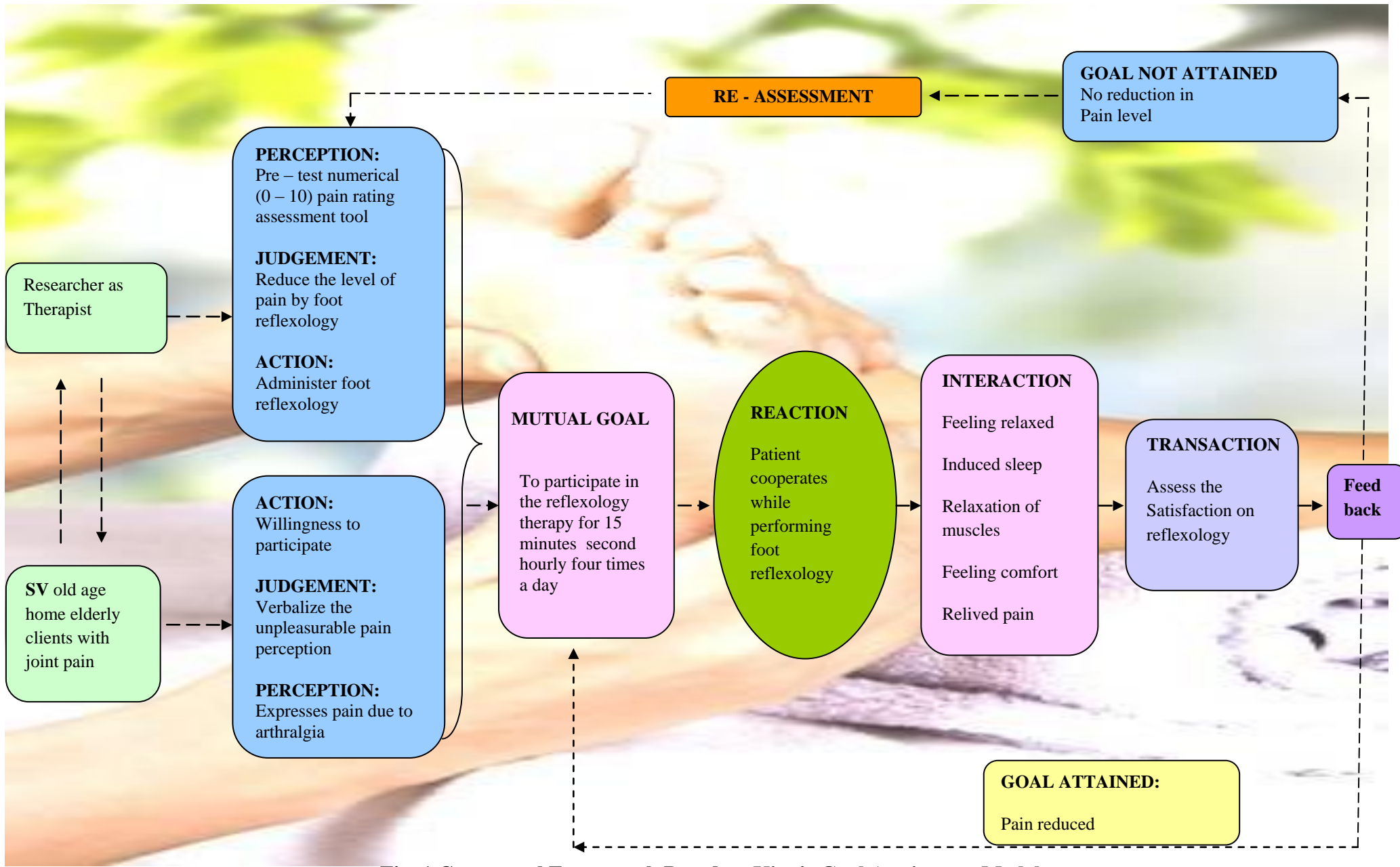


Fig. 1 Conceptual Framework Based on King's Goal Attainment Model

Projected Outcome

The expected outcome will be decrease in joint pain level among arthralgia after reflexology a complementary therapy and increase in patients' level of satisfaction regarding reflexology on pain reduction.

Summary

This chapter has dealt with the background of the study, need for the study, and statement of the problem, objectives, operational definition, hypothesis, assumption, delimitation and conceptual framework.

Organization of the Report

Further aspects of the study are presented in the following five chapters.

Chapter – II : Review of literature

Chapter – III : Research methodology includes research approach, research design, setting, population, sample and sampling techniques, tool description, content validity and reliability of tools, pilot study, data collection procedure and plan for data analysis.

Chapter – IV : Analysis and interpretation of data

Chapter – V : Discussion

Chapter – VI : Summary, conclusion, implications and recommendations.

Chapter II
Review of literature

CHAPTER II

REVIEW OF LITERATURE

A review literature involves the systematic identification, location, scrutiny and summary of written materials that contains information on the research problem. (Polit and Hungler, 2007).

The task of reviewing literature involves the identification, selection, critical analysis and reporting of exciting information on the topic of interest. A review acquaints the researcher with what has been done in the field and it minimizes possibilities of un-intentional duplication.

This chapter deals with the review of published and unpublished research studies and from related materials for present study. The review helped the researcher in building the foundation of the study.

The review of literature for this study is presented under the following headings:

- I. Literature related to joint pain.
- II. Literature related to joint pain reduction strategies.
- III. Literature related to reflexology in different types of pain.
- IV. Literature related to reflexology in reduction of joint pain.

Literature Related to Joint Pain:

In New York, Linde (2008) conducted a study using staff nurses to examine the prevalence of joint pain among elderly clients in old age homes. It was done in 41 clients by using demographic variable, clinical variables and numerical pain rating scale

pre test assessment. Descriptive statistics were used to calculate pain levels among the elderly to find out the prevalence of joint pain. The result concluded that the majority of elderly had prevalence of joint pain and as the age increases the musculoskeletal changes in elderly are normal which occurs due to the degenerative changes in the skeletal system which is more prone to get joint pain. The Calcium rich foods and supplements intake will reduce the problem of joint pain among elderly.

Wang et al (2008) conducted a comparative study to identify changes in knee joint pain, stiffness and functional ability in patients with knee pain after the use of knee sleeves. 52 subjects were randomized to two treatment groups, verum sleeves and knee sleeve. Experimental group 1 was given with the verum sleeves and experimental group 2 given with knee sleeves. Both the groups were compared for the pain levels among elderly clients joint pain. The pain levels were assessed using the numerical pain rating scale in the pretest and post test pain levels before and after application of the sleeves. The study revealed that knee sleeves were more effective with highly significant decrease in woman pain score.

A Mc Gill's pain questionnaire were tools used to assess statistics of prevalence of joint pain by using descriptive statistics for a sample of 118 elderly in the old age home selected by systematic random sampling technique, In Michigan in a cross-sectional study conducted by Palferlman et al (2006) It is found that all 118 cases of elderly were suffering with knee joint pain, the risk factors were overweight, nutritional deficient etc, associated with repair of tissue in the knee joint.

A sample of 40 patients were selected from each hospital in Spring field selected by using systematic random sampling in a cross sectional study conducted by Wilkinson et al (2006) to determine the rates and risk factors for knee joint pain. The hospitals

were selected randomly between February 2005 and March 2006. The main outcome of this study showed that 83% of elderly had knee joint pain due to fragility of joints. The demographic and clinical variables were used to assess knee joint symptom characteristics to know the prevalence knee joint pain. The numerical pain rating scale was used for pain assessment. The result shows the prevalence of joint pain among was high in elderly clients.

Numerical (0 – 10) pain rating scale was used to assess the pre and post test levels of the patients among all clients in hospitals, in a cohort analysis done by Klein (2004). This analysis was mainly done to show that old age is the deterioration of organ system. A review was done to describe the complication of knee joint pain. Through Medline database they found that decalcification of bones increases the pain in the knee joints and to overcome this problem calcium rich foods to be provided from the adolescent period.

A cross sectional study was carried out by Wright et al (2002) with a sample of 2,297 individuals to estimate the association among knee pain and obesity. McGill's pain questionnaire was used to collect data about pain, socio-demographic characteristics and abdominal circumference measurement. Unadjusted and adjusted odds ratio at 95 percentage were estimated by using backward stepwise logistic regression. The prevalence of knee pain was found in 11.2 percentage of the studied sample. Results showed population between ageing, obesity and excessive alcohol consumption had correlation between knee pain and the study population sample.

In the year 1988 Ware and Hays conducted a study to know the Prevalence of joint-related pain in the extremities and spine in five groups of top athletes. A specific self-assessed pain-oriented questionnaire related to the cervical, thoracic and lumbar

spine, as well as the various joints was filled out by the athletes and the non-athletes. The overall frequency of pain reported by the athletes during the last week/last year was as follows; cervical spine 35/55%; thoracic spine 22/33%; lumbar spine 50/68%; shoulder 10/21%; elbow 7/7%; wrist 7/8%; hip 15/23%; knee 22/44% and ankle 11/25%. The study concluded that there was no statistically significant difference in prevalence of pain in the neck, spine and joints between top athletes in different sports or between athletes and non-athletes. Spinal pain was also correlated to pain in the shoulders, hips and knees.

Literature Related to Joint Pain Reduction Strategies

A McGill's pain questionnaire administered to assess the pain level in both the experimental and control group before and after cold application, in a study conducted by Minton (2009), on general principles and practical application of cold in knee joint pain. The study includes 60 samples, 30 in control and 30 in experimental groups. The intervention given for 5 – 10 minutes for the experimental group of patients and the Study findings concluded increase in threshold of pain and physiological changes and it may be used as short or long term therapy”.

A sample was done to select 93 participants in a parallel, single blind, placebo controlled, multi center trial to evaluate the efficacy of continuous low level kinesthetic therapy for treatment of knee joint pain conducted by Larca (2008). The 93 participants were divided into two groups 47 in experimental 1 and 49 in experimental 2 groups. The pain levels were assessed by using the McGill's pain rating scale among both experimental 1 & 2 before after the administration of intervention. The study findings

revealed that kinesthetic was not efficacious for treatment of knee joint pain than the reflexology.

The selected 21 subjects between 60 – 80 years of age were studied using a comparative study in a study conducted by David (2007) on the effect of an ice wrap or reflexology on blood flow and bone metabolism in knees. The intervention is applied to the both the groups for 15 minutes with the different interventions for both experimental 1 & 2 groups. The pre and post test assessment for both the control and experimental group was done. After this application, there was a decreased arterial flow. This study thus provides a scientific rationale for benefits of ice wrap and reflexology. This study findings reveals that reflexology is most effective treatment than the ice wrap therapy.

An experimental study was conducted by Lang (2006) to determine the efficacy of chiropractic manual flexion and reflexology application for the treatment of knee joint pain. The samples of 252 patients were included in treatment. In which the both intervention are administered to both the control and experimental groups are alternatively administered with the treatment the pain was assessed by using visual analog scale in both the experimental 1 & 2 groups .The results concluded that the chiropractic manual flexion combined with reflexology is more effective for knee joint pain.

In 2005 Nadler conducted a comparative study on effectiveness of transcutaneous electrical nerve stimulation, electro acupuncture and the reflexology for knee joint pain for a sample of 90 in which 30 in group 1 , 30 in group 2 and 30 in group 3 of experimental groups .It was given in two times a day for 15 days ,By using numerical pain rating scale pre and post test for the three experimental groups with separate intervention was assessed and the level of satisfaction of the patients about

therapy given is assessed by using the satisfactory rating scale on the type of the therapy. The results concluded that the reflexology is effective in reducing knee joint pain.

Gambles et al (2002) conducted a prospective randomized, parallel, placebo controlled, multicenter clinical trial to evaluate the efficacy and safety of low level heat wrap therapy on 76 patients. In this study heat wrap therapy used for 20 minutes two times a day and the pre and post test pain levels are assessed by using numerical pain rating scale. The effectiveness is compared with the reflexology in the same way. The results concluded than use of heat wrap therapy use of reflexology provided effective pain relief and muscle stiffness.

A comparative study was conducted by Stoller (2000) to compare the efficacy of methods for cryo electro pulse and reflexology in 132 patients with knee joint pain assessed by using visual analog scale in pre and post test assessment of both control and experimental group of patients and by using systemic random sampling in which the 66 in experimental 1 group and 66 in experimental group2. The study findings revealed that use of reflexology was effective than the use of cryo electro pulse was effective in reducing knee joint pain.

A Systemic random sampling technique was used to select 60 samples in an experimental study conducted by Twomey (1987) Manual therapy, with its emphasis on joint movement and exercise, has become increasingly important for the treatment of pain and dysfunction of the musculoskeletal system. The 30 samples are selected and were administered with manual therapy and the other 30 control group samples were observed for movement and pain level. Results showed that manual therapy is effective in the patients with pain and discomfort. Explanations are provided to enable an

understanding of the success of intensive physical therapy for chronic back pain and for manipulation in the treatment of the acute painful locked back..

Literature Related to Reflexology in Different Types of Pain

A descriptive study was conducted in Hong Kong by Chua - -Miranda et.al (2010). An effectiveness of reflexology to reduce distress among urological patients. The authors described distress as a combination of four main factors: pain, physical discomfort, emotional discomfort, and fatigue. A total of 251 patients were allocated to non - randomized single pre - post study over a three year period. The analysis of the data showed a statistically significant reduction in patient-reported distress for all four measures: pain ($F = 638.208$, $p = .000$), physical discomfort ($F = 742.575$, $p = .000$), emotional discomfort ($F = 512.000$, $p = .000$), and fatigue ($F = 597.976$, $p = .000$). This reduction in patient distress was observed regardless of gender, age, ethnicity, or urological type of pain.

Smith (2009) conducted an experimental study in 25 metastatic cancer patients who were randomized by using systematic random sampling in telephone survey of 19 repetitive users of reflexology. The satisfactory levels of 19 repetitive users which was revealed by using the satisfactory rating scale on reflexology developed by investigator. The authors examined reflexology values, which attract repetitive users. The authors identified six valued elements of reflexology the patients valued the most: time for care and personal attention, engaging and competent therapists, trust partnership, holism and empowerment, effective touch, and enhancing relaxation. By this author concluded that reflexology has beneficial effect in pain reduction in metastatic cancer patients.

A Sample of 58 patients of abdominal pain patients were selected as in a Korean study conducted by Chang and Chen (2008) to investigate the effectiveness of reflexology on abdominal pain, anxiety and depression among 58 patients with terminal cancer. 28 patients were assigned to clinical group which received the Aroma massage while 30 patients were assigned to control group which received regular massage with almond oil. A McGill' S pain rating scale was used to assess the pre and post test level of pain perception in both the control and clinical group of patients. The authors concluded that subjects from clinical group showed significant improvements in pain intensity ($t=3.52$, $p=0.001$) and depression ($t=-8.99$, $p=0.000$).

In the year of 2006 a study conducted by Anis et al related to the reflexology and its biochemical effects on CNS function, because it increases the dopamine level, which helps improve mood and decreases anxiety. An experimental study is conducted in leg to determine the pain perception levels. In this study 60 samples were taken in which 30 are in control and 30 were in experimental group. Intervention is given for 15 minutes and by using facial pain rating scale the pain levels were assessed before and after reflexology. This study was concluded by saying reflexology has the pain relieving effect by activating endorphins in our body. The author also pointed out that reflexology increases the lymphocyte count and stimulates natural killer production which is very important factors in the recovery patients.

A clinical study was conducted by Pagan and pauly (2005) on 230 subjects experiencing pain triggered by cancer. For four weeks the authors registered a daily dosage of NSAID consumed by the post -operative patients while they received regular massage treatments. Before to massage treatment the pre test assessment done by using the numerical pain rating scale and then the intervention is given for two times a day

and post test assessment was done by using the numerical pain rating scale. The study showed a significant decrease in the daily usage of medication while reflexology was performed. The authors also registered lowered blood pressure, respiratory rate, and heart rate.

Zhi-xian and Zhang, (2005) studied on effects of reflexology on pain intensity, anxiety, and physiological relaxation over a 16- to 18-hour period in 30 lung cancer patients with bone metastases. Reflexology was shown to have and long-term benefits on level of pain and anxiety. The most significant impact occurred 15 minutes after the reflexology intervention. The McGill' S pain questionnaire was used to assess the pre and post test levels of the pain perception by clients. The author concluded that reflexology therapy can assist health care providers to control pain and anxiety as an additional tool along with pharmacological treatment. This intervention can also be practiced in the community health setting, old age homes by the therapist.

Numerical pain rating scale (standardized tool) is used to assess the pre and post test levels of pain perceptions in both the control and experimental group of patients. by Chorus et al (2003) and discussed therapeutic modality reflexology has its limitations, but frequently patients receive very conflicting information about its health benefits. In this cross sectional study conducted for 100 samples in which 50 samples in experimental and 50 in control group, the result showed that experimental group people had shoulder pain reduction. Some healthcare providers promote reflexology, while other see it as contraindication .The absence of a unified view contributes greatly to the misunderstanding among patients, and within the medical community as well as between patients and healthcare providers.

Literature Related to Reflexology in Reduction of Joint Pain

A cross sectional study conducted by Jianwen et al (2009) in treating of proliferative gonitis with reflexotherapy combined with Tui-na on local acupoints. 57 cases with pain and stiffness in the knee joints were selected and 34 cases in experimental group were given daily foot reflexology treatments for 30 days along with tuina massage (called "local massage"). Twenty three cases in the control group were given only the tuina massage. The study result showed that the experimental group had 96.49 percentage in rate of effectiveness and the control group had 78.26percentage. The study concluded that reflexology had a positive effect in reducing pain and stiffness in the knee joint than tui – na.

Numerical pain rating scale (0 -10) is used as the tool by Currin and Meister (2008) to assess the pain levels and a questionnaire of nursing care to assess the nursing practice in this study and the study was conducted on 45 patients in Korea on the effect of hand reflexology on joint pain, skin temperature and nursing practice, applied to in-patients in the clinical setting. An experimental approach is used in which 25 in control and 20 in clinical group was selected by using systematic random sampling. Five minute hand reflexology therapy was applied to both hands of participant by two research assistants at the same time. The findings showed that after receiving hand reflexology therapy, the subjects showed significant pain relief ($t = -4.94$, $p = .0001$), improvement in feeling, and an increase in skin temperature, thereby suggesting hand reflexology as an excellent method to reduce joint pain.

Poole et al (2007) conducted an observational study to identify the effect of reflexology on knee joint pain and quality of life (QoL) in a patient with rheumatoid arthritis (RA). Using an observational case report, a 6-week course of reflexology

treatments were given to a patient who had Rheumatoid Arthritis. Perceived pain and QoL were assessed, by using the knee joint pain disability questionnaire (KJPDQ) and the Rheumatoid arthritis quality of life questionnaire (RAQoL). The RAQoL scores demonstrated no significant change throughout the duration of the investigation, suggested that the patient's QoL did not change during or at the end of the 6-week course of reflexology. Scores from the KJPDQ indicated reflexology was associated with a reduction in knee joint pain described by the subject. The result showed that reflexology had a valuable addition in the management of knee joint pain with Rheumatoid arthritis.

An experimental study was done in Bangkok by Bergm et al (2007) to examine the effects of reflexology on the levels of pain in postoperative joint surgery patients. The sample consisted of 30 post-abdominal surgery patients who were randomized into 2 groups – experimental and control. The study employed a simple cross-over design and used the manual of hand reflexology which is an instrument for recording patient's personal information, assessing pain perception, satisfaction questionnaires and patient's opinions. Vital signs and pain scores before and immediately after the intervention at day 1 and 2 postoperative were assessed. Data were analyzed using ANOVA and ANCOVA. Findings revealed significantly lower mean pain score in post abdominal surgery patients after receiving true and mimic reflexology at $p < 0.05$. So the study concluded that reflexology is considered as a complementary alternative in nursing practice for reducing pain in post-joint surgery patients.

Reflexology was found to be an effective technique used to reduce pain levels in old age population of 2,297 clients in an experimental study conducted by Wilkinson et

al (2006). A McGill's pain questionnaire about pain, socio-demographic characteristics and abdominal circumference measurement were used for data collection. Unadjusted and adjusted odds ratio and 95 percentage were estimated by using backward stepwise logistic regression. The intervention of reflexology is given for 15 minutes and pre test and post test pain levels were assessed which revealed the significant reduction in pain level ($F= 312.45$, $p = .001$) of intervention group showed highly significance.

Jullie (2006) a study was conducted in Stockport, England, on the effect of foot reflexology on patients' perception of care following knee joint pain as day care patients. This randomized-controlled study employed a sample of 59 women who underwent knee joint and were randomly allocated into two groups. The experimental group received a foot reflexology and analgesia post-operatively, whilst the control group received only analgesia post-operatively. Pre and post test conducted for both the control and experimental group by using a questionnaire was used to assess pain levels and analgesia taken. The findings showed a significant difference in the mean pain scores experienced by the two groups, such that the experimental group consistently reported less pain following a foot reflexology than the control group.

The effectiveness of kinesthetic therapy and reflexology was compared by Maccason (2005) between two groups. 50 groups were given kinesitherapy and other group was given reflexology. The intervention of reflexology given for 15 minutes second hourly four times a day for experimental group1 and kinesthetic therapy given for 15 minutes second hourly four times a day for experimental group 2. The pain levels were assessed using numerical pain rating scale in both the control and experimental group before and after reflexology. The investigator concluded that reflexology reduce joint pain more than kinesthetic therapy.

Jithendar (2004) conducted a study to assess the treatment of knee arthralgia with foot reflexo-therapy. Totally 17 samples were taken in that eight females and nine males age 50 to 80 years old. Foot reflexo-therapy treatment was given 30 - 45 minutes daily for 10 times. Arthralgia (joint pain) was caused by trauma in 5 cases, and by arthritis in 12 cases. Results show that eleven patients (64.71%), including the 5 trauma caused cases completely recovered. Four patients (23.53%) improved. Two patients (11.76%) were unaffected. The results suggested that reflexology has a positive effect in reducing knee arthralgia. The pain level assessed using numerical pain intensity scale.

Sixty-one patients were randomly sampled into two groups in a study conducted in 2002 by Ross et al conducted a study on effects of reflexo therapy to investigate its efficacy as an adjuvant therapy in relieving pain and anxiety among postoperative patients with joint cancer. Patients in the intervention group received the usual pain management plus 20 minutes of foot reflexo therapy during postoperative days 2, 3, and 4 for joint pain patients. A randomized control trial was done in Taipei; Taiwan on Patients in the control group who received the standard usual pain management. The short-form McGill Pain Questionnaire, Visual Analogue Scale for pain and the Hospital Anxiety and Depression Scale were used to assess the data. Results indicated that less pain ($P < .05$) and anxiety over time were reported by the intervention group compared with the control group.

In 1979 another study was conducted in Rochester, USA by Abdella et al to determine the effect of foot reflexology on pain management for joint surgery patients. One hundred and sixty patients were sampled in which 80 in experimental and 80 in control group. A numerical pain rating scale of 0 to 10 (0 = no pain, 10 = worst possible

pain) was used to assess pain scores pre- and post- the intervention , given second hourly four times a day conducted for 4 week. Findings indicated that patients receiving the therapy had significantly decreased pain scores after reflexology ($p \leq .001$, which is statistically significant). Hence it was concluded that foot reflexology therapy may be an important additional pain management component of the healing experience for patients after joint surgery.

Summary

This chapter has dealt with the review of literature related to the problem stated. The literatures presented here were extracted from 25 primary and 7 secondary sources. It has helped the researcher to understand the prevalence and impact of the problem under study. It has also enabled the investigator to design the study, develop the tool, and plan the data collection procedure and to analyze the data.

Chapter III
Research Methodology

CHAPTER III

RESEARCH METHODOLOGY

The methodology of the research study is defined as the way the data are gathered in order to answer the questions to analyze the research problem. It enables the researcher to project a blue print for the research undertaken. The research methodology involves a systematic procedure by which the researcher had a start from the initial identification of the problem to its final conclusion. According to Abdella (1979), research methodology involves the systematic procedure by which the researcher starts from the time of initial identification of the problem to its final conclusion.

This chapter deals with a brief description of different steps undertaken by the researcher for the study. It involves research approach, research design, setting, population, sample and sampling technique, sampling criteria, selection and development of the instruments, validity and reliability of the instruments, pilot study, data collection procedure and plan for data analysis. The present study is conducted to assess the effectiveness of reflexology upon joint pain among arthralgia patients.

Research Approach

According to Polit and Beck, (2008), an experimental research is an extremely applied form of research and involves finding out how well a programme, product, practice or policy is working. Its goal is to assess or evaluate the success of the program. An experimental research is generally applied where the primary objective is to determine the extent to which a given measures meets the desired results. The investigator found that evaluative approach is the scientific investigation in which

observations are made; data is collected according to a set of defined criteria of the study. The observable changes are that which takes place under controlled conditions.

In this study the researcher wants to assess the effectiveness of reflexology upon joint pain among arthralgia patients and uses experimental approach.

Research Design

A research design is the most important methodological design that a researcher works in conducting a research study (Polit & Hunglar 2006). It helps the investigator in the selection of the subjects, manipulation of the independent variables and observation of the type of statistical method to be used to interpret the data.

Pretest posttest design, which is true experimental in nature, is adopted to conduct the study. In this study, the investigator done pre test for selected arthralgia patients, and researcher manipulated the independent variable,

The research design is represented diagrammatically as follows

Pretest post test design – time series design

R **O₁ × O₂, O₃ × O₄, O₅ × O₆, O₇ × O₈**

R **O₁ – O₂, O₃ – O₄, O₅ - O₆, O₇ - O₈**

X – Intervention for

O1 – First observation pretest to assess the pain level among the arthralgia patient in experimental and control group.

O2 – First observation posttest to assess the pain level among the arthralgia patient in experimental group it is done immediately after the first time administration of reflexology for 15 minutes. In control group it is observed 15 minutes after the first pretest.

O3 – Second observation pretest to assess the pain level among the arthralgia patient in experimental and control group for second time 2 hour after 1st foot reflexology and 5 minutes before second time administration of reflexology.

O4 – Second observation posttest to assess the pain level among the arthralgia patient in experimental group done immediately after the second time administration of reflexology for 15 minutes. In control group it is observed 15 minutes after the second pretest.

O5 – Third observation pretest to assess the pain level among the arthralgia patient in experimental and control group for third time 2 hour after 2nd foot reflexology and before third administration of foot reflexology.

O6 – Third observation posttest to assess the pain level among the arthralgia patient in experimental group done immediately after the third time administration of reflexology for 15 minutes. In control group it is observed 15 minutes after the third pretest.

O7 – Fourth observation pretest to assess the pain level among the arthralgia patient in experimental and control group for fourth time 2 hour after 3rd foot reflexology and before fourth administration of foot reflexology.

O6 – Fourth observation posttest to assess the pain level among the arthralgia patient in experimental group done immediately after the fourth time administration of reflexology for 15 minutes. In control group it is observed 15 minutes after the fourth pretest.

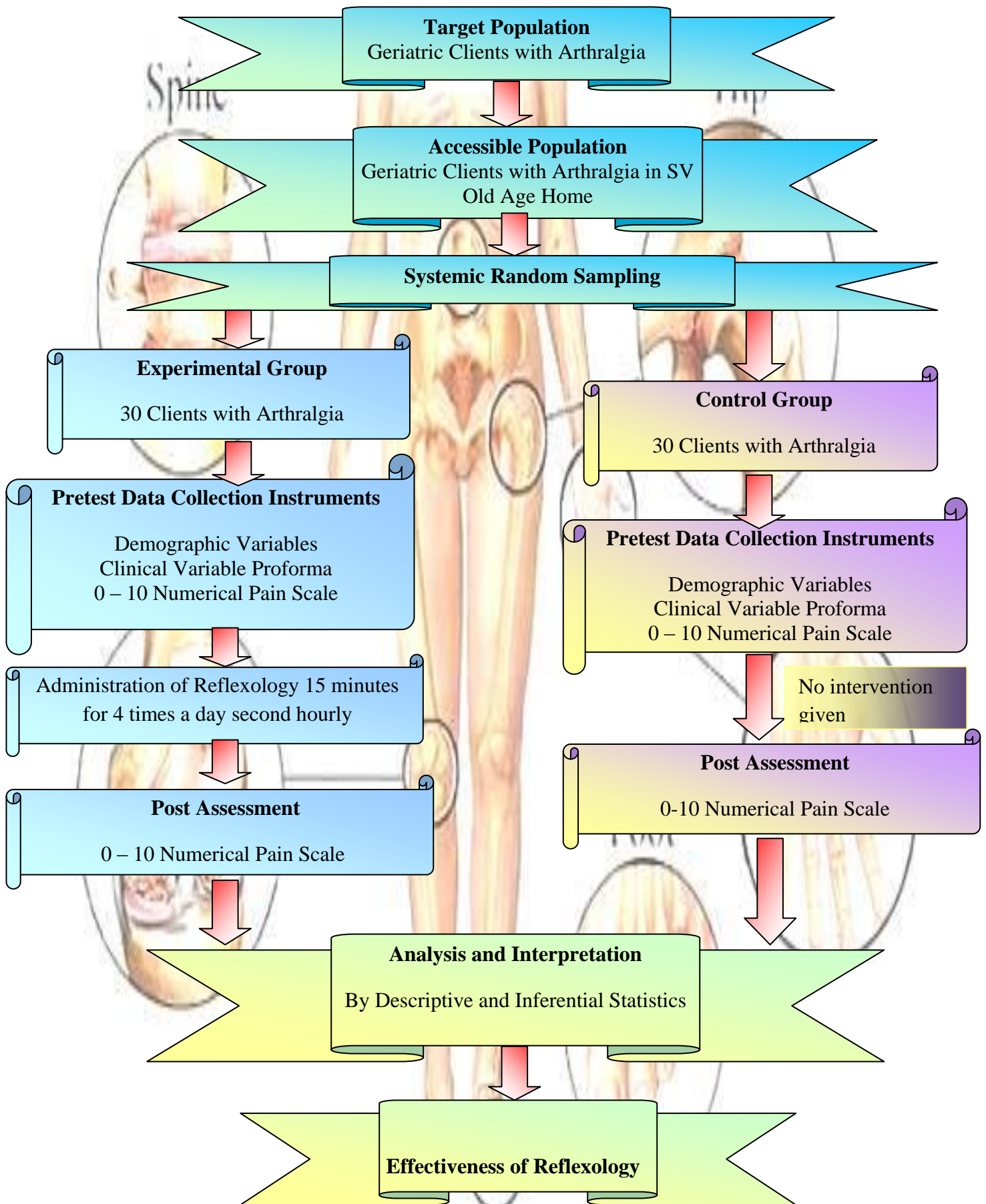


Fig. 2 Schematic Representation of Research Design

Variables

An abstract concept when defined in terms that can be measured is called a variable. Variables are characteristics that vary among the subjects being studied.

Independent variable

The independent variable of the study was reflexology given fifteen minutes, four times daily for 30 patients.

Dependent variable

It was the level of joint pain among the patients before and after the administration of the reflexology.

Attribute variable

It included the demographic variables that consist of age, gender, religion marital status, educational status, type of family, area of residence, occupation and type of work and selected clinical variables consists of history of fall, surgery, duration of period of illness, clinical diagnosis, treatment, route of administration, use of non pharmacological measure, presence of co – morbid illness which influence joint pain.

Research Setting

The physical location and condition in which data collection takes place in a study is the research setting (Polit, 2008)

The present study was conducted in the SV old age home, Chennai. It has sophisticated institutional facilities and also full furnished accommodation for 250 member's old age in the setting similar to the home or residence.

Population

According to Polit (2006) a population is an aggregate of totality of all subjects who possess some common characteristics. The target population is the group of population that the researcher aims to and the study findings whom will be generalized. The target population of the present study was arthralgia patients (above 65 years of age). Accessible population is the population that the researcher aims to study. In this study, the accessible population compromise of 120 arthralgia patients (above 60 years of age), in SVold age home, Chennai.

Sample

According to Polit and Beck (2008) sample is a subset of population, selected to participate in the study. A sample of 60 arthralgia patients who has joint pain and meeting the inclusion criteria were selected for the study, 30 in control group and 30 in experimental group.

Sampling Technique

Sampling is the process of selecting a portion of the population to represent the entire population (Polit, 2008). The participants of arthralgia patients in SV old age home were selected by administering pre test pain level assessment by numerical pain rating scale from this the samples of the present study were selected by probability systemic sampling technique in which the participants are selected from population at fixed intervals i.e. 2nd person of every desired sample size (60) who fulfilled the sampling criteria. The 60 participants were divided into two groups 30 in experimental

and 30 in control group by using lottery method the initial 30 odd numbers were selected in control and remaining 30 members were selected for experimental group.

$$K = \text{total samples} / \text{desired sample size} = 120 / 60 = 2$$

Sampling Criteria

Inclusion Criteria

The study includes elderly who were

- admitted in old age homes Chennai.
- admitted during data collection.
- experiencing mild, moderate and severe arthralgia pain.
- with or without pain medication.
- who can understand Tamil / telugu / English / hindi.

Exclusion Criteria

The study excludes patients

- who cannot understand Tamil/ Telugu/ English / Hindi
- not willing to participate in the study.
- with neurological conditions.
- who are seriously ill.

Selection and Development of Study Instruments

As the study aimed to evaluate the effectiveness of reflexology upon joint pain among arthralgia patients the data collection tool was prepared by the investigator after a thorough review of literature and experts suggestion. The instruments used in this study were Demographic variable Proforma, Clinical variable Proforma, 0-10

Numerical pain rating scale, Satisfaction rating scale on reflexology of the arthralgia patients regarding the intervention that was developed by the investigator.

Demographic variable proforma of arthralgia patients

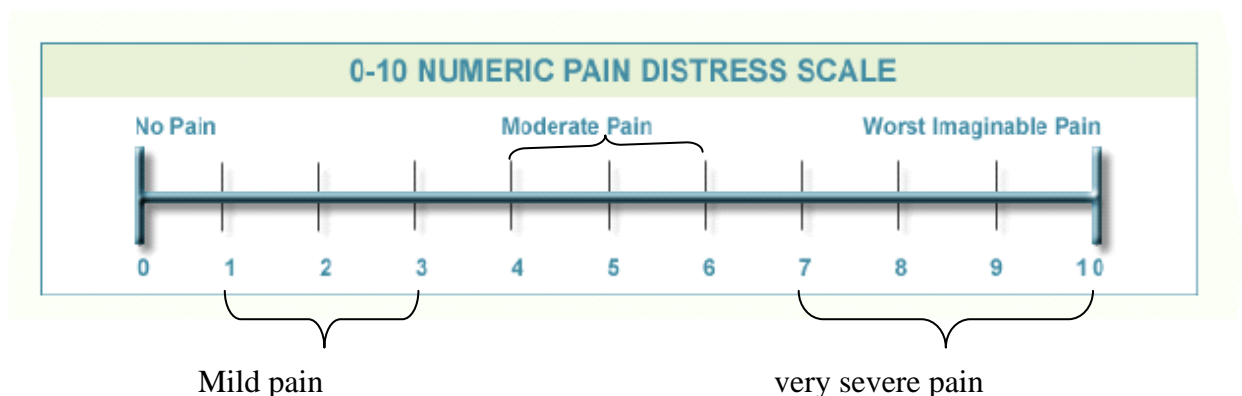
Demographic variable proforma consists of age, gender, religion marital status, educational status, type of family, area of residence, occupation and type of work.

Clinical variable proforma regarding of arthralgia patients

Clinical variables proforma consists of history of fall, surgery, duration of period of illness, clinical diagnosis, treatment, route of administration, use of non pharmacological measure, presence of co – morbid illness and information regarding reflexology.

Structured pain assessment tool for joint pain

It is a 0 – 10 numerical pain rating scale used by the investigator to assess the level of pain perception of the participants regarding the reflexology.



Score Interpretation

- 1 -3 - Mild pain
- 4 – 6 - Moderate pain
- 7 - 10 - Severe pain

Level of satisfaction rating scale on reflexology

This rating scale was designed by the investigator to assess the level of satisfaction of the participants regarding the reflexology. Based on three aspects i.e. regarding

administration - 33.3% (Giving reflexology, Frequency, Application and Easy use)

physiological factor - 33.3 % (Reduction of pain , Promoting relaxation of muscles ,
Use of best method , Promoting sleep)

psychological factor - 33.3 % (Help in diversion of mind , Promoting relaxation of
mind, Increase in coping ability , Minimizing frustration)

Score Interpretation

| | | |
|---------|---|------------------|
| 10 - 22 | - | Dissatisfied |
| 23 - 35 | - | Satisfied |
| 36- 48 | - | Highly satisfied |

Psychometric Properties of Study Instruments

Validity of the Study Instrument

Content validity is the degree to which an instrument measures what it is supposed to measure. Content validity is the sampling adequacy of the content being measured (Polit 2006). Content validity of the tool was obtained by getting opinion from experts in the field of nursing. Based on their suggestions, the investigator modified the item and finalized the tool for the study.

Reliability of the Instrument

Reliability of an instrument refers to the accuracy and consistency of the measuring tool. It refers to the extent to which the same results are obtained on repeated administration of the instrument. The reliability of the tool was elicited by using split – half technique for satisfactory rating scale and for 0 -10 numerical pain rating scale reliability elicited by using test retest method .The result showed that the tool was highly reliable.

0 – 10 numerical pain rating scale – 0.78 ($p = < 0.001$) {test- re test method }

Satisfactory rating scale on reflexology – 0.84 {split half method }

Pilot Study

Polit (2006) stated that, Pilot study is the miniature of an actual study, in which the instruments are administered to the subjects drawn from the same population. The purpose is to find out the feasibility and practicability of the study and to finalize the tools. And the tools will be modified if required. Pilot study was conducted with total 10% of population.

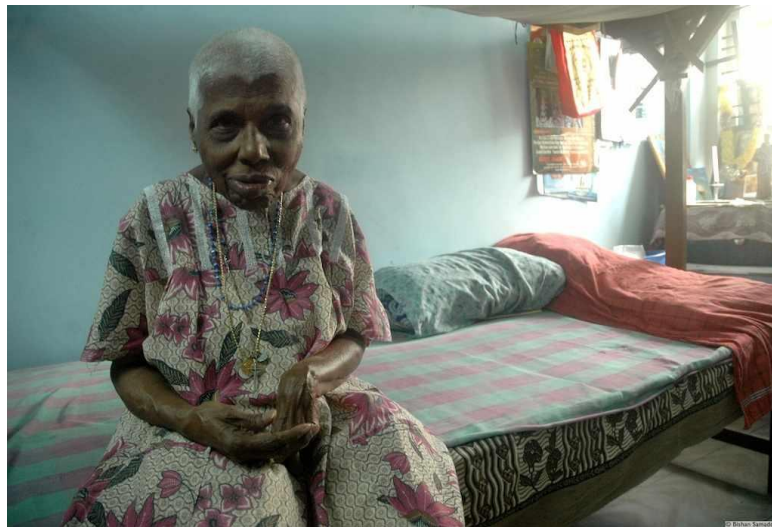
A pilot study was conducted on arthralgia patients after obtaining oral permissions from the authorities of SV old age home, Chennai. The samples were chosen by systemic random sampling technique. The pilot study was conducted in SV old age home at Chennai from 26.11.2012 to 30.11.12. Six patients with in control and six patients for experimental were selected as study participants. Pre test assessment done by using demographic variable proforma, clinical variable proforma, and numerical pain rating scale for experimental and control group. The intervention was

given for experimental group after getting consent from the participants for 15 minutes for four times a day second hourly. The pre test and post test assessment was administered before and after the reflexology immediately every time for four times a day by using numerical pain rating scale and satisfactory rating scale on reflexology given at last intervention of the day to the experimental clients which is developed by the investigator. In control post assessment was done each time administration of reflexology after 15 minutes. The pain levels of control and experimental group compared for the effectiveness of the intervention. The pilot study analysis shows that there is significant improvement in the pain levels as evidenced by the 't' value 10 at $p < 0.05$. So after the study, it was found to be feasible and effective and the study instruments were found to be appropriate.

Intervention Protocol

- The intervention was done in the morning 10 am to 5pm for 4 patients per day, thus for 30 patients within 2 weeks. It is given for 15 minutes second hourly four times a day reflexology was given.
- Informed consent is obtained from the patient after completely explaining about the procedure.
- Asked the patient to wash their feet with soap and rinse it with water.
- Patient is asked to take the comfortable position (sitting/lying).
- Investigator also takes the appropriate position (sitting) by placing the chair near to the patient.
- Inspected for any cuts or broken skin and wiped the feet with the towel to dry the feet.

- Relaxation techniques like thumb walking range of motion exercises were taught to make the patient relax and asked come back to comfortable position.
- Stroke and Pressure given not more than 15 minutes at the pressure points i.e. in between the toes, starting from the left to the right by the fingers of the investigator at the sole area.
- The pressure applied till the patient tolerance level to the sole area.
- Patient is asked to relax for 15 minutes by lying in flat position on the bed.



Protection of Human Rights

- The study was conducted after obtaining clearance from Ethical committee, Apollo hospitals, Chennai and permission from the Research and Medical guide.
- Consent was obtained from all the participants before the data collection.
- Confidentiality was maintained throughout the study.

Data Collection Procedure

The data collection procedure is gathering of information needed to address a research problem. Prior to data collection permission was obtained from the concerned authority to conduct the study. SV old age home is an institution providing professional care in the setting similar to their residence for the elderly people who are aged 60years or more. The participants of arthralgia patients in SV old age home were selected by administering pre test pain level assessment by numerical pain rating scale from this 120 arthralgia patients the samples of the present study were selected by probability systemic sampling technique in which the participants are selected from population at fixed intervals i.e. 2nd person of every desired sample size (60) who fulfilled the sampling criteria. The 60 participants were divided into two groups 30 in experimental and 30 in control group by using coin method. From every study participant consent was obtained. They were explained about the procedure method, benefits and the effect of the intervention. Pre test assessment done by using demographic variable proforma, clinical variable proforma, 0- 10 numerical pain rating scale for control and experimental group the pretest assessment is repeated for every time before administration of reflexology for experimental group. Experimental group (30members) of people were administered with 10 – 15 minutes interval for four times a day second

hourly reflexology by the investigator on the foot of arthralgia clients at sole of foot through application of the strokes and pressure at the pressure points. The post test assessment was done in experimental group every time immediately after the administration of reflexology and level of satisfaction on reflexology was given to the clients at the last intervention which is developed by investigator. In control group pretest and post test assessment was done after 2hrs without giving reflexology. The collected data were organized and planned for an analysis.

Problems Faced During Data Collection

The problems faced during the process of this study were,

- The number of clients willing to participate is comparatively less.
- Some clients expressed that the duration is shorter.

Plan for Data Analysis

Data analysis is the systemic organization and synthesis of research data and testing of research hypothesis by using obtained data (Polit, 2006). The data will be analyzed with the help of descriptive statistics like mean, percentage, standard deviation and inferential statistics like paired “t” test and chi-square. The association between the demographic variables and other variables were analyzed with the help of chi-square test.

Summary

This chapter deals with the selection of research approach, research design, setting, population, sample and sampling technique, selection and development of instruments, validity and reliability of the instruments, pilot study, interventional protocol, data collection and plan for the data analysis.

Chapter IV
Analysis and Interpretation

CHAPTER IV

ANALYSIS AND INTERPRETATION

Data was collected from arthralgia patients with joint pain at SV old age home Chennai – 06, among them 30 in control group and 30 in experimental group to determine the effectiveness of reflexology. The data were analysed according to the objectives and hypothesis of the study.

The data was analysed, tabulated and interpreted using descriptive and inferential statistics.

Organisation of the Findings

The findings of the study were organized and presented under the following heading:

- Frequency and percentage distribution of demographic variable in the control and experimental group of arthralgia patients.
- Frequency and percentage distribution of clinical variable in the control and experimental group of arthralgia patients.
- Frequency and percentage distribution of pain perceived before and after reflexology in control and experimental group of arthralgia patients.
- Comparing of mean and standard deviation of pain perception by control and experimental group of arthralgia patients.
- Dimension wise frequency and percentage distribution of level of satisfaction of arthralgia patients in the experimental group regarding reflexology upon joint pain.
- Association between the selected demographic variables and pain perception of arthralgia patients in control group.

- Association between the selected demographic variables and pain perception of arthralgia patients in experimental group.

- Association between the selected clinical variables and pain perception of arthralgia patients in control group.

- Association between the selected clinical variables and pain perception of arthralgia patients in experimental group.

Table 1

Frequency and Percentage Distribution of Demographic variables (Gender, Religion, Type of family, Area of Residence, Occupation, Type of Work) in the Control and Experimental Group of Arthralgia Patients.

| Demographic variables | Control group (n=30) | | Experimental group (n=30) | |
|--------------------------|--------------------------|------|------------------------------|-----|
| | n | p | n | p |
| Gender | | | | |
| Male | 9 | 30 | 8 | 36 |
| Female | 21 | 70 | 22 | 74 |
| Religion | | | | |
| Hindu | 16 | 53.3 | 30 | 100 |
| Muslim | 7 | 23.3 | - | - |
| Christian | 7 | 23.3 | - | - |
| Others | - | - | - | - |
| Type of family | | | | |
| Nuclear | 15 | 50 | 26 | 87 |
| Joint | 14 | 47 | 4 | 13 |
| Extended | 1 | 3 | - | - |
| Area of residence | | | | |
| Urban | 16 | 53 | 15 | 50 |

| | | | | |
|-------------------------------|----|----|----|----|
| Semi urban | 8 | 27 | 9 | 30 |
| Rural | 6 | 20 | 6 | 20 |
| Corporation \ municipality | - | - | - | - |
| Occupation | | | | |
| Employed | 11 | 37 | 6 | 20 |
| Unemployed | 19 | 63 | 24 | 40 |
| Type of work | | | | |
| Heavy | 15 | 50 | 13 | 43 |
| Moderate | 8 | 27 | 15 | 50 |
| Sedentary | 7 | 23 | 2 | 7 |

The data in table 1 reveal that significant number of the arthralgia patients were in the age group of 70 – 80 years (43%, 47%), most of them were female (73%, 45%), majority were belonging to nuclear family (87%,60%), most of them were Hindus (100%,87%), most of them were residing in urban area (53%,50%), majority of them were widows (63%,56%), majority of the them were educated (63%,40%), most of the patients were un employed (83.33%,66.7%) and among employed most of them were heavy workers (50% ,43%) in control and experimental group respectively.

In Fig: 3 it is depicted that significant members in experimental (43%) and control (47%) group belong to the age group of 70 -80 years.

Fig: 4 reveals that most of the patients were married in experimental (60%) and control (47%) group.

Fig: 5 Interprets that most of the patients were not educated in experimental (63%) and control (40%) group.

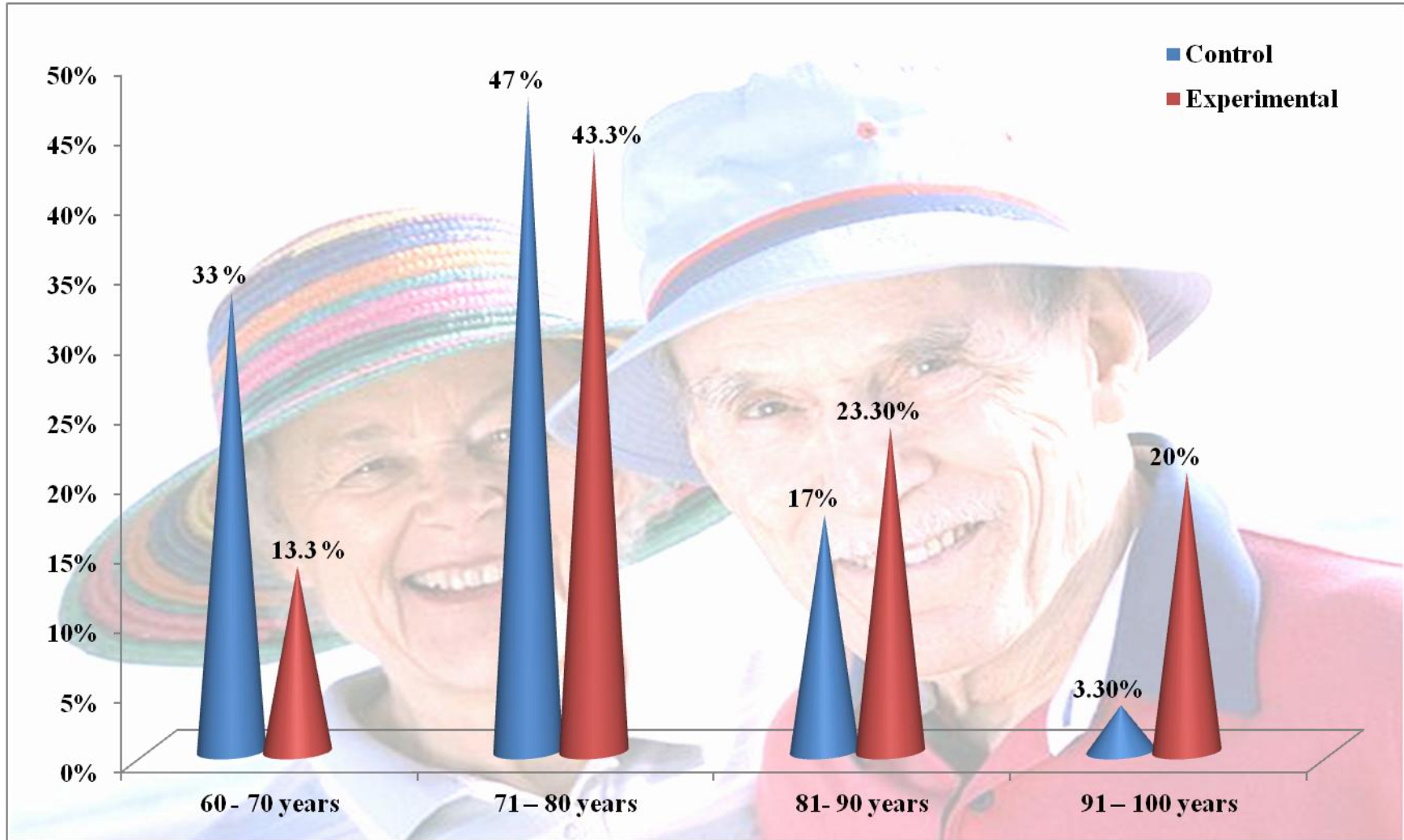


Fig. 3 Percentage Distribution of Age Group in Arthralgia Patients

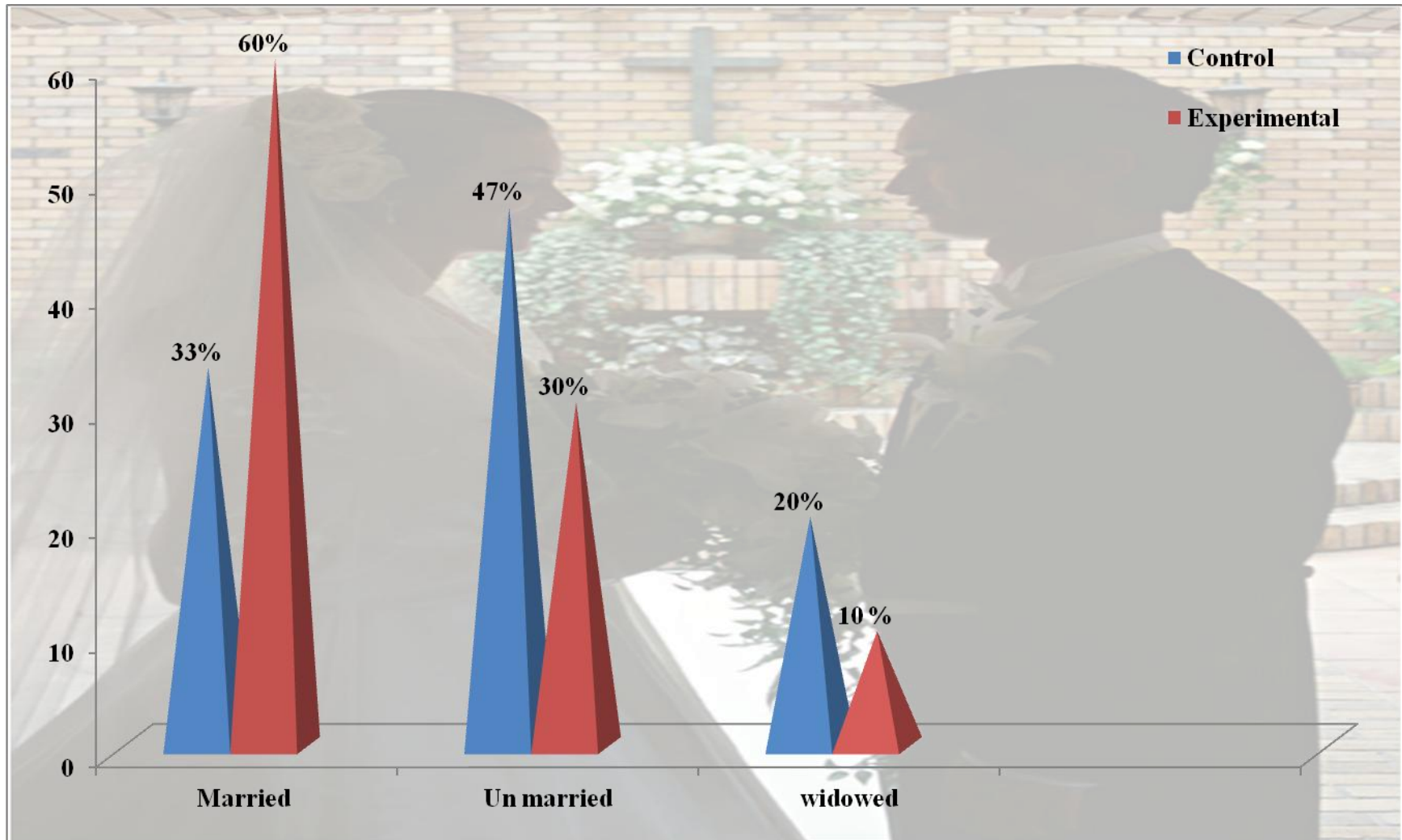


Fig. 4 Percentage Distribution of Marital Status in Arthralgia Patients

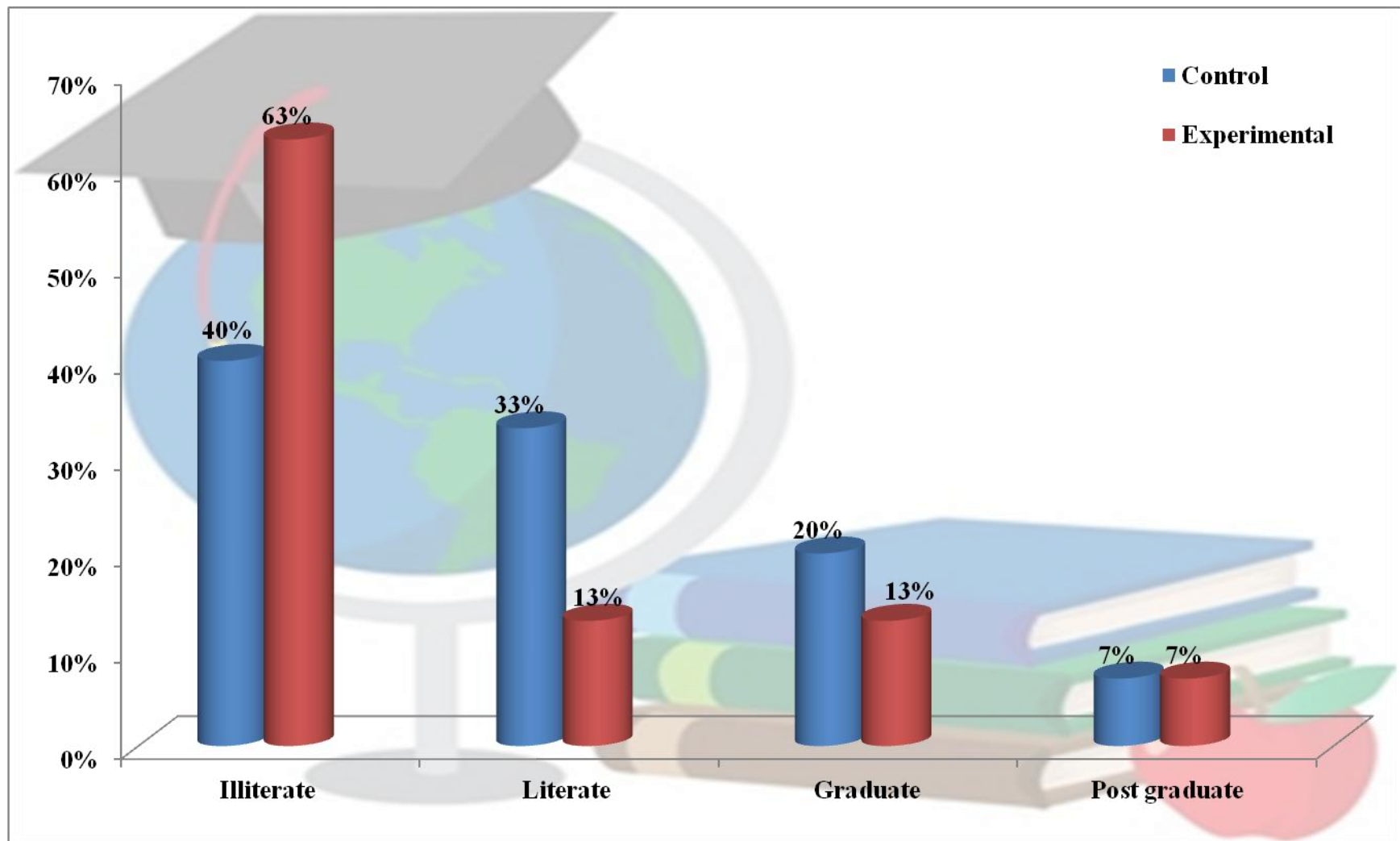


Fig. 5 Percentage Distribution of Education Status in Arthralgia Patients

Table 2

Frequency and Percentage Distribution of Clinical Variable (History of Fall, Surgery, Duration of Period of Illness, Clinical Diagnosis, Treatment, Use of Non Pharmacological Measure and Information Regarding Reflexology) in the Control and Experimental Group of Arthralgia Patients.

| Clinical variables | Control Group | | Experimental Group | |
|--|---------------|-----|--------------------|----|
| | (n=30) | | (n=30) | |
| | n | p | n | p |
| History of fall or injury | | | | |
| Yes | 18 | 60 | 14 | 47 |
| No | 12 | 40 | 16 | 53 |
| Did you undergo any surgeries | | | | |
| Yes | 15 | 50 | 17 | 57 |
| No | 15 | 50 | 13 | 43 |
| Did you experience joint stiffness in the morning | | | | |
| Yes | 30 | 100 | 6 | 20 |
| No | - | - | 24 | 80 |
| Duration of period of illness | | | | |
| <5years | 6 | 20 | 8 | 27 |
| 5 – 10 years | 11 | 37 | 18 | 60 |
| > 10 years | 13 | 43 | 4 | 13 |

| | | | | |
|---|----|-------|----|-----|
| Did you ever receive information regarding reflexology | | | | |
| Yes | 2 | 7 | 6 | 20 |
| No | 28 | 93 | 24 | 80 |
| Clinical diagnosis | | | | |
| Blood chemistry | 11 | 37 | 30 | 100 |
| Radiological investigation | 19 | 63 | - | - |
| Treatment | | | | |
| Medical | 30 | 100 | 6 | 20 |
| Surgical | - | - | 14 | 47 |
| Non pharmacological methods | - | - | 10 | 33 |
| Use of another non pharmacological management for joint pain | | | | |
| Yes | 30 | 100 | 30 | 100 |
| No | - | - | - | - |
| If yes specify | | | | |
| Music | 4 | 17 | 3 | 10 |
| Exercise | 11 | 37 | 11 | 37 |
| Distraction | 9 | 3 | 11 | 37 |
| Acupuncture | 5 | 17 | 5 | 16 |
| Acupressure | - | - | - | - |
| Massage | 10 | 33.33 | - | - |

| | | | | |
|--|----|-----|----|-----|
| Yes | 30 | 100 | 30 | 100 |
| No | - | - | - | - |
| Duration of co – morbid illness | | | | |
| <5 years | 18 | 60 | 14 | 47 |
| 5 – 10 years | 12 | 40 | 15 | 50 |
| > 10 years | - | - | 1 | 3 |
| Treatment for co – morbid illness | | | | |
| Yes | 20 | 67 | 22 | 73 |
| No | 10 | 33 | 8 | 27 |

The data presented in table 2 Depicts that majority of the arthralgia patients had injury (47% ,60%), had under gone surgeries (57%, 50%), most of the patients had joint stiffness (55%,45%), half of them with period of illness for more than 10 years (50%, 33.33%), and for all the patients clinical diagnosis is made through radiological investigation (100%,63.3%), Few were on analgesic treatment (37%,53%), and few were taking non pharmacological treatment like exercise (37%,36.66%), most of the patients have the co – morbid illness (57% ,33%), for the duration more than 5 -10 years (60%,50%) in control and experimental groups respectively.

Fig: 6 Illustrates majority of the patients were taking intramuscular route of administration for pain relief in control (57%) and in experimental (53%)

It was depicted from fig: 7 that majority of the patients were having cardiovascular problems in control (57%) and in experimental (33.3%) .

Majority of the patients were not taking any treatment for pain relief in control(63%)and in experimental (37%) were noticed from fig: 8.

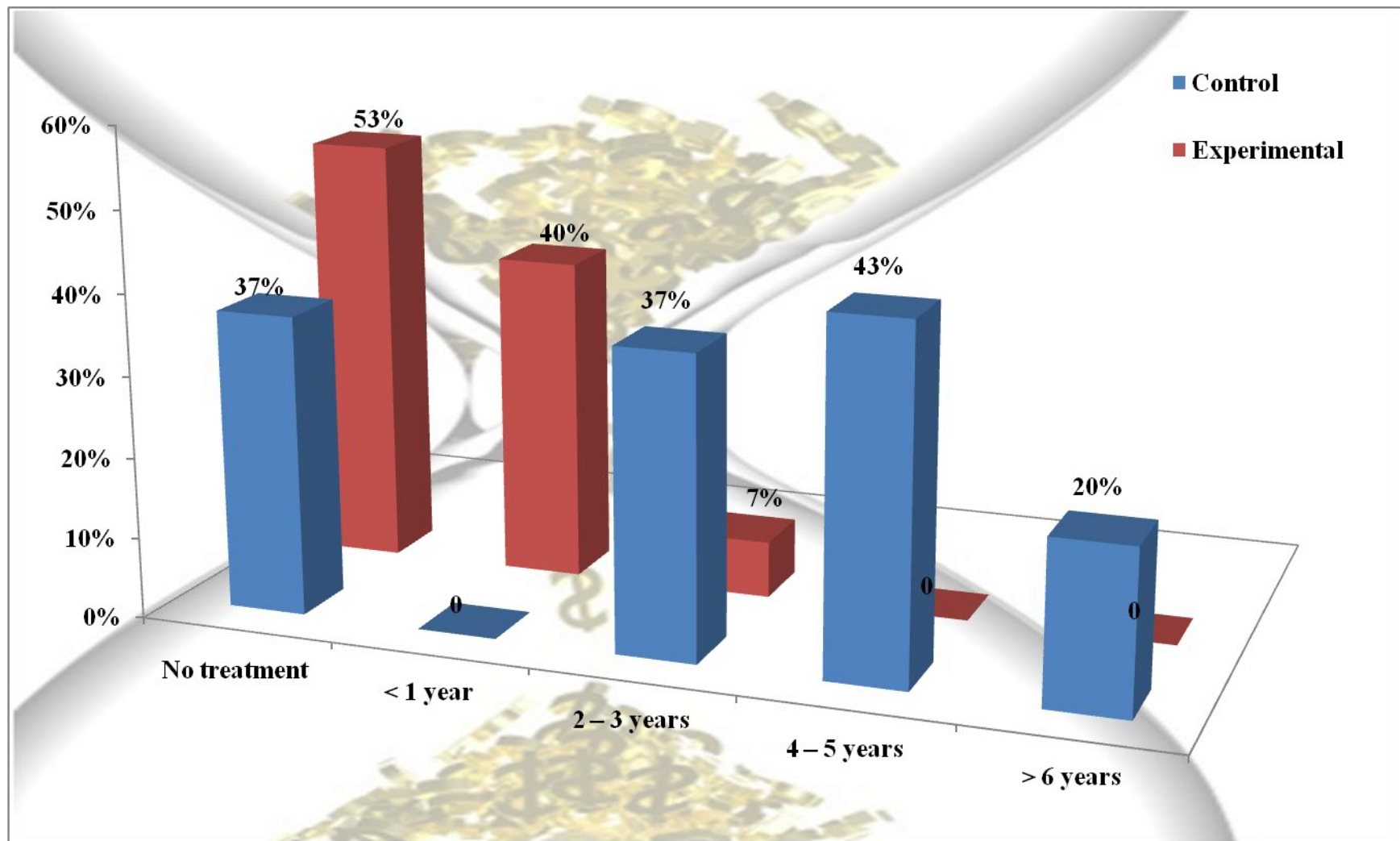


Fig. 6 Percentage Distribution of Duration of Treatment in Arthralgia Patients

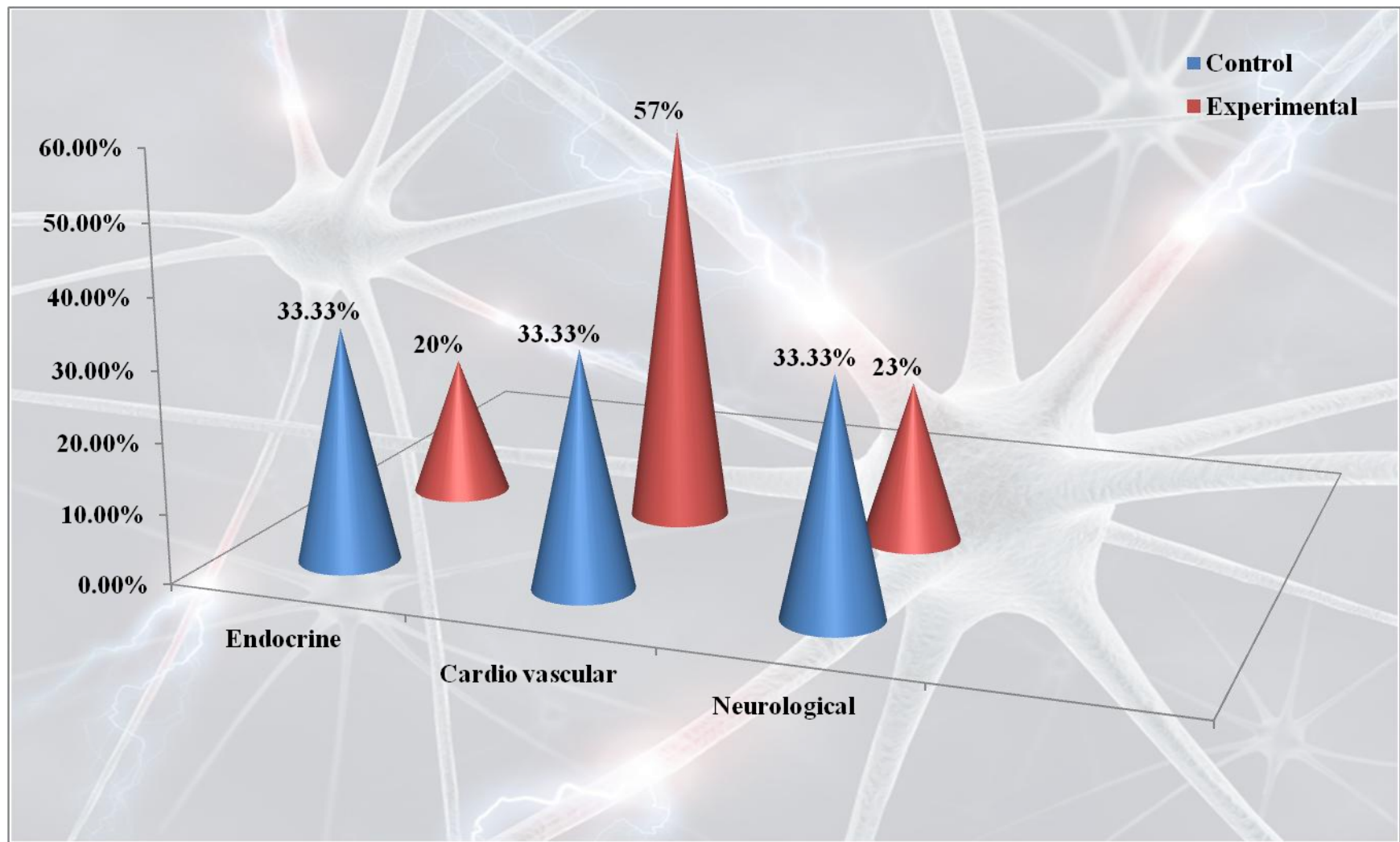


Fig. 7 Percentage Distribution of Presence of Co Morbid Illness in Arthralgia Patients

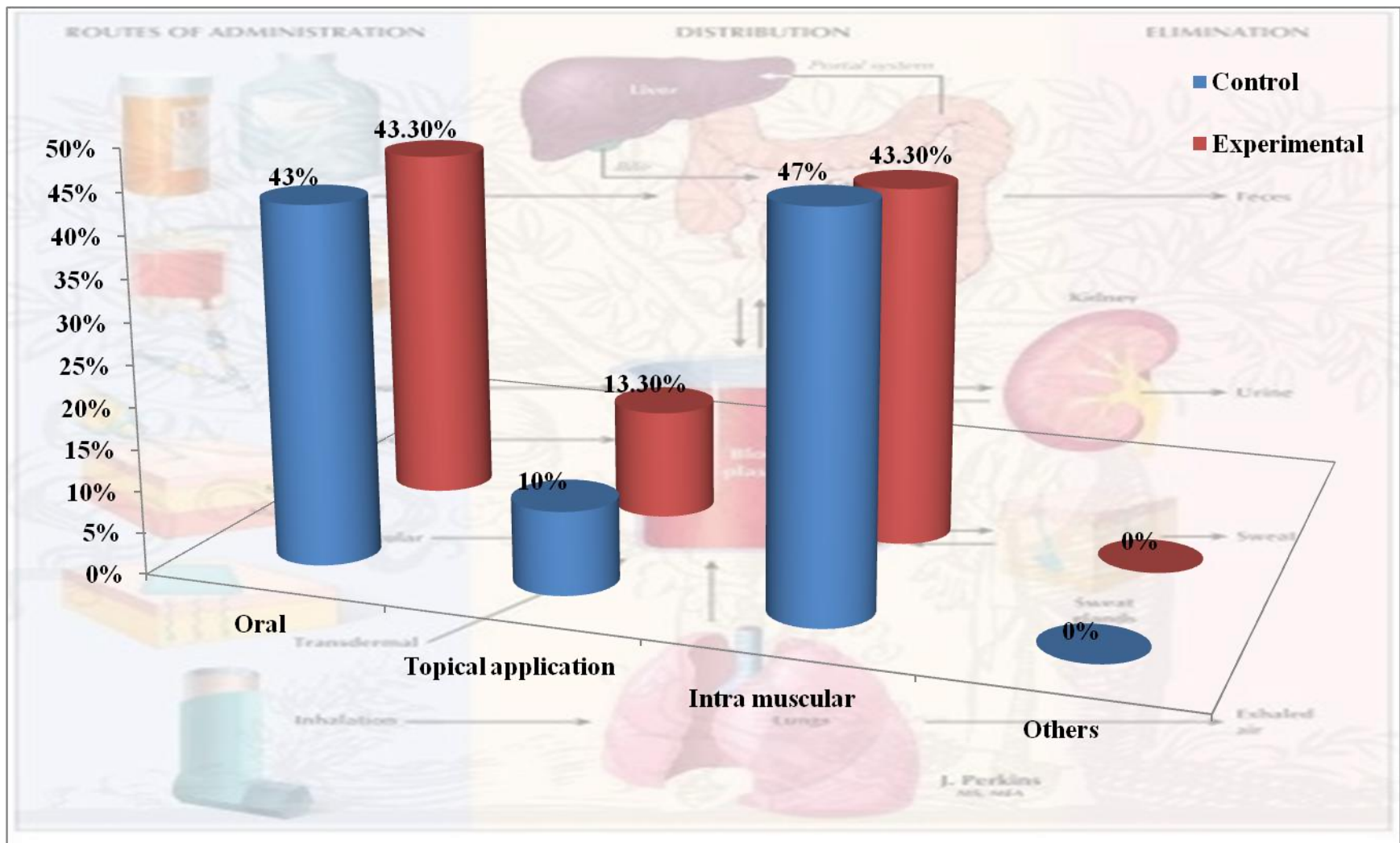


Fig. 8 Percentage Distribution of Route of Administration of Analgesic Medication in Arthralgia Patients

Table 3

Frequency and Percentage Distribution of Pain Perceived by Arthralgia Patients Before and After Reflexology in Control and Experimental Group.

(N = 60)

| Pain perceived | | Mild | | Moderate | | Severe | |
|---------------------------|------------------|------|----|----------|----|--------|----|
| | | n | p | n | p | n | p |
| Control group | Pre test | - | - | 10 | 33 | 20 | 67 |
| | Post test | - | - | 15 | 50 | 15 | 50 |
| Experimental group | Pre test | - | - | 15 | 50 | 15 | 50 |
| | Post test | 26 | 87 | 4 | 13 | - | - |

The data presented in the table 3 reveals that all the arthralgia patients before reflexology in control group (33%, 67%) and experimental (50%, 50%) have moderate and severe pain. But after reflexology the experimental group had mild (87%) and moderate pain (13%) where as the control group presented the same moderate (50%) and severe level of pain (50%).

Table 4

Comparison of Mean and Standard Deviation of Pain Perception by Control and Experimental Group of Arthralgia Patients.

(N = 60)

| Group | N | M | SD | 't' value |
|--------------------|----|---|------|-----------|
| Control group | 30 | 8 | 0.91 | 27.7* |
| Experimental group | 30 | 3 | 0.5 | |

*****P<0.001**

The data in the table 4 depicts that the mean and standard deviation of the control and experimental group is 8, 0.91, 3 and 0.5 respectively. The 't' value of 27.7 is highly significant at P< 0.001 level of significance. Which shows that the experimental group shows a significant reduction in the level of pain perception after reflexology. Hence the null hypothesis H₀1 is rejected.

Table 5

Dimension Wise Frequency and Percentage Distribution of Level of Satisfaction of Arthralgia Patients in Experimental Group Regarding Reflexology upon Joint Pain.

(N = 60)

| Dimensions | High satisfaction | | Moderate satisfaction | | Low satisfaction | |
|-----------------------|-------------------|-----|-----------------------|---|------------------|---|
| | n | p | n | p | n | p |
| Administration | 4 | 100 | - | - | - | - |
| Physiological aspects | 4 | 100 | - | - | - | - |
| Psychological aspects | 4 | 100 | - | - | - | - |

The data from the table 5 noticed that all the patients in experimental group of arthralgia patients were highly satisfied with the administration (100%), physiology factors (100%), and psychological factors (100%) related to administration of reflexology.

Table 6:

Association Between the Selected Demographic Variables and Pain Perception of Arthralgia Patients in Control.

(n= 30)

| Demographic variables | Pain levels | | | | χ^2 |
|-----------------------|-------------|----|------------|-----|-----------------|
| | Upto mean | | Above mean | | |
| | n | p | n | p | |
| Age in years | | | | | |
| 60 - 70 years | 2 | 7 | 2 | 7 | 22.49*** |
| 71 – 80 years | 5 | 17 | 8 | 27 | (df = 3) |
| 81- 90 years | 3 | 10 | 4 | 13 | |
| 91 – 100 years | 2 | 7 | 4 | 13 | |
| Gender | | | | | |
| Male | 7 | 23 | 3 | 10 | 0.9 |
| Female | 17 | 57 | 3 | 10 | (df = 1) |
| Religion | | | | | |
| Hindu | 12 | 40 | 4 | 13 | |
| Muslim | 4 | 13 | 3 | 10 | 19.37** |
| Christian | 6 | 20 | 1 | 3.3 | (df= 3) |
| Others | - | - | - | - | |

| | | | | | |
|----------------------------|----|----|---|----|----------------|
| Marital status | | | | | |
| Married | 8 | 27 | 2 | 7 | |
| Un married | 11 | 37 | 3 | 10 | 12.44** |
| Widowed | 5 | 17 | 1 | 3 | (df = 4) |
| Divorced | - | - | - | - | |
| Separated | - | - | - | - | |
| Educational status | | | | | |
| Illiterate | 11 | 37 | 1 | 3 | |
| Literate | 8 | 27 | 3 | 10 | 10.61* |
| Graduate | 5 | 17 | - | - | (df = 3) |
| Post graduate | 0 | - | 2 | 6 | |
| Type of family | | | | | |
| Nuclear | 12 | 40 | 3 | 10 | |
| Joint | 11 | 37 | 3 | 10 | 3.76 |
| Extended | 1 | 3 | - | - | (df = 2) |
| Area of residence | | | | | |
| Urban | 14 | 47 | 2 | 7 | |
| Semi urban | 6 | 20 | 2 | 7 | 3.27 |
| Rural | 4 | 13 | 2 | 7 | (df = 3) |
| Corporation \ municipality | - | - | - | - | |

| | | | | | |
|---------------------|----|----|---|----|----------|
| Occupation | | | | | |
| Employed | 8 | 27 | 3 | 10 | 1.63 |
| Unemployed | 15 | 50 | 4 | 13 | (df =1) |
| Type of work | | | | | |
| Heavy | 11 | 37 | 4 | 13 | 4.01 |
| Moderate | 8 | 27 | - | - | (df = 2) |
| Sedentary | 4 | 13 | 3 | 10 | |

***P< 0.05, *P< 0.05, **P < 0.1, ***P< 0.001**

From the table 6, it could be interpreted that there was a significant association between the age of the client, religion, marital status, educational qualification and pain perception and no significant association between other demographic variable and pain perception in control group. Hence the null hypothesis H₀2 is partially rejected.

Table 7:

Association Between the Selected Demographic Variables and Pain Perception of Arthralgia Patients in Experimental Group.

(n =30)

| Demographic variables | Pain scores | | | | χ^2 |
|-----------------------|-------------|----|------------|----|--------------|
| | Upto mean | | Above mean | | |
| | n | p | n | p | |
| Age in years | | | | | |
| 60 - 70 years | 3 | 10 | 1 | 3 | |
| 71 – 80 years | 6 | 20 | 7 | 23 | 7.62* |
| 81- 90 years | 5 | 17 | 2 | 7 | (df = 3) |
| 91 – 100 years | 3 | 10 | 3 | 10 | |
| Gender | | | | | |
| Male | 5 | 17 | 3 | 10 | 0.68 |
| Female | 10 | 3 | 12 | 40 | (df = 1) |
| Religion | | | | | |
| Hindu | 15 | 50 | 15 | 50 | |
| Muslim | - | - | - | - | 18** |
| Christian | - | - | - | - | (df = 3) |
| Others | - | - | - | - | |

| | | | | | |
|----------------------------|----|----|----|----|-----------------|
| Marital status | | | | | |
| Married | 7 | 23 | 11 | 37 | |
| Un married | 8 | 27 | 1 | 3 | 10.42** |
| Widowed | - | - | 3 | 10 | (df = 4) |
| Divorced | - | - | - | - | |
| Separated | - | - | - | - | |
| Educational status | | | | | |
| Illiterate | 9 | 30 | 10 | 30 | |
| Literate | 2 | 7 | 2 | 7 | 4 |
| Graduate | 1 | 3 | 3 | 10 | (df =3) |
| Post graduate | 2 | 7 | - | - | |
| Type of family | | | | | |
| Nuclear | 2 | 7 | 4 | 13 | 0.9 |
| Joint | 10 | 3 | 9 | 3 | (df = 2) |
| Extended | 3 | 10 | 2 | 7 | |
| Area of residence | | | | | |
| Urban | 8 | 27 | 8 | 27 | |
| Semi urban | 3 | 10 | 5 | 17 | 2.12 |
| Rural | 3 | 10 | 3 | 10 | (df =3) |
| Corporation \ municipality | - | - | - | - | |

| | | | | | |
|---------------------|----|----|----|----|----------|
| Occupation | | | | | |
| Employed | 3 | 10 | 3 | 10 | 0 |
| Unemployed | 12 | 40 | 12 | 40 | (df = 3) |
| Type of work | | | | | |
| Heavy | 8 | 27 | 7 | 23 | |
| Moderate | 4 | 13 | 4 | 13 | 0.2 |
| Sedentary | 3 | 10 | 4 | 13 | (df = 2) |

***P < 0.05, ** P < 0.1, ***P < 0.1**

Table 7 notifies that there was a significant association between the age, religion, marital status and pain perception and no significant association between other demographic variable and pain perception in experimental group. Hence the null hypothesis H₀₂ is partially rejected.

Table 8:

Association Between the Selected Clinical Variables and Pain Perception of Arthralgia Patients in Control Group.

(n = 30)

| Clinical variable | Pain score levels | | | | χ^2 |
|--|-------------------|----|------------|----|----------|
| | Upto mean | | Above mean | | |
| | n | p | n | p | |
| History of fall or injury | | | | | |
| Yes | 11 | 37 | 7 | 23 | 0.08 |
| No | 8 | 27 | 4 | 13 | (df = 1) |
| Did you undergo any surgeries | | | | | |
| Yes | 11 | 37 | 4 | 13 | 0.40 |
| No | 8 | 27 | 7 | 23 | (df = 1) |
| Did you experience joint stiffness in the morning | | | | | |
| Yes | 14 | 47 | 16 | 53 | 0.9 |
| No | - | - | - | - | (df = 1) |
| Duration of period of illness | | | | | |
| <5years | 6 | 20 | 4 | 13 | |
| 5 – 10 years | - | - | - | - | 0.35 |
| > 10 years | 5 | 17 | 6 | 20 | (df = 2) |

| | | | | | |
|---|----|----|---|----|-----------------|
| Have you ever received information regarding reflexology | | | | | |
| Yes | 5 | 17 | 2 | 7 | 0.23 |
| No | 14 | 47 | 9 | 30 | (df = 1) |
| Clinical diagnosis | | | | | |
| X –ray | 12 | 40 | 7 | 23 | 0.2 |
| Blood chemistry | 6 | 20 | 5 | 17 | (df = 1) |
| Others | - | - | - | - | |
| Duration of treatment | | | | | |
| No treatment | 10 | 33 | 4 | 13 | 3.95* |
| > 1 year | 11 | 37 | 5 | 17 | (df = 1) |
| Treatment | | | | | |
| Medical | 7 | 23 | 4 | 13 | 2.09 |
| Surgical | 7 | 23 | 6 | 20 | (df = 2) |
| Non pharmacological methods | 5 | 17 | 1 | 3 | |
| Route of administration | | | | | |
| Oral | 9 | 30 | 4 | 13 | |
| Topical application | 2 | 7 | 1 | 3 | 14.68*** |
| Intra muscular | 8 | 27 | 6 | 20 | (df = 2) |
| Both 1 & 2 | - | - | - | - | |

| | | | | | |
|---|----|----|----|----|-----------------|
| Use of another non pharmacological management for joint pain | | | | | |
| Yes | 19 | 63 | 11 | 37 | 0.94 |
| No | - | - | - | - | (df = 1) |
| If yes specify | | | | | |
| Music | 4 | 13 | 1 | 3 | |
| Exercise | 8 | 27 | 3 | 10 | |
| Distraction | 3 | 10 | 5 | 17 | 5.45 |
| Acupuncture | 4 | 13 | 1 | 3 | (df =5) |
| Acupressure | - | - | - | - | |
| Massage | - | - | - | - | |
| Presence of co- morbid illness | | | | | |
| Endocrine | 5 | 17 | 5 | 17 | |
| Cardio vascular | 7 | 23 | 3 | 10 | 0.82 |
| Neurological | 6 | 20 | 4 | 13 | (df = 2) |
| Other | - | - | - | - | |
| Nil | - | - | - | - | |
| Treatment for co – morbid illness | | | | | |
| Yes | 8 | 27 | 12 | 40 | 21.15*** |
| No | 5 | 17 | 5 | 17 | (df =1) |

| Duration of co – morbid illness | | | χ ² | | |
|--|---|----|----------------|----|---------|
| < 5 years | 9 | 30 | 9 | 30 | 1.06 |
| 5 – 10 years | 5 | 17 | 7 | 23 | (df =2) |
| >10 years | - | - | - | - | |

***P < 0.05, ***P < 0.001, ***P < 0.001**

The table 8, indicated that there was a significant association between the duration of the treatment, route of administration, treatment for co – morbid illness and pain perception and there was a no significant association between other clinical variable and pain perception in control group. Hence the null hypothesis H₀₃ is partially rejected.

Table 9:

Association Between the Selected Clinical Variables and Pain Perception of Arthralgia Patients in Experimental Group.

(n=30)

| Clinical variable | Pain score levels | | | | χ^2 |
|--|-------------------|----|------------|----|----------|
| | Upto mean | | Above mean | | |
| | n | P | n | p | |
| History of fall or injury | | | | | |
| Yes | 12 | 40 | 2 | 7 | 0.52 |
| No | 12 | 40 | 4 | 13 | (df =1) |
| Did you undergo any surgeries | | | | | |
| Yes | 15 | 50 | 2 | 7 | 2.94 |
| No | 9 | 30 | 4 | 13 | (df = 1) |
| Did you experience joint stiffness in the morning | | | | | |
| Yes | 4 | 13 | 2 | 7 | 0 |
| No | 16 | 53 | 8 | 27 | (df = 1) |
| Duration of period of illness | | | | | |
| <5years | 7 | 23 | 1 | 3 | 1.94 |
| 5 – 10 years | 13 | 43 | 5 | 17 | (df =2) |
| > 10 years | 4 | 13 | - | - | |

| | | | | | |
|---|----|----|---|----|----------|
| Have you ever received information regarding reflexology | | | | | |
| Yes | 5 | 17 | 1 | 3 | 0.75 |
| No | 19 | 63 | 5 | 17 | (df = 1) |
| Clinical diagnosis | | | | | |
| X –ray | 24 | 80 | 6 | 20 | 2 |
| Blood chemistry | - | - | - | - | (df = 2) |
| Others | - | - | - | - | |
| Duration of treatment | | | | | |
| No treatment | 9 | 30 | 7 | 23 | 0.09 |
| > 1 year | 6 | 20 | 8 | 27 | (df = 1) |
| Treatment | | | | | |
| Medical | 5 | 16 | 1 | 3 | |
| Surgical | 12 | 40 | 3 | 10 | 0.58 |
| Non pharmacological methods | 7 | 23 | 5 | 16 | (df =2) |
| Route of administration | | | | | |
| Oral | 12 | 40 | 1 | 3 | |
| Topical application | 3 | 10 | 1 | 3 | 1.28 |
| Intra muscular | 10 | 33 | 3 | 10 | (df = 2) |
| Both 1 & 2 | - | - | - | - | |

| | | | | | |
|---|----|----|---|----|----------------|
| Use of another non pharmacological management for joint pain | | | | | 1 |
| Yes | 24 | 80 | 6 | 20 | (df = 1) |
| No | - | - | - | - | |
| If yes specify | | | | | |
| Music | 2 | 7 | 1 | 3 | |
| Exercise | 9 | 30 | 2 | 7 | 3.63 |
| Distraction | 9 | 30 | 2 | 7 | (df =5) |
| Acupuncture | 5 | 17 | - | - | |
| Acupressure | - | - | - | - | |
| Massage | - | - | - | - | |
| Presence of co- morbid illness | | | | | |
| Endocrine | 5 | 17 | 1 | 3 | |
| Cardio vascular | 12 | 40 | 5 | 17 | 10.84** |
| Neurological | 7 | 23 | - | - | (df = 2) |
| Other | - | - | - | - | |
| Nil | - | - | - | - | |

| | | | | | |
|--|----|----|----|----|-----------------|
| Treatment for co – morbid illness | | | | | |
| Yes | 10 | 33 | 12 | 40 | 21.15*** |
| No | 4 | 13 | 14 | 47 | (df = 1) |
| Duration of co – morbid illness | | | | | |
| <5years | 7 | 23 | 7 | 23 | 1.06 |
| 5- 10 years | 7 | 23 | 8 | 27 | (df = 2) |
| >10 years | 1 | 3 | - | - | |

****P< 0.1, ***P< 0.001**

From the table 9, it could be illustrate that there was a significant association between the presence of co – morbid illness, treatment of co – morbid illness and pain perception and no significant association between other clinical variable and pain perception in experimental group. Hence the null hypothesis H_03 is partially rejected.

Summary

This chapter has dealt with analysis and interpretation of the data obtained by the researcher. The analysis showed that the post test pain level of patients regarding reflexology upon joint pain was improved. The patient satisfaction and patient outcome were high in experimental group after the implementation of reflexology.

Chapter V
Discussion

CHAPTER V

DISCUSSION

The discussion in this chapter deals with the various aspects pertaining to the study which provides us with adequate information related to reflexology, the symptoms and the related factors that are associated with joint pain. An experimental study to assess the effectiveness of reflexology on joint pain among arthralgia clients, at selected old age homes, Chennai.

Objectives of the Study

- 1 To assess the level of joint pain before and after reflexology in control and experimental groups of arthralgia patients.
- 2 To assess the effectiveness of reflexology by comparing the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
- 3 To determine the level of satisfaction regarding reflexology in experimental group of arthralgia patients.
- 4 To find out the association between selected demographic variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
- 5 To find out the association between selected clinical variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.

The discussion is presented as follows:

The demographic variables, clinical variables, level of joint pain and association of selected demographic variables and clinical variables with level of joint pain, and the level of satisfaction on reflexology in the experimental group of geriatric clients.

Demographic variables of arthralgia patients

The study findings reveal that significant number of the arthralgia patients were in the age group of 70 – 80 years (43%, 47%), most of them were female (73%, 45%), majority were belonging to nuclear family (87%,60%), were Hindus (100%,87%), and residing in urban area (53%,50%), majority of them were widows (63%,56%),and were educated (63%,40%), were un employed (83.33%,66.7%) and among employed most of them were heavy workers (50% ,43%) in control and experimental group respectively.

It was found that about (47%, 43.3%) of the participants were in the age group of 71 – 80 years, this shows that as the incidence of joint pain is high in this age group, and since the aging population is constantly growing globally their health is the greatest challenge to the health team, so a specialized care (nutritional supplementation, exercise) has to be provided to them to prevent the age related functional disabilities. This is congruent with the study findings of Steklov et.al (2009) that at 75 – 79 years, approximately 100% of men and women show some signs of joint pain.

Most of the participants (70%, 74%) in control and experimental group were female; this data reveals that females are affected more with joint pain, which might be due to the hormonal changes during menopause or due to obesity, so it is essential that they have to be supplemented with estrogen.

Majority of the elderly arthralgia patients were illiterates (40%,60%) in control and experimental groups, The major problem in elderly arthralgia patients is lack of knowledge regarding the supplemental diet, life style modification and regular exercises, So it is important that education should be given to the elderly to cope up with their condition.

As it is a Hindu religious institution all the patients are Hindus. Majority of the patients (53% of patients in control group and 50% of patients in experimental group) were residents of urban area. So they have easy access to such institutions. This type of institutions can be started in the rural areas also for the easy access and attend to the concerns of the elderly people.

Most of the people were unemployed both in experimental (83.3%) and control (67.3%) and so they are depended on the others for food and other requirements; grouped by which would have caused problems related to the vitamin and mineral deficiency that can be corrected with proper supply of the nutrients.

Among the employed all the patients were heavy workers (100%) which lead to the problem of the depletion of calcium from bone causing fragility of the bone which can fracture easily. Reduction of work and maintenance of the resting periods improves ability and prevents the fracture.

Clinical variables of arthralgia patients

The majority of the arthralgia patients had injury (47% ,60%) , had under gone surgeries (57%, 50%), most of the patients had joint stiffness (55%,45%), half of them

with period of illness for more than 10 years (50% ,33.33%),and for all the patients clinical diagnosis is made through radiological investigation (100%,63.3%), Few were on analgesic treatment (37%,53%), and few were taking non pharmacological treatment like exercise (37%,36.66%), most of the patients have the co – morbid illness (57% ,33%), for the duration more than 5 -10 years (60%,50%) in control and experimental groups respectively.

The fact that most of the patients were injured helps concludes that elderly people have more risk of falls and injury due to their degenerative changes in the skeletal system for which the safety measures are to be taught to the patients and careful observation of the elderly is also necessary.

Most of the patients have had joint stiffness (85%, 15%) in control and experimental groups, which means that joint stiffness is one of the most common problem in elderly. Half of the patients with period of illness for more than 10 years (50% and 33.33%).This shows that presence of co morbid illness worsens the joint related problems in elderly. That all the patients (100%) had undergone the radiological investigation reveals the foremost important diagnostic measure to observe the changes in bone is the radiological studies.

It is found that the long duration treatment for pain relief has no effect in control and experimental groups (43%,57%) of arthralgia patients, most of the participants (43%, 47%) were receiving intra muscular pain medication which has no significant affect on joint pain for which the complementary and alternative therapies has to be used as the pain reduction strategies.

Majority of the participants (57%, 34%) had co – morbid illness cardiovascular problems in both the control group and experimental group of clients which is most common in the elderly age advised for life style modification. Prolongation of this co morbid illness worsens the condition. Few of the people were taking other nonpharmacological measures which had no effect on the pain relief in compared to reflexology.

Comparison of level of pain perception by using mean and standard deviation in control and experimental group of patients

The data depicts that level of joint pain among experimental group in pre test was high (M = 7.4, SD = 0.55) in contrast to the post test level of joint pain (M = 3, SD = 0.5) which shows a high significance (t=27.7) at $p < 0.001$ level. Whereas in control group the level of pain in joint was almost the same (M = 6.46, SD = 2.10) in pretest and post test (M = 8, SD = 0.91) which shows it is not significant. Hence null hypothesis H_0 1 was rejected.

The above finding was supported by a study conducted by Sabena (2008) among the elderly in rural and urban areas of Haryana who were given reflexology for 15 days. Thus the health workers should be aware of the benefits of reflexology. This is possible by updating the knowledge with the recent studies done by using reflexology. It is a commonly used method for treating pain.

Association between selected demographic variables with level of joint pain of arthralgia patients

There was a significant association between the age of the patient ($\chi^2 = 7.62$, df = 3), ($p < 0.05$) in experimental, ($\chi^2 = 22.49$, df = 3), ($p < 0.001$) in control, religion ($\chi^2 =$

19.37, df = 3) ,(p < 0.1) in control, ($\chi^2= 18$, df = 3), (p < 0.1) in experimental, marital status($\chi^2= 10.42$, df =3), (p<0.1) in experimental , ($\chi^2= 12.44$, df =4), (p<0.1) in control and educational qualification ($\chi^2= 10.61$, df =3), (p<0.05) in control with the level of joint pain in control and experimental groups of patients.

The incidence of joint pain is high in this age group, and since the aging population is constantly growing globally their health is the greatest challenge to the health team, so a specialized care (nutritional supplementation, exercise) has to be provided to them to prevent the age related functional disabilities. As it is Hindu religious institution all the patients are Hindus. Illiteracy is the major problem in elderly arthralgia patients. Due to lack of knowledge regarding the supplemental diet, life style modification and regular exercises they suffer very much, so it is important that education should be given to the elderly to cope up with their condition. Hence the null hypothesis H₀₂ is rejected with regard.

Association between selected clinical variables with level of joint pain

There was a significant association between the selected clinical variables such as duration of treatment($\chi^2 = 3.95$,df = 1), (p< 0.05) route of administration,($\chi^2=14.68$, df=2), (p < 0.001),presence of co morbid illness($\chi^2 = 10.84$, df =1), (p< 0.1), treatment of co morbid illness ($\chi^2 = 21.15$, df = 1), (p< 0.001) with the level of joint pain in control and experimental groups of patients.

And there was no significant association between history of illness, fall history, history of surgeries, experiencing any joint stiffness, duration of period of illness, clinical diagnosis, and treatment, any other pharmacologic method, treatment for co morbid illness and duration of co morbid illness. Hence the null hypothesis H₀₃ is

partially rejected. The changes in elderly are due to the degenerative changes; the duration of treatment will help to prevent some amount of pain in elderly. Age increase which leads to many problems ending with stress related problems.

Level of satisfaction of arthralgia patients

The data depicted represents that the level of satisfaction for joint pain which was measured using rating scale among elderly in the experimental group. The three points scale shows that all the participants in experimental group (100%) had high satisfaction regarding reflexology in all the three aspects of administration, physiological and psychological factors.

The findings were supported by the study conducted by Sirawal (2003) regarding reflexology on knee joint pain among elderly in pune. It is found that 21 cases were with joint pain. Reflexology was given for 7 days. The result showed that reflexology was effective in reducing joint pain and acceptable by all the arthralgia patients.

This helps the community health nurse to use reflexology as a strategic measure to reduce the joint pain. Since the study was conducted in old age homes, and as almost all the participants were receptive to the researcher; reflexology can also be used in hospital settings and other similar institutions.

Summary

This chapter deals with the objectives of the study, demographic variables of elderly with joint pain, clinical variables of elderly with joint pain, level of joint pain of elderly before and after reflexology, mean and standard deviation of level of joint pain among elderly before and after reflexology, association between selected demographic variables and level of joint pain of elderly, association of clinical variables and level of joint pain of elderly and level of satisfaction on reflexology.

Chapter VI
Summary, Conclusion, Implications
and Recommendations

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATIONS

This is the most creative and demanding part of the study. This chapter gives a brief account of the present study including the conclusion drawn from the findings, recommendations, limitations of the study, suggestions for the study and nursing implications.

Summary

An Experimental Study to Assess the Effectiveness of Reflexology upon Joint Pain in Arthralgia Patients at Selected Old Age Homes, Chennai.

The objectives of the study were,

1. To assess the level of joint pain before and after reflexology in control and experimental groups of arthralgia patients.
2. To assess the effectiveness of reflexology by comparing the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
3. To determine the level of satisfaction regarding reflexology in experimental group of arthralgia patients.
4. To find out the association between selected demographic variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
5. To find out the association between selected clinical variables and the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.

Null Hypotheses

- H₀₁** There will be no significant difference in the level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
- H₀₂** There will be no significant association between selected demographic variables and level of joint pain before and after reflexology in control and experimental group of arthralgia patients.
- H₀₃** There will be no significant association between selected clinical variables and level of joint pain before and after reflexology in control and experimental group of arthralgia patients.

The conceptual framework of the present study is based on King's goal attainment theory. The study variables, reflexology and level of joint pain among arthralgia clients were formulated. The level of significance selected was $p < 0.05$. An extensive review of literature and guided by experts formed the foundation to the development of tool.

An experimental approach was used to achieve the objectives of the study. The present study was conducted in SV old age home (control & experimental). The samples (60) were randomly (systematic random sampling) selected and assigned to control (30) and experimental (30) groups.

The investigator used a demographic variable proforma, a clinical variable proforma, pain scale (0 -10 numerical pain rating scale) and a rating scale on the level of satisfaction on reflexology. The data collection tools were validated and reliability was established. After confirming the feasibility and researchability through pilot

study, the data for the main study was collected. The collected data was tabulated and analyzed using descriptive and inferential statistics like mean, standard deviation, paired 't' test and chi – square.

Majority Findings of the Study

Demographic variables of arthralgia patients

The study findings reveal that significant number of the arthralgia patients were in the age group of 70 – 80 years (43%, 47%), most of them were female (73%, 45%), majority were belonging to nuclear family (87%, 60%), were Hindus (100%, 87%), and were residing in urban area (53%, 50%), majority of them were widows (63%, 56%), and were educated (63%, 40%), were un employed (83.33%, 66.7%) and among employed most of them were heavy workers (50% ,43%) in control and experimental group respectively.

Clinical variables of arthralgia patients

The majority of the arthralgia patients had injury (47% ,60%) , had under gone surgeries (57%, 50%), most of the patients had joint stiffness (55%, 45%), half of them with period of illness for more than 10 years (50% ,33.33%), and for all the patients clinical diagnosis is made through radiological investigation (100%, 63.3%), Few were on analgesic treatment (37%, 53%), and few were taking non pharmacological treatment like exercise (37%, 36.66%), most of the patients have the co – morbid illness (57%, 33%), for the duration more than 5 -10 years (60%, 50%) in control and experimental groups respectively.

Level of joint pain among arthralgia clients

In the control group there was no significant differences in the joint pain levels before (M = 6.46, SD =2.10) & after reflexology (M = 8, SD =0.91).In contrast, in experimental group the joint pain levels before therapy (M =7.4, SD = 0.55) and level of pain (M =3, SD = 0.5) after therapy shows significant difference. The difference was found to be statistically significant (t=27.7) at $p < 0.001$, which attributes to be effectiveness of reflexology. Hence the null hypothesis H_{01} is rejected.

Association between selected demographic variables with level of joint pain of arthralgia patients

There was a significant association between the age of the patient ($\chi^2 = 7.62$, df = 3), ($p < 0.05$) in experimental, ($\chi^2 = 22.49$, df = 3), ($p < 0.001$) in control, religion ($\chi^2 = 19.37$, df = 3) ,(p < 0.1) in control, ($\chi^2 = 18$, df = 3), (p < 0.1) in experimental, marital status($\chi^2 = 10.42$, df =3), (p<0.1) in experimental , ($\chi^2 = 12.44$, df =4), (p<0.1) in control and educational qualification ($\chi^2 = 10.61$, df =3), (p<0.05) in control with the level of joint pain in control and experimental groups of patients. And there was no significant association between the other selected demographic variables with the level of joint pain among arthralgia clients in control and experimental group before and after reflexology. Hence the null hypothesis H_{02} is partially rejected.

Association between selected clinical variables with level of joint pain of arthralgia patients

There was a significant association between the selected clinical variables such as duration of treatment($\chi^2 = 3.95$,df = 1), (p< 0.05) route of administration,($\chi^2 = 14.68$,

df=2), ($p < 0.001$), presence of co morbid illness ($\chi^2 = 10.84$, df =1), ($p < 0.1$), treatment of co morbid illness ($\chi^2 = 21.15$, df = 1), ($p < 0.001$) with the level of joint pain in control and experimental groups of patients, but there was no association between the other clinical variables and the level of joint pain among arthralgia patients in control and experimental group. Hence the null hypothesis H_03 is partially rejected.

Level of satisfaction of arthralgia patients on reflexology

All the participants (100%) expressed high level of satisfaction on reflexology. None of the participants expressed low level of satisfaction.

Conclusion

The findings of the study revealed that the reflexology among joint pain was effective in treating the pain as a complementary and alternative therapy. This therapy can be given by the trained personnel in reflexology among arthralgia clients. The most of the elderly people will have the joint pain due the degenerative process in the skeletal system. By giving pressure at the reflex points on the foot it is effective in release of endorphins and blocks the pain pathways which cause effective pain relief in arthralgia clients.

Implications

The findings of the study have the following implications in the areas of nursing service, nursing education, nursing administration and nursing research.

Nursing service

Reflexology is a complementary therapy used to reduce the pain level by giving pressure to reflex points by trained personnel. So training to nursing students should be provided as daily practiced of care which can be practiced in hospitals, health care settings and old age homes.

This can also be practiced by a nurse independently in community health settings as a complimentary therapy. This helps the community health nurse to use reflexology as a strategic measure to reduce the joint pain and to gain co operation from community.

Nursing education

With emerging health care trends, nursing education must focus on complementary therapy to enhance nursing care. The nursing students should be taught on complementary therapy. Therefore the curriculum should incorporate complementary and alternative therapies.

Nurse educators should take initiatives to publish articles in journals related to the importance of complementary and alternative therapies used in the treatment of arthralgia.

Nursing administration

With technological advances and the ever – growing challenges of health care needs, the administrators have a responsibility to provide the nurse with substantive continuing education opportunities. This will enable the nurses to update their knowledge, acquire special skills to demonstrate high quality care. Nursing

administrators should take the initiative in organizing educational programs on complementary and alternative therapies for the nursing personnel in the hospital and community settings to gain adequate knowledge regarding the management of arthralgia.

Nursing administrators should collaborate with governing bodies in formulating policies and protocols to emphasize nursing care of clients with arthralgia, with the use of complementary and alternative therapy and plan for man power, money, material methods and time to conduct successful and useful educational programmes.

Nursing research

There is a need for extensive and intensive research in this area. It opens a big avenue for innovative methods of arthralgia management, focus on patients interest in quality and safety ,so as to generate more scientific database in order to manage arthralgia , disseminate the findings of the research through conferences , seminars and publishing in nursing journals there by promote effective utilization of research findings in management of arthralgia, further research is needed to link the use of reflexology in various groups of patients and in comparison with other therapies.

Recommendations

- A similar study can be undertaken on a large scale for a more valid generalization.
- A comparative study can be conducted to assess the effectiveness of the alternative and complementary therapies.
- The study can be conducted in different settings.
- A similar study can be conducted by using cross – over design.
- A Meta analysis study can be conducted to have the more valid information.

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Appendices

APPENDIX I

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY



Apollo College of Nursing

(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/0400/12

25.06.12

To

The Director
SV Home
New 88 old No.50
Panchalamman Koil street
Arumbakkam
Chennai – 600 106.

Respected Sir / Madam,

Sub.: To request permission for research study – Reg.

Greetings! As part of the curriculum requirement our 2nd year M. Sc. (N) student

MS.P.Supraja has selected the following title for her research study.

An experimental study to assess the effectiveness of foot reflexology upon joint pain in arthralgia patients at selected old age homes, Chennai."

So I kindly request your good selves to permit her to conduct study in your esteemed institution.

Thanking You,


Dr. LATHA VENKATESAN
PRINCIPAL

IS/ISO 9001:2000



Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095.
Ph. : 044 - 2653 4387 Tele fax : 044 - 2653 4923 / 044- 2653 4386

APPENDIX II

LETTER FOR PERMITTING TO CONDUCT THE STUDY

S.V. HOME FOR AGED

Charitable Trust (Regd.)

&

Geriatric Medical Research Foundation

50/88, Panchaliamman Kovil Street,
Arumbakkam, Chennai-600 106.

Phone : 044 - 24755700, 24756700, 24757777, 42640877

E-mail : svhome@airtelmail.in

Web Site : www.svhomeforaged.org



Ref: svh/acn/002/07/2012 – 2013.

Dated: July 19, 2012.

To

The Principal,
Apollo College of Nursing,
Vanagaram / Ambattur Main Road,
Ayanambakkam,
Chennai – 600 095.

Dear Sir,

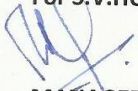
Sub: Your student Ms.P.SUPRAJA, M.Sc., [N] performed experimental study to access The Effectiveness of foot reflexology upon joint pain in arthralgia patients inmates of S.V.Home For Aged, Arumbakkam successfully – Reg.

Ref: Your letter to us dtd. 25/06/2012 – Reg.

We acknowledge your performance of experimental study to access The Effectiveness of foot reflexology upon joint pain in arthralgia patients inmates of among Old aged persons staying in our home.

Thanking you,

For S.V.HOME FOR AGED,


MANAGER – Administration.
K.RAVI.



APPENDIX III

ETHICAL COMMITTEE CLEARANCE

LETTER

Ethics Committee



30th August 2012

To,

Ms. P.Supraja,
2nd Year M.Sc (Nursing),
Department of Medical Surgical Nursing,
Apollo College of Nursing,
Chennai.

Ref: An Experimental study to assess the effectiveness of reflexology upon joint pain in arthralgia patients admitted in selected old age home, Chennai.

Sub: Approval of the above referenced project and its related documents.

Dear Ms. P.Supraja,

Ethics Committee-Apollo Hospitals has received the following document submitted by you related to the conduct of the above-referenced study.

- Project proposal.

The Ethics Committee-Apollo Hospitals reviewed and discussed the study proposal documents submitted by you related to the conduct of the above referenced study at its meeting held on 29th August 2012.

The following Ethics Committee Members were present at the meeting held on 29th August 2012.

| Name | Profession | Position in the committee |
|-----------------------|------------------------------------|---------------------------|
| Mr. S. S. Narayanan | Ethicist | Chairman |
| Dr. Rema Menon | Clinician | Member Secretary |
| Dr. Radha Rajagopalan | Clinician | EC-Member |
| Dr. Krishnakumar | Clinician | EC-Member |
| Dr. Vijaya Kumar | Clinician | EC-Member |
| Dr. Clive Fernandes | Consultant Clinical Pharmacologist | Basic Medical Scientist |
| Dr. Nalini Roa | Social Worker | EC-Member |

Apollo Hospitals Enterprise Limited

21, Greams Lane, Off Greams Road, Chennai - 600 006

Tel : 91 - 44 - 2829 3333 Extn : 6008, 91 - 44 - 2829 5465 Extn : 6639 Fax : 91 - 44 - 2829 4449

E - Mail : ecapollochennai@gmail.com

Ethics Committee



| | | |
|---------------------|-------------------------------|-----------|
| Ms. N. Suseela | Retired English Teacher | Layperson |
| Ms. Maimoona Badsha | Lawyer | Lawyer |
| Dr. Paul Dilipkumar | Clinician | EC-Member |
| Dr. V. Balaji | Clinician | EC-Member |
| Dr. M. A. Raja | Consultant Medical Oncologist | EC-Member |

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The EC review and approval of the report is only to meet their academic requirement and will not amount to any approval of their conclusions / recommendations as conclusive, deserving adoption and implementation, in any form, in any healthcare institution.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

With Regards,

Dr. Rema Menon,
Ethics Committee-Member Secretary,
Apollo Hospitals, Chennai,
Tamil Nadu, India.

Date:

30/8/12

Dr. REMA MENON
MEMBER SECRETARY
ETHICS COMMITTEE, APOLLO HOSPITALS
APOLLO HOSPITALS ENTERPRISE LIMITED
CHENNAI-600 008, TAMILNADU

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APPENDIX IV
LETTER SEEKING PERMISSION FOR CONTENT VALIDITY

From
Ms. P.Supraja
M.Sc (Nursing) Second Year,
Apollo College of Nursing,
Chennai – 600 095.

To
Dr. Latha Venkatesan,
Principal,
Apollo College of Nursing.

Sub: Requesting for opinions and suggestions of experts for establishing content validity for research tool.

Respected Madam,

I am a postgraduate student of the Apollo College of Nursing. I have selected the below mentioned topic for research project to be submitted to The Tamil Nadu Dr. M.G.R Medical University, Chennai as a partial fulfillment of Masters of Nursing Degree

TITLE OF THE TOPIC

An Experimental Study to Assess the Effectiveness of foot reflexology upon joint pain among arthralgia clients at Selected Old age homes, Chennai.

With regards may I kindly request you to validate my tool for its appropriateness and relevancy. I am enclosing the Background, Need for the study, Statement of the problem, Objectives of the study, Demographic Variable Proforma, Clinical Variable Proforma, satisfactory rating scale on the reflexology. I would be highly obliged and remain thankful for your great help if you could validate and send it as soon as possible.

Thanking you,

Date:

Yours sincerely,

Place:

(P. SUPRAJA)

APPENDIX V

CERTIFICATE FOR REFLEXOLOGY TRAINING



Institute Of Alternative And Complimentary Therapy

Affiliated to Dr. Vijay's Health Science and Research Foundation

Chennai, India

Date: 06.06.2012

Whomsoever may be concern

This is to certify that **Ms.P.Supraja** a student of M.Sc.Nursing from Apollo College of Nursing, Chennai-95, has done her training in **Foot Reflexology Upon Arthralgia patients** for one week in our institute. The Project work entitled "*An Experimental Study to Assess the Effectiveness of reflexology upon joint pain in arthralgia patients in selected old age homes, Chennai.*" During that period, she had been trained in that topic, she acquitted herself well. She was prompt in her duty and her conduct has been good.



Dr.E.VijayaKumar., MPT., MD(Acu.), MIAP, DYT, FIMT

Address: 42/3, G.N.G Street, Varadharajapuram, Amabttur, Chennai -53, Mobile: +91 99406 79698

APPENDIX VI

LIST OF EXPERTS FOR CONTENT VALIDITY OF THE TOOL

1. **Dr. Latha Venkatesan, M.Sc(N), M.Phil(N), Ph.D(N),**
Principal and Professor in Maternity Nursing,
Apollo College of Nursing,
Chennai- 600 095
2. **Prof. Lizy Sonia. A, M.Sc(N),**
Vice Principal and Professor in Medical Surgical Nursing,
Apollo College of Nursing,
Chennai-600 095
3. **Prof. K. Vijayalakshmi, M.Sc(N),**
Professor in Psychiatric Nursing,
Apollo College of Nursing,
Chennai- 600 095
4. **Prof. Shobana, M.Sc(N),**
Professor in Community Health Nursing,
Apollo College of Nursing,
Chennai- 600 095
5. **Mrs. Nesa Sathya Satchi, M.Sc(N),**
Reader in Pediatric Nursing,
Apollo College of Nursing,
Chennai- 600 095

6. Mrs. Jaslina Gnana Rani .J, M.Sc(N),

Reader in Medical Surgical Nursing,

Apollo College of Nursing,

Chennai- 600 095

7. Mrs.D. Sasi Kala, D.M.Sc(N),

Reader in Medical Surgical Nursing

Apollo College Of Nursing

Chennai-600 095.

8. Mrs. Kanchana, M.Sc (N)., M.Sc(Psy),

Reader in Medical Surgical Nursing,

Apollo College of Nursing,

Chennai-600 095.

9. Mrs. Kasthuri, M.Sc (N),

Lecturer in Medical Surgical Nursing,

Apollo College of Nursing,

Chennai- 600 095

APPENDIX VII

RESEARCH PARTICIPANT CONSENT FORM

Dear participant/ bystander,

I am P. SUPRAJA. a M.Sc Nursing student of Apollo College of Nursing, Chennai. As part of my study, a research on “**Effectiveness of foot reflexology upon joint pain**”. The findings of the study will be helpful in reducing the pain in arthralgia clients.

I hereby seek your consent for your participation and that the advantages and disadvantages of procedure of intervention are being explained by me. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be maintained.

Signature of the researcher

IHereby consent to participate my relative in this study.

Place:

Date:

Signature of the participant/ bystander

APPENDIX VIII
CERTIFICATE FOR ENGLISH EDITING
TO WHOMSOEVER IT MAY CONCERN

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation “An experimental study to assess the effectiveness of reflexology upon joint pain in arthralgia patients in SV old age home, Chennai” by Ms. P. Supraja II year Msc (N), Apollo College of nursing was edited for English language appropriateness by Mrs. M. TAMIZHARASI.


Signature

M. TAMIZHARASI, M.A., B.Ed
B.T ASST.
G.H.SCHOOL
NEMMELI - 603 104.

APPENDIX IX

CERTIFICATE FOR TAMIL EDITING TO WHOMSOEVER IT MAY CONCERN

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation “An experimental study to assess the effectiveness of reflexology upon joint pain in arthralgia patients in SV old age home, Chennai” by Ms. P. Supraja II year Msc (N), Apollo College of nursing was edited for tamil language appropriateness by MRS. TAMILARASI.



Signature

மா.தமிழரசி, எம்.எ.பி.எட்
உதவி பட்டதாரி ஆசிரியர்
அ.மே.பள்ளி
நெம்மேலி - 603 104.

APPENDIX X

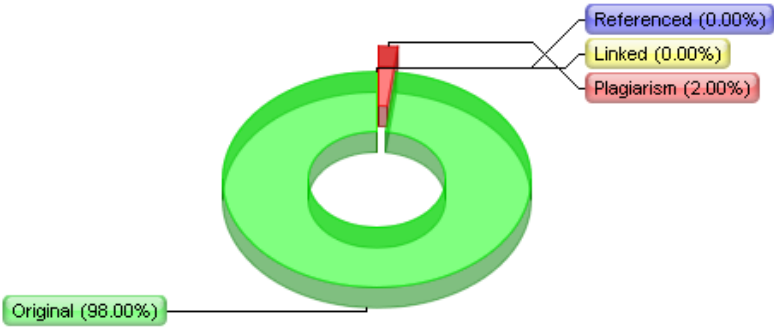
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APPENDIX XI

DEMOGRAPHIC VARIABLE PROFORMA FOR ARTHRALGIA PATIENTS

Purpose

This Proforma is used by the researcher to collect the information on demographic variables such as age, gender, Religion, Marital Status, Educational status, Type of family, Area of residence, Occupation, Type of work, and information regarding reflexology.

Instruction

Please answer the following questions. This information will be filled by the researcher. Please be frank and free in answering these questions. The collected information will be kept confidential and anonymity maintained.

SETTING:

SAMPLE NUMBER:

1 Age in years

1.1 60 - 70 years

1.2 71 - 80 years

1.3 81- 90 years

1.4 91- 100years

2. Gender

1.1 Male

1.2 Female

3. Religion

- 1.1 Hindu
- 1.2 Muslim
- 1.3 Christian
- 1.4 Others

4. Marital Status

- 1.1 Married
- 1.2 Unmarried
- 1.3 Widowed
- 1.4 Divorced
- 1.5 Separated

5. Educational status

- 1.1 Illiterate
- 1.2 Literate
- 1.3 Graduate
- 1.4 Post graduate

6. Type of family

- 1.1 Nuclear family
- 1.2 Joint family
- 1.3 Extended family.

7. Area of residence

1.1 Urban

1.2 Semi urban

1.3 Rural

1.5 Corporation / Municipality

8. Occupation

1.1 Employed

1.2 Unemployed

9. Type of work

1.1 Heavy

1.2 Moderate

1.3 Sedentary

சமூக அறிவியல் பட்டியல்

நோக்கம்

இந்த மாதிரிப்படிவம் முதுமை மக்களின் மாறுபட்டக் குறிப்புகளான வயது, பால், மதம், திருமணநிலை, கல்விநிலை, குடும்ப வகை, வீடு உள்ள இடம், தொழில் நிலை, வேலை வகை மற்றும் அனிச்சைச் செயலியல்.

அறிவுரை:

முதுமை மக்களிடம் நேர்கானல் மூலம் ஆய்வாளர் தகவல்களை சேகரிப்பார். பின்வரும் கேள்விகளுக்கு உங்கள் பதில்களை சுதந்திரமாகவும் வெளிப்படையாகவும் அளிக்கவும். பதில்கள் பாதுகாக்கப்படும்.

அமைப்பு

மாதிரி எண்:

1. வயது

- | | |
|-----------------|--------------------------|
| 1.1 60-70 வயது | <input type="checkbox"/> |
| 1.2 71-80 வயது | <input type="checkbox"/> |
| 1.3 81-90 வயது | <input type="checkbox"/> |
| 1.4 91-100 வயது | <input type="checkbox"/> |

2. பால்

- | | |
|----------|--------------------------|
| 2.1 ஆண் | <input type="checkbox"/> |
| 2.2 பெண் | <input type="checkbox"/> |

3. மதம்

- | | |
|----------------------|--------------------------|
| 3.1 இந்து மதம் | <input type="checkbox"/> |
| 3.2 கிறிஸ்துவர் மதம் | <input type="checkbox"/> |
| 3.3 இஸ்லாமியர் மதம் | <input type="checkbox"/> |
| 3.4 பிறமதம் | <input type="checkbox"/> |

4. திருமண நிலை

- 4.1 மணமானவர்
- 4.2 மணமாகாதவர்
- 4.3 விதவை
- 4.4 விவாகரத்து பெற்றவர்
- 4.5 தனிமையாக்க பட்டவர்

5. கல்வி நிலை

- 5.1 எழுதிப்படிக்க தெரியாதவர்
- 5.2 கற்றவர்
- 5.3 பட்டம் பெற்றவர்
- 5.4 முதுகலை பட்டம் பெற்றவர்

6. குடும்ப வகை

- 6.1 தனி குடும்பம்
- 6.2 கற்றவர்
- 6.3 பட்டம் பெற்றவர்
- 6.4 முதுகலை பட்டம் பெற்றவர்

7. வீடு உள்ள இடம்

- 7.1 நகரம்
- 7.2 நகரியம்
- 7.3 கிராமம்
- 7.4 மாநகரம்

8. தொழில் நிலை

- 8.1 வேலை
- 8.2 வேலை இல்லை

9. வேலை வகை

9.1 கனமான

9.2 மிதமான

9.3 கூலி தொழில்

APPENDIX XII

CLINICAL VARIABLE PROFORMA FOR ARTHRALGIA PATIENTS

Purpose

This proforma is used to measure the clinical variables such as history of fall, past surgical history, joint stiffness, duration of illness, information about reflexology, clinical diagnosis, duration of analgesic treatment, pharmacological and non pharmacological management, presence of co – morbid illness, type of treatment of co – morbid illness and duration of co – morbid illness.

Instruction

Please answer the following questions. This information will be filled by the researcher. The collected information will be kept confidential and anonymity maintained.

1 History of fall or injury

- 1.1 Yes
- 1.2 No

2 Did you undergo any surgeries in the past

- 1.1 Yes
- 1.2 No

3 Did you experience joint stiffness in the early morning?

- 1.1 Yes
- 1.2 No

4 Duration of illness

- 1.1 < 5 year
- 1.2 5- 10 years
- 1.3 > 10 years

5 Have you ever received information regarding joint pain relief and reflexology?

- 1.1 Yes
- 1.2 No

6 Clinical diagnosis

- 1.1 x- ray
- 1.2 Blood chemistry
- 1.3 Radiological investigation

7 Duration of analgesic treatment

- 1.1 No treatment with analgesics
- 1.2 < 1 year
- 1.3 2 – 3 years
- 1.4 4 – 5 years
- 1.4 > 6 years

8 Treatment

- 1.1 Medical management
- 1.2 Surgical management
- 1.4 Non pharmacological methods

9 Route of administration for pharmacological management of joint pain

- 1.1 Oral
- 1.2 Topical application
- 1.3 Intramuscular
- 1.5 Both 1 & 2

10 Use of another non-pharmacologic management to joint pain

- 1.1 Yes
- 1.2 No

11 If yes specify the use of non pharmacology

- 1.1 Music
- 1.2 Exercise
- 1.3Distraction
- 1.4Acupuncture
- 1.5Acupressure
- 1.6Massage

12 Presence of co – morbid illness

- 1.1 Endocrine disorders
- 1.2 Cardiovascular disorders
- 1. 3 Neurological disorders
- 1.4. Others
- 1.6 Nil

13 Treatment for co – morbid illness

1.1 Yes (If yes specify)

1.2 No

14 Duration of co – morbid illness

1.1 < 5 years

1.2 5 – 10 years

1.3 > 10 years

மருத்துவ மாறிகள் மாதிரிப் படிவம்

நோக்கம்

இந்த மாதிரிப்படிவம் முதுமை மக்களின் வீழ்ச்சி, கடந்த அறுவை சிகிச்சை, மூட்டு விறைப்பு, நோயின் கால அளவு, மருத்துவ வியாதி நிர்ணயம், வலி நிவாரண சிகிச்சை காலம், மருந்தியல் மற்றும் மருத்தும் அல்லாத சிகிச்சை, இணை ஆரோக்கியமற்ற நோயின் காலம் மற்றும் சிகிச்சை வகை பற்றி அறிய ஆய்வாளர் பயன்படுத்துவது.

அறிவுரை:

உங்கள் பதில்களை சுதந்திரமாகவும், வெளிப்படையாகவும் அளிக்கவும், பதில்கள் பாதுகாக்கப்படும். முதுமை மக்களிடம் நேர்க்காணல் மூலம் ஆய்வாளர் தகவல்களைச் சேகரிப்பார்.

1. முதுமை மக்களின் வீழ்ச்சி வரலாறு

- 1.1 ஆம்
- 1.2 இல்லை

2. நீங்கள் கடந்த காலத்தில் ஏதேனும் அறுவை சிகிச்சை பெற்றதுண்டா?

- 2.1 ஆம்
- 2.2 இல்லை

3. உங்களுக்கு காலையில் மூட்டு விறைப்பு அனுபவம் இருந்ததுண்டா?

- 3.1 ஆம்
- 3.2 இல்லை

4. நோய் காலம்

- 4.1 < 5 வருடங்கள் ஆண்டுகள்
- 4.2 5-10 வருடங்கள் ஆண்டுகள்
- 4.3 > 10 வருடங்கள் ஆண்டுகள்

5. நீங்கள் எப்போதாவது மூட்டு வலி நிவாரணம் மற்றும் பற்றி தகவல் கிடைத்ததுண்டா?

- 5.1 ஆம்
- 5.2 இல்லை

6. வியாதி நிர்ணயம்

- 6.1 ஆம்
- 6.2 இல்லை

7. வலி நிவாரண சிகிச்சை காலம்

- 7.1 வலி நிவாரணம் இல்லை
- 7.2 <1 வருடங்கள்
- 7.3 2-3 வருடங்கள்
- 7.4 4-5 வருடங்கள்
- 7.4 > 6 வருடங்கள்

8. சிகிச்சை வகை

- 8.1 மருத்துவ சிகிச்சை
- 8.2 அறுவை சிகிச்சை
- 8.3 மருத்துவம் அல்லாத

9. மூட்டு வலி நிவாரணத்தின் பாதை

- 9.1 வாய் வழி
- 9.2 மேற்பூச்சு பயன்பாடு
- 9.3 தசை வழி
- 9.4 1 மற்றும் 2

10. மூட்டு வலிக்கு மருத்துவம் அல்லாத நிவாரணங்கள் பயன்படுத்தியதுண்டா

- 10.1 ஆம்
- 10.2 இல்லை

11. ஆம் என்றால் குறிப்பிடவும்

- 11.1 இசை
- 11.2 பழக்கு
- 11.3 சிதறல்
- 11.4 அலகுக்குத்தல் ஊசி வழி
- 11.5 அழுத்துதல்
- 11.6 மசாஜ்

12. வேறு இணை நோய் ஏதேனும் உள்ளதா?

- 12.1 உட்கரப்பு சீர் குலைவுகள்
- 12.2 இருதய குறைபாடுகள்
- 12.3 நரம்பியல் கோளாறுகள்
- 12.4 வேறு நோய்
- 12.5 இல்லை

13 வேறு இணை நோய் ஏதேனும் சிகிச்சை பெற்றதுண்டா?

- 13.1 ஆம்
- 13.2 இல்லை

14 வேறு இணை நோய் ஏதேனும் சிகிச்சை பெற்றதுண்டா?

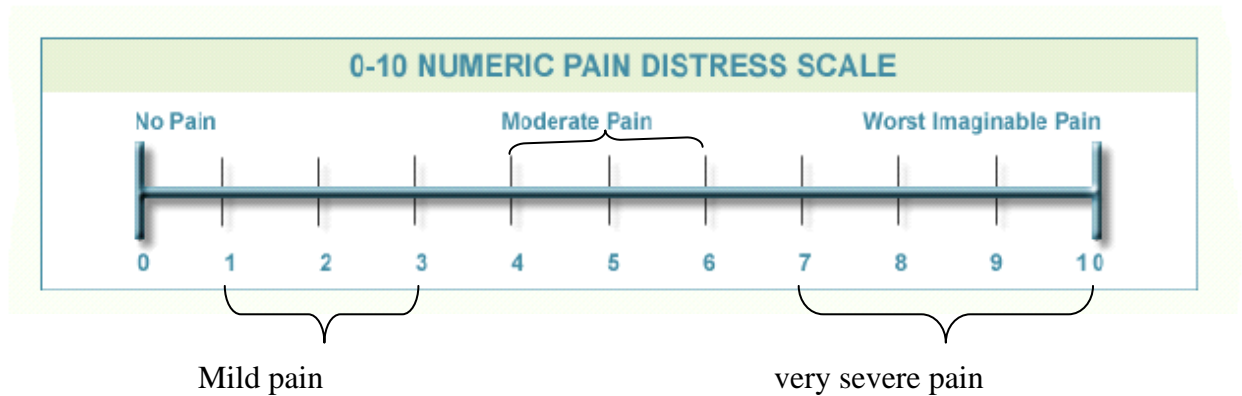
- 14.1 < 5 ஆண்டுகள்
- 14.2 5-10 ஆண்டுகள்
- 14.3 > 10 ஆண்டுகள்

APPENDIX XIII

STRUCTURED PAIN ASSESSMENT TOOL FOR JOINT PAIN

Purpose:

This scale is used to assess the level of pain experienced by arthralgia patients before and after reflexology.



INTERPRETATION:

| Level of pain | Scores |
|------------------|--------|
| Mild pain | 1-3 |
| Moderate pain | 4-6 |
| Very Severe pain | 7-10 |

Pain assessment chart

| | | | | |
|--|---|---|---|---|
| Period of assessment (2 ND Hourly four times a day) | 1 | 2 | 3 | 4 |
| Pain score before reflexology | | | | |
| Pain score after reflexology | | | | |

BLUE PRINT ON RATING SCALE ON SATISFACTION OF REFLEXOLOGY

| S.NO | CONTENT | ITEMS | TOTAL ITEMS | PERCENTAGE |
|-------------|-------------------------|--------------|------------------------|-------------------|
| 1 | Administration | 1,2,3,4 | 4 | 33.33% |
| 2 | Physiological | 5,6,7,8 | 4 | 33.33% |
| 3 | Psychological factor | 9,10,11,12 | 4 | 33.33% |

திருப்தி நிலை பற்றிய நிழற்ப்பட திட்ட வரைவு

| வ.எண் | பொருளடக்கம் | வகைகள் | மொத்த வகைகள் | சதவீதம் |
|-------|-------------|------------|-----------------|---------|
| 1. | நிர்வாகம் | 1,2,3,4 | 4 | 33.33% |
| 2. | உடலியல் | 5,6,7,8 | 4 | 33.33% |
| 3. | உளவியல் | 9,10,11,12 | 4 | 33.33% |

APPENDIX XIV

RATING SCALE ON SATISFACTION OF REFLEXOLOGY

Purpose

This rating scale is designed to assess the level of satisfaction of arthralgia patients regarding reflexology and this is assessed by the researcher after treatment.

Instruction

The researcher will ask the study participants and put the tick mark against the appropriate response. Responses extent from highly satisfied to dissatisfied.

| S.no | Questions | Highly satisfied 4 | Moderately Satisfied 3 | Just Satisfied 2 | Dis Satisfied 1 |
|------|---|-----------------------|---------------------------|---------------------|--------------------|
| 1 | Giving reflexology at appropriate time. | | | | |
| 2 | Frequency. | | | | |
| 3 | Application of correct amount of pressure. | | | | |
| 4 | Easy to use. | | | | |
| 5 | Reduction of pain. | | | | |
| 6 | Promotes relaxation of muscles. | | | | |
| 7 | Best method of non pharmacological measure. | | | | |
| 8 | Promotes sleep. | | | | |
| 9 | Helps in diversion of mind from pain. | | | | |
| 10 | Promotes relaxation of mind. | | | | |
| 11 | Increase in coping ability. | | | | |
| 12 | Frustrations can be minimized. | | | | |

The total score is converted in to percentage and graded as given below.

| SCORE | SATISFACTION LEVEL |
|--------------|---------------------------|
| <10 | Not satisfied |
| 10 -23 | Low |
| 24 - 35 | Moderate |
| 36 - 48 | High |

**அனிச்சைச் செயலியல் பற்றி மூட்டுவலி நோயாளிகளின் மனநிறைவு மதிப்பீடு
அளவுகோல்**

நோக்கம்

இந்த அளவு கோலானது அனிச்சைச் செயலியலுக்கு பிறகு மூட்டு வலி நோயாளிகளுக்கு ஏற்பட்ட திருப்தியின் அளவையும் அதன் பயன்பாட்டையும் மதிப்பீடு செய்ய ஆய்வாளர் பயன்படுத்தியது

அறிவுரை

ஆய்வாளர் ஆய்வு பங்கேற்பாளர்களிடம் கேட்டு சரியான பதிலுக்கு எதிராக டிக்மார்க் செய்வார். பதில்களின் எல்லை மிகவும் திருப்தியிலிருந்து திருப்தியில்லை வரை இருக்கும். உங்கள் பதில்கள் பாதுகாக்கப்படும்

| வ.எண் | விவரம் | மிகவும் திருப்தி 4 | திருப்தி 3 | அதிருப்தி 2 | மிகவும் திருப்தியற்றவர் 1 |
|-------|---|--------------------------|---------------|----------------|---------------------------------|
| 1. | பொருத்தமாத நேரத்தில் அனிச்சை செயல் கொடுக்கப்பட்டது | | | | |
| 2. | அலைவெண் | | | | |
| 3. | சரியான அளவு அழுத்தம் கொடுக்கப்பட்டது / கொடுக்கப்பட்ட பயன்பாடு | | | | |
| 4. | பயன்படுத்த எளிதானது | | | | |
| 5. | வலி குறைப்பு | | | | |
| 6. | தசை தளர்வை ஊக்குவிக்கின்றது | | | | |
| 7. | மருந்தியல் அல்லாத சிறந்த முறை | | | | |
| 8. | துக்கத்தை ஊக்குவிக்கிறது | | | | |
| 9. | வலியில் இருந்து மனதை திசை மாற்ற உதவுகிறது | | | | |

| | | | | | |
|-----|--------------------------------------|--|--|--|--|
| 10. | முன தளர்வை ஊக்குவிக்கிறது | | | | |
| 11. | சமாளிக்கும் திறனை அதிகரிக்கின்றது | | | | |
| 12 | ஏமாற்றத்தை குறைக்க உதவுகிறது | | | | |

மதிப்பெண் விளக்கம்

| சதவீதம் | திருப்திநிலை |
|---------|------------------|
| <10 | திருப்தி இல்லை |
| 10-23 | குறைவான திருப்தி |
| 24-35 | மிதமான திருப்தி |
| 36-48 | மிகவும் திருப்தி |

APPENDIX XV

PROCEDURE MANUAL FOR REFLEXOLOGY

Definition:

Reflexology, or **zone therapy**, is an alternative medicine involving the physical act of applying pressure to the feet, hands, or ears with specific thumb, finger, and hand techniques without the use of oil or lotion. It is based on what reflexologists claim to be a system of zones and reflex areas that they say reflect an image of the body on the feet and hands, with the premise that such work effects a physical change to the body.

Indications:

Reflexology is a form of preventive medicine that aims to maintain a person's balance and well-being. Though empirical studies are lacking, many patients have benefited from reflexology. Conditions treated may include:

- Migraine headache
- Hypertension
- Menstrual cramps or irregularities
- Myofascial pain
- Fibromyalgia
- Insomnia
- Anxiety disorders

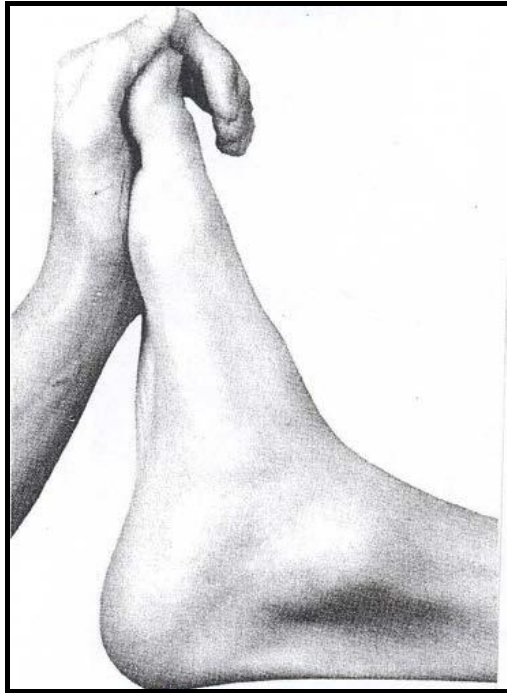
Contraindications:

- Recent surgical removal of a malignant tumor
- Foot wounds and burns

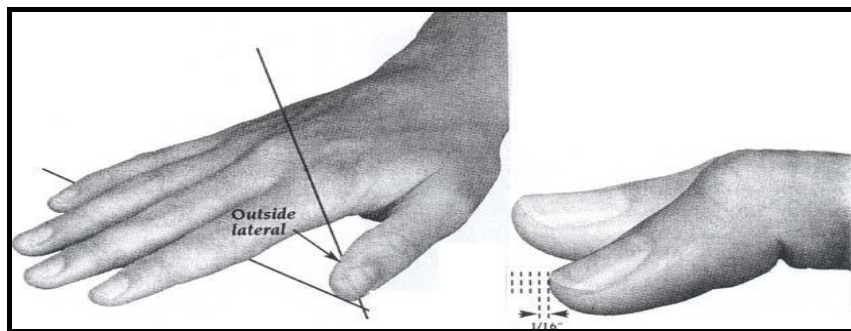
Mechanism of Action:

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.

STEPS OF REFLEXOLOGY

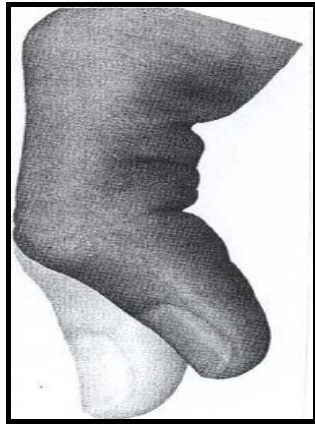


Picture 1: Basic holding technique

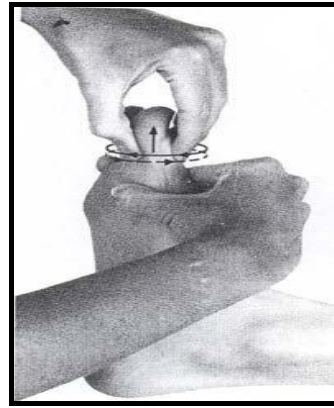


Picture 2 Position for the basic thumb technique

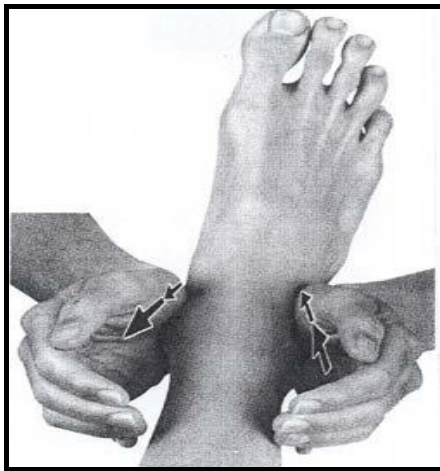
Picture 3 Basic thumb walking technique



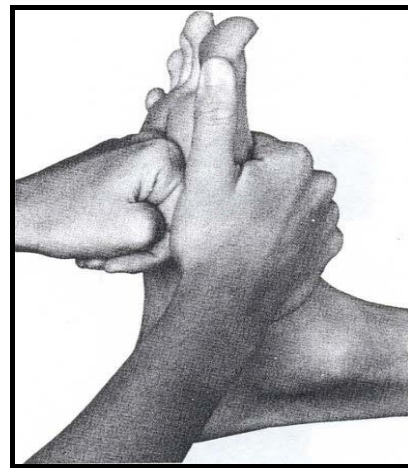
Picture 4 Hook-In, Back-Up



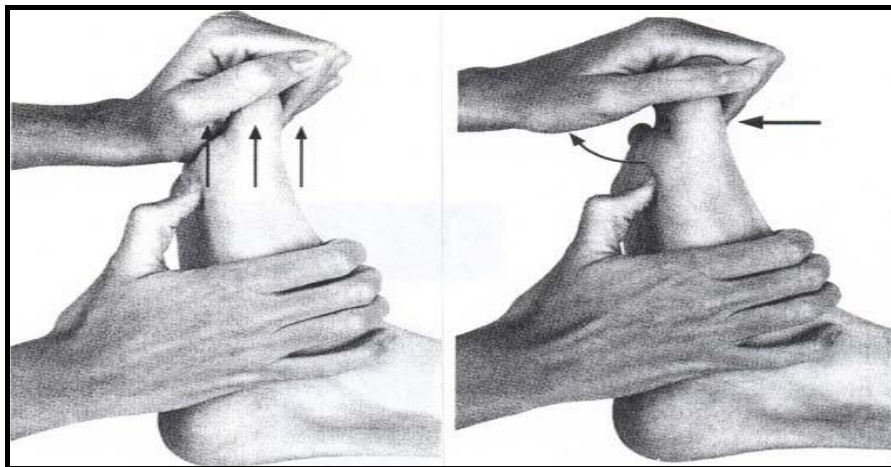
Picture 5 Toe rotation



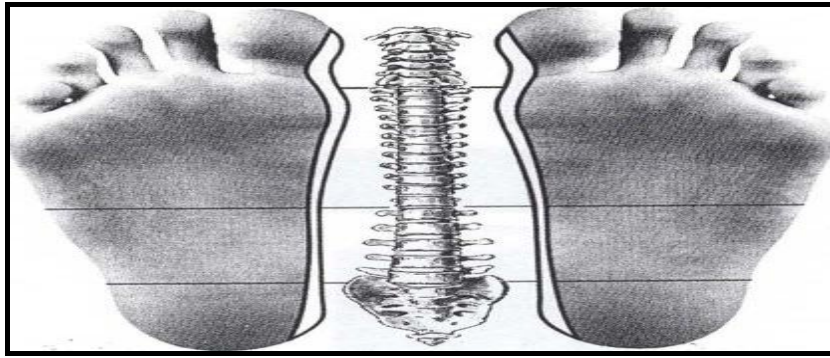
Picture 6 Ankle loosening



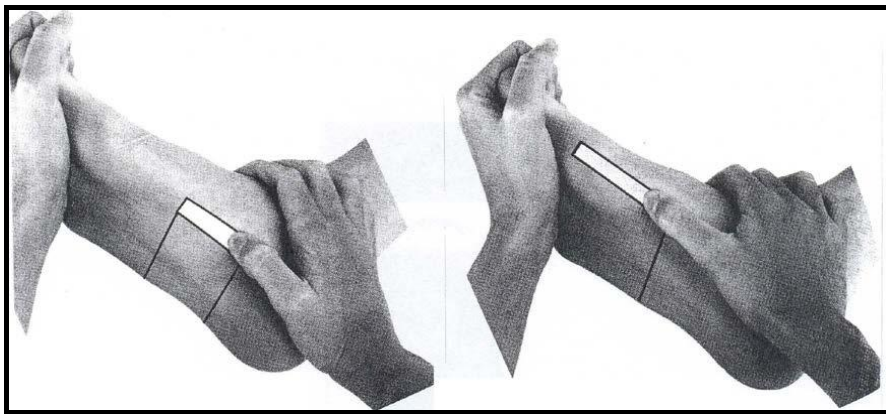
Picture 7 Metatarsal kneading



Picture 8 Diaphragm/solar plexus tension relaxation process

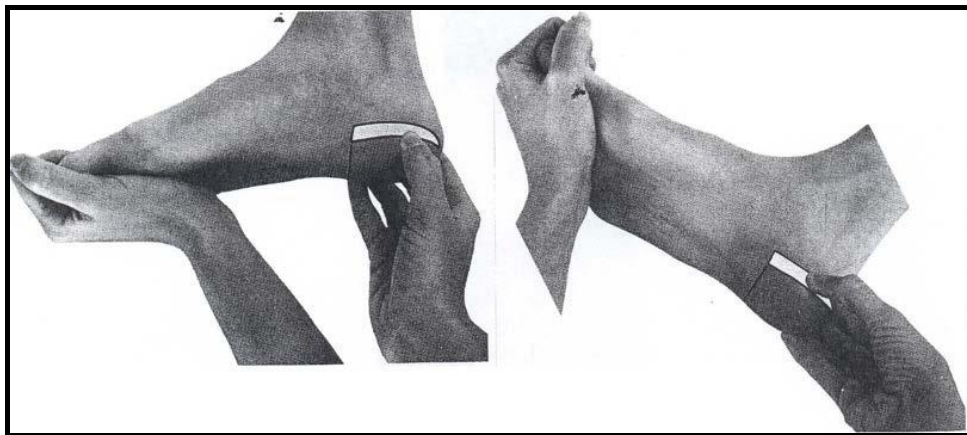


Picture 9 The spinal reflex compared to the spinal vertebrae



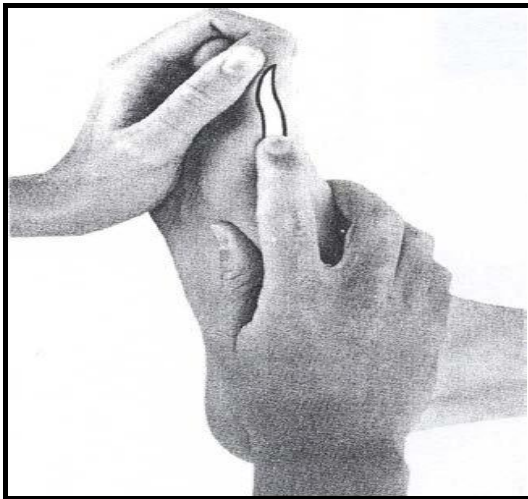
**Picture 10 Working across the
sacral~coccyx reflex**

**Picture 11 Working up the
sacral~coccyx reflex**

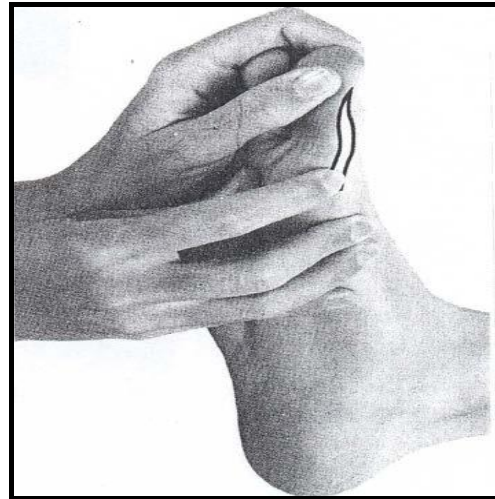


**Picture 12 Working up the lumbar
reflex**

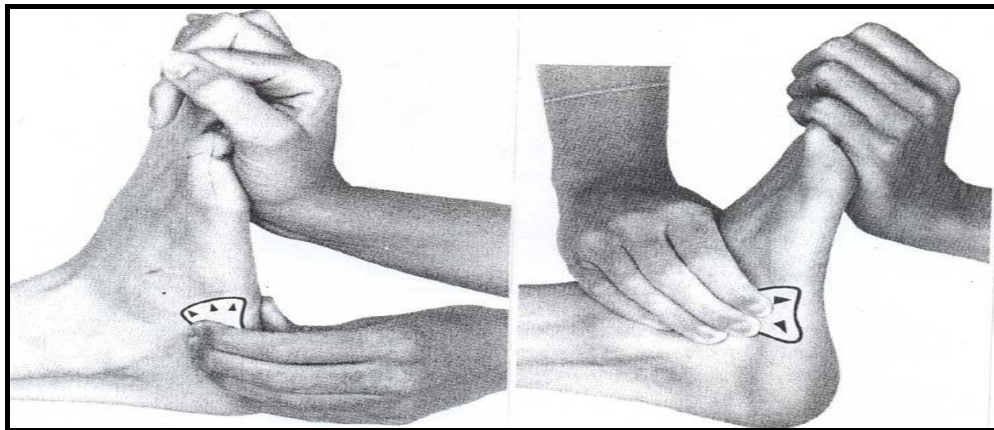
**Picture 13 Working up the thoracic
reflex**



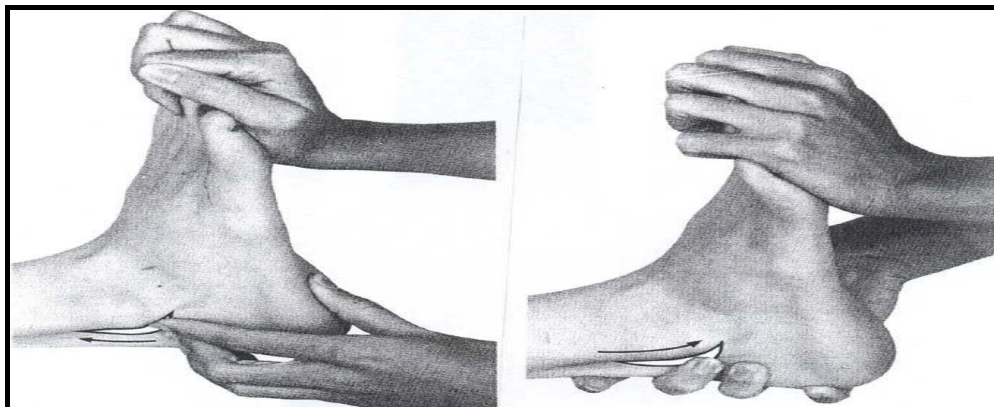
Picture 14 Working up the cervical reflex



Picture 15 Working across the cervical reflex



Picture 16 Working the knee reflex Picture



Picture 17 Working up the sciatic reflex

Picture 18 Working down hip sciatic reflex

**APPENDIX – XVI
DATA CODE SHEET**

| | | | |
|---------------------------|------------|--|-------------|
| Control group | CG | History of Surgeries | |
| Experimental group | EG | HS | |
| Age in years | AGE | Yes | 1 |
| 60-70 yrs | 1 | No | 2 |
| 71-80yrs | 2 | Experience of joint pain | |
| 81-90yrs | 3 | EX.J | |
| 91-100 yrs | 4 | Yes | 1 |
| Gender | GEN | No | 2 |
| Male | 1 | Duration of period of illness | |
| Female | 2 | DOT | |
| Religion | REL | < 5 year | 1 |
| Hindu | 1 | 6 – 10 years | 2 |
| Muslim | 2 | > 10 years | 3 |
| Christian | 3 | Information regarding reflexology | |
| Others | 4 | IRR | |
| Marital status | MS | Yes | 1 |
| Married | 1 | No | 2 |
| Unmarried | 2 | Clinical diagnosis | |
| Widowed | 3 | CD | |
| Divorced | 4 | x- Ray | 1 |
| Separated | 5 | Blood chemistry | 2 |
| Educational Status | ES | Radiological investigation | 3 |
| Illiterate | 1 | Treatment | |
| Literate | 2 | TOF | |
| Graduate | 3 | Medical | 1 |
| Post graduate | 4 | Surgical | 2 |
| Type of family | TOF | Nonpharmacological | 3 |
| Nuclear | 1 | Route of administration | |
| Joint | 2 | ROA | |
| Extended | 3 | Oral | 1 |
| Area of residence | AOR | Topical | 2 |
| Urban | 1 | Intramuscular | 3 |
| Semi urban | 2 | Both 1 & 2 | 4 |
| Rural | 3 | Use other non pharmacological | |
| Corporation/municipality | 4 | UNM | |
| Occupation | OCU | Yes | 1 |
| Employed | 1 | No | 2 |
| Unemployed | 2 | If yes specify | IF Y |
| Type of work | TOW | S | |
| Heavy | 1 | Music | 1 |
| Moderate | 2 | Exercise | 2 |
| Sedentary | 3 | Distraction | 3 |
| History of fall | HOF | Acupuncture | 4 |
| Yes | 1 | Acupressure | 5 |
| No | 2 | Massage | 6 |

Presence of co morbid illness**POCI**

| | |
|---------------------|---|
| Endocrine disorders | 1 |
| Cardiovascular | 2 |
| Neurological | 3 |
| Others | 4 |
| Nil | 5 |

Treatment of co morbid illness**TOCI**

| | |
|-----|---|
| Yes | 1 |
| No | 2 |

Duration of co morbid illness**DOCL**

| | |
|--------------|---|
| <5 years | 1 |
| 5 – 10 years | 2 |
| >10 years | 3 |

APPENDIX - XVIII
MASTER CODE SHEET
EXPERIMENTAL GROUP

| Demographic variables(EG) | | | | | | | | | Clinical variables(EG) | | | | | | | | | | | | | Pretest experimental | | Post test experimental | | Level of satisfaction | | | | |
|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------------------------|-----|-------|-----|-----|-----|-------|----------------|------|------|--------|------|-------|----------------------|-------|------------------------|-------|-----------------------|-------|----|----|-------|
| AG E | GEN | REL | MS | ES | FA | AOR | OCU | WO | HOF | HS | EX .J | DOT | IRR | CD | D A T | T _x | RO A | UN M | IF Y S | POCI | TC OI | DUC OI | S. no | P. levels | S. No | p. levels | S .no | Hs | S | TOTAL |
| 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1 | 7 | 1 | 3 | 1 | 36 | 9 | 45 |
| 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 2 | 7 | 2 | 3 | 2 | 28 | 15 | 43 |
| 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.3 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.3 | 1.3 | 1.2 | 1.2 | 3 | 8 | 3 | 3 | 3 | 28 | 15 | 43 |
| 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.3 | 1.2 | 1.2 | 1.1 | 4 | 9 | 4 | 4 | 4 | 40 | 6 | 46 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 5 | 8 | 5 | 3 | 5 | 32 | 12 | 44 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.3 | 1.1 | 1.3 | 1.2 | 1.3 | 1.2 | 6 | 8 | 6 | 2 | 6 | 32 | 12 | 44 |
| 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.3 | 1.1 | 1.3 | 1.2 | 1.3 | 1.1 | 7 | 8 | 7 | 3 | 7 | 24 | 24 | 48 |
| 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.1 | 1.3 | 1.2 | 1.2 | 1.1 | 8 | 7 | 8 | 3 | 8 | 36 | 9 | 45 |
| 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1/1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.3 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.1 | 9 | 7 | 9 | 3 | 9 | 32 | 12 | 44 |
| 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 10 | 7 | 10 | 3 | 10 | 32 | 12 | 44 |
| 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.3 | 1.3 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 11 | 7 | 11 | 4 | 11 | 36 | 9 | 45 |
| 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.3 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 12 | 8 | 12 | 3 | 12 | 28 | 10 | 38 |
| 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.1 | 1.3 | 1.1 | 1.2 | 1.2 | 13 | 7 | 13 | 3 | 13 | 40 | 6 | 46 |
| 1.4 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.3 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.3 | 1.2 | 14 | 7 | 14 | 3 | 14 | 32 | 12 | 44 |
| 1.2 | 1.2 | 1.1 | 1.1 | 1.3 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.3 | 1.3 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 15 | 8 | 15 | 4 | 15 | 28 | 10 | 38 |
| 1.2 | 1.2 | 1.1 | 1.3 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 16 | 8 | 16 | 3 | 16 | 32 | 12 | 44 |
| 1.4 | 1.2 | 1.1 | 1.3 | 1.3 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 17 | 8 | 17 | 3 | 17 | 24 | 24 | 48 |
| 1.2 | 1.1 | 1.1 | 1.3 | 1.1 | 1.1 | 1.3 | 1.2 | 1.3 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.2 | 1.3 | 1.1 | 1.1 | 1.4 | 1.3 | 1.2 | 1.3 | 18 | 8 | 18 | 3 | 18 | 44 | 3 | 47 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.3 | 19 | 8 | 19 | 3 | 19 | 32 | 12 | 44 |
| 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.3 | 1.1 | 1.2 | 1.3 | 1.1 | 1.3 | 20 | 8 | 20 | 3 | 20 | 24 | 24 | 48 |
| 1.2 | 1.1 | 1.1 | 1.1 | 1.4 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.1 | 1.2 | 1.2 | 1.3 | 1.1 | 1.2 | 1.3 | 1.1 | 1.3 | 21 | 8 | 21 | 3 | 21 | 44 | 3 | 47 |
| 1.2 | 1.2 | 1.1 | 1.1 | 1.5 | 1.1 | 1.3 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.1 | 1.4 | 1.3 | 1.2 | 1.2 | 22 | 7 | 22 | 3 | 22 | 32 | 12 | 44 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.4 | 1.2 | 1.3 | 1.2 | 23 | 8 | 23 | 2 | 23 | 40 | 6 | 46 |
| 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.4 | 1.2 | 1.3 | 24 | 7 | 24 | 3 | 24 | 44 | 3 | 47 |
| 1.4 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.1 | 1.4 | 1.2 | 1.3 | 1.1 | 25 | 6 | 25 | 4 | 25 | 32 | 12 | 44 |
| 1.4 | 1.2 | 1.1 | 1.2 | 1.3 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.3 | 1.3 | 1.1 | 1.2 | 26 | 6 | 26 | 3 | 26 | 36 | 9 | 45 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.4 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 27 | 7 | 27 | 4 | 27 | 32 | 12 | 44 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.5 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.2 | 1.2 | 1.3 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 28 | 6 | 28 | 3 | 28 | 44 | 3 | 47 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 29 | 8 | 29 | 4 | 29 | 24 | 24 | 48 |
| 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 3.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 | 30 | 7 | 30 | 3 | 30 | 36 | 9 | 45 |

CONTROL GROUP

| Demographic variables(CG) | | | | | | | | | Clinical variables (CG) | | | | | | | | | | | | | Pretest control group | | Post test control group | | |
|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------|-----|------|-----|-----|-----|-----|----------------|-----|-----|-----|------|------|-----------------------|-------|-------------------------|-------|----------|
| AGE | GEN | REL | MS | ES | TOF | AOR | OCU | TOW | HOF | HS | EX.J | DOT | IRR | CD | DAT | T _x | ROA | UNM | IFY | POCI | TCOI | DOCI | S. No | PAIN LEV | S. No | PAIN LEV |
| 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1 | 7 | 1 | 9 |
| 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.3 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 2 | 6 | 2 | 8 |
| 1.2 | 1.2 | 1.2 | 1.2 | 1.3 | 1.2 | 1.3 | 1.2 | 1.3 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.3 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 3 | 5 | 3 | 6 |
| 1.2 | 1.2 | 1.3 | 1.2 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.4 | 1.2 | 1.1 | 1.3 | 4 | 6 | 4 | 8 |
| 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 | 1.1 | 1.2 | 1.3 | 1.2 | 1.3 | 5 | 7 | 5 | 9 |
| 1.2 | 1.2 | 1.3 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.3 | 1.2 | 1.3 | 1.3 | 1.1 | 1.3 | 1.2 | 1.3 | 1.2 | 6 | 8 | 6 | 9 |
| 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.3 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.3 | 7 | 4 | 7 | 7 |
| 1.2 | 1.2 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.3 | 1.2 | 1.3 | 1.2 | 8 | 5 | 8 | 8 |
| 1.1 | 1.2 | 1.1 | 1.2 | 1.3 | 1.1 | 1.3 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.3 | 1.1 | 1.3 | 1.2 | 1.3 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.2 | 9 | 6 | 9 | 8 |
| 1.1 | 1.2 | 1.1 | 1.2 | 1.4 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 | 1.2 | 1.1 | 1.3 | 1.1 | 1.1 | 1.1 | 1.3 | 1.1 | 1.3 | 1.3 | 10 | 8 | 10 | 9 |
| 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.3 | 1.2 | 1.3 | 1.2 | 1.1 | 1.3 | 1.1 | 1.2 | 1.1 | 1.2 | 1.3 | 11 | 6 | 11 | 8 |
| 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 | 1.2 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.1 | 1.1 | 1.2 | 12 | 7 | 12 | 9 |
| 1.3 | 1.2 | 1.1 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.3 | 1.2 | 1.1 | 1.2 | 1.2 | 1.3 | 1.1 | 1.4 | 1.3 | 1.3 | 1.2 | 13 | 8 | 13 | 9 |
| 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.3 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.3 | 14 | 7 | 14 | 8 |
| 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.3 | 1.1 | 1.2 | 1.2 | 1.2 | 1.1 | 1.3 | 1.2 | 1.2 | 1.3 | 1.1 | 1.3 | 1.3 | 1.1 | 1.2 | 15 | 8 | 15 | 9 |
| 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.4 | 1.1 | 1.2 | 1.1 | 16 | 6 | 16 | 8 |
| 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.3 | 1.2 | 1.1 | 1.3 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.3 | 1.2 | 17 | 7 | 17 | 9 |
| 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.3 | 1.1 | 1.3 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.3 | 1.2 | 1.3 | 1.1 | 1.3 | 1.3 | 1.2 | 1.3 | 18 | 8 | 18 | 9 |
| 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.4 | 1.1 | 1.1 | 1.2 | 19 | 5 | 19 | 8 |
| 1.2 | 1.1 | 1.3 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.3 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.3 | 1.2 | 1.1 | 1.3 | 1.1 | 1.2 | 1.2 | 1.3 | 1.1 | 20 | 4 | 20 | 9 |
| 1.3 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 21 | 7 | 21 | 9 |
| 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.3 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.2 | 1.1 | 1.3 | 1.1 | 1.4 | 1.2 | 1.3 | 1.2 | 22 | 8 | 22 | 8 |
| 1.3 | 1.2 | 1.1 | 1.3 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.3 | 1.2 | 1.3 | 23 | 5 | 23 | 7 |
| 1.1 | 1.1 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.2 | 1.3 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.1 | 1.2 | 1.3 | 1.3 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 24 | 6 | 24 | 6 |
| 1.4 | 1.2 | 1.1 | 1.3 | 1.3 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.3 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.3 | 1.3 | 1.3 | 25 | 7 | 25 | 8 |
| 1.2 | 1.1 | 1.1 | 1.3 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.3 | 1.3 | 1.2 | 1.3 | 1.1 | 1.2 | 1.1 | 1.3 | 1.2 | 26 | 6 | 26 | 7 |
| 1/3 | 1.2 | 1.2 | 1.1 | 1.3 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.1 | 1.1 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.3 | 1.2 | 1.3 | 27 | 6 | 27 | 6 |
| 1/2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.2 | 1.1 | 1.3 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 28 | 7 | 28 | 7 |
| 1/3 | 1.2 | 1.2 | 1.2 | 1.4 | 1.1 | 1.3 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.2 | 1.3 | 29 | 8 | 29 | 8 |
| 1/2 | 1.2 | 1.1 | 1.3 | 1.2 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | 30 | 6 | 30 | 8 |

APPENDIX - XVII
PHOTOGRAPHS TAKEN DURING ADMINISTRATION OF
FOOT REFLEXOLOGY

