

**A STUDY TO ASSESS THE EFFECTIVENESS OF HOT
WATER APPLICATION WITH EPSOM SALT IN REDUCING
JOINT PAIN AMONG OLD AGE PATIENTS
WITH RHEUMATOID ARTHRITIS IN A
SELECTED HOSPITAL
AT COIMBATORE**



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

APRIL 2016

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**BY
RUTH BENITA .F**

EXTERNAL

INTERNAL

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APPROVED BY THE DISSERTATION COMMITTEE ON _____

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DISSERTATION SUBMITTED TO THE TAMILNADU
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MASTER OF SCIENCE IN NURSING
APRIL 2016

CERTIFIED THAT THIS IS THE BONAFIDE WORK OF

RUTH BENITA.F

ELLEN COLLEGE OF NURSING,
COIMBATORE.

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING TO
THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY,
CHENNAI

COLLEGE SEAL

CAPT.PROF.KALPANA JAYARAMAN, M.SC., (N),
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COIMBATORE. TAMILNADU.

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I express my deep sense of Gratitude to the **Lord Almighty** for the blessing which has enabled me to complete this study.

I extend my profound and a deep sense of Gratitude to my study participants who extended their co-operation throughout the study period, without their co-operation and Participations it would have been impossible to conduct the study.

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expert suggestion, encouragement and support that helped me to tide over the hardships encountered during the study.

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I also record my respect and tribute to the librarian Ellen College of Nursing, for allowing me a free hand into the library.

My sincere thanks and gratitude to all my patients for their endurance and support. My friend **MRS. S. VIMALA M.SC (N)**, Who dedicated her valuable, time to guide and to support me to submit this thesis.

Words are inadequate to express the affection, inspiration and devotion shown by my beloved husband **MR. QUBERT THAMBI RAJ** my beloved daughter & son **DEBORAH GLORIANE & DAVID SHERWIN** for their unending words of encouragement and constant support throughout this study.

A special thanks to my friends and all well wishers who had helped me to complete my study.

ABSTRACT

Pain is a multi dimensional phenomenon. Management of pain includes pharmacological and non pharmacological approaches. Rheumatoid arthritis is a chronic, systemic inflammatory disorder that may affect many tissues & organs but principally attacks the joints produce an inflammatory synovitis that often progresses to destruction of articular cartilage and ankylosis of the joints. The researcher found that the hot water application is very effective in relieving pain in the joints. Hence the Researcher planned to conduct a study to assess the effectiveness of hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis in a selected hospital at Coimbatore.

Objectives of the study

- To assess the level of joint pain among old age patients with rheumatoid arthritis in experimental and control group.
- To evaluate the effectiveness of hot water compress with Epsom salt in reducing joint pain among old age patients with rheumatoid arthritis in experimental and control group.
- To determine the association between degree of joint pain and selected demographic variables of old age patients with Rheumatoid arthritis in experimental and control group

The main focus of this study was to assess the effectiveness of Hot water compress with Epsom salt among old age patients with Rheumatoid Arthritis joint pain admitted at ortho ward in Spine Arthroscopic and Joint Replacement Centre, Coimbatore. The research design adopted was an **experimental pretest and post test control group design**. The population was old age patients in the age group of 60-80 years with Rheumatoid Arthritis joint pain. The conceptual framework of this research was based on Modified Imogene king's Goal attainment theory model. The study has adopted simple random sampling technique and the estimated sample size was 60 Patients. Descriptive statistics were used to analyze the data and to test the study hypothesis.

The major findings of the study were,

- ❖ mean post test level of rheumatoid arthritis pain among old age in experimental group was significantly lower than the mean post test level of pain among old age patients in control group ($t=10.95$ $p=0.001$)
- ❖ There was a significant difference between pre and post-test level of arthritis pain score among old age patients in experimental group. (t value = 10.95, $p= 0.001$ at $p<0.05$ level of significance.
- ❖ The association between pain reduction score and patients demographic variables. Elders ($\chi^2=7.76$, $p=0.05$), more educated ($\chi^2=7.90$ $p=0.05^*$), less duration of pain ($\chi^2=9.14$ $p=0.03^*$) and exercise ($\chi^2=9.16$ $p=0.01^*$) patients had more reduced pain than others.

CONCLUSION

From the result of the study, it was concluded that hot water application with Epsom salt was effective in reducing Rheumatoid Arthritis joint pain among Old age patients. Therefore the investigator felt that, more importance should be given for hot water compress with Epsom salt for reducing Rheumatoid arthritis joint pain among old age patients.

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APPENDIX- A

LETTER SEEKING AND GRANTING PERMISSION FOR CONDUCTING THE STUDY

**ELLEN COLLEGE OF NURSING**
(Recognized by Government of Tamilnadu and Indian Nursing Council, New Delhi)
Affiliated to the Tamilnadu Dr.M.G.R Medical University, Chennai)

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COLLEGE ADDRESS : Navakkarai, Madukkarai (P.O), Coimbatore - 641 105 Ph. 0422 - 2656999, 2656767 Fax. 0422 - 2656400
Website : www.ellencollegeofnursing.org E-mail : ellencollegeofnursing@gmail.com

A.GUNASINGH EMMANUEL, M.A., B.L., Ph.D.,
Chairman & Correspondent

Date **20/06/2015**
Ref **ECN/PG.DISS.PERM./2015-16**

To

DR.DAVID RAJAN
CHAIRMAN & MANAGING DIRECTOR
SPINE & JOINT REPLACEMENT CENTRE
COIMBATORE.

Respected Sir,

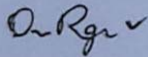
ERUTH BENITA is a student of Ellen College of Nursing, Coimbatore studying M.Sc (nursing) II year. She is conducting, 'A Study to assess the effectiveness of hot water application with Epsom Salt in reducing joint pain among old age patient's with Rheumatoid arthritis in a selected hospital at Coimbatore.'

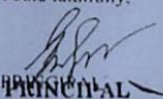
This is for her research work to be submitted to the Tamilnadu Dr.M.G.R.Medical University in partial fulfillment of the university requirement for the university requirement for the award of M.Sc., Nursing Degree.

As a part of her study she would like to collect data from Rheumatoid arthritis patients from your well authorized hospital. Project will be furnished by the student personally. The norms, ethics and policies practiced in the hospital setting will be followed by the student.

Thanking you,



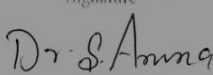
For Spine Arthroscopic And Joint Replacement Centre Pvt Ltd.


Dr. David V. Rajan,
Chairman cum Managing Director.

Yours faithfully,

EMMANUEL
ELLEN COLLEGE OF NURSING
NAVAKKARAI, COIMBATORE - 641 105

APPENDIX-B

LETTER SEEKING EXPERTS OPINION FOR CONTENT VALIDITY

	ELLEN COLLEGE OF NURSING (Recognized by Government of Tamilnadu and Indian Nursing Council, New Delhi) Affiliated to the Tamilnadu Dr.M.G.R Medical University, Chennai)
<p>HOSPITAL ADDRESS : 285, Sathy Main Road, Gandhipuram, Coimbatore - 641 012. Ph : 0422-2521212, 2525920 Fax : 0422 - 4373090 COLLEGE ADDRESS : Navakkaral, Madukkarai(PO), Coimbatore - 641 105. Ph : 0422 - 2656999, 2656767, Fax : 0422 - 2656400 Website : www.ellencollegeofnursing.org E-mail : ellencollegeofnursing@gmail.com</p>	
<p>Dr.A.GUNASINGH EMMANUEL, M.A.,B.L.,Ph.D., Chairman & Correspondent</p>	<p>Date : 13/5/15 Ref :</p>
CERTIFICATE OF VALIDATION	
<p>This is to certify that the tool submitted by Ms. F.RUTH BENITA, M.Sc (Nursing) II - Year student of Ellen College of Nursing, Coimbatore, Tamilnadu (Affiliated to The Tamilnadu Dr.M.G.R.Medical University, Chennai) is validated by undersigned and can proceed with this tool and conduct the dissertation entitled, 'A Study to assess the effectiveness of hot water application with Epsom Salt in reducing joint pain among old age patient's with Rheumatoid arthritis in a selected hospital at Coimbatore.'</p>	
<p>Place: Coimbatore Date: 13/5/15</p>	<p> Signature  Name and Designation HEAD OF THE DEPARTMENT DEPARTMENT OF MEDICAL SURGERY SAVEETHA COLLEGE OF NURSING SAVEETHA UNIVERSITY, THANDALAM-602 105.</p>

APPENDIX – C

LIST OF EXPERTS FOR CONTENT VALIDITY

MEDICAL EXPERTS

1. Dr. DAVID V. RAJAN MS.(Ortho)M.N.A.M.S.(Ortho) F.R.C.S.(G)

SPINE ARTHROSCOPIC & JOINT REPLACEMENT CENTRE.

COIMBATORE.

2. DR.P ARULRAJ ,MS.,DNB.,MNAMS.MRCS(Edin)

GKNM Hospital

COIMBATORE

3. A.B GOVINDARAJ

ORTHOPAEDIC SURGEON

FORTIS MALAR HOSPITAL

CHENNAI

NURSING EXPERTS

1. **MRS.ARUNA., M.SC(N)**

HEAD OF THE DEPARTMENT

MEDICAL SURGICAL NURSING

SAVEETHA COLLEGE OF NURSING,

CHENNAI

2. **MRS. RATHNA KUMARI M.SC (N)**

ASST.PROFESSOR,

A.C.S COLLEGE OF NURSING,

CHENNAI



4. R. KAVITHA ELIZABETH M.SC (N)

PROFFESSOR
V.P.M.M COLLAGE OF NURSING
V.P.M NAGAR
VIRUDHUNAGAR
TAMILNADU

5. VICTOR DEVA ASHIRVADAM M.SC (N) , Ph.D.

PROFFESSOR
V.P.M.M COLLAGE OF NURSING
V.P.M NAGAR
VIRUDHUNAGAR
TAMILNADU

CERTIFICATE OF VALIDATION

 <h1 style="margin: 0;">ELLEN COLLEGE OF NURSING</h1> <p style="margin: 0; font-size: small;">(Recognized by Government of Tamil Nadu and Indian Nursing Council, New Delhi) Affiliated to Rajiv Gandhi Dr.M.G.R Medical University, Chennai</p>			
HOSPITAL ADDRESS: 285, Ghaty Man Road, Gandhinagar, Coimbatore - 641 012 Ph: 0422 2521212, 2526002 Fax: 0422 4573886 COLLEGE ADDRESS: Narasimarai, Madhavara(P.O), Coimbatore - 641 505 Ph: 0422 2606996, 2606767 Fax: 0422 2606400 Website: www.ellencollegeofnursing.org E-mail: ellencollegeofnursing@gmail.com			
<table border="0" style="width: 100%;"> <tr> <td style="width: 60%; vertical-align: top;"> Dr.A.GUNASINGH EMMANUEL, M.A., M.Phil., Ph.D. Chairman & Correspondent </td> <td style="width: 40%; vertical-align: top; text-align: right;"> Date _____ Ref _____ </td> </tr> </table>		Dr.A.GUNASINGH EMMANUEL, M.A., M.Phil., Ph.D. Chairman & Correspondent	Date _____ Ref _____
Dr.A.GUNASINGH EMMANUEL, M.A., M.Phil., Ph.D. Chairman & Correspondent	Date _____ Ref _____		
CERTIFICATE OF VALIDATION			
<p style="text-align: center; font-style: italic;">This is to certify that the work submitted by Ms. F.KEITHY ROSELYA, M.Sc Nursing II - Your student of Ellen College of Nursing, Coimbatore, Tamilnadu (Affiliated to The Tamilnadu Dr.M.G.R Medical University, Chennai) is validated by undersigned and can proceed with this work and conduct the dissertation entitled - "A Study to assess the effectiveness of foot water application with Epsom Salt in reducing joint pain among old age patient's with Rheumatoid arthritis in a selected hospital at Coimbatore."</p>			
Place: Coimbatore _____ Date: _____	Signature _____ Name and Designation _____		
<div style="text-align: right; margin-right: 100px;">  SIGNATURE </div>			
Name & Designation Dr. P. ARULRAJ, MS, DNB, MNAMS, MBBS (Fellow), MCh (Surg Oncol), F.R.C.S. (Ed) 1995 HOD, Surgical Oncology V. R. Cancer Centre G.K.N.M. Hospital COIMBATORE - 641 037.			

APPENDIX – E
INFORMED CONSENT

Respected Madam,

I **Mrs. Ruth Benita .F** IIndYear, M.Sc. (Nursing) student from Ellen College of Nursing, Navakkarai

, Coimbatore is Conducting **“A study to assess the effectiveness of hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis in a selected hospital at Coimbatore”**. I request your co operation to complete my research. I assure you that you won't get any harm due to the research.

I am MR./Mrs..... I heard about the effectiveness of hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis from Ruth Benita .F .She explained me about the benefits of this intervention. I agree with this intervention of hot water application with Epsom salt in reducing joint pain whole heartedly.

Yours

Sincerely,

Place:

Date:

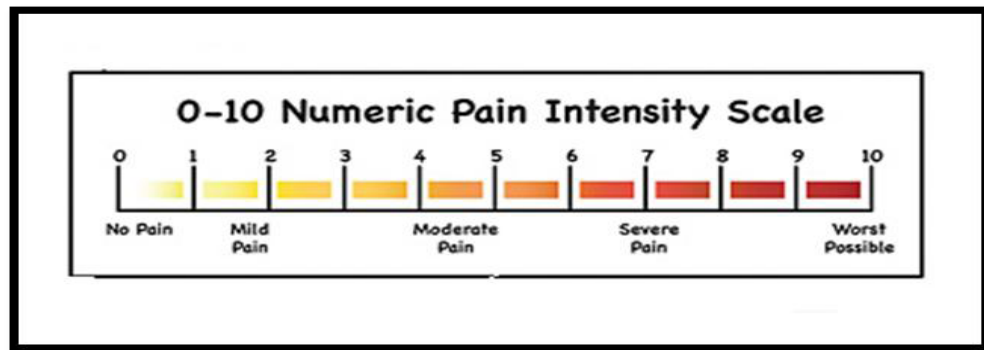
APPENDIX F

TAMIL CONSENT

APPENDIX G

COPY OF THE TOOL

Numerical Pain Rating Scale



Description	Rater	score
No pain	0	0
Mild pain	1-3	1
Moderate pain	4-6	2
Severe	7-9	3
Worst pain	10	4

APPENDIX H

DEMOGRAPHIC VARIABLES (Structured Questionnaire)

APPENDIX – I

INTERVENTION GUIDE FOR HOT WATER APPLICATION WITH EPSOM SALT FOR OLD AGE PATIENTS WITH RHEUMATOID ARTHRITIS JOINT PAIN

INTRODUCTION

As a part of my research study intervention chosen for the study was hot water application with Epsom salt.

PRELIMINARIES

- ❖ Assess the patients knowledge regarding hot water application and joint pain
- ❖ Explain the procedure and its effect on Old age patients with joint pain
- ❖ Check the joint pain by using Numeric Pain Intensity scale
- ❖ Explain the benefits of hot water application with Epsom salt

PROCEDURE

- ❖ Explain the procedure to patients
- ❖ Get consent from them.
- ❖ Epsom salt compress was prepared by adding 30 grams of Epsom salts to one liter of boiling water
- ❖ (The temperature of the boiling water was as tolerated by the client) creating a hot compress by dipping a clean washcloth in the boiling water, wringing it out,
- ❖ Applying for 20 **minutes over the joint in which pain was present, twice a**

POST TEST

- ❖ At the end of the hot water compresses with Epsom salt therapy, on the tenth day, the subjects were assessed again for pain score using the research tool **day for 10 days.**

CHAPTER-1

INTRODUCTION

A man too busy to take care of his health is like a mechanic too busy to take care of his tools. - Spanish Proverb

"If you can go through life without experiencing pain, you probably haven't been born yet." -Neil Simon

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

Rheumatoid arthritis is a chronic, systemic inflammatory disorder that may affect many tissues & organs but principally attacks the joints produce an inflammatory synovitis that often progresses to destruction of articular cartilage and ankylosis of the joints. It also produces diffuse inflammation in lungs, pericardium, pleura & sclera. About 1% of the world's population is afflicted by rheumatoid arthritis, women three times more often than men. Onset is more frequent between the ages of 40 and 50. It can be disabling and painful, which can lead to substantial loss of functioning and mobility.

In most cases arthritis pain and inflammation cannot be avoided as the body ages. In fact, most people over the age of 50 show some signs of arthritis. Joints naturally degenerate over time. Fortunately, arthritis can be managed through a combination of medication, exercise, rest, weight-management, nutrition, and, in some cases, surgery etc. Arthritis is a chronic disease that will remain for a long time and possibly for the rest of life. The treatments will probably change over time and medication may be adjusted. Having a positive mental outlook and the support of family and friends will help to live with arthritis and be able to continue to perform daily activities. Arthritis is not just 1 disease; it is a complex disorder that comprises

more than 100 distinct conditions and can affect people at any stage of life. Two of the most common forms are osteoarthritis and rheumatoid arthritis.

Some complications of arthritis include joint stiffness, social complications, reduced physical activity, reduced leisure activity etc. Joint pain due to arthritis can limit sexual activity. Rheumatoid arthritis affects the quality of the life. The complications of Rheumatoid arthritis include joint distraction, heart failure, lung disease, low or high platelets, spine instability etc. Affected joints may worsen the ordinary tasks of the day to day life. Rheumatoid arthritis complications of this disease may shorten survival in some individuals.

Pain too is part of the body's defense system, it triggers mental problem solving strategies that seek to end the painful experience. Pain intensity may range from slight through severe to agonizing; it is experienced as having qualities such as sharp, throbbing, dull, nauseating, burning and shooting. It often has both an emotional quality and a sensed bodily location.

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

Joint pain is a common musculoskeletal disorder affecting 80% of people at some point in their lives. In India it is the most common cause of job related disability and the second most common neurological ailment- only headache is more common. It can be either acute, sub acute (or) chronic in duration. With conservative measures, the symptoms of joint pain typically show significant improvement within a few weeks of onset.

Pain in the joint is a common concern, affecting up to 90% of Americans at some point in their lifetime. Up to 50% will have more than one episode. joint pain is not a specific disease, rather it is a symptom that may occur from a variety of different processes. In up to 85% of people with joint pain, despite a thorough medical

examination, no specific cause of the pain can be identified. America spends approximately \$50 billion a year on joint pain.

Although there is no known cure for most forms of arthritis, treatment designed for individual patient can reduce/eliminate symptoms and limit functional impairment. The goals of contemporary management of arthritis extend beyond pain control to the enhancement of patients' functional status and health-related quality of life. Patient education regarding joint protection and avoidance of excessive joint loading is important for this patient. Physical measures like hot pack, paraffin bath or occupational therapies may be helpful.

Complementary and alternative medicine (CAM) has been defined by the National Center for Complementary and Alternative Medicine as "a group of diverse medical and healthcare systems, practices, and products that are not presently considered to be part of conventional medicine". For some CAM practices, there is scientific evidence that a treatment is both beneficial and safe. Most patients who use complementary and alternative medicine treatments were not dissatisfied with conventional or established medical treatments but find that complementary medicine appeals to their values and beliefs about health.

The medical surgical nursing, one of the major branch of dealing with all the adult health problems. Most of the adult health problem manifested through pain .The article 2008 reported especially the pain is the major symptom of most musculoskeletal disorders. The pain may be mild or severe, local or diffuse, depending on where the injury occurred. Although pain may be acute and short-lived, as is the case with most injuries, pain may be ongoing with chronic illnesses, such as arthritis.

NEED FOR THE STUDY

"The art of life is the art of avoiding pain" -William Hazlin

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

NSAIDs are also useful but the drugs have severe side effects. Instead of using their drugs home remedies can be practice which is effective and safe.

Srivastava in 2007 reported that the old age (people above the age of 60 years) comprise 7.5 percent of India's total population, and making health care available and accessible to them is one of the health priorities of the country.

The prevalence of rheumatoid arthritis was studied in the adult Indian population. As the first step, a house-to-house survey of a rural population near Delhi was conducted by two trained health workers. The target population comprised 44,551 adults (over 16 years old). The health workers identified the possible cases of rheumatoid arthritis (RA) using a questionnaire. These cases were then further evaluated by the authors using the 1987 revised ARA [Acute Rheumatoid Arthritis] criteria for the diagnosis of RA. A response rate of 89.5% was obtained and 3393 persons were listed as possible cases of RA by the health workers. Of these, 299 satisfied the revised ARA criteria for the diagnosis of RA, giving a prevalence of 0.75%. Projected to the whole population, this would give a total of about seven million patients in India.

According to the findings of the 60th National Sample Survey Round in 2006 reported that, the proportion of age, persons who cannot move and are confined to their bed or home ranges from 77 per 1000 in urban areas to 84 per 1000 in rural areas Morbidity⁷. It is currently estimated that adults over 60 years make up 8 per cent of India's population and by 2021 that number will be 137 million. India now has the second largest aged population in the world. The small-family norm means that fewer working, younger individuals is called upon to care for an increasing number of economically unproductive, old age persons. In India 75% population living in the rural areas.

Despite recent improvements in treatment and disability outcomes, women with rheumatoid arthritis may have difficulty maintaining jobs, one NIAMS-supported study shows. Researchers who followed two groups of women with rheumatoid arthritis 11 years apart—the first group beginning in 1987, the second in 1998—found the rate at which women left the workforce did not fall significantly. They found that more than a quarter of the women in both groups stopped working within 4 years after being diagnosed with rheumatoid arthritis

Most people don't get enough magnesium, which can affect their nerve, muscle and enzyme function, ultimately contributing to pain and inflammation that can affect your back, and according to the Epsom Salt Council. Soaking in Epsom salt is one of the best ways to get its benefits, since your body doesn't process ingested magnesium as efficiently as it does absorb magnesium.

On the physical side, Epsom salt, which is the mineral magnesium sulfate, has been found to help alleviate pain. Additionally, soaking in an Epsom Salt and Epsom salt compress helps to pull toxins from the body, which speeds the healing process. When a cold or the flu is coming on, adding Epsom Salt to a before-bed bath can often stop the virus in its track.

Doctors usually refer to joint pain is as acute if it has been presence for less than a month and chronic if it lasts for a longer period of time. Joint pain is one of the most common medical problems affecting 8 out of 10 people at some point during their lives. Joint pain can range from a dull, constant ache to a sudden, sharp pain.

The study conducted by Brosseau L, Yonge KA, Robinson V et.al in 2003 to determine the effectiveness of thermotherapy in the treatment of OA of the Joints. The outcomes of interest were relief of pain, reduction of edema, and improvement of flexion or range of motion (ROM) and function. The results shows that three randomized controlled trials, involving 179 patients, were included in this review. In one trial, administration of 20 minutes of ice massage, 5 days per week, for 3 weeks, compared to control demonstrated a clinically important benefit for OA on increasing quadriceps strength (29% relative difference) and another trial with hot application. There was also a statistically significant improvement. Result showed that cold packs decreased edema. The thermotherapy reduces the pain. The study concluded that more well designed studies with a standardized protocol and adequate number of subjects is needed to evaluate the effect of thermotherapy in the treatment of OA of the Joints.

Applying the heat by general or local which produce the physiological change in the body such as vasodilatation and relaxation of muscles which produce the beneficial therapeutic effect of relieving the pain.

In the hot water application for the joint pain is Epsom salt hot water bath very effective in the treatment of joint pain. Epsom salt can act topically and immediately reduce the pain in joint. The 200 mg of Epsom salt mixed in hot water the painful joints can be bathed for 20 mins .It can be used for thrice a week. It is very effective to relieve morning stiffness in joints (html- Cached- Sim updated 2006)

From the above review and by the researcher's own observation, the researcher found that the hot water application is very effective in relieving pain in the joints. Few studies supporting the benefit of Epsom salt hot water application. In this study the investigator planned to conduct the study to evaluate the effectiveness of hot water application with Epsom salt for reducing joint pain in old age patients.

STATEMENT OF THE PROBLEM

“A study to assess the effectiveness of hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis in a selected hospital at Coimbatore”.

OBJECTIVES OF THE STUDY

- To assess the level of joint pain among old age patients with rheumatoid arthritis in experimental and control group.
- To evaluate the effectiveness of hot water compress with Epsom salt in reducing joint pain among old age patients with rheumatoid arthritis in experimental and control group.
- To determine the association between degree of joint pain and selected demographic variables of old age patients with Rheumatoid arthritis in experimental and control group

HYPOTHESIS

- H1: There will be a significant difference between the mean pre and post-test level of joint pain score among old age patients with Rheumatoid arthritis in experimental group.

- H2: There will be a significant difference between the mean pre and post -test level of joint pain score among old age patients with Rheumatoid arthritis in control group.
- H3: There will be a significant difference between the mean post-test level of joint pain score among old age patients with Rheumatoid arthritis in experimental and control group.
- H4: There will be a significant association between the post-test level of joint pain score among old age patients with Rheumatoid arthritis in with their selected demographic variables in experimental and control group.

OPERATIONAL DEFINITIONS

- **Assess:** It is the organized, systematic and continuous process of collecting data from the old age patient regarding the level of joint pain.
- **Effectiveness:** Outcome of the intervention measured with a numerical pain scale.
- **Hot Water compress:** Applying the heat at localized areas, which produce the physiological change in the body, such as vasodilatation and relaxation of muscles which produce the beneficial therapeutic effect of relieving the joint pain.
- **Hot Water application with Epsom Salt:** Epsom salt is the one of the home remedy which is rich in magnesium. This is very helpful for relieving the joint pain.
- **Rheumatoid arthritis** - Rheumatoid Arthritis [RA] is the most common form of autoimmune arthritis, discomfort of the joints due to stiffness of the joint, tendons, ligaments and muscles.
- **Joint Pain:** Joint Pain due to RA is a chronic (long-term) disease that causes pain, stiffness, swelling and limited motion and function of many joints. While RA can affect any joint, the small joints in the hands and feet tend to be involved most often. Inflammation sometimes can affect organs as well, for instance, the eyes or lungs..
- **Old age:** Those who fall in the age group of 60 years and above.

ASSUMPTION

1. Hot application relieves pain, inflammation and congestion.
2. Epsom salt has analgesic properties.
3. Epsom salt easy to avail low cost
4. Reducing the pain and Meeting the comfort needs of the old age patients is an important function of a nurse.

DELIMITATIONS

- The study was delimited to the old age patients who were suffering with Rheumatoid Arthritis joint pain
- The study was limited to small sample size. The samples taken were only 30 for the experimental group and 30 for the control group

PROJECTED OUTCOMES

- The study will help the nurses to assess the level of Rheumatoid Arthritis joint pain reduction experienced by the old age patient's with after the hot water application with Epsom salt.
- The study will help the nurses to assess the effectiveness of Epsom salt in reducing Rheumatoid Arthritis joint pain.
- The study will help the old age patients with Rheumatoid arthritis to practice a complementary therapy to reduce pain.

CHAPTER II

REVIEW OF LITERATURE

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

- H.L. Mencken

According to Polit and Hunglar, the literature review is defined as “a critical summary of research on a topic of interest often prepared to put a research problem in context.” Literature review helps to lay the foundations for the study. It provides the background for understanding the current knowledge on Illustration the significance of the new study. The investigator assembles knowledge by reviewing the literature of a selected problem and is presented under the following headings.

- **Section A:** Review of literature related to rheumatoid arthritis joint pain in old age
- **Section B:** Review of literature related to the effectiveness of hot water application and joint pain.
- **Section C:** Review of literature related to the effectiveness of Epsom salt, hot application

Section A: Review of literature Studies related to rheumatoid arthritis joint pain in old age

Pytel A, Wrzosek Z.et.al (2012) conducted a preliminary study to estimate patient knowledge on rheumatoid arthritis in the range of their own disease. The subject of studies included 270 people with rheumatoid arthritis. A self-made questionnaire was used for studies, aimed at obtaining basic information about patients with a diagnosed rheumatoid arthritis. The examined patients were divided into 2 groups according to gender. The condition of knowledge of old age on their own disease is definitely higher and relatively high. It was revealed that the interest in obtaining information on the disease is higher in people with higher education both in women and men. Independently of the age, the main source of knowledge on the disease is a doctor, physiotherapist or a nurse. Educational deficiency in therapeutic teams was revealed, which indicates the necessity of developing information

programmes and of running trainings, talks aiming at increasing knowledge on rheumatoid arthritis among patients.

Elly M Van Der Wardt.et.al. (2011) conducted a study to gain insight into the general public's knowledge and perceptions regarding rheumatic diseases in the Netherlands. A questionnaire was sent by mail to a random sample of 1800 Dutch homes; the response was 658. Questions mainly focused on knowledge, attitudes, behavioural intentions and use of the mass media with regard to rheumatic diseases. The respondents gave the right answer to a mean of 8.2 statements out of 17 true/false statements regarding factual knowledge of rheumatic diseases. Respondents particularly were unaware of several rheumatic disorders. Thus the study concluded that the public in general do not know very much about rheumatic diseases.

Lena, et al. (2009) conducted a cross-sectional study on problems among 231 elders in Udupi Taluk, Karnataka. The result of the study showed that a majority of them had problems such as hypertension followed by arthritis, diabetes, asthma, cataract, and anemia. Among them, 68% of the patients suffered with joint pain. Joint pain was found to be more common among female. A survey conducted by the investigator in the Anderson pet village, Chennai (2009) showed the total number of old age people as 160, among them 90% reported joint pain in either one or both joints.

Thyberg I et.al., (2009) conducted a cross-sectional study of health and social problems among two hundred and seventy-six old age patients, 191 women and 85 men, with early rheumatoid arthritis were included. Aliments were examined with respect to 28-joint count disease activity score, and disability variables reflecting pain, sleep disturbance, fatigue, mental health, and activity limitation, at follow-ups at 1, 2 and 3 years after diagnosis. Among them 80% reported joint pain in either one or both joints.

Catherine Hill, et al. (2008) conducted a prevalence study of joint pain among 4060 old age population in the North West region of Adelaide, South Australia. Participants were asked to report their pain, aching or stiffness on most days in either of their joint. Overall, 17.4% of participants indicated that they had joint pain. This study concluded by saying that joint pain affected nearly one in five people in the community, was associated with age, female sex and pain in other body region.

Men'shikova IV, Babyre VV. (2008); conducted a cross-sectional study. The study included 214 patients aged from 35 to 85 years with a pain level of at least 40 mm by the visual analog scale (VAS). The results of the physical and X-ray examination provided indications for further studies that were performed by ultrasonographic (40.1%), arthroscopic (52.3%), and MRT (64.2%) techniques. One third of the patients were aged women with the body mass index > 40.1 and stage 3 osteoarthritis (OA) in whom pain was attributable to primary osteoarthritis. The remaining patients had pain of other origin. There was excellent (98.6%) agreement between MRT diagnosis and arthroscopic data on licensed intra-articular structures, articular cartilage, and subchondral bone. Arthroscopy revealed traumatic and degenerative meniscal tear in 85% patients, injured anterior cruciate ligament in 8%, signs of sinusitis in 52.6%, chondromalacia of the femoral condyle in 57.6%, and isolated pathology of patellofemoral articulation in 33% of the patients.

Rishmaki (2008) conducted a study on physical exercise and risk of severe OA related joint pain requiring arthroplasty. The study result showed that, both in the men and women, the risk was less in those with higher numbers of cumulative hours of exercise than with those who had no regular physical exercise. The association was significant ($p < 0.05$). The study concluded that moderate recreational physical exercise is associated with a decrease in the risk of OA related joint pain.

Bartels EM, Lund H, Hagen KB, (2007) The coherent study conducted to compare the effectiveness and safety of aquatic-exercise interventions in the treatment of knee and hip osteoarthritis. In total, six trials (800 participants) were included. At the end of treatment for combined knee and hip osteoarthritis, there was a small-to-moderate effect on function (SMD 0.26, 95% confidence interval (CI) 0.11 to 0.42) and a small-to-moderate effect on quality of life (SMD 0.32, 95% CI 0.03 to 0.61). A minor effect of a 3% absolute reduction (0.6 fewer points on a 0 to 20 scale) and 6.6% relative reduction from baseline was found for pain. Aquatic exercise appears to have some beneficial short-term effects for patients with hip and/or knee OA while no long-term effects have been documented. Based on this, one may consider using aquatic exercise as the first part of a longer exercise programme for osteoarthritis patients.

Bhatia & Verma (2007) conducted an epidemiological study in correlated joint pain in 362 old age people aged more than 65 years in the urban and rural areas of Chandigarh, India. The study revealed that the overall prevalence of joint pain among old age as 56.6% in rural areas, it was 32.6% and in urban it was 60.3%. Joint pain was more in females compared to males (70.1% Vs 41.6%).

Section B : Review of literature related to hot water application and joint pain

Yildirim , N., Filiz Ulusoy, M., & Bodur, H. (2010) conducted a study to evaluate the effect of heat application on pain, stiffness, physical function and quality of rheumatoid Arthritis the faculty of health sciences, Midwifery department, Cumhuriyet university, turkey. The intervention group received 20 minute heat application every day for four weeks in addition to routine medication. It was found that heat application decreased pain and disability of the patients with rheumatoid arthritis. Heat application was found to improve the sub dimensions of quality of life scores of physical function, pain and general health perception of patients.

Kirk, J.A., & Kersley, G.D. (2009) studied the effectiveness of heat in the physical treatment of rheumatoid arthritis of at Royal national 19 hospitals for rheumatic diseases. Hot packs were given for 20 minutes with temperatures approximately 45 degrees C at the beginning and at the end 41 degree C. Results showed that greater relief from pain and stiffness due to hot application.

Lehmann, JF., Warren, CG., & Scham, SM. (2009) conducted a study to assess the therapeutic effect of heat on rheumatoid arthritis. Patients received heat application to affected joint. Hot application had an effect on pain and relieving stiffness. Patients preferred heat therapy. The researcher concluded that superficial heat can be applied to chronic pain management.

Stanton, DE., Lazaro, R., & Macdermid, JC. (2008) reviewed the effectiveness of hot baths on rheumatoid arthritis at department of occupational therapy, Samuel Merritt college, California. The result addressed the physiological changes of hot application on blood flow, intramuscular temperature, subcutaneous temperature, and the influence of room temperature and age. The authors concluded that the heat bath procedure increased superficial blood flow and skin temperature.

Chou, R., Huffman, LH. (2007) conducted a meta-analysis of studies of non – pharmacological therapies for chronic pain in rheumatoid arthritis: a review of the evidence for an American pain society, American college of physicians. They found good evidence that the only non pharmacological therapies with evidence to reduce pain or superficial heat application

Parminder Kaur, et.al,(2007) conducted a study to assess the effect of ‘moist heat application’ on the intensity of joint pain among the geriatric population residing in Dadu Majra Colony, Chandigarh.. The sample size consisted of 87 subjects, i.e. 43 in the experimental and 44 in the control group. Intensity of joint pain was assessed on the 1st and the 8th day of the intervention among both experimental and control groups. ‘Moist heat’ was applied at the joint twice a day for seven days in the experimental group. The results show that the intensity of joint pain and intake of painkiller was reduced significantly in the experimental group as compared to the control group .

Robinson, V., et al. (2007) conducted a review of research reports of studies at an institute of population health, university of Ottawa, Canada, on thermotherapy for treating rheumatoid arthritis to evaluate the effectiveness of thermotherapy application of objectives and subjective measures of disease activity in patients with RA. The review concluded that superficial moist heat can be used as palliative therapy.

Welch, V. Et al. (2007) the studies conducted to compare the ice and heat therapy in rehabilitation of rheumatoid arthritis patients. This study was conducted with 79 subjects to assess the effect of heat versus ice in relieving inflammation, pain and mobility. They found that patients preferred heat therapy to ice. The study concluded that heat therapy can be used as palliative therapy, which can be applied at home as needed to relieve pain

Oosterveld, FG., & Rasker, JJ. (2006) reviewed the scientific basis for the treatment of arthritis pain with locally applied heat. They reviewed the experimental studies in healthy subjects and in patients. They found that the effect of heat on pain, stiffness of joints, grip strength and joint function in inflamed joints reported beneficial effects. They suggested that heat can be applied for chronic inflammation.

Preisinger, E., & quittan, M. (2006) reviewed the studies conducted to assess the effectiveness of thermotherapy at university of physical medicine and rehabilitation, Wein. Results showed that muscle spasm can be reduced by heat. Joint stiffness was decreased by heat application.

Kathleen L. Barman et al (2005) tested the efficacy of Treating joint Pain and Dysfunction Secondary to Osteoarthritis: Chiropractic Care Compared With The Moist Heat Alone. Two hundred fifty-two patients with joint pain secondary to OA were randomly assigned to either the treatment group (moist hot pack plus chiropractic care). Chiropractic care combined with heat is more effective than heat alone for treating OA-based joint pain.

Jeff Behar (2004) Hydrotherapy Additional measures to help ease the joint pain and stiffness include heat treatment. Simple hot water treatments are easy ways to soothe joint pain. To relieve stiffness and dull, penetrating pain, warm (not hot) compress applied directly to the affected area is the best option. Hot showers or baths or heating pads may also help by improving flexibility, especially before exercise or other physical activity.

Brosseau L, Yonge KA, Robinson Vet. al (2003) conducted a randomized and controlled clinical trials to determine the effectiveness of thermotherapy in the treatment of OA of the joints. This study involving 179 patients, were included in this review. In one trial, administration of 20 minutes of ice massage, 5 days per week, for 3 weeks, compared to control demonstrated a clinically important benefit for the joints OA on increasing quadriceps strength (29% relative difference) and another trail with hot applications. There was also a statistically significant improvement. The result showed that cold packs decreased the joints edema. The thermotherapy reduces the pain. The study concluded that more well designed studies with a standardized protocol and adequate number of subjects is needed to evaluate the effect of thermotherapy in the treatment of OA on the joints.

Lloyd A, et al (2003) studied the Cost-effectiveness of low-level heat wrap therapy for joint pain. 371 patients aged 60 to 65 years presenting with acute uncomplicated joint pain. They found that low level heat wrap both clinically

meaningful pain relief and clinically meaningful reduction in disability. They suggested heat wrap therapy in place of oral analgesics in managing episodes of joint pain.

Lurie-Luke E, et al (1984) found that between 60 and 80% of the population in industrialized countries experience joint pain at some time in their lives. An exploratory workplace study to investigate the perceived value of continuous low-level heat wrap therapy in manual workers was undertaken to investigate the benefits of a new form of continuous low-level heat wrap therapy available for the symptomatic relief of acute low back pain in the workplace. The study results show that use of the heat wrap therapy significantly reduced pain intensity and impact of pain on everyday activities.

Section C : Studies related to the effectiveness of Epsom salt, hot application and Joint pain

Adam Ramsay, (2014) 'Epsom salts, which are high in magnesium, can help to relieve joint pain, Christine Horner, nutritional therapist ' says at Margaret Hills Clinic the Epsom salt compress that helps patients with arthritis. 'Before bed, dissolve three teacups of Epsom salts into hot water' Soak a clean cloth in to hot water and make a compress, apply the compress to the joint for 10 to 15 minutes, whilst slowly exercising the joints and muscles this will help to relieve the joint pain.

Fioravanti A, Tenti S, Giannitti C, Fortunati NA, Galeazzi M.(2013) conducted a prospective randomized , single blind controlled trial to evaluate the effectiveness of Epsom salt compress in 60 outpatients with bilateral pain divided into two groups with experiment group (n=30) treated with 12 daily generalized thermal baths with magnesium sulfate mineral water added to usual treatment and control group (n=30) continued regular outpatient care routine (exercise, NSAIDs and/or analgesics) for a duration of three months the study results confirmed that epsom salt compress had a beneficial effect in patients with joint OA .

Lawson Michelle (2010) According to MayoClinic.com, arthritis is a chronic inflammatory disorder that commonly affects the smaller joints in our feet and hands. The website also states that arthritis is more common among women than men and typically occurs between the ages of 40 and 60. The use of Epsom salt compress may reduce stiffness and pain due to arthritis.

Matthew Lewis at (2008) reported that there are dietary supplement of magnesium that everyone cannot use effectively. Scientists have learned that the best way to get magnesium in the body is topically through the skin. A hot Epsom Salt compress is the old New England home remedy for arthritis pain. Just the heat of the compress itself has been able to increase circulation and reduce swelling. It can also be used to soothe achy, burning feet.

The news paper of Neha **Arora in (2008)** on personal health posted about the home Remedies for joint pain, a very common problem encountered by many people. Home Remedies for Leg Pain and joint pain is a warm water compress of Epsom salt. Warm water compress of Epsom salt, which is rich in magnesium, is a good pain reliever. This is very helpful for arthritis.

Health & Wellness › Common ailments(2007) the article reported that 30 grams of Epsom salts added to one liter of boiling water(The temperature of the boiling water is as tolerated by the client) creating a hot compress by dipping a clean washcloth in the boiling water, wringing it out, and applying for **20 minutes, twice a day for 7days to 10 days** will often relieve the joint pain ,leg pain and other joint muscle alignments. This will relieve the pain and reduce the swelling and stiffness of arthritic fingers. It can also be used to soothe achy, burning feet.

All the above literatures that have been reviewed clearly state that joint pain is very much prevalent worldwide and in India too. It mainly affects old age patients. Hot water compress with Epsom salt has the property to relieve pain as it has anti-inflammatory properties. Moist heat has proved to improve circulation and reduce pain. Hot water compress with Epsom salt combines the positive effect in relieving pain and has no adverse effects on health.

CONCEPTUAL FRAME WORK

The conceptual framework for research study presents the measurement on which the purposes of the proposed study are based. The framework provides the prospective from which the investigator views the problem. The study was designed to assess the effectiveness of hot water compress with Epsom salt on old age patients with rheumatoid arthritis joint pain.

The study was based on the concept to assess the pain perception before and after hot water compress with Epsom salt. The investigator adopted the Modified Imogene King's Goal attainment theory. The theory is based on the assumption that humans are open systems and who are having constant interaction with their environment. The major concepts in this theory of goal attainment are interacting, perception, communication, transaction, role, stress, growth and development, time and space.

The definitions of these concepts are as follows:

Interaction

In 1981 King proposed an open system model as a basis for her goal attainment theory. According to King all systems are open in that there is a continual exchange of matter energy and information. Open system has been verified degree of interaction with the input and gives feed backs. In this study the nurse explains the hot water compress with Epsom salt procedure and gets their consent for research.

Perception

According to Imogene M. King, it is the primary features of the personal system because it influence all the other behaviors, refers to a person's representation of reality. In this study, the old age persons consistent with different demographic variables (age, sex, education, occupation, diet, exercise income, joint pain duration, treatment, nature the of pain) which influence their behaviors related to hot water application with Epsom salt.

Communication

It is defined as “a process whereby information is given from one person to another either directly in face-to-face meetings or indirectly through telephone, television, or the written word.”, in this study the nurse presents explanation and demonstration about hot water application with Epsom salt technique to the study participants.

Transaction

It is a process of interactions in which human beings communicate with the environment to achieve goals that are valued; transactions are goal-directed human behaviors, the outcome of the study shows that there was a significant reduction of rheumatoid arthritis joint pain in post assessment.

Role

According to Imogene M. King's each person occupies in a social system has specific roles and obligations. In this study, the investigator occupies health educator role and old age people who have rheumatoid arthritis joint pain occupies study participant's role.

Person

A person is rational, purposeful, active and time oriented being. They have fundamental health needs such as timely and useful health information, care that prevents illness and helps when the self-care demands cannot be met. Here the persons were old age patients with rheumatoid arthritis joint pain.

Environment

Environment in the open system allows the exchange of matter, energy and the information. In this study the environment was the Male and Female ortho ward in Arthroscopy, Spine Arthroscopic and Joint Replacement Centre in Coimbatore in selected Hospitals, Coimbatore

Health

Health is described as the dynamic state in the life using personal resources to achieve optimal daily living. All the clients in this study have deviated from health and need assistance to get back to optimal level of health.

Nursing

Nursing promotes, maintains and restores health and cares for the sick, uses a goal oriented approach in which the client and nurse interact to attain goal so that they can perform their own role independently. Here the researcher was the nurse who gave hot water compress with Epsom salt to relieve Rheumatoid arthritis joint pain in the clients with joint pain.

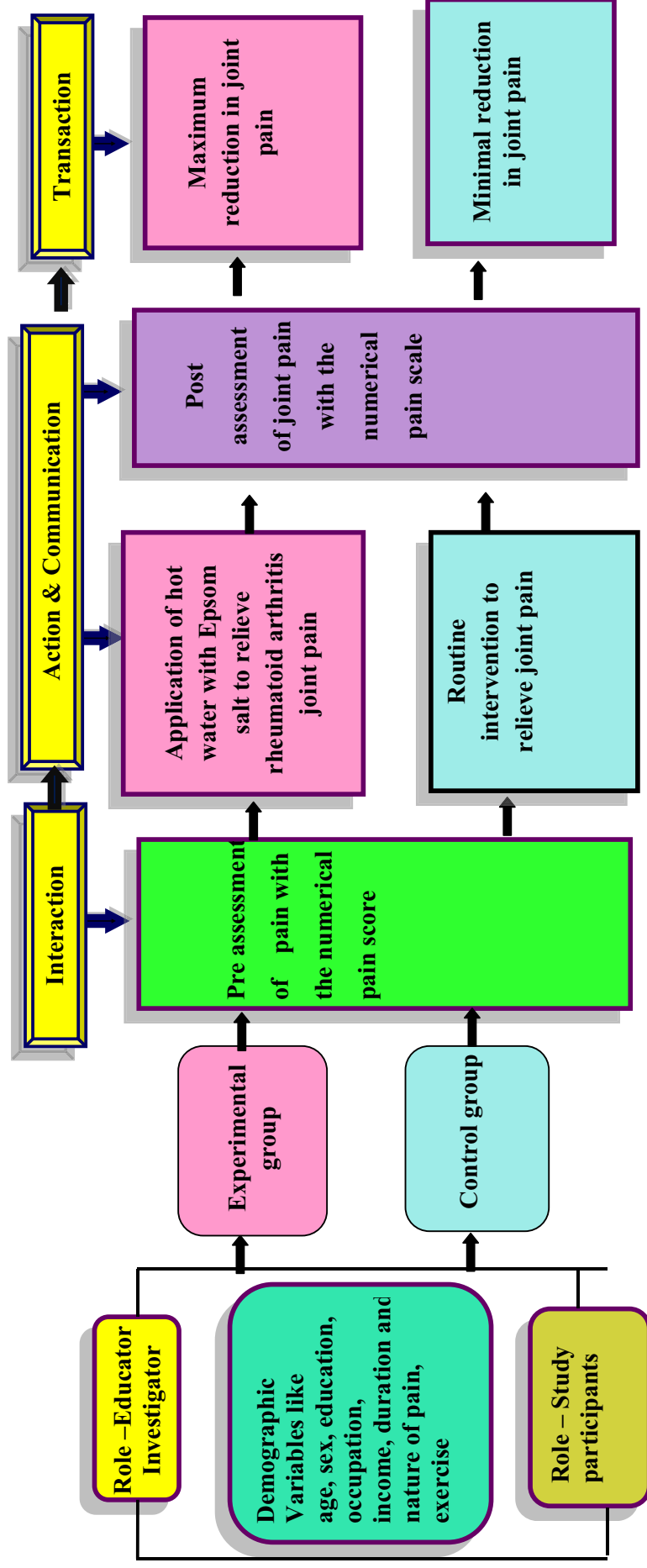


Figure 1: Conceptual Framework based on Modified King's Goal Attainment Theory

CHAPTER III

METHODOLOGY

“Every discourse, even a poetic or oracular sentence carries with it a system of rules for producing analogous things and thus an outline of methodology’

-Jacques Dernida

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

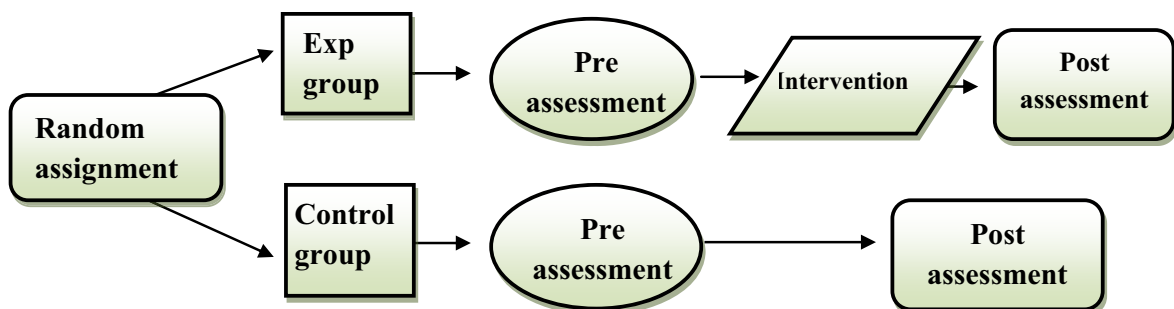
RESEARCH APPROACH

The research approach tells the researcher from where the data is to be collected, what is to be collected, how to collect and how to analyze them. It also suggests a possible conclusion and helps the researcher in answering specific research questions in an accurate and efficient way.

The research approach adopted for this study is an evaluative approach. This study aims at assessing the effectiveness of hot water compress with Epsom salt in reliving rheumatoid arthritis joint pain.

RESEARCH DESIGN

The research design selected for the present study was a true experimental research design. In this study the subjects were randomly assigned to either the experimental or the control group. The effect of the dependent variable on both the groups was seen before the treatment. Later, the treatment was carried out in experimental group only, and after treatment observation of the dependent variable was made for both the groups to examine the effect of the manipulation of the independent variable on the dependent variable. (Dr. Suresh K. Sharma)



VARIABLES

- **Independent variables** - Hot water compress with Epsom salt.
- **Dependent variables** - Pain perception.

SETTINGS OF THE STUDY

This study was conducted in male and female Ortho ward in Arthroscopy, Spine Arthroscopic and Joint Replacement Centre in Coimbatore.

POPULATION

Population were the entire aggregation of cases that meet a designed set of criteria. In this present study population was old age patients who were having rheumatoid arthritis joint pain admitted in male & female ortho ward in Arthroscopy, Spine Arthroscopic and Joint Replacement Centre in Coimbatore.

SAMPLE AND SAMPLE SIZE

Sample refers to subjects of a population selected to participate in a research study. Sample consist a total number of 60 subjects with non specific joint pain admitted in ortho ward in Arthroscopy, Spine Arthroscopic and Joint Replacement Centre in Coimbatore.

SAMPLING TECHNIQUE

Sampling technique used for the present study was simple random sampling technique. The required number of joint pain subjects was selected as the sample.

CRITERIA FOR SAMPLE SELECTION

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

INCLUSION CRITERIA

- The study participants who were able to understand Tamil or English
- The study participants who were willing to give consent.
- The study participants who were available at the time of data collection.
- The study participants who have joint pain.

EXCLUSION CRITERIA

Clients with

- Old age clients with severe neuropathies, burns, skin lesion on the joints.
- Old age clients with complicated like facilities, neuropathies, vascular compromise and systemic lupus erythematosus.

DEVELOPMENT AND DESCRIPTION OF TOOL

The tools for the study had four sections.

SECTION – A

Had questions for collection of demographic data. It was developed by the researcher. It had 8 questions with multiple options. The study participants had to tick the appropriate boxes. It had questions related to age, sex, education, occupation, monthly income, exercise, type of exercise,

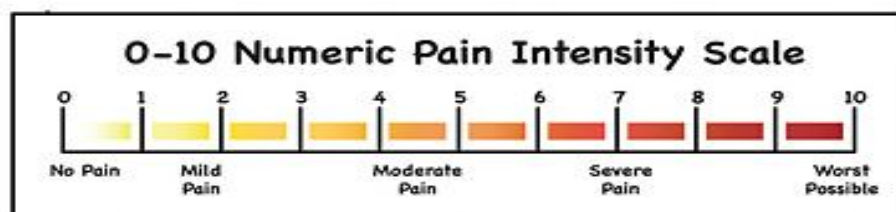
SECTION – B

Pain Numerical Rating Scale. It is a standardized tool. The scoring key is given below.

Min=0 Max=10

Scoring key

Description	Rater	score
No pain	0	0
Mild pain	1-3	1
Moderate pain	4-6	2
Severe	7-9	3
Worst pain	10	4



INTERVENTION ON HOT WATER APPLICATION WITH EPSOM SALT

Old age patients will be given hot water application with Epsom salt for the affected joint which has pain. This should be done for 10 minutes daily for ten days with hot water compress with Epsom salt. The questions were asked to assess the subjective effect of hot water compress with Epsom salt like relaxation, smoothening, pain relief etc among the old age patients.

VALIDITY OF THE TOOL

Validity of the tool was assessed using content validity. Content validity was determined by experts from Nursing and Medical. They suggested certain modifications in tool. After the modifications they agreed this tool for evaluate the effectiveness of hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis in a selected hospital at Coimbatore. The tool was developed in English and Tamil and validity was established during the days between 11.05.2015 to 16.05.2015.

RELIABILITY

After pilot study reliability of the tool was assessed by using interrater method and its correlation coefficient r -value was 0.87. This correlation coefficient was very high and it was a good tool for evaluating the effectiveness of hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis in a selected hospital at Coimbatore.

PILOT STUDY

The pilot study was conducted in Anurag hospital during the days between 18.05.2015 and 30.05.2015 with permission of the authorities. In order to test the feasibility of the study, a pilot study was conducted among In order to test the feasibility of the study; a pilot study was conducted among six clients in the same manner as final study. Old age patients with non-specific joint pain (six in number)

were selected using a simple random sampling technique for the purpose of the pilot study. They were assessed for pain perception on the first day using the research tools.

After the pre assessment, hot water application with Epsom salt was given for about 20 minutes twice a day for ten consecutive days. At the end of the hot water compresses with Epsom salt therapy, on the tenth day, the subjects were assessed again for pain perception using the research tool. The tool was found to be satisfactory in terms of simplicity and clarity. Based on the findings of the pilot study it was concluded that it was feasible and practicable to conduct the main study and criterion measures were found to be effective.

DATA COLLECTION PROCEDURE

The data were collected for four weeks from 13.07.2015 to 22.08.2015. Prior permission from authorities was sought and obtained. Formal written permission to conduct the study in Hospital was obtained. During the 1st visit, the researcher introduced herself and explained the purpose of the study and confirmed the willingness of the old age patients to participate in the study by getting consent from them as per the inclusion criteria

The data collection was done in ortho ward in Arthroscopy, Spine Arthroscopic and Joint Replacement Centre in Coimbatore every week from Monday to Saturday; The objective of the study was explained to the medical officer and other paramedical personnel. before starting the data collection to get their cooperation during the data collection. Based on the criteria for sample selection 10 subjects a day from the experimental group were selected and the intervention was given for 10 days.

The subjects were explained about the purpose of the study and were assured of confidentiality of the data collected. Adequate privacy was provided. On the first day of sample selection, the demographic data and pre assessment of pain perception of the subjects were assessed.

Epsom salt compress was prepared by adding 30 grams of *Epsom salts* to one liter of boiling water (The temperature of the boiling water was as tolerated by the client) creating a hot compress by dipping a clean washcloth in the boiling water, wringing it out, and applying for 20 **minutes over the joint in which pain was**

present, twice a day for 10 days will often relieve the joint pain, leg pain and other joint muscle alignments.

Data Collection Schedule

DAY	NUMBER OF CLIENTS	EXPERIMENTAL GROUP	CONTROL GROUP	POST TEST
Day 1	8	4	4	Day 11
Day 2	8	4	4	Day 12
Day 3	8	4	4	Day 13
Day 4	10	5	5	Day 14
Day 5	10	5	5	Day 15
Day 6	10	5	5	Day 16
Day 7	6	3	3	Day 17

PLAN FOR DATA ANALYSIS

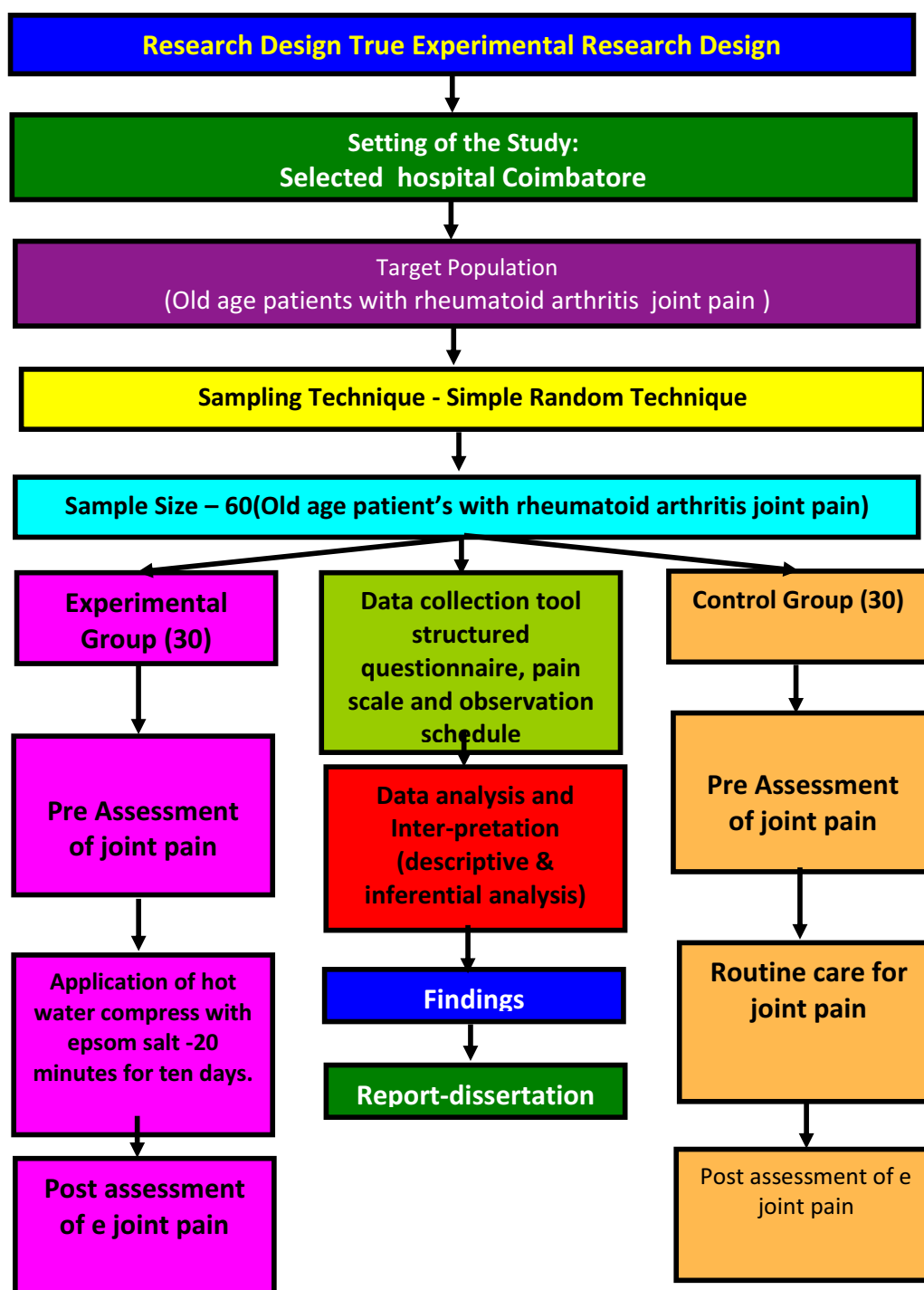
After the data collection, the collected data were organized, tabulated, summarized and analyzed. The data were analyzed according to the objectives of the study using descriptive and inferential statistics

1. Analysis of the frequency and percentage distribution of the demographic data.
2. Hypothesis related to the effectiveness of Hot water compress with Epsom salt therapy, reducing the pain perception was tested using student paired “t” test, mean and standard deviation and Mc Nemar Chi-square test, test of significance.
3. Student independent “t” test were used to find out the association between the level of pain perception and selected demographic variables (age, occupation, sex, education, duration etc.)

ETHICAL CONSIDERATION

Research proposal was approved by experts prior to the pilot study and permission for the main study was obtained from the ethical committee, Head of the department, Department of Medical and Surgical Nursing, Permission was also obtained from the HOD of ortho department. A written consent of each study subject was obtained before starting the data collection, assurance was given to the subjects that confidentiality and privacy would be maintained.

FIGURE-2: Schematic representation of research methodology



CHAPTER –IV

DATA ANALYSIS AND INTERPRETATION

“Analysis is the art of creation through destruction.”

[P.S. Baber,](#)

**“The ultimate authority must always rest with the individual's own
reason and critical analysis”.**

Dalai Lama

Analysis is the appraisal of the data and interpretation of the data consisting of a relation between the findings of the study of the research problem and theoretical framework of the study. An important function of the process of interpretation is to link the findings of the study to the mainstream of scientific knowledge in the field.

This chapter deals with the analysis and interpretation of data collected from patients with Rheumatoid Arthritis Pain in selected hospital, Coimbatore.

The data collected from 60 samples (30 experimental group and 30 control group) of clients with Rheumatoid Arthritis joint pain were being analyzed, classified and tabulated on the basis of the objectives of the study.

The analysis and interpretation of data was based on data collection and the results were computed by using descriptive and inferential statistics.

The study findings of the samples were presented in the following sections.

Section I: Description of demographic variables of the clients with Rheumatoid Arthritis joint pain.

Section II: Data on assessment of the level of arthritis joint pain score among clients
With numerical Rating Scale in experimental and control group.

Section III: Data on effectiveness of Hot water application with Epsom salt On Rheumatoid Arthritis joint pain score among clients in experimental and control group

Section IV: Data on Association between the level of joint pain among old age patients with Rheumatoid Arthritis the selected demographic variables in experimental and control group.

Section I: DATA ON DEMOGRAPHIC VARIABLES OF CLIENTS WITH RHEUMATOID ARTHRITIS JOINT PAIN

Table 1:Frequency and percentage distribution of demographic variables among old age patients with rheumatoid Arthritis joint pain in relation to their selected demographic variables.

N= [30+30]

Demographic variables		Group			
		Experiment(n=30)		Control(n=30)	
		n	%	n	%
Age	60 -65 years	8	26.7%	14	46.7%
	66 -70 years	16	53.3%	10	33.3%
	71 -75 years	4	13.3%	3	10.0%
	76 -80 years	2	6.7%	3	10.0%
Sex	Male	15	50.0%	15	50.0%
	Female	15	50.0%	15	50.0%
Educational Status	Un-Educated	21	70.0%	16	53.4%
	Primary Education	7	23.3%	10	33.3%
	Secondary Education	2	6.7%	4	13.3%
Occupation	Housewife/ retired	26	86.7%	27	90.0%
	Self Employee	4	13.3%	3	10.0%
Family Income Per Month	<Rs. 10000	18	60.0%	12	40.0%
	Rs. 10001 -15000	5	16.7%	5	16.7%
	Rs. 15001-20000	2	6.6%	4	13.3%
	Rs. >20000	5	16.7%	9	30.0%
Religion	Hindu	30	100.0%	30	100.0%
	Muslim	-	-	-	-
Type of Diet	Vegetarian	6	20.0%	9	30.0%
	Mixed	24	80.0%	21	70.0%
How long do you have rheumatoid arthritis joint pain?	1- 3months	3	10.0%	5	16.7%
	3- 6months	4	13.3%	7	23.3%
	6month -1year	11	36.7%	5	16.7%
	above 1year	12	40.0%	13	43.3%
How long do you have taking treatment for rheumatoid arthritis joint pain?	1- 3months	6	20.0%	7	23.3%
	3- 6months	3	10.0%	5	16.7%
	6month -1year	15	50.0%	9	30.0%
	above 1year	6	20.0%	9	30.0%
Do you perform any exercise? If yes, what type of exercise?	Walking	10	33.3%	5	16.7%
	Yoga	2	6.7%	4	13.3%
	No	18	60.0%	21	70.0%

Table 1 depicts the frequency and percentage distribution of demographic variables of patients with Rheumatoid Arthritis joint pain with respect to age, sex, education. occupation, monthly income, religion, type of diet, how long they have rheumatoid arthritis joint pain? How long they have been taking treatment for rheumatoid arthritis joint pain, were they performing any exercise? If yes, what type of exercise?

The above table reveals that

- Majority of the participants were in the age group between 60-70years (53.3% in experimental and 33.3% in control group)
- Both gender patients were participated in this study in equal distribution.
- Majority of the study subjects were uneducated (70% In experimental and 53.4%in control group).
- Majority of the women patients participated in this study were house wife in both group, and males were retired persons.(86.7% in experimental and 90% in control)
- Majority of the patients income status was less than Rs10,000 in both group (Experimental-60%, Control-40%).
- All of the study participants were hindus
- Majority of the patients in both group were having rheumatoid arthritis more than a year. (Experimental-40%, Control-43.3%)
- Majority of the patients who were having arthritis were taking treatment for the condition was between six months to one year (Experimental-50%, Control-30%).
- Majority of the participants in both group were not following any exercises (Experimental-60%, Control-70%)

SECTION II: DATA ON ASSESSMENT OF THE LEVEL OF ARTHRITIS JOINT PAIN SCORE AMONG CLIENTS WITH NUMERICAL RATING SCALE IN EXPERIMENTAL AND CONTROL GROUP.

Table: 2.1

Frequency and Percentage Distribution of pre-test level of pain among patients with Rheumatoid Arthritis joint pain in experimental group.

N= 30

Level of pain	Group	
	Experiment	
	Frequency	Percentage %
No pain	0	0.0%
Mild pain	0	0.0%
Moderate pain	4	13.3%
Severe pain	18	60.0%
Worst	8	26.7%
Total	30	100.0%

Table 2.1 shows the pretest level of pain score among experimental group of old age patients with rheumatoid arthritis pain. In pretest, among experiment, none of them had no pain and mild pain, 13.3% of had moderate pain, 60% of them had severe pain and 26.7% of them had worst pain.

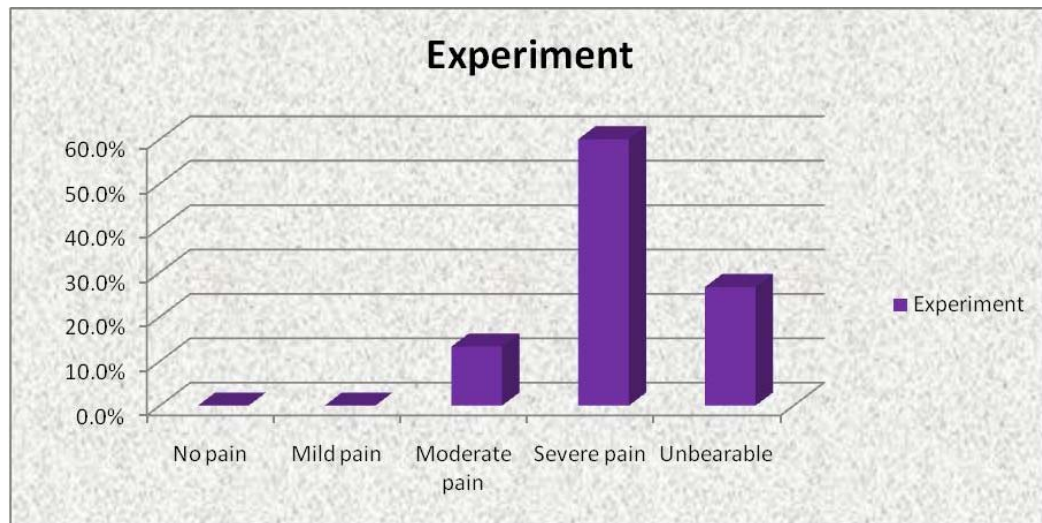


Figure 3. pre test level of pain among old age patients with rheumatoid arthritis pain in experimental group.

Table : 2.2

Frequency and Percentage Distribution of pre-test level of Rheumatoid Arthritis joint pain among old age patient's in control group.

Level of pain	Group	
	Control	
	Frequency	Percentage %
No pain	0	0.0%
Mild pain	2	6.7%
Moderate pain	2	6.7%
Severe pain	15	50.0%
Worst	11	36.6%
Total	30	30

Table 2.2 shows the In pretest, among control, none of them were having no pain , 6.7% of them were having mild pain, 6.7% of were having moderate pain, 50% of them were having severe pain and 36.7% of them were having worst pain

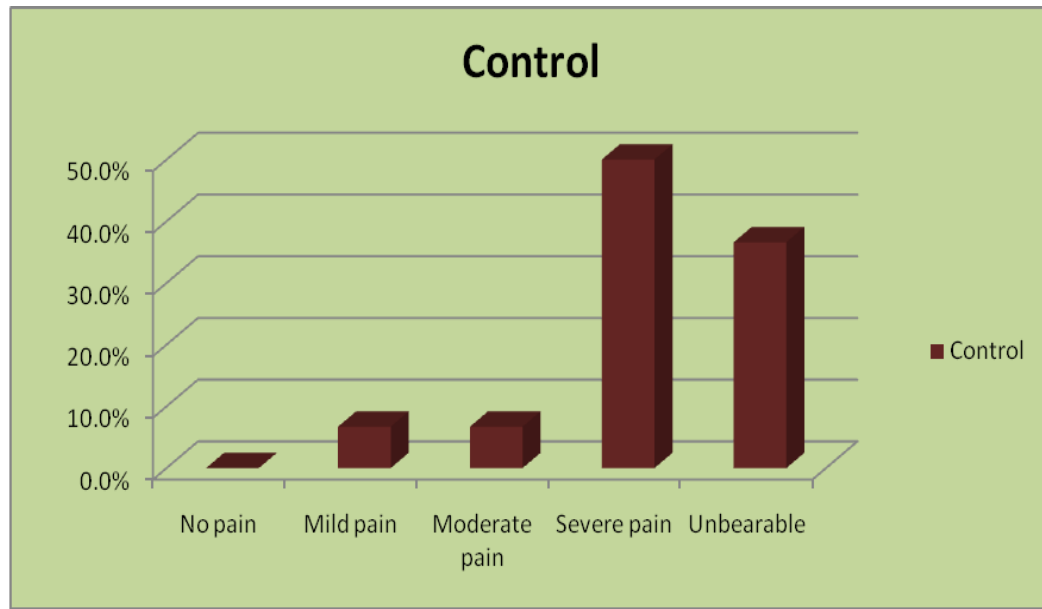


Figure 4. pre test level of pain among old age patients with rheumatoid arthritis pain in Control group.

**Section III: DATA ON EFFECTIVENESS OF HOT WATER APPLICATION
WITH EPSOM SALT ON RHEUMATOID ARTHRITIS JOINT PAIN SCORE
AMONG CLIENTS IN EXPERIMENTAL AND CONTROL GROUP**

Table 3.1: Frequency and percentage distribution of pre-test and post-test level of joint pain score among Rheumatoid Arthritis old age patients with Rheumatoid Arthritis in experimental group

N=30

	Group				Chi square test
	Pretest		Posttest		
	n	%	n	%	
No pain	0	0.0%	14	46.7%	$\chi^2=49.82$ $p=0.001^{***}$ $DF=4$ significant
Mild pain	0	0.0%	9	30.0%	
Moderate pain	4	13.3%	7	23.3%	
Severe pain	18	60.0%	0	0.0%	
Worst	8	26.7%	0	0.0%	
Total	30	100.0%	30	100.0%	

Table 3.1 shows the pretest and posttest level of pain score among experiment group of old age patients with rheumatoid arthritis joint pain. In pretest, among experimental group, none of them had no pain and mild pain, 13.3% of had moderate pain, 60% of them had severe pain and 26.7% of them had worst pain. In posttest, among experimental group, 46.7% of them had no pain, 30.0% of them had mild pain, 23.3% of had moderate pain, none of them had severe pain and worst pain.

Frequency and percentage distribution of pre-test and post-test level of joint pain score among Rheumatoid Arthritis old age patients with Rheumatoid Arthritis in experimental group

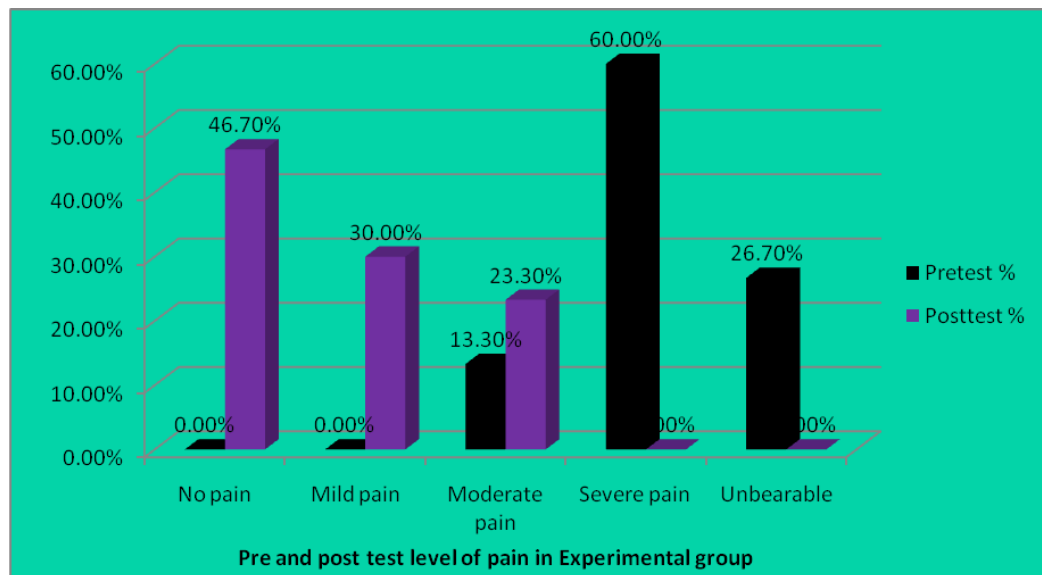


Figure 5: The pretest and posttest level of pain score among experiment group

Table 3.2: Distribution of pre-test and post-test level of pain among old age patients in Control group.

N = 30

	Group				Chi square test
	Pretest		Post test		
	n	%	n	%	
No pain	0	0.0%	1	3.3%	$\chi^2=1.63$ p=0.80 DF=4 not significant
Mild pain	2	6.7%	3	10.0%	
Moderate pain	2	6.7%	3	10.0%	
Severe pain	15	50.0%	14	46.7%	
Worst	11	36.7%	9	30.0%	
Total	30	100.0%	30	100.0%	

Table 3.2 shows the pretest and posttest level of pain score among control group of old age patients with rheumatoid arthritis pain. In pretest, among control group, none of them had no pain, 6.7% of them had mild pain, 6.7% of had moderate pain, 50% of them had severe pain and 36.7% of them had worst pain. In posttest, among control, 3.3% of them had no pain, 10.0% of them had mild pain, 10.0% of had moderate pain, 46.7% of them had severe pain and 30.0% of them had worst pain.

Distribution of pre-test and post-test level of pain among old age patients in Control group.

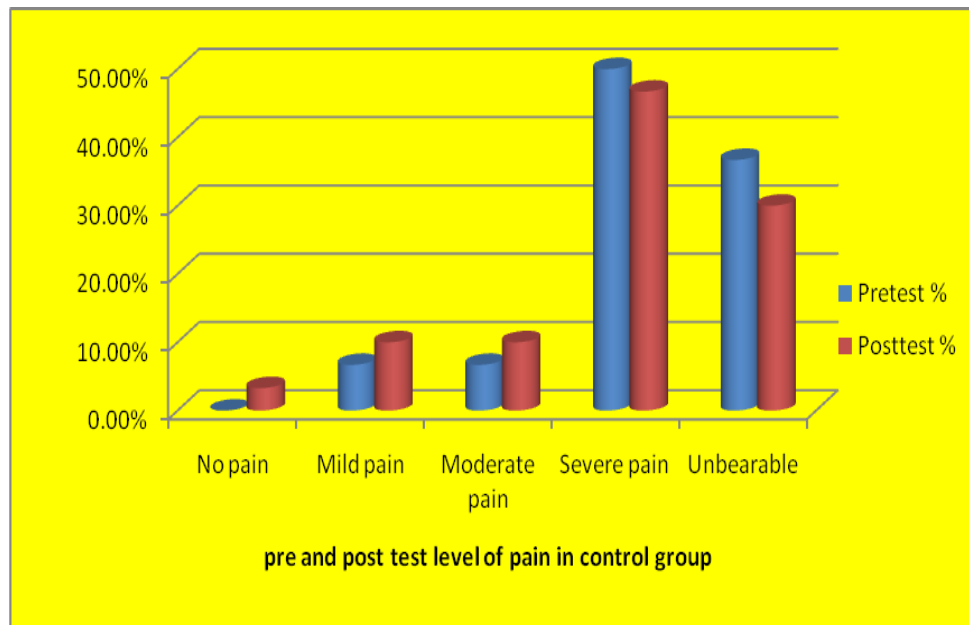


Figure 6 pre and post test level of pain score among control group

Table 3.3: MEAN, STANDARD DEVIATION AND “T”VALUE OF PRE AND POST-TEST LEVEL OF PAIN AMONG OLD AGE PATIENTS IN EXPERIMENTAL GROUP.

N= 30

	No. of patients	Group		Student independent t-test
		Experiment		
		Mean	SD	
Pre-test	30	7.77	1.81	t=10.95 p=0.001*** DF=29 significant
Post-test	30	2.26	0.73	

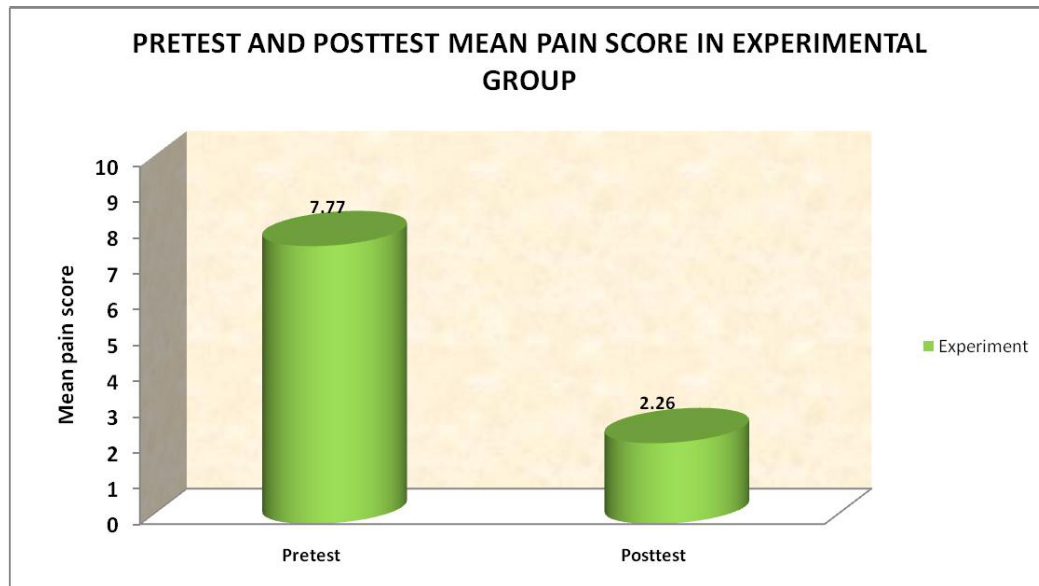
*Significant

Table 3.3 shows the pre and post test pain score among old age in experimental group.

In pretest Experiment group patients had 7.77 Mean pain score , and the standard deviation was 1.81, In posttest Experimental group patients had 2.26 mean pain score , and the standard deviation was 0.73, t value was 10.95, p= 0.001. This was statistically significant. It was confirmed using student independent t-test.

Hence the research hypothesis stated that, there was a significant difference between pre and post-test level of arthritis pain score among old age patients in experimental group at $p < 0.05$ level of significance. Hypothesis (H1) was accepted.

MEAN, STANDARD DEVIATION AND “T”VALUE OF PRE AND POST-TEST
LEVEL OF PAIN AMONG OLD AGE PATIENTS IN EXPERIMENTAL GROUP



**Figure 7 shows the pre and post test pain score among old age in experimental
group**

Table 3.4: MEAN, STANDARD DEVIATION AND “t”VALUE OF PRE AND POST-TEST LEVEL OF PAIN AMONG OLD AGE PATIENTS IN CONTROL GROUP

N=30

	No. of Patients	Group		Mean Difference	Student independent t-test
		Control			
		Mean	SD		
Pre-test	30	7.97	2.09	0.20	t=1.66 p=0.11 DF=29 Not significant
Post-test	30	7.26	1.10	5.00	

*–Non-Significant

Table 3.4 shows the pre and post test pain score among old age in control group.

In pretest Control group patients were having 7.97 Mean pain score , and the standard deviation was 2.09, In posttest Control group patients had 7.26 mean pain score , and the standard deviation was 1.10, t value was 1.66, p= 0.11. This was statistically not significant. It was confirmed using student independent t-test.

Hence the research hypothesis stated that, there was a significant difference between pre and post-test level of arthritis pain score among old age patients in Control group at $p < 0.05$ level of significance. Hypothesis (H2) was rejected.

MEAN, STANDARD DEVIATION AND “t”VALUE OF PRE AND POST-TEST
LEVEL OF PAIN AMONG OLD AGE PATIENTS IN CONTROL GROUP

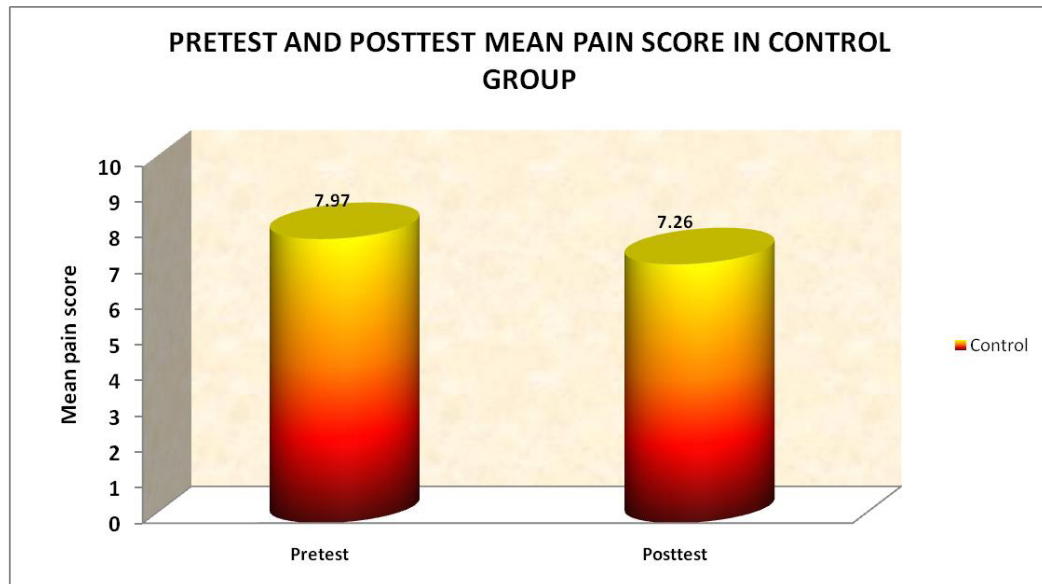


Figure 8 shows the pre and post test pain score among old age in Control group

Table : 3.5 Mean, standard deviation and“t” value of pre and post-test level of pain among old age patients in experimental and control group.

N=60

	No. of patients	Group				Mean Difference	Student's paired t-test
		Pre-test		Post-test			
		Mean	SD	Mean	SD		
Experiment	30	7.77	1.81	2.26	0.73	5.51	t=10.95 p=0.001*** DF=29 significant
Control	30	7.97	2.09	7.26	1.10	0.71	t=1.66 p=0.11 DF=29 Not significant

*Significant

Table 3.5 depicts the comparison of mean and standard deviation of the pre test and post - test level of pain among old age patients with Rheumatoid Arthritis joint pain between the experimental and control group.

In experiment group

In pretest, patients were having 7.77 pain score and in post test they had 2.26 pains score, so the difference was 5.51. This difference was statistically significant. It was confirmed using student paired t-test.

In control group

In pretest, patients had 7.97 pain score and in posttest they had 7.26 pains score, so the difference was 0.71. This difference was statistically not significant. It was confirmed using student paired t-test.

Hence the research hypothesis stated that, mean post test level of rheumatoid arthritis pain among old age in experimental group will be significantly lower than the mean post test level of pain among old age patients in control group. Hence (H3) was accepted.

Mean, standard deviation and “t” value of pre and post-test level of pain among old age patients in experimental and control group.

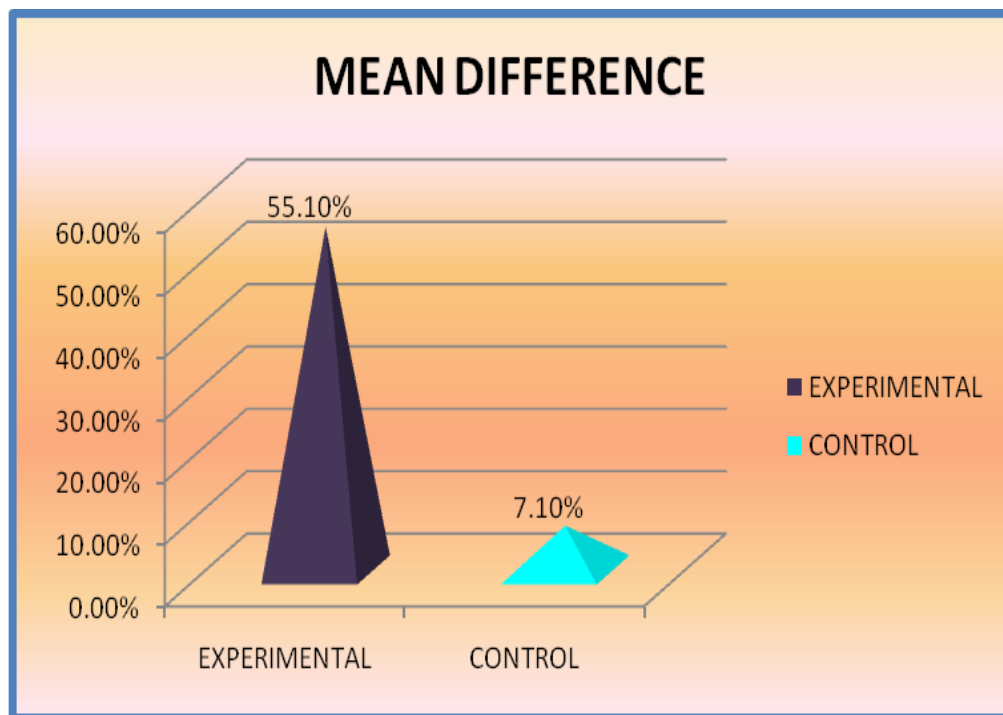


Figure 7 : mean difference value between experimental and control group

Section IV: DATA ON ASSOCIATION BETWEEN THE POST TEST LEVEL OF RHEUMATOID ARTHRITIS JOINT PAIN AMONG OLD AGE PATIENTS WITH THE SELECTED DEMOGRAPHIC VARIABLES IN EXPERIMENTAL AND CONTROL GROUP.

Table 4.1: Association of post-test level of rheumatoid arthritis joint pain among old age patients with their selected demographic variables in experimental group.

N=30

Demographic variables		Level of pain reduction				Total	Chi square test
		Below average(≤ 2.63)		Above average(> 2.63)			
		n	%	n	%		
Age	60 -65 years	1	12.5%	7	87.5%	8	$\chi^2=7.76$ $p=0.05^*$ DF=2 Significant
	66 -70 years	9	56.3%	7	43.7%	16	
	71 -75 years	3	75.0%	1	25.0%	4	
	76 -80 years	2	100.0%	0	0.0%	2	
Sex	Male	8	53.3%	7	46.7%	15	$\chi^2=0.13$ p=0.71
	Female	7	46.7%	8	53.3%	15	
Educational Status	Un-Educated	14	66.3%	7	33.3%	21	$\chi^2=7.90$ $p=0.05^*$ DF=2 Significant
	Primary Education	1	14.3%	6	85.7%	7	
	Secondary Education	0	0.0%	2	100.0%	2	
Occupation	Housewife/retired	14	53.8%	12	46.2%	26	$\chi^2=1.15$ p=0.28
	Self Employee	1	25.0%	3	75.0%	4	
Family Income Per Month	<Rs. 10000	10	55.6%	8	44.4%	18	$\chi^2=2.22$ p=0.53 DF=3 not significant
	Rs. 10001-15000	3	60.0%	2	40.0%	5	
	Rs. 15001-20000	1	50.0%	1	50.0%	2	
	Rs. >20000	1	25.0%	4	75.0%	5	
Religion	Hindu	15	100.0%	15	100.0%	30	$\chi^2=0.00$ p=1.00
Type of Diet	Vegetarian	1	6.7%	5	33.3%	6	$\chi^2=3.33$ p=0.07
	Mixed	14	93.3%	10	66.7%	24	
How long do you have rheumatoid arthritis joint pain?	1- 3months	0	0.0%	3	100.0%	3	$\chi^2=9.14$ $p=0.03^*$ DF=3 Significant
	3- 6months	0		4	100.0%	4	
	6month -1year	7	63.6%	4	36.4%	11	
	above 1year	8	66.7%	4	33.3%	12	
How long do you have taking treatment for rheumatoid arthritis joint pain?	1- 3months	1	16.7%	5	83.3%	6	$\chi^2=4.26$ $p=0.23$ DF=3 not significant
	3- 6months	1	33.3%	2	66.7%	3	
	6month -1year	9	60.0%	6	40.0%	15	
	above 1year	4	66.7%	2	33.3%	6	
Do you perform any exercise? if yes, what type of exercise?	Walking	2	20.0%	8	80.0%	10	$\chi^2=9.16$ $p=0.01^*$ DF=2 Significant
	Yoga	0	0.0%	2	100.0%	2	
	No	13	72.2%	5	27.8%	18	

Significant

Table 4.1 shows the association between pain reduction score and patients demographic variables. Elders ($\chi^2=7.76, p=0.05$), more educated ($\chi^2=7.90, p=0.05^*$), less duration of pain ($\chi^2=9.14, p=0.03^*$) and exercise ($\chi^2=9.16, p=0.01^*$) patients had more reduced pain than others. Statistical significance was calculated using chi square test. Hence the Hypothesis (H4) was accepted.

**Table 4.2: ASSOCIATION BETWEEN PAIN REDUCTION SCORE AND PATIENTS
DEMOGRAPHIC VARIABLES (Control group)**

Demographic variables		Level of pain reduction				Total	Chi square test
		Below average(≤ 0.37)		Above average(>0.37)			
		n	%	n	%		
Age	60 -65 years	8	57.1%	6	42.9%	14	$\chi^2=2.55$ p=0.46 DF=3 not significant
	66 -70 years	3	30.0%	7	70.0%	10	
	71 -75 years	2	66.7%	1	33.3%	3	
	76 -80 years	2	66.7%	1	33.3%	3	
Sex	Male	6	40.0%	9	60.0%	15	$\chi^2=1.20$ p=0.27 DF=1 not significant
	Female	9	60.0%	6	40.0%	15	
Educational Status	Un-Educated	7	43.8%	9	56.2%	16	$\chi^2=0.65$ p=0.73 DF=2 not significant
	Primary Education	6	60.0%	4	40.0%	10	
	Secondary Education	2	50.0%	2	50.0%	4	
Occupation	Housewife	14	51.8%	13	48.2%	27	$\chi^2=0.37$ p=0.54 DF=2 not significant
	Self Employee	1	33.3%	2	66.7%	3	
Family Income Per Month	<Rs. 10000	5	41.7%	7	58.3%	12	$\chi^2=0.64$ p=0.88 DF=3 not significant
	Rs. 10001-15000	3	60.0%	2	40.0%	5	
	Rs. 15001-20000	2	50.0%	2	50.0%	4	
	Rs. >20000	5	55.6%	4	44.4%	9	
Religion	Hindu						$\chi^2=0.00$ p=1.00 DF=1 not significant
		15	100.0%	15	100.0%	30	
Type of Diet	Vegetarian	6	40.0%	3	20.0%	9	$\chi^2=1.42$ p=0.23 DF=1 not significant
	Mixed	9	60.0%	12	80.0%	21	
How long do you have rheumatoid arthritis joint pain?	1- 3months	2	13.3%	3	20.0%	5	$\chi^2=11.80$ p=0.01 DF=3 not significant
	3- 6months	1	6.7%	6	40.0%	7	
	6month - 1year	1	6.7%	4	26.7%	5	
	above 1year	11	73.3%	2	13.3%	13	
How long do you have taking treatment for rheumatoid arthritis joint pain?	1- 3months	3	42.8%	4	57.2%	7	$\chi^2=8.03$ p=0.05 DF=3 not significant
	3- 6months	2	40.0%	3	60.0%	5	
	6month - 1year	3	33.3%	6	66.7%	9	
	above 1year	7	77.8%	2	22.2%	9	
Do you perform any exercise? f yes, what type of exercise?	Walking	3	60.0%	2	40.0%	5	$\chi^2=0.25$ p=0.88 DF=2 not significant
	Yoga	2	50.0%	2	50.0%	4	
	No	10	47.6%	11	52.4%	21	

The above table shows the association between demographic variables and pain score in control group. There was no significant relationship between these.

CHAPTER V

DISCUSSION

This chapter deals with the interpretation of results and discussion of findings. Old age clients were commonly affected with rheumatoid arthritis joint pain. Although there is no known cure for most forms of arthritis, treatment designed for individual patient can reduce/eliminate symptoms and limit functional impairment. The goals of contemporary management of arthritis extend beyond pain control to the enhancement of patients' functional status and health-related quality of life.

The main focus of this study was to assess the effectiveness of Hot water compress with Epsom salt among old age patients with rheumatoid arthritis joint pain admitted at Ortho ward in Arthroscopy, Spine Arthroscopic and Joint Replacement Centre in Coimbatore in selected Hospitals, Coimbatore. The research design adopted was an experimental pretest and post test control group design. The population was old age patients in the age group of 60-80 years with rheumatoid arthritis joint pain. The conceptual framework of this research was based on Modified Imogene king's Goal attainment theory model. The study adopted was simple random sampling technique and the estimated sample size was 60 old age Patients. Descriptive statistics were used to analyze the data and to test the study hypothesis.

Objective 1

The first objective was to assess the level of rheumatoid arthritis joint pain among old age patients rheumatoid arthritis in experimental and control group

Among 30 samples in the experimental group during pre test assessment, 4(13.3%) of old age patients experienced moderate pain, 18(60%) were experience severe pain, and 8 (26.7%) of patients experienced worst pain, in control group 0(0%) were experienced no pain, 2(6.7%) were experienced mild pain, 2(6.7%) moderate pain, 15(50%) of patients experienced severe pain and 11(36.6%) of clients experienced worst pain, where as in post assessment among experimental group 14(46.7%) of them were having no pain, 9(30.0%) of them were having mild pain, 7(23.3%) of were having moderate pain, none of them were having severe pain and worst pain. In posttest, among control , 3.3% of them were having no pain , 10.0% of

them were having mild pain, 10.0% of were having moderate pain, 46.7% of them were having severe pain and 30.0% of them were having worst pain

Objective 2:

To evaluate the effectiveness of hot water compress with Epsom salt in reducing rheumatoid arthritis joint pain among old age patients rheumatoid arthritis in experimental and control group.

This was done by post assessment of pain level by using the tool numerical pain rating scale. The findings of the data shows that in pre test among Experiment group patients had 7.77 pain score and control group patients had 7.97 pains score, so the difference was 0.20. This difference was statistically not significant. It was confirmed using student independent t-test. In posttest: Experiment group patients had 2.26 pain score and control group patients had 7.26 pains score, so the difference was 5.00. This difference was statistically significant. It was confirmed using student independent t-test.

The effectiveness of hot water application with Epsom salt

Among experiment , 55.1% of pain score reduction after hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis.

Among control , 7.1% of pain score reduction after routine treatment in reducing joint pain among old age patients with Rheumatoid arthritis . Differences between pretest and posttest score was analysed using percentage with 95% CI and mean difference with 95% CI.

This was also supported by a study was conducted by **Fioravanti A, Tenti S, Giannitti C, Fortunati NA, Galeazzi M. 2013 Jan 14.** a prospective randomized , single blind controlled trial to evaluate the effectiveness of Epsom salt compress in 60 outpatients with joint pain divided into two groups with experiment group (n = 30) treated with 12 daily generalized thermal baths with magnesium sulfate mineral water added to usual treatment and control group (n = 30) continued regular outpatient care routine (exercise, NSAIDs and/or analgesics) for a duration of three months the study results confirmed that Epsom salt compress had a beneficial effect in patients with Rheumatoid Arthritis Joint pain.

Objective 3

To determine the association between degree of Rheumatoid arthritis joint pain and selected demographic variables of old age rheumatoid arthritis in experimental and control group

The association between pain reduction score and patients demographic variables. The old age patients who had arthritis joint pain ($\chi^2=7.76, p=0.05$), those who were educated ($\chi^2=7.90, p=0.05^*$), those experiencing less duration of pain ($\chi^2=9.14, p=0.03^*$) and those following regular exercises ($\chi^2=9.16, p=0.01^*$) Though the number of patients were reduced but they had more pain than others. Statistical significance was calculated using chi square test.

The association between level of pain reduction and their demographic variables in control group. None of the demographic variables were significantly associated with level of reduced pain. Statistical significance was calculated using chi square test. Hence, the research hypothesis H4 was rejected

CHAPTER VI

SUMMARY AND CONCLUSION

This chapter deals with the summary of the study and the conclusions drawn. It clarifies the limitations of the study. The implications and recommendations were given for different areas of nursing such as practice, education, research and administration in the health care delivery system.

Summary of the study

Recently old age population was increasing in all families. The well-being of the family members depends on the well-being of the old age persons who was believed as the pillar of the family. Most of them were suffering from rheumatoid arthritis joint pain than other illness. The cause of this complex syndrome was unknown, and there was no known cure. Numerous research results indicate that non-pharmacological interventions were found to be effective in relieving the rheumatoid arthritis joint pain. Hence this study was undertaken to determine the effectiveness of hot water compress with Epsom salt in reducing the pain of the old age patients with rheumatoid arthritis joint pain.

The following objectives were set for the study:

- To assess the level of rheumatoid arthritis joint pain among old age patients in experimental and control group.
- To evaluate the effectiveness of hot water compress with Epsom salt in reducing rheumatoid arthritis pain among old age patients in experimental and control group.
- To determine the association between degree of Rheumatoid arthritis joint pain and selected demographic variables of old age patients in experimental and control group

The study was based on the assumption that

- Hot water compress with Epsom salt may reduce the intensity of pain perceived.

- Hot application relieves pain, inflammation and congestion.
- Epsom salt has analgesic properties.
- Epsom salt easy to avail low cost

The following hypotheses were formulated:

- H1: There will be a significant difference between the mean pre and post-test level of pain score among old age patients in experimental group.
- H2: There will be a significant difference between the mean pre and post -test level of pain score among old age patients in control group.
- H3: There will be a significant difference between the mean post-test level of pain score among old age patients in experimental and control group.
- H4: There will be a significant association between the post-test level of pain score among old age patients in with their selected demographic variables in experimental and control group.

The research design adopted for this study was quasi experimental pre test and post test design which mimics like true experimental design. It also provides great deal of efficiency. The sampling technique adopted by the investigator was simple random sampling method . A structured interview schedule was developed based on the questionnaire “Numerical pain rating scale”. Items on background data and screening form were developed by the investigator.

The Research Variables includes.

Independent variable Hot water compress with Epsom salt

Dependent variable pain perception score

Extensive review of literature, professional experience and experts’ guidance from the field of Medicine, orthopaedics, and nursing led the investigator to design the methodology, develop the tool for data collection and the protocol for administrating hot water compress with Epsom salt. The conceptual frame work developed for the study was based on the Imogene King’s Modified Goal attainment theory. Every week from Monday to Saturday, the data was collected. Formal permission was obtained from the Head of the department.

The objective of the study was explained to the Medical Officer and para medical staffs and the participants before starting the data collection to get their cooperation during data collection.

Hot water compress with Epsom salt was given for 20 minutes for ten consecutive days. Adequate privacy was provided during the procedure. The post assessment of pain perception was obtained at the end of the tenth day. The opinion questionnaire regarding the intervention was also tested at the end of the tenth day.

Descriptive statistics, (Viz-percentage distribution, mean, standard deviation) and inferential statistics (Viz-t' chi square and student paired t test) were used to analyze the data and to test hypotheses. The data were then interpreted and discussed based on the objectives of the study, hypotheses and relevant studies from literature reviewed.

Major findings of the study:

- Majority of the participants were in the age group between 60-70years (53.3% in experimental and 33.3% in control group)
- Both gender patients were participated in this study in equal distribution.
- Majority of the study subjects were un educated (70% In experimental and 53.4%in control group).
- Majority of the women patients participated in this study were house wife in both group, and males were retired persons.(86.7% in experimental and 90% in control)
- Majority of the patients income status was less than Rs10,000 in both group (Experimental-60%, Control-40%).
- All of the study participants were Hindus
- Majority of the patients in both group were having rheumatoid arthritis more than a year.(Experimental-40%, Control-43.3%)
- Majority of the patients who were having arthritis were taking treatment for the condition was between six months to one year (Experimental-50%, Control-30%).
- Majority of the participants in both group were not following any exercises (Experimental-60%, Control-70%)

The major objectives brought out the following findings,

- In the pretest level of pain score among experiment and control group of old age patients with rheumatoid arthritis pain. In pretest, among experiment, none of them had no pain and mild pain, 13.3% of were having moderate pain, 60% of them were having severe pain and 26.7% of them were having worst pain. In pretest, among control, none of them were having no pain , 6.7% of them were having mild pain, 6.7% of were having moderate pain, 50% of them were having severe pain and 36.7% of them were having worst pain
- In the posttest level of pain score among experiment and control group of old age patients with rheumatoid arthritis pain. In posttest, among experiment, 46.7% of them were having no pain, 30.0% of them were having mild pain, 23.3% of were having moderate pain, none of them were having severe pain and worst pain. In posttest, among control , 3.3% of them were having no pain , 10.0% of them were having mild pain, 10.0% of were having moderate pain, 46.7% of them were having severe pain and 30.0% of them were having worst pain
- In the pretest and posttest level of pain score among experiment group of old age patients with rheumatoid arthritis pain. In pretest, among experiment, none of them were having no pain and mild pain, 13.3% of were having moderate pain, 60% of them were having severe pain and 26.7% of them were having worst pain. In posttest, among experiment, 46.7% of them were having no pain, 30.0% of them were having mild pain, 23.3% of were having moderate pain, none of them were having severe pain and worst pain.
- **In pretest:** Experiment group patients were having 7.77 pain score and control group patients were having 7.97 pains score, so the difference was 0.20. This difference was statistically not significant. It was confirmed using student independent t-test.
- **In post test:** Experiment group patients were having 2.26 pain score and control group patients were having 7.26 pains score, so the difference was 5.00. This difference was statistically significant. It was confirmed using student independent t-test.

- **In experiment group:** In pretest, patients were having 7.77 pain score and in posttest they were having 2.26 pain score, so the difference was 5.51. This difference was statistically significant. It was confirmed using student paired t-test.
- **In control group:** In pretest, patients were having 7.97 pain score and in posttest they were having 7.26 pain score, so the difference was 0.71. This difference was statistically not significant. It was confirmed using student paired t-test.
- **The effectiveness of hot water application with Epsom salt**
- On an average, among experiment, 55.1% of pain score reduction after hot water application with Epsom salt in reducing joint pain among old age patients with Rheumatoid arthritis.
- On an average, among control, 7.1% of pain score reduction after routine treatment in reducing joint pain among old age patients with Rheumatoid arthritis.
- The association between pain reduction score and patients demographic variables. Elders ($\chi^2=7.76, p=0.05$), more educated ($\chi^2=7.90, p=0.05^*$), less duration of pain ($\chi^2=9.14, p=0.03^*$) and exercise ($\chi^2=9.16, p=0.01^*$) patients were reduced more pain than others. Statistical significance was calculated using chi square test.

CONCLUSIONS

The following conclusions were drawn from the study:

There was a significant difference in the mean pain perception score of the patients with rheumatoid arthritis joint pain before and after hot water compress with Epsom salt.

There was an association between the levels of pain perception of the patients with the selected demographic variables. Justification for undertaking this study was to relieve the clients from rheumatoid arthritis joint pain by hot water compress with Epsom salt and to determine its effectiveness, so that hot water compress with Epsom salt can be used in future for all the rheumatoid arthritis joint pain patients for health promotion.

IMPLICATIONS

Low cost treatment is an economic advent to developing countries like India. Home is a place of prevention; long term care and follow up, hence such preparations have to be taught to the old age with joint pain and their family members in order to practice and to benefit from the long standing effects in combating joint pain. Hence nurses have to realize their responsibility in creating the awareness regarding complimentary alternative medicine. The implication drawn from the present study was of vital concern to the health team including the professional nurse practitioners, nurse administrators, nurse educators and researchers.

IMPLICATIONS FOR NURSING PRACTICE

1. The findings of the study enlighten the fact that hot water compress with Epsom salt therapy can be used to reduce the pain perception of rheumatoid arthritis joint pain patients.
2. The study findings will help the nursing personnel to include that hot water compress with Epsom salt therapy as a nursing intervention in the management of rheumatoid arthritis joint pain.
3. A protocol steps on implementation of the that hot water compress with Epsom salt therapy can be developed and used in all nursing care setting.

IMPLICATION FOR NURSING EDUCATION

1. The study has proved that hot water compress with Epsom salt therapy has effect in reducing non-specific rheumatoid arthritis joint pain in the patients.
2. To practice this, nursing personnel need to have adequate knowledge, desirable attitude and skill regarding the hot water compress with Epsom salt therapy .

3. These findings would help nursing faculty to give importance for hot water compress with Epsom salt therapy as a nursing intervention in the management rheumatoid arthritis joint pain.
4. Motivate the nursing students to use this intervention in the management of these patients .

IMPLICATION FOR NURSING RESEARCH

There is a need for extensive and intensive research in this area.

1. One of the aims of Nursing research was to expand and broaden the scope of nursing; findings of this study will provide baseline data about the pain perception and the hot water compress with Epsom salt therapy implication . Hence it can be used for further studies in this area.
2. This study also brings about the fact that more studies need to be done at different settings which was culturally acceptable.

IMPLICATIONS FOR NURSING ADMINISTRATION

1. Nursing administrator should prepare a procedure manual and protocol regarding which can be used at the community setting and in the hospitals.
2. Clinical Nurses and Nurse Educators should be given an in-service education to update their knowledge regarding that hot water compress with Epsom salt therapy and its technique in reducing rheumatoid arthritis joint pain among old age patients.
3. periodic conference, seminar, symposium can be arranged for Nursing personnel regarding care of non-specific rheumatoid arthritis joint pain patients and the new findings regarding their care.

LIMITATIONS

- Small sample size may not be generalized to larger population with different level of literacy.

- Lack of follow up on the practice of the hot water applications with Epsom salt in their home care management.

RECOMMENDATIONS

1. Similar kind of study can be conducted for a larger group to generate the findings.
2. A longitudinal study can be conducted to assess the effect of hot water compress with Epsom salt therapy in reducing pain.
3. The same study can be conducted among different age group.
4. A comparison study can be done to determine the effect of hot water compress with Epsom salt therapy in different settings.
5. The study can be conducted by using other techniques of the hot water compress with Epsom salt that was Cold water compress with Epsom salt.
6. This study can be done as comparative study between cold and hot water compress with Epsom salt.
7. Similar kind of study can be conducted for patients who were having other orthopedic disorder.
8. The same study can be conducted by administering hot water compress with Epsom salt for a longer period.

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பிற்சேர்க்கை - II ஒப்புதல் படிவம்

மதிப்பிற்குரியோரே!

வணக்கம், திருமதி. ருத் பெனிட்டா என்ற நான் எல்லன் செவிலியர் கல்லூரியில், செவிலியர் பட்ட மேற்படிப்பு படித்துக்கொண்டிருக்கிறேன். நான் வயதானவர்களுக்கு ஏற்படும் ஆர்த்ரைட்டிஸ் மூட்டுவலியினை எப்சம் சால்ட் கலந்த வெந்நீர் ஒத்தடம் மூலம் குறைக்கும் முறை பற்றி ஆராய்ச்சி செய்யவுள்ளேன். இதற்காக நான் தங்களது முழு ஒத்துழைப்பை கேட்டுக்கொள்கிறேன். மேலும் இதனால் தங்களுக்கு எந்த ஒரு பாதிப்பும் ஏற்படாது என்பதை தெரிவித்துக் கொள்கிறேன்.

திரு./திருமதி. என்கின்ற நான் திருமதி. ருத் பெனிட்டா செவிலியர் அவர்களிடமிருந்து ஆர்த்ரைட்டிஸ் மூட்டுவலியினை எப்சம் சால்ட் கலந்த வெந்நீர் ஒத்தடம் மூலம் குறைக்கும் முறை பற்றி தெரிந்து கொண்டேன் எனவே நான் முழு மனதுடன் இந்த ஆராய்ச்சியில் ஈடுபட சம்மதிக்கிறேன்.

தங்கள் உண்மையுள்ள

இடம் :

நாள் :

STRUCTURED QUESTIONNAIRE

INSTRUCTIONS:

Please put a tick mark in the space provided in the side of each question which you feel as appropriate option. The response will be kept confidential

S. No :

Name of the Participant :

Address :

SECTION-A

DEMOGRAPHIC DATA

1. Age

- | | | | |
|----------------|--------------------------|---------------|--------------------------|
| a) 60-65 years | <input type="checkbox"/> | b) 66-70years | <input type="checkbox"/> |
| c) 71-75years | <input type="checkbox"/> | d) 76-80years | <input type="checkbox"/> |

2. Sex

- | | | | |
|---------|--------------------------|-----------|--------------------------|
| a) Male | <input type="checkbox"/> | b) Female | <input type="checkbox"/> |
|---------|--------------------------|-----------|--------------------------|

3. Education

- | | | | |
|----------------------|--------------------------|------------------------|--------------------------|
| a) Primary Education | <input type="checkbox"/> | b) Secondary Education | <input type="checkbox"/> |
| c) Higher Secondary | <input type="checkbox"/> | d) Diploma | <input type="checkbox"/> |
| e) Degree | <input type="checkbox"/> | f) Illiterate | <input type="checkbox"/> |

4. Occupation

- | | | | |
|------------------------|--------------------------|------------------------|--------------------------|
| a) Retried /House wife | <input type="checkbox"/> | b) Laborer | <input type="checkbox"/> |
| c) self employee | <input type="checkbox"/> | d) Government employee | <input type="checkbox"/> |

5. Monthly income:

- | | | | |
|-----------------------|----------------------|----------------------|----------------------|
| a) < Rs.10, 000 | <input type="text"/> | b) Rs. 10,000-15,000 | <input type="text"/> |
| c) Rs. 15,000- 20,000 | <input type="text"/> | d) >Rs. 20,000 | <input type="text"/> |

6. Religion

- | | | | |
|--------------|----------------------|-----------|----------------------|
| a) Hindu | <input type="text"/> | b) Muslim | <input type="text"/> |
| c) Christian | <input type="text"/> | d) Others | <input type="text"/> |

7. Type of Diet

- | | | | | | |
|---------------|----------------------|--------------------|----------------------|----------|----------------------|
| a) Vegetarian | <input type="text"/> | b) Non- Vegetarian | <input type="text"/> | c) Mixed | <input type="text"/> |
|---------------|----------------------|--------------------|----------------------|----------|----------------------|

8. How long have you been diagnosed with Rheumatoid Arthritis?

- | | | | |
|----------------|----------------------|----------------------|----------------------|
| a) < 6 months | <input type="text"/> | b) 6 months - 1 year | <input type="text"/> |
| c) 1 yr- 2 yrs | <input type="text"/> | d) > 2 yrs | <input type="text"/> |

9. How long have you been taking treatment for Rheumatoid Arthritis?

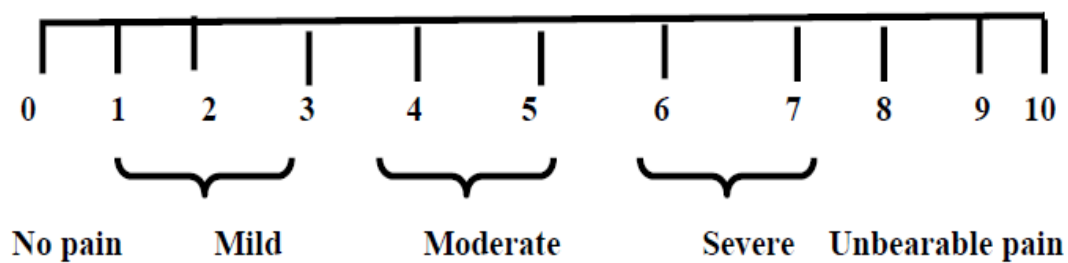
- | | | | |
|----------------|----------------------|----------------------|----------------------|
| a) < 6 months | <input type="text"/> | b) 6 months - 1 year | <input type="text"/> |
| c) 1 yr- 2 yrs | <input type="text"/> | d) > 2 yrs | <input type="text"/> |

10. Do you perform any exercise? If yes, what type of exercise?

- | | | | |
|------------|----------------------|-----------------------|----------------------|
| a) Walking | <input type="text"/> | b) breathing exercise | <input type="text"/> |
| c) Yoga | <input type="text"/> | d) No | <input type="text"/> |

SECTION B

PAIN NUMERICAL RATING SCALE



Description	Rater	score
No pain	0	0
Mild pain	1-3	1
Moderate pain	4-6	2
Severe	7-9	3
Un bearable pain	10	4

பகுதி-அ

விஞ்ஞான ரீதியானமக்களின்தகவல்

மாதிரிஎண்:

1) வயது

அ)60-65 வயது ஆ)66-70வயது

இ)71-75 வயது ஈ)76-80 வயது

2) பாலினம்

அ)ஆண் ஆ) பெண்

3)கல்விபடிப்பு

அ) ஆரம்பக்கல்வி

ஆ) உயர்கல்வி

இ) மேல்கல்வி

ஈ)பட்டயபடிப்பு

உ) பட்டபடிப்பு

) படிப்பறிவு இல்லாதவர்கள்

4)தொழில்

அ)இல்லத்தரசி/வேலைஇல்லை

ஆ) கூ லி வேலை

இ)சுயதொழில்

ஈ) அரசவேலையில்இருப்பவர்

5)மாதவருவாய்

அ) <ரூ. 10, 000 ஆ)ரூ. 10,000-15,000

இ)ரூ. 15,000- 20,000 ஈ)ரூ. > 20,000

6)சமயம்

அ)இந்து ☐ ஆ)இஸ்லாம் ☐

இ)கிறிஸ்துவர் ☐

7) உணவு முறை

அ) சைவம் ☐ ஆ) அசைவம் ☐

இ) இரண்டும் கலந்த உணவுமுறை ☐

8) உங்களின் வலி எவ்வளவு கால ம் உள்ளது

அ) < 6 மாதம் ☐ ஆ) 6 மாதம் - 1 வருடம் ☐

இ) $1 - 2$ வருடம் ☐ ஈ) > 2 வருடம் ☐

9) எத்தனை கால மாக வலிநிவாரண முறைகள்

அ) < 6 மாதம் ☐ ஆ) 6 மாதம் - 1 வருடம் ☐

இ) $1 - 2$ வருடம் ☐ ஈ) > 2 வருடம் ☐

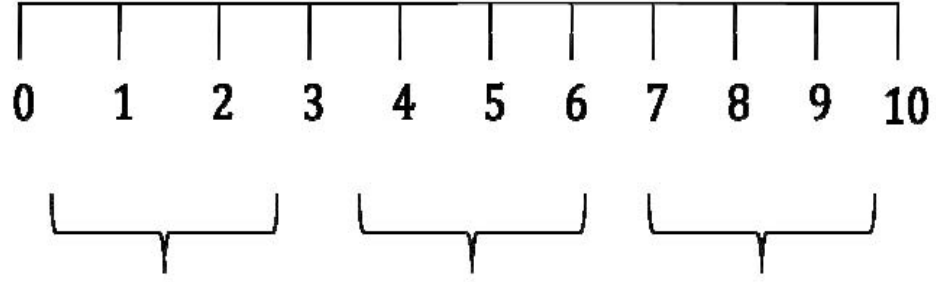
10) உடற்பயிற்சி செய்வீர்களா? ஆம் என்றால் எவ்வகை உடற்பயிற்சி செய்வீர்கள்

அ) யோகா ☐ ஆ) நடைபயிற்சி ☐

இ) ஆழ்ந்தகவாசபயிற்சி ☐ ஈ) இல்லை ☐

பகுதி - ஆ

எண்ணிக்கை வலி அளவு கோள்

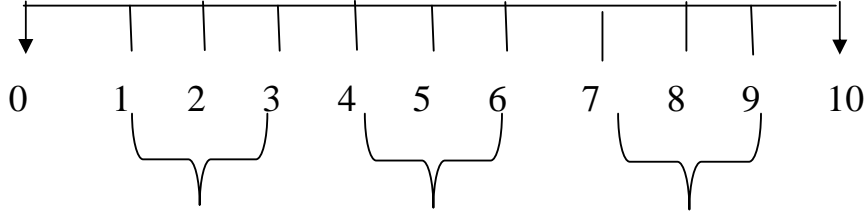


வலி இல்லை சிறிதளவு ஓரளவு அதிகமாக தாங்கமுடியாத வலி

விளக்கம்	அளவு	மதிப்பு
வலி இல்லை	0	0
சிறிதளவு வலி	1~3	1
ஓரளவு வலி	4~6	2
அதிகமாக	7~9	3
தாங்கமுடியாத வலி	10	4

பகுதி - ஆ

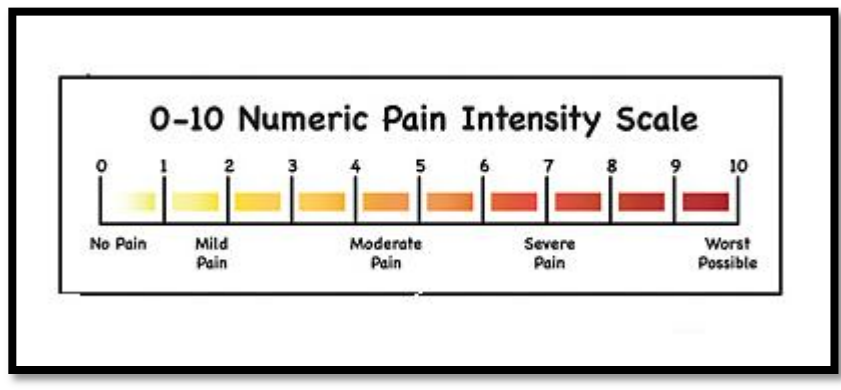
எண்ணிக்கைவலி அளவுகோள்



வலி இல்லை சிறிதளவு ஓரளவு அதிகமாக தாங்கமுடியாத வலி

விளக்கம்	அளவு	மதிப்பு
வலி இல்லை	0	0
சிறிதளவுவலி	1-3	1
ஓரளவுவலி	4-6	2
அதிகமாக	7-9	3
தாங்கமுடியாதவலி	10	4

Numerical Pain Rating Scale



Description	Rater	score
No pain	0	0
Mild pain	1-3	1
Moderate pain	4-6	2
Severe	7-9	3
Worst pain	10	4

பிற்சேர்க்கை - II ஒப்புதல் படிவம்

மதிப்பிற்குரியோரே!

வணக்கம், திருமதி. ருத் பெனிட்டா என்ற நான் எல்லன் செவிலியர் கல்லூரியில், செவிலியர் பட்ட மேற்படிப்பு படித்துக்கொண்டிருக்கிறேன். நான் வயதானவர்களுக்கு ஏற்படும் ஆர்த்ரைட்டிஸ் மூட்டுவலியினை எப்சம் சால்ட் கலந்த வெந்நீர் ஒத்தடம் மூலம் குறைக்கும் முறை பற்றி ஆராய்ச்சி செய்யவுள்ளேன். இதற்காக நான் தங்களது முழு ஒத்துழைப்பை கேட்டுக்கொள்கிறேன். மேலும் இதனால் தங்களுக்கு எந்த ஒரு பாதிப்பும் ஏற்படாது என்பதை தெரிவித்துக் கொள்கிறேன்.

திரு./திருமதி. என்கின்ற நான் திருமதி. ருத் பெனிட்டா செவிலியர் அவர்களிடமிருந்து ஆர்த்ரைட்டிஸ் மூட்டுவலியினை எப்சம் சால்ட் கலந்த வெந்நீர் ஒத்தடம் மூலம் குறைக்கும் முறை பற்றி தெரிந்து கொண்டேன் எனவே நான் முழு மனதுடன் இந்த ஆராய்ச்சியில் ஈடுபட சம்மதிக்கிறேன்.

தங்கள் உண்மையுள்ள

இடம் :

நாள் :