# EFFECTIVENESS OF HYDROTHERAPY ON PAIN AND FUNCTIONAL STATUS AMONG PATIENTS WITH RHEUMATOID ARTHRITIS

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## Abstract

A quasi experimental pretest and post test with control group design was adopted to assess the effectiveness of hydrotherapy in terms of reducing pain and improving functional status among patients with Rheumatoid arthritis in Madurai Arthritis and Rheumatism centre, Madurai,Tamilnadu. Quantitative approach was used to collect data. Purposive sampling technique was used to select 60 samples with Rheumatoid Arthritis of which 30 were in experimental and 30 were in control group. Experimental group received nursing intervention(hydrotherapy) for 30 minutes twice a week for 4 weeks and control group received only routine treatment. The data was organized and analyzed using both descriptive and inferential statistics. The mean post test pain score of experimental group was significantly ($t=11, P<0.05$) lower than the control group. The mean post test functional status score of experimental group was significantly ($t=11.8$, $P<0.05$) higher than the control group. There was a significant negative correlation between pain and functional status and a significant association found between the pretest pain and functional status score and selected demographic variable. Based on the findings it is recommended that hydrotherapy can be used for promoting well being of Rheumatoid Arthritis patients.

**Key words:** Effectiveness, Hydrotherapy, Pain, Functional status, Rheumatoid Arthritis.

## Introduction

Rheumatoid Arthritis is a form of an inflammatory arthritis and an autoimmune disease. It is a chronic progressive disease causing inflammation in the joints and resulting in painful deformity and immobility, especially in the fingers, wrists, feet, and ankles. The immune system which is designed to protect health by attacking foreign cells such as viruses and bacteria instead attacks the body's own tissues specifically the synovium, a thin membrane that lines the joints. As a result of the attack, fluid builds up in the joints, causing pain in the joints and inflammation that's systemic[1].It affects between 0.5 and 1% of adults in the developed world whereas 5 and 50 per 100,000 people newly developing the condition each year. In 2012 it resulted in about 49,000 deaths globally. Onset of Rheumatoid arthritis is uncommon under the age of 15 but the incidence rises with age until the age of 80. Women are affected three to five times as often as men[2].

Pain is the most common and

distressing symptom experienced by patients and often lowers their functional status. Functional status or the ability to carry out meaningful activities, is affected by pain intensity .So pain and functional status have the negative relationship with each other. Disease or illness will make the patients to decline in their functional status (daily activities) by experiencing severe pain. Rheumatoid Arthritis is one of the conditions which causes both the pain and problems in functional status[3] .

Hydrotherapy is an ancient practice and has been used throughout history as a general tonic and for treating many diseases.[10] Modern hydrotherapy is most often used for muscle and skeletal disorders, including osteoarthritis, joint pain associated with Rheumatoid Arthritis. Hydrotherapy showed significantly greater improvement in joint tenderness and in knee range of movement in patients with muscle and skeletal disorders.[4]

Hydrotherapy is frequently indicated for the treatment of patients with Rheumatoid Arthritis [7].The potential benefits of hydrotherapy for patients with rheumatoid arthritis are to improve and or maintain functional ability and quality of life. It has a positive role in reducing pain and improving the health status of patients with rheumatoid arthritis in the short term.[5]

## Objectives of the study:

1. To assess the;
   a) pre and post test level of pain among patients with rheumatoid arthritis in experimental group.
   b) pre and post test level functional status among patients with rheumatoid arthritis in experimental group;
   c) pre and post test level of pain among patients with Rheumatoid Arthritis in control group;
   d) pre and post test level of functional status among patients with rheumatoid arthritis in control group;
2. To find out the co-relation between pre test level of pain and functional status among patient with rheumatoid arthritis in experimental group .
3. To assess the effectiveness of hydrotherapy on pain and functional status among patient with rheumatoid arthritis in experimental group.
4. To find out association between pre test level of pain and functional status among patients with rheumatoid arthritis in experimental and control group with selected demographic variables such as age, sex, occupation, family income, type of the family, education, duration of illness, medication intake and other therapy.

## Materials and Methods

**Research approach:** Quantitative research approach.

**Research design:** Quasi experimental, pre-test and post- test with control group.

**Setting of the study:** Madurai Arthiritis and Rheumatism Centre, Madurai.

**Population:** Patients with rheumatoid arthritis who attended out- patient department.

**Sample size:** 60 (30 in experimental group and 30 in control group).

**Sampling technique:** Purposive sampling method was used to select 60 patients whose disability index is below three and divided into two groups randomly for the experimental group and the control group.

**Research tool and techniques**: The tool used for assessment had three parts such as

Part I : Demographic data

Part II : Health assessment questionnaire - disability index.

Part III : Numerical descriptive pain scale

Tool for experimentation- Hydrotherapy

**Content validity:** Content validity for both the tools were obtained from five experts in nursing and Rheumatology.

**Reliability:** The reliability of the numerical descriptive pain scale was established by inter rater method (r = 0.86). The reliability of the health assessment questionnaire-disability index was established by split-half method, (r = 0.83).

**Data collection procedure:** Permission was sought from the ethical committee and informed consent was sought from the patients prior to the data collection procedure. Confi - dentiality was maintained. Pretest was conducted by collecting the demographic data, the pain level and functional status level of patients in control group and experimental group were assessed.

Intervention was applied to the experimental group. Each sample underwent 30 minutes hydrotherapy that includes flexion and extension of knee joint, relaxation, flexion and extension of elbow and flexion and extension of fingers inside the warm water which was in 34 $^{0}$ C temperature twice for 4 weeks [6,8]. The control group was maintained by regular treatment practices, no hydrotherapy was used. After four weeks of continuous administration, the post-tests were done for the both the control and the experimental groups by assessing the pain and functional status level using numerical descriptive pain scale and health assessment questionnaire- disability index.

## Results

- ✓ Highest percentage (57%) in experimental group were in the age group of 36-50 years most of the patients in experimental group (73%) and 26% in control group were females majority of the patients in the experimental group (30%) and control group (37%) had higher secondary education. Most of patients in experimental group (90%) and majority (63%) in control group had no occupation. Among those who were working (97%) in the experimental group and (97%) in the control group were moderate workers. Highest percentage of patients in both experimenatl

group (47%) and most of the patients in the control group (77%) were residing in rural area. Further most of the experimental group (87%) and control group (93%) patients were from the nuclear families and had income more than Rs. 8000 per month.

- ✓ The level of pain after administration of hydrotherapy among patients with rheumatoid arthritis in experimental group was lower than the pain score before administration of hydrotherapy.
- ✓ The level of functional status after administration of hydrotherapy among patients with rheumatoid arthritis in experimental group was higher than the functional status score before administration of hydrotherapy.
- ✓ There was a significant negative co-relation between pre test level of pain and functional status among patients with Rheumatoid Arthritis.
- ✓ There was a significant association between pre-test pain and functional status and variable such as duration of disease.

There was a significant reduction in the intake of NSAIDs in experimental group.

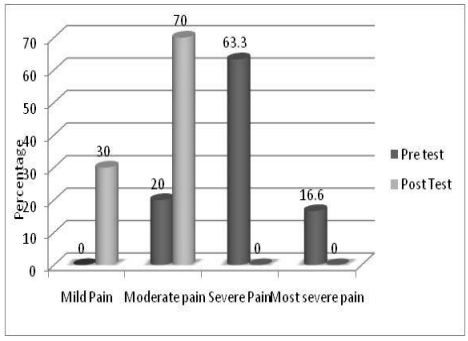


Figure No.1: Comparison of percentage of patients according to their severity of pain in experimental group

The distribution of subjects according to the level of pain score before interventions in experimental group was 20% with moderate pain,63.3% had severe pain and 16.6% had most severe pain, where as after administration of selected nursing interventions the pain score has been reduced, 30% had mild pain and 70% had moderate pain. This difference in experimental group might be related to the effect of treatment.

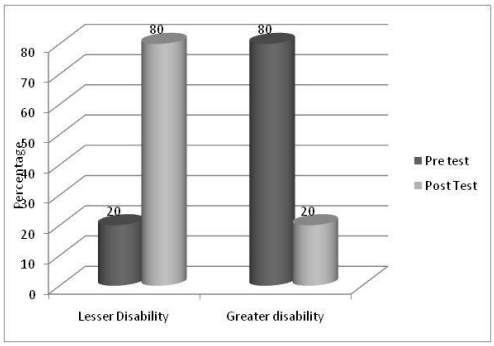


Figure No.1: Comparison of percentage of patients according to their severity of pain in experimental group

The distribution of functional status of sample according to the disability index score in the experimental group revealed 20% in experimental group had lesser disability score in pretest and three forth subjects (80%) were found to have only lesser disability and only 20% sample had greater disability score.

**Table No. 1: Comparison of pre test and post test mean pain scores and functional status scores of experimental group**

| Test | Pain | | | | Functional Status | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | MD | 't' value | Mean | SD | MD | 't' value |
| Pre test | 6.76 | 0.9 | 2.86 | 17.98* | 1.13 | 0.37 | 0.77 | 13.38* |
| Post test | 3.9 | 0.7 | | | 1.9 | 0.28 | | |

*Significant at 0.05 level

Mean post test pain score 3.9 indicate mild level of pain after administration of selected nursing intervention was lower than the mean pretest pain score 6.76 which was at moderate level. The obtained 't' value was 17.98, which was significant at 0.05 level. This indicates that the difference between the means 2.86 was a true difference and had not occurred by chance. The mean post test functional status 1.9 after administration of selected nursing intervention was higher than the mean pre test functional status 1.13. The obtained 't' value was 13.38, which was significant at 0.05 level. This indicates that the difference between the means 0.77 was a true difference and was not by chance. The difference between the two means was might be due to the effect of selected nursing intervention..

**Table No. 2: Comparison of post test mean pain scores and functional status scores of the experimental group with control group.**

| Group | Pain | | | | Functional Status | | | |
|---|---|---|---|---|---|---|---|---|
| | N | S.D | Mean | 't' value | N | S.D | Mean | 't' value |
| Experim-ental Group | 30 | 0.7 | 3.9 | 11* | 30 | 0.28 | 1.9 | 11.8* |
| Control Group | 30 | 0.8 | 6.1 | | 30 | 0.1 | 1.7 | |

*Significant at 0.05 level.

The mean post test level of pain score of the experimental group 3.9 indicates the mild level of pain after administration of selected nursing interventions that was lower than the mean post test level of pain score the control group 6.1 which was at moderate level. The obtained 't' value was 11, which was significant at 0.05 level.

This indicates the difference between the mean 2.2 was a true difference and not by chance. The mean post test level of functional status score of the experimental group 1.9 after administration of selected nursing interventions was higher than the mean post test level of functional status score the control group 1.3. The obtained 't' value was 11.8, which was significant at 0.05 level. This indicates the difference between the mean 0.6 was a true difference and not by chance. The difference between the two means was due to the effect of selected nursing interventions.

**Discussion and Conclusion**

The mean post test pain score was 3.9 indicates mild level of pain after administration of selected nursing interventions was lower than the mean pretest pain score (6.76) which was at moderate level of pain. The obtained 't' value was 17.98, which was significant at 0.05 level which indicates the difference between the pre and post test means (2.86) was a true difference and not occurred by chance. The difference between the two means was due to the effect of selected nursing interventions.

The mean post test functional status score was 1.9 after administration of selected nursing interventions that was higher than the mean pre test functional status (1.13).The obtained 't' value was 13.38, which was significant at 0.05 level. This indicates that the difference between the pre and post test means (0.77) was a true difference and not by chance. The difference between these two might be due to the effect of selected nursing interventions in the experimental group.

The following study supports this findings, Jane Hall,( 2005), conducted a randomized control trial on rheumatoid arthritis pain.139 patients with chronic rheumatoid arthritis were randomly assigned to hydrotherapy, flexion and extension, land exercise, or progressive relaxation. Patients attended 30-minute sessions twice weekly for 4 weeks. Physical and psychological measures were completed before and after intervention. All patients improved physically and emotionally, as assessed by the Arthritis Impact Measurement Scales 2 questionnaire. Findings revealed that with the use of hydrotherapy there was significant improvement in knee range of movement and greater reduction in pain by

that it improves the functional status. This study, therefore, provides some justification for the continued use of hydrotherapy. The administration of hydrotherapy found to be effective in reducing pain and improving functional status in patients with rheumatoid arthritis.

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