# A Quasi experimental study to assess the effectiveness of hot water application with Epsom salt and hot water application on joint pain among adults suffering from arthritis

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**Abstract -** Arthritis has a serious impact on people's life. Its one of the most important cause of disability. Most patients need to alter their activity patterns and life styles due to the aggravating pain. Epsom salts have well known benefits known from past hundred years. Epsom salt is rich in magnesium. Intake of Epsom salt provides the body with sufficient magnesium to combat the inflammation and lessen the swelling in the joints and reduction of joint pain. Researcher conducted a study to assess the effectiveness of hot water application with Epsom salt and hot water application on joint pain among adults suffering from arthritis in selected urban area of New Delhi. Aim of the study was to assess the pain level and to compare the effectiveness between hot water application with Epsom salt and hot water application on joint pain among adults with mild or moderate arthritis. 60 samples were included using purposive sampling technique in which 30 samples were selected for hot water application with Epsom salt and 30 samples were selected for hot water application. Tool used were Oxford Knee Score and Numeric Pain Rating. The data was analysed using SPSS IBM Version 21. Results revealed that both the treatment i.e. hot water application with Epsom salt (p=0.000) and hot water application (p=0.000) were effective in decreasing joint pain among adults suffering from arthritis however, the mean post test scores of experimental group 1 (1.60) is less than the mean post test scores of experimental group 2 (2.70) which shows that hot water application with Epsom salt is more effective in reducing joint pain. There was no significant association between the pre-test scores of both the groups with their Age, Gender, Duration of pain and practicing any modality to reduce pain. The study concludes that joint pain among adults suffering from arthritis can be reduced by both the treatment i.e. hot water application with Epsom salt and hot water application as they were effective in decreasing joint pain among adults suffering from arthritis.

**Index Term –** Effectiveness, Arthritis, Joint Pain, Hot Water Application, Epsom Salt

## I. Introduction

Aging is a physiological natural process. As people are become elder the functioning and tissues of the body starts declining and causes deformity and health issues. Arthritis is creating a serious health crisis that affects millions of people of all ages, genders, races and ethnic groups and it is growing. It is one of the leading cause of disability, Arthritis is progressive joint disease characterized by joint inflammation and a reparative bone response. Arthritis can seriously limit people's mobility – it prevents elderly from walking, difficult to climbing stairs, not able to perform activities of daily living that is bathing, getting dressed, preparing meals and living live to its fullest. Arthritis is a group of serious diseases that steals people's quality of life. Arthritis is a large and very complex family of diseases. No matter what type, it can cause damage in ways most people don't realize – physically, emotionally and financially.

There are more than 100 types of arthritis and related conditions. But the common thread is that they all attack joints and connective tissues, making everyday life challenging and often very difficult. Arthritis joint have many symptoms include swelling, pain, stiffness and decreased range of motion. Symptoms appears and disappears and it can be mild, moderate or severe. Arthritis affects 9.6% of men and 18% of women ages above 60 years or older and the condition will be fourth leading cause of disability by 2020. Arthritis in the aging population will generate a global avalanche of costs and disability.

Epsom salt, named for a bitter saline spring at Epsom in Survey, England, is not actually salt but a naturally occurring pure mineral compound of magnesium and sulphate. The main components of Epsom salt are magnesium and sulphate which play important role due to their unique healing properties. Long known as a natural remedy for a number of ailments, Epsom salt has numerous health benefits. It's not the same as Dead Sea salt, a blend of minerals found only in the Dead Sea in the Middle East. The water and light there supposedly help in skin diseases, arthritis, and other health problems.

Scientist have learned that the best way to get magnesium into the body is typically through the skin. Application of hot water with Epsom salt is the oldest home remedy for arthritis pain. Epsom salt can be a part of your daily routine and can add a whole lot of goodness in your way of life.

## II. MATERIALS AND METHODS

The study was conducted on 60 adults selected using Oxford Knee Score who were suffering from mild or moderate arthritis having knee joint pain through purposive sampling technique residing in selected urban area of New Delhi. 30 adults were given hot water application (experimental group 1) and 30 adults were given hot water application with Epsom salt (experimental group 2). The subjects were explained regarding purpose of the study and were assured of confidentiality of data collected. The demographic data and pre assessment of pain score of the subjects were assessed using Numeric Pain Rating Scale. Hot water application with Epsom salt was prepared by adding 200 grams of Epsom salt to 20 litres of Hot water (The temperature of the Hot water was as tolerated by the client, 45-50 degree Celsius), and immersing the affected knee joint for 20 minutes, thrice in a week (alternate days). After 7 days of intervention post assessment of pain perception of the subjects were assessed using Numeric Pain Rating Scale.

## III. RESULT AND DISCUSSION

The present study pointed on effectiveness of Epsom salt on reduction of joint pain and association of demographic variables of adults suffering from arthritis with knee joint pain in a selected urban area of New Delhi. The present study depicts in experimental group 1, the data revealed that in pre- test, majority of 18 (60%) had moderate pain, 7 (23.33%) had mild pain and only 5 (16.67%) had severe pain. Whereas in post-test majority 16 (53.33%) had no pain, 11 (36.67%) had mild pain and 3 (10%) had moderate pain. In experimental group 2, the Data revealed that in pre- test, majority of 15 (50%) had moderate pain, 12 (40%) had mild pain and only 3 (10%) had severe pain. Whereas in post -test majority 13 (43.33%) had moderate pain, 9 (30%) had no pain, and 7(23.33%) had mild pain and 1 (3.33%) had severe pain.

The mean pre-test pain score 4.77 ±1.870 and in post-test mean pain score 1.06 ± 2.207 so the mean difference was 3.17 ±1.206. On computing paired t test the value of t (14.384) was significant at 0.05 level of significance suggesting the effectiveness of hot water application with Epsom salt among adults suffering from arthritis in experimental group 1. The mean pre-test pain score 4.50 and in post-test mean pain score 2.70 so the mean difference was 1.8 ± 1.349. On computing paired t test the value of t (7.307) was significant at 0.05 level of significance suggesting the effectiveness of hot water application among adults suffering from arthritis in experimental group 2.

The mean post-test pain score of experimental group 1 (1.60 ±2.207) and mean post-test pain score of experimental group 2, (2.70 ±2.246) was found to be statistically Not-significant. On computing unpaired t test the Value of t (1.914) was Not-significant at 0.05 level of significance suggesting that hot water application with Epsom salt and hot water application were both equally effective in

reducing joint pain among adults suffering from arthritis. Hot water application with Epsom salt was slightly more effective than hot water application.

On applying Fisher's exact test in experimental group 1, p value for Age, Gender, Duration of pain, practicing any modalities to reduce pain was computed. In all cases p>0.05, Age (0.972), Gender (1.000), Duration of pain (0.760) and Practicing any modalities to reduce pain (0.985) which denotes that there is no significant association between pre-test scores of level of pain and selected demographic variables at 0.05 level of significance.

On applying Fisher's exact test in experimental group 2, p value for Age, Gender, Duration of pain, practicing any modalities to reduce pain was computed. In all cases p>0.05, Age (0.495), Gender (0.574), Duration of pain (0.933) and Practicing any modalities to reduce pain (0.808) which denotes that there is no significant association between pre- test scores of level of pain and selected demographic variables at 0.05 level of significance.

The same significant finding was reported by Anitha R, Madhavi S, Thennavan AS, a study to assess the effectiveness of Epsom salt fomentation on knee joint pain, knee swelling and activities of daily living among elderly. It was one group pre-test post-test experimental design with 30 samples. Results reveals with significant improvement (p<0.01) in pain, swelling and activities of daily living after 5 days of therapy.

The present study depicts that both the treatment i.e., hot water application with Epsom salt and hot water application both are effective in reducing knee joint pain.

**Table 1 : mean, standard deviation, mean difference and "t" value of pain score in pre test and post test in experimental group 1**

| **Test** | **Mean** | **$M_D$** | **SD** | **$S.E_{MD}$** | **Paired "t" scores** | **'p' value** |
|---|---|---|---|---|---|---|
| **Pre test** | 4.77 | 3.17 | 1.870 | 0.220 | 14.384 | 0.000* |
| **Post test** | 1.60 | | 2.207 | | | |

**Table 2 : mean, standard deviation, mean difference and "t" value of pain score in pre test and post test in experimental group 2**

| **Test** | **Mean** | **$M_D$** | **SD** | **$S.E_{MD}$** | **Paired "t" Scores** | **'p' Value** |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| **Pre test** | 4.50 | 1.8 | 1.907 | 0.246 | 7.307 | 0.000* |
| **Post test** | 2.7 | | 2.246 | | | |

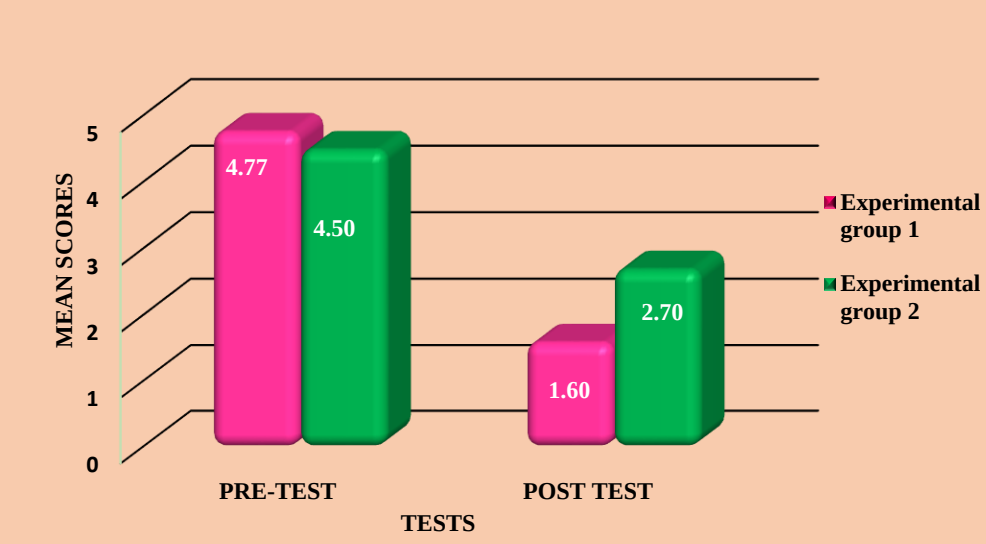


Figure 1: A column diagram showing mean pre test and post test pain scores in experimental group 1 and experimental group 2

## IV. CONCLUSION

The study was conducted on Adults suffering from arthritis having knee joint pain in selected urban area of New Delhi. There is a significant reduction in the pain score after the application of hot water application with Epsom salt which indicates that hot water application with Epsom salt was effective in reducing the joint pain among adults suffering from arthritis.

There is a significant reduction in pain score in both groups, indicating that both the treatments were effective in reducing joint pain. Hot water application with Epsom salt was more effective than hot water application.

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