

Effectiveness of Epsom Salt with Hot Water Application on Knee Joint Pain among Elderly in a Selected Rural Area at Puducherry

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ABSTRACT

Osteoarthritis (OA) is a disease of cartilage degradation, which results pain in major joints, especially in knee joint. Globally, OA ranks eighth in all diseases and covers around 15% proportions among all musculoskeletal problems.

Background: Osteoarthritis is a disease of the cartilage which leads to degradation and results in pain in the major joints, especially in the knee joints. Knee joint pain is the most frequent complaint among the geriatric population. The objectives of this study were to assess the level of pain in knee joint among elderly, to evaluate the effectiveness of hot water application with Epsom salt on knee joint pain among elderly, and to find out the association between the level of pain in knee joint and selected demographic variables.

Materials and methods: A preexperimental research design was adopted for this study. This study was conducted among elderly aged above 60 years residing in T.N. Palayam. In total, 29 samples of elderly aged above 60 years residing in T.N. Palayam were selected based on the purposive sampling technique. The demographic data were collected from the elderly and then the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) oestoeoarthritis rating scale was used to assess the degree of pain.

Results: The result revealed that out of 29 samples, pretest mean score level of pain was 2.93 with the standard deviation of 0.593, whereas after implementation of Epsom salt with hot water application, the posttest mean pain score was 2.17 with the standard deviation of 0.384. The effectiveness was statistically tested by paired *t* test which was found to be highly statistically significant at *p* less than 0.001.

Keywords: Elderly, Epsom salt, Hot water application, Knee pain, Osteoarthritis.

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INTRODUCTION

Aging is a natural process of living organisms.¹ Commonest health problem among elderly population is a musculoskeletal pain based on the health surveys undertaken in both developed and developing countries. Knee and low back pain are the most frequent complaints among the elderly population.² Knee joint pain is more common among elderly than back pain.³

Elderly people are troubled with chronic knee joint pain caused by OA. Its prevalence increases with age and generally affects female than male.¹ It affects the majority of the elderly and contributes major ill effect on health and their quality of life.⁴

Osteoarthritis is a disorder of cartilage which leads to degradation of joint and inflammation of the synovial membrane. It acts as a cushion-like structure present in-between the joints and bones and prevents the rubbing of each other. Synovial fluid acts as a lubricant of the joints which is secreted from the synovial membrane.

The signs and symptoms of OA may include stiffness, crepitus, swelling, bony tenderness, and limp. A person may experience instability of the joint in case of advanced condition. Osteoarthritis affects every aspect of an individual's day-to-day activities and quality of life. Pain in the knee joint is the primary reason for access treatment.⁵

The primary type of OA is most commonly caused by aging process.^{6,7} The second most common rheumatologic problem is OA and also most frequent joint disease with the prevalence rate of 22–39% in India.^{6,8} The prevalence rate increases with aging process.^{6,7,9} Nearly 45 and 70% of the women have the symptoms and radiological evidences of pathology.^{7,9,10} It is one of the major causes of mobility impairment among females.

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Osteoarthritic management should be comprehensive and individualized. Management plan should be reviewed regularly which is based on nonpharmacological and pharmacological measures. People residing in rural area prefer nonpharmacological treatment plan which include exercise, hot application, cold application, oil massage, yoga, electrical heat application, and use of naturopathy.¹¹ Several complementary therapies may play an important role in the management of joint pain. Epsom salt is a natural mineral. Magnesium and sulfates are absorbed through the skin and into the body, where these two compounds have many vital functions. Epsom salt has been used for joint pain relief.¹²

Need for the Study

According to World Health Organization (WHO), 18.0% of women and 9.6% of men over the age of 60 years have symptomatic OA worldwide. They have limitations in movement around 80% of

those with OA, and 25% of them cannot perform their major daily day-to-day activities of life.¹³

There is a difference in the prevalence rate of symptomatic knee OA and the radiographic finding of knee OA.^{14,15} Symptomatic OA is most relevant for public health purposes because the symptoms such as pain, stiffness, and swelling cause nuisance to the affected individuals.¹⁶

Adam Ramsay (2014), is a nutritional therapist, says at Margaret Hills Clinic regarding the Epsom salt compress which helps patients with arthritis, Epsom salts, which are high in magnesium, can help to relieve joint pain. Dissolve three teacups of Epsom salts mixed with hot water then soak a clean cloth into hot water and make a compress, apply the compress to the affected knee joint area for 10–15 minutes and slowly exercising the joints and muscles this will help to relieve the joint pain.¹²

In India, among OA patients, nearly 80% of the population had knee joint pain, out of which approximately 20% reported incapacities in daily activities and around 11% need peculiar care.^{17,18} Approximately 40% of the population had OA above the age group of 70 years, in which nearly 2% have severe knee pain and disability.^{19,20}

In a study, 43.4% of elderly had a complaint of joint pain and stiffness problem.^{20–22} In total, 80% of the population with radiographic evidence of OA were estimated but only 60% revealed symptomatically. This prevalence for female vs male was 62:38.²³ A cross-sectional study was conducted in Kanchipuram District, Tamil Nadu, and the study report revealed 18.6% elderly with knee joint pain.^{13,24} A study conducted in rural area of Tamil Nadu showed 39% cases of OA, out of which 35.5% had left knee joint pain and 38% had right knee joint pain. The gender distribution of prevalence rate for male and female was 40.8–59.2%, respectively.^{22,25}

Epsom salt, is the magnesium sulfate mineral, has been found to help alleviate pain.^{13,20,26,27} Additionally, soaking in an Epsom salt and Epsom salt compress helps to pull toxins from the body, which enhances the healing process.^{28–31} Many old-age people are suffering from knee joint pain, which will affect their quality of life.^{32,33} Epsom salt contains high level of sulfate and magnesium and is low cost, easily available, and have more health benefits, so I have selected this topic.

Objectives

- To assess the level of pain in knee joint among elderly.
- To determine the effectiveness of hot water with Epsom salt application on knee joint pain among elderly.
- To find out the association between the level of pain in knee joint and selected demographic variables.

Hypotheses

- H1: Knee joint pain among elderly people differs before and after application of hot water with Epsom salt.
- H2: There is a significant association between level of pain and selected demographic variables.

MATERIALS AND METHODS

A quantitative research approach and preexperimental research design was adopted in this study. The population of this study was elderly residing in T.N. Palayam of Puducherry. A purposive sampling technique was used to select 29 samples based on the

inclusion and exclusion criteria. The inclusion criteria include both male and female with the age above 60 years and those who were willing to participate in the study. The researcher obtained formal permission and informed consent from the study participants. The demographic variables were collected using interview schedule. The purposes of the study were explained to all the samples. Pretest assessment of level of pain was done using Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) OA rating scale and then Epsom salts (30 g) added with hot water applied to the knee joint for 10 days. The posttest assessment of level of pain was done using WOMAC OA rating scale after 10 days.

RESULTS

Majority of the samples (18, 62.1%) belong to the age group of 60–65 years and 80% of them were female, 16 (55.2%) were housewife, and majority of the sample (22, 75.9%) were earning <Rs. 10,000. All 29 (100%) samples were Hindus, not taking any treatment for joint pain and not doing any exercises. A total of 14 (48.3%) were taking mixed diet and were sedentary worker, and 12 (41.4%) elderly had pain for 1–2 years.

Majority of the samples, 80% of them were female and 62.1% belong to the age group of 60–65 years. The similar findings reported in WHO reports (2010) worldwide state that OA affects 9.6% of men and 18% of women aged above 60 years.

Figure 1 shows the distribution of level of pain among elderly with knee joint pain during pretest and posttest. In pretest, out of 29 samples, 20.7% of elderly had mild level of pain, 65.6% of elderly had moderate level of pain, and 13.8% of elderly had severe level of pain. In posttest, 82.8% of elderly had mild level of pain, and 17.2% of elderly had moderate level of pain after application of Epsom salt with hot water application. This shows that hot water application with Epsom salt was effective in reducing knee joint pain.

Majority of the samples had moderate-to-severe (65.6%) level of pain before the intervention. The similar finding reported in WHO (2013) report in India is likely to notice an endemic OA with 80% of them above 65 years population suffering from wear and tear of joints. Of these people, 40% are likely to suffer from severe OA, which will disable from daily activities.

Table 1 reveals a comparison of pretest and posttest mean levels of pain in elderly. Pretest mean score level of pain was 2.93 with the standard deviation of 0.593, whereas after implementation of

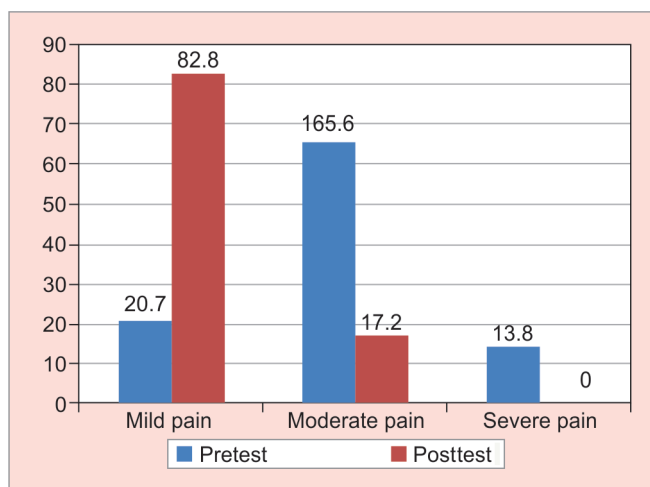


Fig. 1: Distribution of level of pain among elderly with knee joint pain during pretest and posttest

Table 1: Comparison of pretest and posttest mean levels of pain in elderly

Observation	Mean pain level	Standard deviation	Mean difference	t value	p value
Pretest	2.93	0.593	0.539	7.085	0.000
Posttest	2.17	0.384			

Epsom salt with hot water application, the posttest mean pain score was 2.17 with the standard deviation of 0.384. The effectiveness was statistically tested by paired *t* test which was found to be highly statistically significant at $p < 0.001$. It indicates that Epsom salt with hot water application was effective in reduction of knee joint pain. Hence, the stated hypothesis H1 was accepted.

The study finding was supported by the study conducted by Shilpa Parag Satralkar and Basvant Dhudum to assess the effectiveness of application of warm compress with Epsom salt to reduce knee joint pain among women. The nonprobability purposive sampling technique was used, and 60 samples were selected, in which 30 samples were Epsom salt application group and 30 samples were control group. In the experimental group, hot water application with Epsom salt was done with 200 mg of Epsom salt mixed in hot water, and the painful joints were bathed with hot water for 20 minutes thrice a week. The result revealed that posttest level of pain in the control group was $p = 8.1$ and in the experimental group $p = 1.03$, which indicates warm Epsom salt application was highly effective in reduction of knee joint pain in arthritis patient.²⁶

In association, there is no significant association between level of pain and demographic variables like age, gender, occupation, income, diet, type of work, duration of pain, treatment for joint pain, and performance of exercise. H2 was rejected.

IMPLICATIONS

The finding of this study clearly pointed out that hot water application with Epsom salt is effective in reducing the intensity of knee joint pain among elderly people. The community health nurses have a very important role in reducing pain and promoting comfort. This can be facilitated by encouraging the utilization of this technique as a nonpharmacological therapy among rural elderly people. This is cost-effective, easily available, and has more medicinal value.

LIMITATION

It is difficult to obtain consent from the elderly.

RECOMMENDATIONS

- The study can be replicated with a large sample for better generalization.
- More studies can be conducted on reduction of intensity of knee joint pain among elderly people using different complementary and alternative modalities to establish a rightful place in elderly care.
- Studies can be done to assess the knowledge, attitude, and practice of nurse on complementary and alternative therapies for knee joint pain management.
- Comparison can be done to evaluate the effectiveness of other nursing interventions such as hydrotherapy and ice application.

CONCLUSION

The main conclusion of this study was hot water application with Epsom salt was effective in reducing knee joint pain among elderly.

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