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Evaluate the Effectiveness of Hot Water with Epsom Salt Application to Reduce Knee Pain Among Osteoarthritis Women in Selected Rural Areas at Kolhapur

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Abstract: ***Background**: Osteoarthritis (OA) is a degenerative joint disease and a leading cause of disability worldwide, especially among women above the age of 45. Knee OA causes chronic pain, reduced mobility, and significant impact on daily living activities. While pharmacological treatments are common, there is growing interest in simple, accessible, and non-pharmacological interventions like Epsom salt therapy. **Objective**: To evaluate the effectiveness of hot water with Epsom salt application in reducing knee pain among osteoarthritis-affected women in rural Kolhapur. **Methods**: A quasi-experimental, non-equivalent control group pretest-posttest design was used. Sixty participants were divided into experimental and control groups. The experimental group received hot water with Epsom salt therapy for 20 minutes daily over 7 days. The control group received no intervention. Pain levels were measured using a modified numerical pain rating scale. Socio-demographic data were collected to explore associations with pain outcomes. **Results**: The post-intervention pain score was significantly lower in the experimental group compared to the control group. The calculated t-value (3.11) was greater than the tabulated value (2.00), confirming statistical significance. Chi-square tests showed significant associations between pain score changes and variables such as age and menopause. **Conclusion**: Epsom salt therapy was found to be an effective, low-cost, non-invasive intervention to reduce knee pain in osteoarthritis patients. Its use is especially suitable for resource-limited rural settings.*

Keywords: Osteoarthritis, Knee Pain, Epsom Salt, Hydrotherapy, Women's Health, Rural Health

1. Introduction

Osteoarthritis is one of the most prevalent musculoskeletal disorders globally, affecting both men and women, with a higher prevalence in women. It commonly affects weight-bearing joints such as the knees. Symptoms include joint stiffness, swelling, reduced mobility, and persistent pain, all of which severely affect quality of life [1].

OA progresses with age and is influenced by obesity, sedentary lifestyle, and postmenopausal changes. Standard treatment often includes NSAIDs, physiotherapy, and in severe cases, joint replacement surgery. However, integrative treatments such as hydrotherapy and natural pain relief methods are gaining acceptance due to their minimal side effects and accessibility [2].

Epsom salt, or magnesium sulfate, is widely used in integrative medicine for its muscle-relaxing and pain-relieving properties. When dissolved in hot water, it promotes vasodilation and muscle relaxation, reducing joint stiffness and discomfort [3].

2. Objectives

1) To assess pre-intervention knee pain scores in both experimental and control groups.
2) To evaluate the effectiveness of hot water with Epsom salt in reducing knee pain in the experimental group.
3) To compare post-intervention pain scores in both experimental and control groups.
4) To examine associations between socio-demographic variables and knee pain levels.

3. Methodology

This quasi-experimental study was conducted among 60 women diagnosed with osteoarthritis in selected rural areas of Kolhapur. Participants were selected using a convenient sampling method and divided into two groups of 30 each. The experimental group received Epsom salt therapy for 7 consecutive days, involving immersion of the affected knee in hot water mixed with Epsom salt for 20 minutes. The control group received no such intervention.

Data Collection Tools Included:
- A structured socio-demographic questionnaire
- A modified numerical pain rating scale (0–10)
- Pre- and post-intervention assessments

Reliability: Cronbach's alpha = 0.816

Analysis: Paired t-tests and chi-square tests were used for data analysis.

4. Results

The findings revealed that the mean difference in knee pain score post-intervention was 0.53 in favor of the experimental group. The t-test analysis confirmed a statistically significant reduction in pain ($t = 3.11$, $p < 0.05$).

Chi-square tests identified significant associations between pain scores and:
- Age ($\chi^2 = 18.307$, χ^2_{tab} = 11.071)
- Age at menopause ($\chi^2 = 15.334$, χ^2_{tab} = 12.592)

This indicates that older age and menopausal status may influence the effectiveness of Epsom salt therapy in knee pain reduction.

5. Interpretation and Conclusion

The present study demonstrated the positive impact of a simple intervention—hot water with Epsom salt—in managing knee pain due to osteoarthritis. Participants reported noticeable pain relief, improved mobility, and comfort.

Given its affordability and ease of application, this method can be recommended as a supportive intervention in rural healthcare settings. It reduces reliance on medications and empowers individuals to manage chronic conditions naturally.

Future studies may explore its long-term benefits, optimal duration of therapy, and integration with physiotherapy for enhanced outcomes.

6. Conceptual Framework

This study is based on **Ernestine Wiedenbach's Helping Art of Clinical Nursing Theory (1964)**, which includes the following elements:

1) **Identification of Need for Help:** Osteoarthritis women experiencing knee pain were identified through socio-demographic and health history assessment.
2) **Ministration of Help Needed:** The intervention (hot water with Epsom salt) was administered to provide relief.
3) **Validation:** Reduction in knee pain was measured using a modified numerical rating scale after intervention.
4) **Feedback Loop:** The findings contributed to evidence-based nursing practices and further improvements in patient care.

This theory emphasizes purposeful nursing actions based on the needs of the patient, promoting individualized and effective clinical interventions.

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Conflict of Interest
The author declares no conflict of interest.

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