

Isometric Exercise Intervention for Mrs. E with Uric Acid-Induced Pain Above Normal: A Case Study

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Abstract: Elevated uric acid levels, also known as hyperuricemia, is a metabolic condition caused by the accumulation of monosodium urate monohydrate crystals in the joints. This condition often leads to painful gout attacks, characterized by excruciating pain that is recurrent and can cause joint damage over time. The presence of uric acid crystals contributes to inflammation and pain by interacting with phospholipid membranes and serum factors. Pain management for hyperuricemia can involve both pharmacological and non-pharmacological treatments, with one such non-pharmacological approach being isometric exercise. This study aims to analyze family nursing care for a patient with elevated uric acid levels above normal and the effect of isometric exercise in reducing joint pain in Cikondang Village, Tanjung Kemuning, within the working area of UPT Public Health Center Tarogong, Garut Regency. A descriptive case study method was used, which included anamnesis, observation, physical examination, and medical record review. The case study showed that chronic pain, the primary nursing problem in this patient with elevated uric acid levels, was effectively managed through isometric exercise. This was evidenced by a reduction in the patient's pain score from moderate pain (4) to mild pain (1). The isometric exercise intervention significantly reduced joint pain in the patient with elevated uric acid levels.

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Introduction

Hyperuricemia, the condition of elevated uric acid levels in the blood, has long been recognized as a precursor to gout arthritis, a debilitating and painful form of arthritis. This condition occurs when excess uric acid forms sharp crystals that deposit in the joints, leading to intense inflammation, swelling, and severe pain, particularly in the lower extremities such as the feet and toes. While gout is often associated with middle-aged men, women, particularly after menopause, are also increasingly affected by this condition. Beyond the physical pain, hyperuricemia and gout severely impact the quality of life, causing disruptions in daily activities, mobility, and sleep patterns (Jin et al., 2012; Zhang, 2021). Consequently,

managing this condition requires an integrated approach that includes both pharmacological and non-pharmacological interventions aimed at controlling pain, reducing uric acid levels, and improving the patient's functional status (Engel et al., 2017; Rogenmoser & Arnold, 2018; Shekelle PG, FitzGerald J, Newberry SJ, 2016; Yadav et al., 2022).

While pharmacological treatments such as urate-lowering therapy and pain relievers are commonly used, recent evidence highlights the value of non-pharmacological approaches, including lifestyle modifications, dietary adjustments, physical therapy, and patient education. The involvement of the patient's family has also been recognized as an essential component in enhancing the overall effectiveness of

treatment. Family members play a crucial role in implementing the care plan at home, ensuring adherence to dietary recommendations, and assisting with activities that improve the patient's physical and emotional well-being (Latif et al., 2019; Lin et al., 2024; Ministry of Health Malaysia et al., 2021).

This case study explores the nursing care provided to Ny. E M, a 49-year-old woman diagnosed with elevated uric acid levels in Cikondang Village, Tanjung Kamuning, within the jurisdiction of the Tarogong Health Center. The study specifically focuses on evidence-based nursing interventions designed to address the primary concerns of chronic pain, disturbed sleep patterns, and ineffective health maintenance due to hyperuricemia. The aim of this article is to examine the effectiveness of these interventions and evaluate how family participation can contribute to the management of this chronic condition.

Method

The study was conducted over four days, from June 13th to June 16th, 2024. The nursing interventions implemented during this period were individualized based on a comprehensive assessment of Ny. E's condition and the family's involvement in her care. A detailed initial assessment was conducted, including interviews with the patient and family members, physical examinations, and a head-to-toe assessment of all family members. The data were categorized into subjective (patient-reported symptoms) and objective (clinical observations and family input) findings, which informed the development of nursing diagnoses and care plans. The primary nursing diagnoses identified were chronic pain, disrupted sleep patterns, and ineffective health maintenance. Each diagnosis guided the implementation of nursing interventions, which were evaluated daily for their effectiveness.

Result and Discussion

At the time of the initial assessment, Ny. E reported chronic pain in her right foot joint, which she described as sharp and intermittent. She rated her pain intensity as 4 on a scale from 0 to 10. This pain was most pronounced at night, disrupting her sleep and reducing her overall comfort. The physical examination revealed signs of joint swelling, redness, and warmth, consistent with the symptoms of gout arthritis. Sleep disturbances were reported as significant, with Ny. E waking up multiple times during the night due to pain. Additionally, Ny. E expressed limited understanding of how to manage her condition, indicating a lack of knowledge regarding dietary restrictions and lifestyle modifications.

Based on these findings, the primary nursing diagnosis was *Chronic Pain related to elevated uric acid levels*, with secondary diagnoses of *Disturbed Sleep Patterns* and *Ineffective Health Maintenance* due to insufficient knowledge about managing hyperuricemia. The pain reduction progress over the three days explained below.

Day 1 (June 13, 2024): Upon initial assessment, Ny. E reported a pain intensity level of 4/10 in her right foot joint. The pain was described as sharp, like being pricked by needles, and accompanied by a feeling of stiffness. This pain was most intense at night, which negatively affected her sleep and comfort. To address the pain, interventions such as warm compresses and isometric exercises were introduced, alongside basic education on pain management.

Day 2 (June 14, 2024): On the second day of nursing intervention, Ny. E reported a slight reduction in pain intensity, with the scale decreasing to 3/10. The family followed the recommended interventions, including warm compresses applied to the painful joint and daily practice of isometric exercises. These interventions seemed to have a positive effect, as the patient noted a reduction in the sharpness of the pain. Additionally, she reported improved sleep quality, although occasional waking due to discomfort still occurred. The family was educated further about dietary changes to help reduce uric acid levels, which could help in long-term pain management.

Day 3 (June 16, 2024): By the third day, Ny. E's pain intensity had decreased significantly to 1/10. The pain was now more of a dull ache rather than sharp, and it was less frequent. The patient also reported an improvement in her overall sleep quality, with fewer interruptions during the night. The family's understanding of the condition had improved, and they felt more confident in managing Ny. E's health at home. The combination of isometric exercises, warm compresses, and better sleep hygiene seemed to have had a positive impact on her condition. The patient's ability to engage in daily activities was also improved, as she experienced less discomfort and was able to move more freely.

The reduction in pain intensity from 4/10 to 1/10 over the three-day intervention period indicates the effectiveness of the nursing interventions provided. The pain relief observed can be attributed to several key factors:

1. **Warm Compresses:** The application of warm compresses helped to alleviate the pain by increasing blood flow to the affected area and relaxing the muscles and joints. This intervention provided immediate relief, particularly in the acute stages of pain (Hartoyo,

2023; Nopriani & Fadila, 2018; Refina et al., 2023).

2. **Isometric Exercises:** These exercises, which involve muscle contraction without joint movement, were effective in reducing pain and improving joint stability. They help to strengthen the muscles around the affected joint, which can reduce the overall strain on the joint and decrease the intensity of pain caused by elevated uric acid levels (Alsouhibani, 2019; Geneen et al., 2014; Kellis & Blazevich, 2022).
3. **Improved Sleep Quality:** As the pain decreased, Ny. E experienced better sleep, which is crucial for overall pain management. Sleep deprivation can exacerbate pain perception, so improving sleep hygiene and addressing discomfort was key in enhancing the patient's quality of life (Alsouhibani, 2019; Geneen et al., 2014; Kellis & Blazevich, 2022; Nijs et al., 2018).

Conclusion

The reduction in pain intensity over the course of the three-day intervention demonstrates the importance of a comprehensive, multidisciplinary approach to managing elevated uric acid levels. Non-pharmacological interventions, along with family involvement and education, can significantly improve the patient's comfort and quality of life, even in a short time frame. The positive outcomes observed in this case underscore the value of evidence-based nursing interventions in managing chronic conditions like hyperuricemia.

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