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Nursing Process Based on Johnson's Behavioral System Model in Clients with Osteoarthritis

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Abstract

Introduction: Osteoarthritis is a non-inflammatory joint disease that causes pain and disability, impaired mobility, function, and balance. Nurses should use a systematic and coherent model to care for these patients. Nurses can provide necessary services to chronic patients using the theories that form the basis of nursing science. The aim of this study is to apply a care program based on Johnson's behavioral system model in a patient with osteoarthritis.

Case Presentation: The research method used in this study is a case study. In this study, the research population was all patients with osteoarthritis who referred to educational and treatment centers in Hamadan province in 2024. One client with osteoarthritis was selected through purposive sampling based on the inclusion criteria. The client was examined using the Johnson Behavioral System Model survey form. The data collection method was observation and interview. After the examination, the patient's unstable behaviors in the subsystems were identified, and with the nursing measures of the Johnson model, the nurse took care of the patient and then evaluated him.

The results of our study showed that the client had unstable behavior in the subsystems of achievement, aggression and protection, avoidance, absorption, sexuality, and reserve. After 2 months of implementing nursing measures based on Johnson's behavioral system model, we witnessed the elimination or reduction of the patient's unstable behaviors.

Discussion and Conclusion: Based on the results of this study, it can be concluded that in patients with osteoarthritis, we can eliminate and reduce the patient's unstable behaviors with the help of Johnson's behavioral system model. Since the goal of Johnson's behavioral system model is to create a balance between the patient and the environment by the nurse in order to bring the patient to the desired level of performance and improve the patient's quality of life, it can be hoped that nurses will achieve improved standards of care and increased patient satisfaction and quality of life by using this model.

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Introduction

Osteoarthritis is a non-inflammatory joint disease that occurs in movable joints due to the degradation of articular cartilage, accompanied by new bone formation at the surface and margins of the affected joints. It is a significant cause of disability in a large population of adults (1). The knee is a common site for osteoarthritis, and the clinical symptoms of knee osteoarthritis include decreased balance, reduced performance, pain, muscle weakness, decreased range of motion, and joint instability (2). The severity of arthritis varies among individuals; some may develop it earlier or experience it more severely, while others may experience it to a lesser extent. Factors such as excess weight and specific physical activities can accelerate this process (3).

This musculoskeletal disorder often affects the elderly and is a major cause of pain and disability, leading to impairments in mobility, function, and balance (4). The disease process involves not only the articular cartilage but also the joint structure, including subchondral bone, joint capsule, synovial membrane, and surrounding muscles. Thinning of the articular cartilage may lead to changes in the subchondral bone, including cyst formation and bone spurs (5). There are numerous risk factors for the development of arthritis, including joint dysplasia, avascular necrosis of the femoral head, malunion, bone fractures, cartilage injury from trauma, obesity, mechanical factors, calcium deposition diseases, and joint infections (6). Knee osteoarthritis causes pain, decreased muscle strength, and joint stiffness, leading to limitations in physical activities and a reduced quality of life (7). Currently, there is no definitive treatment for osteoarthritis, and healthcare providers strive to slow the progression of the disease and assist patients in maximizing their abilities in life. If the complications arising from the disease and the limitations leading to disability in these patients are reduced, they can lead dynamic lives free from burdens. Today, strategies for disease management are implemented through pharmacological, non-pharmacological, and surgical approaches, each with its own effects and side effects (8).

Given that osteoarthritis is a chronic disease, nurses caring for these patients should utilize a systematic and coherent framework. Nurses can provide necessary services to chronic patients using theories and concepts that form the foundation of nursing science. When nursing actions and care stem from nursing science, we can hope for patient recovery and improved health outcomes (9). The application of nursing theories at the bedside can create an environment for nurses to think and make decisions, allowing them to analyze conditions and issues and implement the best care plans for patients (10, 11). Utilizing nursing theories can streamline the nursing process, enhancing the quality of care and improving patients' quality of life (12, 13). One nursing model that is effective for chronic patients is Johnson's Behavioral System Model. In this behavioral model, the human being is seen as a system composed of interrelated components, each with its own specific boundary. Johnson views the primary goal of nursing as creating balance within the individual and believes that nursing interventions should focus on behavioral changes. According to Johnson, a person is a behavioral system made up of a collection of subsystems. Any stress or impact on one of the subsystems directly affects the other systems, manifesting in some way. Based on Johnson's perspective, a person is a behavioral system composed of eight sub-behavioral subsystems: the attachment subsystem, the protective-attack subsystem, the dependency subsystem, the eliminative subsystem, the absorptive subsystem, the energy conservation subsystem, the achievement subsystem, and the sexual subsystem (14, 13). Unfortunately, the care and treatment processes for patients with osteoarthritis have received less attention in nursing research, despite these patients needing a comprehensive nursing care program due to the chronic nature of their disease. Therefore, this study aims to implement a nursing process based on Johnson's Behavioral System Model for client suffering from osteoarthritis.

Case Presentation

The research method used in this study is a case study. The research population consisted of all patients with osteoarthritis visiting educational and therapeutic centers in Hamadan province in the year 2024. One client with osteoarthritis was selected through purposive sampling based on specific inclusion criteria. The inclusion criteria included: having at least a primary education, being over twenty years old, having a minimum of six months since diagnosis, client not being in an acute stage of the disease, and not having other physical or mental illnesses based on the individual's medical history.

Initially, the researcher carried out the assessment and understanding phase, which included two stages: In the first stage, the nurse identified systems that had lost or were at risk of losing their adaptability through observation, interviews, and measurements. In this stage, behaviors that caused stability and instability in the patient were specified in each subsystem. In the second stage, the disrupted systems were examined more closely to determine the causes of the problems. Following that, nursing diagnoses were established based on the identified unstable behaviors, and information was collected using semi-structured interviews and field observations of the client. To verify

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the accuracy and robustness of the qualitative data obtained from the client interview, interviews were also conducted with the nurses. To enhance the transferability of the data, all research processes and activities conducted during the study were clearly and accurately documented, allowing others to track the research path and the characteristics of the individual studied. After the nursing diagnoses and goals were established, nursing interventions and evaluations were implemented. The patient was assured of the confidentiality of the information, and the researcher avoided mentioning the name of the individual studied, adhering to honesty and integrity. This study received an ethics code number IR.UMSHA.REC.1403.698 from Hamadan University of Medical Sciences.

The client is a fifty-eight-year-old woman weighing 92 kilograms, client holds a master's degree and works as an employee in the education sector. She is married and has three children, two daughters aged 32 and 35, and a son aged 26. She has been experiencing knee pain for eight years, which has gradually worsened. After consulting a specialist and undergoing MRI and other paraclinical procedures, she was diagnosed with osteoarthritis. Following her diagnosis, client visited several physiotherapy centers for rehabilitation, but after each course of physiotherapy, her joint and bone pain returned along with her mobility limitations shortly thereafter. Regarding the client's anatomical and physiological deviations, it can be noted that she limps due to knee pain while walking, and her knees are swollen. The patient has gained weight due to her inability to exercise and lack of adequate physical activity, with her weight increasing from 75 kilograms to 92 kilograms over the past year. Additionally, the client has become isolated and withdrawn; client reports that at social gatherings, she cannot stretch her legs, which is considered inappropriate, so she tries to avoid gatherings, in the past two years, as her condition has worsened, she has limited her contact with relatives, including her parents, except for her children. In relation to the patient's expectations and behaviors concerning her social role, it can be said that she was a school principal and an active, dynamic person. However, following her osteoarthritis diagnosis, she stepped back from management and took a clerical position in an education department. During conversations, she only refers to her capabilities and vitality during her management period, believing that she is experiencing burnout in her current job, as it does not align with her energetic, active, and creative personality. The patient's subsystems were examined, and her stable and unstable behaviors in each system were identified (Table 1).

Nursing diagnoses based on the unstable behaviors identified in the previous stage, along with goals, interventions, and evaluations, are presented as follows:

1. Nursing Diagnosis: Impaired social interactions related to changes in physical status

Goal: The client will demonstrate the ability to communicate and use appropriate social behaviors in her interactions.

Interventions: The nurse's actions in this diagnosis included Defend, Facilitate, and Inhibit:

- The client's fears regarding attending gatherings with relatives and the community were identified; and client expressed a fear of being seen as incompetent and pitiful by others, the client was encouraged to speak freely and confidently with her close ones.
- The client's daughters, who played a significant role in caring for their mother, were asked to discuss the reality of the client's condition with their relatives.
- The client was encouraged to focus on the present moment and the positive feelings associated with being with her relatives, avoiding thoughts that distanced her from them.
- The client's abilities to care for herself were emphasized, and the focus was placed on her strengths.
- The client was advised to take control of her environment and not let it control her.

Evaluation: After two months, the client reported that she was able to communicate with her family members, including her parents, and they understood client issues without expressing pity, instead offering support.

2. Nursing Diagnosis: Grief related to current physical condition and changes in occupational role

Goal: The client will have an appropriate understanding of her role in light of the changes in her physical condition.

Interventions: The nurse's actions in this diagnosis were of the Inhibit type:

- The client's self-confidence was assessed, in counseling with client, it was discussed that her current job requires as much dynamism and activity as her previous position, if the client can utilize her abilities in this role, it will contribute to organizational growth and foster a sense of usefulness and vitality within her.
- The client's abilities and capabilities were evaluated, and by focusing on her strengths, client was encouraged to remain active in her current job.

Evaluation: After two months, the client reported feeling good about her job, and her efforts led to recognition and rewards from the organization.

3. Nursing Diagnosis: Disturbed sleep pattern related to inappropriate sleep habits

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Goal: The client will sleep at least seven hours each night.

Interventions: was facilitate

- The client was advised to take a half-hour nap after returning from work to reduce fatigue.
- The client was asked to change her sleep schedule to between 11 PM and 6 AM.

Evaluation: The client reported that her nighttime sleep had increased to seven to eight hours and that she felt less fatigued during the day.

4. Nursing Diagnosis: Constipation due to inactivity

Goal: The client will have a bowel movement at least once a day.

Interventions: was facilitate and inhibit

- Since the client has knee pain and is unable to walk, she was advised to increase her fluid intake during the day.
- It was recommended that half of her food intake consist of vegetables and to reduce the consumption of fried foods.

Evaluation: The client reported having bowel movements one to three times a day.

5. Nursing Diagnosis: Risk for falls related to imbalance and pain while walking

Goal: The client will maintain her balance while walking.

Interventions: Was defend and facilitate:

- Since the client was reluctant to be seen using a walker, was advised from client to use it when at home with her children and to ask for help from family members when others were present.
- The client was encouraged to perform leg-strengthening exercises under the supervision of a trainer at a gym.
- The client was advised to take her medications regularly as prescribed by her specialist and to engage in water therapy to reduce pain and increase her range of motion.

Evaluation: After two months, the client reported using the walker for walking and did not experience issues with balance or falling, additionally, client pain level while walking decreased from an eight to a five.

6. Nursing Diagnosis: The client is obese due to inactivity.

Goal: The client's body mass index (BMI) will reach below 25.

Interventions: Was facilitate, restrict, and inhibit.

The client was informed that this excess weight would accelerate the progression of his osteoarthritis, client was advised to reduce his weight under the supervision of a nutritionist until he could walk without pain.

Evaluation: The client, under the supervision of the specialist, was able to lose six kilograms in two months solely through dietary changes.

7- Nursing Diagnosis: Impaired sexual activity due to the reluctance of the client and her spouse.

Goal: The issues related to sexual communication will be expressed by the client and her spouse.

Interventions: Was facilitate and inhibit:

The client was encouraged to discuss her sexual needs with her spouse and seek assistance from a counselor or psychologist to address their issues.

Evaluation: After two months, the client reported that after discussions with the psychologist and her spouse, many of her sexual relationship issues with her spouse had been resolved.

Discussion and Conclusion

This study examined the application of the nursing process based on Johnson's Behavioral System Model in a client with osteoarthritis. As noted in the literature, Johnson's Behavioral System Model provides a conceptual framework for nursing practices (15, 16). Our study results indicated that the client exhibited unstable behaviors in the subsystems of achievement, aggression and protection, elimination, absorption, sexual, and storage. After two months of implementing nursing interventions based on Johnson's Behavioral System Model, we observed a reduction or resolution of the client's unstable behaviors. In a study by Paymani et al. (2020), the researchers explored the nursing process based on Johnson's Behavioral System Model in a client with multiple sclerosis, finding that the patient exhibited unstable behaviors in four behavioral subsystems (inefficiency in aggression and protection, elimination, storage, and sexual), after implementing the designed nursing interventions, the unstable behaviors decreased (17), similarly, in a study by Abadian and Adib (2023), researchers examined the nursing process based on Johnson's Behavioral System Model in a patient with diabetes, showing that the client exhibited unstable behaviors in four behavioral subsystems (inefficiency in aggression and protection, absorption, storage, and sexual), and after the designed nursing interventions, the unstable behaviors decreased (18). In the study by Aşkar and Ovayolu (2022), the researchers applied Johnson's Behavioral System Model in a patient with coronary artery disease (CAD), and the results indicated that this model could correct and modify unstable behaviors in the patient's subsystems, leading to stable behaviors and improved quality of life (19). Additionally, in the study by Kardaş Kin Ö (2018), the impact of Johnson's Behavioral System Model on a patient with chronic obstructive pulmonary disease (COPD) was analyzed, revealing that this model effectively improved the patient's physical condition and established stable behaviors (20). In summary, it can be concluded that Johnson's Behavioral System

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Model is effectively applicable in chronic diseases that can reduce the patient's quality of life, and the results of these studies align with our findings on chronic osteoarthritis. Further research on other chronic physical and mental illnesses with larger sample sizes is recommended.

Based on the results of this study, it can be concluded that in patients with osteoarthritis, unstable behaviors can be addressed and reduced with the help of Johnson's Behavioral System Model. Since the goal of this model is to create a balance between the patient and the environment through nursing interventions to achieve optimal functioning and improve the patient's quality of life, it is hoped that nurses employing this model will enhance care standards and increase patient satisfaction and quality of life.

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References:

1. Sinusas K. Osteoarthritis: diagnosis and treatment. Am Fam Physician 2012;85:49-56.

2. Lund H, Weile U, Christensen R, Rostock B, Downey A, Bartels EM, et al. A randomized controlled trial of aquatic and land-based exercise in patients with knee osteoarthritis.

J Rehabil Med 2008;40:137-44.

3. Sansone M, Ahlden M, Jonasson P, Thomeé C, Swärd L, Collin D, et al.Outcome of hip arthroscopy in patients with mild to moderate osteoarthritis-A prospective study. J Hip

Preserv Surg 2015;3:61-7.

4. Blagojevic M, Jincs C, Jeffery A, Jordan KP. Risk factors for onset of osteoarthritis of the knee in older adults: A systematic review and meta-analysis. Osteoarthritis Cartilage 2010;18:24-33.

5. Valdes AM, Spector TD. The contribution of genes to osteoarthritis. Med Clin North Am 2009;93:45-66.

6. Dieppe P. Developments in osteoarthritis. Rheumatology (Oxford) 2011;50:245-7.

7. Seeman TE, Merkin SS, Crimmins EM, Karlamangla AS. Disability trends among older Americans: National health and nutrition examination surveys, 1988-1994 and 1999-2004. Am J Public Health 2010;100:100-7.

8. Harle P, Fleck M. Treatment of osteoarthritis with drugs and other modalities. Internist (Berl) 2008;49:1458-62.

9. Ashketorab T, Pazokian M. Nurses and PhD stu-dent's Perspective of Barriers Orem self care Appli-cation: Content analysis. Journal of Medical Educa-tion Development. 2012;4(7):10-7.

10. Khodaei A, Mansourain M, Ganjei S, Asgari H. Strategies for decreasing gap between theory & clin-ical performance from the viewpoints of nursing stu-dents in tabriz university of medical sciences. Re-search in Medical Education. 2016;8(2):49-59.

11. Karimi, S., Derakhshan, M., & Tondro, A. (2024). The effect of aquatherapy on pain intensity and performance in patients with osteoarthritis. Journal of family medicine and primary care, 13(5), 1793–1796.

12. Sadeghnezhad Forotaghe M, Vanaki Z, Memarian R. The effect of nursing care plan based on "Roy Adaptation model" on psychological adaptation in patients with diabetes type II. Evidence Based Care.2011;1(1):5-20.

13. Reynolds W, Cormack DF. An evaluation of the Johnson Behavioural System Model of Nursing. J Adv Nurs. 1991 Sep;16(9):1122-30.

14. Fruehwirth S. E. (1989). An application of Johnson's behavioral model: a case study. Journal of community health nursing, 6(2), 61–71.

15. Smith, M. J., Liehr, P. R., & Carpenter, R. D. (Eds.). (2023). Middle range theory for nursing. Springer Publishing Company.

16. Velioğlu P. Concepts and theories in nursing. Istanbul: Academy Press;2012.

17. Payamani F, Cheraghi F, Borzou S R, Hojjatoleslami S, Khatiban M. Nursing process based on Johnson's Behavioral System Model in Patients with Multiple Sclerosis: Case Report. 3 JNE 2020; 9 (2) :19-26.

18. Abadian L, Adib-Hajbaghery M. Nursing Process Based on Johnson's Behavioral System Model in Patients with Diabetes: Case Report. J Diabetes Nurs 2023; 11 (4) :2242-2251.

19. Aşkar, S. E., & Ovayolu, Özlem. (2022). Nursing care based on Dorothy Johnson's Behavioral System Model in Coronary Artery Disease: A case report. Medical Science and Discovery, 9(2), 138–142.

20. Kardaş Kin Ö, Türeyen A. interpretation Dorothy Johnson's behavioural system model: COPD case report. Journal of Nursing Science. 2018;1(3):46-50.

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