



## Nursing Health Management in Rehabilitation of Patients with Impaired Physical Mobility

Faleh Nafea Alshammari<sup>1</sup>, Mohammed Khulaif Alanazi<sup>2</sup>, Saad Helail Alanazi<sup>3</sup>,  
Abdulaziz Khaleef J Alanazi<sup>4</sup>, Abdullah Khaleef Alanazi<sup>5</sup>, Saud Hulayyil Alanazi<sup>6</sup>

1. Health Administration and Hospitals
2. Nursing Technician
3. Health Administration and Hospitals
4. Specialist Laboratory
5. Specialist Nursing
6. Physiotherapist

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### Abstract

**Aim:** To evaluate the clinical relevance of nursing outcomes, as per the Nursing Outcomes Classification (NOC), in the progression of orthopedic patients with Impaired Physical Mobility.

**Method:** A longitudinal study conducted involving 21 patients undergoing Total Hip Arthroplasty. Patients were assessed daily by pairs of trained data collectors. Data collection utilized an instrument containing five Nursing Outcomes, 16 clinical indicators, and a five-point Likert scale, which were then statistically analyzed.

**Results:** Significant increases in mean scores were observed in the outcomes of Body Positioning: self-initiated, Mobility, Knowledge: prescribed activity, and Fall Prevention Behavior when comparing the initial and final evaluations ( $p < 0.001$  and  $p = 0.035$ ).

**Conclusion:** The utilization of NOC outcomes facilitates the demonstration of clinical progression in orthopedic patients with Impaired Physical Mobility, indicating its applicability in this context.

**Keywords:** Nursing Diagnosis; Nursing Process; Classification; Outcome Assessment (Health Care); Orthopedic Nursing.

### Introduction:

As life expectancy increases, so does the prevalence of orthopedic issues among the elderly population, leading to a rise in surgical interventions such as Total Hip Arthroplasty (THA). THA is recommended when conservative treatments fail, aiming to improve patients' quality of life by enhancing functional capacity, reducing pain, and restoring coxofemoral function. This procedure has become increasingly common globally, including in Brazil, where it ranks among the most frequently performed surgeries under the Brazilian National Health System (SUS). (Lenza et al., 2013)

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Post-operative care, crucial for the success of THA, primarily falls under the purview of nurses, who play a pivotal role in patient mobilization and education during the recovery period. Due to mobility limitations and bed confinement, these patients often require extensive nursing attention. Despite various interventions, the measurement of Nursing Outcomes remains relatively novel in Brazilian nursing practice. Achieving desired outcomes necessitates precise diagnoses, clearly defined goals, and effective interventions tailored to each patient's needs. (Piano et al., 2010)

The Nursing Outcomes Classification (NOC) was developed to standardize nursing language concerning outcome evaluation. Comprising Nursing Outcomes, indicators, and Likert scales, NOC facilitates the assessment of patient progress or regression, thereby enabling the evaluation of interventions prescribed and implemented by nurses. Its integration with Diagnosis and Nursing Interventions classifications enhances clinical decision-making and patient care monitoring. (Portal Brasil, 2012)

Impaired Physical Mobility (IPM) emerges as a prevalent Nursing Diagnosis among THA patients. However, the clinical progression of patients with this diagnosis using a standardized classification remains largely unexplored. (Tay Swee Cheng et al., 2014)

In recent years, there has been a surge in studies focused on NOC, with emphasis on its reliability, validity, and nurses' perceptions regarding its practical utility. Despite this, only a handful of studies have applied NOC in clinical nursing practice. (Seganfredo & Almeida, 2010)

Building upon these observations, this study seeks to shed light on the clinical progression of orthopedic patients through the application of a standardized classification. By assessing changes in mobility achieved by patients, this research aims to inform the development of more effective care strategies. Thus, the study's objective is to evaluate the clinical applicability of NOC outcomes in tracking the progression of orthopedic patients with impaired physical mobility. (Moorhead et al., 2010)

### **Methods:**

This longitudinal study was conducted at a large hospital. The Nursing Process, operationalized via computerization, encompasses nursing diagnosis (ND) based on NANDA International terminology and prescribed care guided by the Nursing Interventions Classification (NIC).

The study targeted patients in the postoperative period of Total Hip Arthroplasty (THA) hospitalized in Surgical Nursing Service units. Sample size calculation, aimed at detecting a 0.5 difference in NOC score, was performed using the WinPepi Version 10.5 program. Accounting for a power of 90% and an alpha error of 1%, 17 patients were initially deemed necessary, with a 20% buffer added to accommodate potential losses during the monitoring period.

Consecutive sampling was employed for participant selection, with patients enrolled based on admission to the units. Inclusion criteria comprised patients aged  $\geq 18$  years undergoing THA, with the Nursing Diagnosis of Impaired Physical Mobility (IPM) documented in medical records, and a hospitalization duration of at least four days or until discharge. Exclusion criteria included clinical instability during data collection, transfer to other institutions or units, and communication or interaction limitations hindering engagement with researchers.

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Nursing Outcomes selection involved considering 44 outcomes based on the NOC-NANDA-I linkage, including those specifically associated with IPM diagnosis. Three nurses, each with at least three years of orthopedic patient care experience, evaluated these outcomes for clinical relevance. Through consensus, five Nursing Outcomes and 16 indicators were identified for further assessment, aligning with NOC recommendations for contextually relevant outcome selection.

Subsequently, a data collection instrument was developed, encompassing sociodemographic and clinical variables alongside the five selected Nursing Outcomes and their associated 16 indicators. Conceptual and operational definitions were derived from a comprehensive literature review to ensure consistency and clarity.

The nurses who selected the outcomes and indicators validated the content and appearance of the instrument, incorporating minor suggestions. The instrument underwent testing in a pilot study involving four patients. The pilot study aimed to observe variation in indicator scores, standardize data collection logistics, and support sample size calculation. Notably, patients evaluated in the pilot study were excluded from the final sample, and measurement scales were maintained in accordance with NOC guidelines.

Data collection was carried out by undergraduate research students affiliated with a research group focused on NANDA-I nursing classifications, NIC, and NOC. These students underwent 18 hours of training, including theoretical lectures on the THA postoperative period, discussions on clinical cases of THA patients with IPM, and a review of instruments and data collection procedures.

Data collection was done, starting with patient recruitment in inpatient units. After obtaining informed consent, patients underwent daily evaluations. Two collectors simultaneously evaluated each patient independently, recording data in individual instruments. Evaluation utilized data from medical records, interviews, and physical examinations, guided by conceptual and operational definitions developed for selected clinical indicators. These indicators were assessed using a five-point Likert scale, with 1 representing the worst score and 5 the best score, aligning with NOC measurement scales.

Data sheets were constructed using Excel 2010 software, with analysis conducted using the Statistical Package for the Social Sciences (SPSS) version 18.0. Continuous variables were expressed as mean and standard deviation for normally distributed data or median and interquartile range for skewed variables. Categorical variables were presented as percentages and absolute numbers. Student's t-test for paired samples was employed to compare means between collectors and between the first and last days of evaluation, with significance set at  $p < 0.05$ .

The study received approval from the Research Ethics Committee of the institution

### **Results:**

The study encompassed 21 patients, undergoing a total of 68 evaluations, with 15 (71.4%) patients monitored over a four-day period and the remainder over three days, adjusted based on hospital stay duration.

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Among the monitored patients, the majority were female, with a mean age of 58.8 ( $\pm 16.7$ ) years, with 15 (71.4%) undergoing primary THA. Osteoarthritis emerged as the predominant basal disease in the majority of cases (see Table 1).

**Table 1 - Socio-demographic and clinical characteristics of the patients undergoing THA. Porto Alegre, RS, Brazil, 2013.**

Variable	Total n=21
Age, years*	58.8 ( $\pm 16.7$ )
Gender, female†	13 (61.9%)
BMI (kg/m <sup>2</sup> )*	23.01 ( $\pm 7.09$ )
Schooling, years*	8.2 ( $\pm 4.1$ )
Caregiver presence on admission†	17 (80.9%)
<b>Reason for surgical indication</b>	
- Osteoarthritis†	16 (76.2%)
- Dislocation†	3 (14.2%)
- Fractures†	2 (9.5%)
Primary THA†	15 (71.4%)
Performed preoperative outpatient nursing consultation†	5 (23.8%)
Received preoperative nursing home visits†	4 (19%)
Presence of pain in the hip prior to surgery†	20 (95.2%)
Suffered a fall in the previous year†	10 (47.6%)
Evaluation time, 4 days†	15 (71.4%)

\*Numbers expressed as mean ( $\pm$ standard deviation) †n(%)

Nursing Outcomes were assessed daily in accordance with patients' clinical progression. Mean scores exhibited a significant increase in nearly all evaluations, with the exception of Pain Level ( $p=0.265$ ), as detailed in Table 2.

**Table 2 – Mean scores of the Nursing Outcomes for patients with IPM ND undergoing THA. Porto Alegre, RS, Brazil, 2013.**

Nursing Outcomes	1st Day	2nd Day	3rd Day	4th Day
Body positioning: self-initiated	2.10 ( $\pm 1.47$ )	3.68 ( $\pm 1.20$ )	4.23 ( $\pm 1.00$ )	4.48 ( $\pm 0.99$ )
Mobility	1.00 ( $\pm 0.00$ )	1.40 ( $\pm 1.06$ )	2.93 ( $\pm 1.67$ )	3.47 ( $\pm 1.36$ )
Pain level	3.87 ( $\pm 0.99$ )	4.00 ( $\pm 0.93$ )	4.27 ( $\pm 0.96$ )	4.20 ( $\pm 1.27$ )
Knowledge: prescribed activity	3.12 ( $\pm 0.51$ )	3.52 ( $\pm 0.55$ )	3.75 ( $\pm 0.39$ )	3.64 ( $\pm 0.56$ )
Fall prevention behavior	2.15 ( $\pm 0.72$ )	2.78 ( $\pm 0.77$ )	3.29 ( $\pm 0.75$ )	3.55 ( $\pm 0.56$ )

\*p-values obtained from paired Student's t-test.

Temporal curves depicting the clinical evolution illustrated differences in NOC outcome scale scores across each evaluated day.

Comparison of mean scores between the first and last evaluations revealed no significant differences in measurements between collectors. The mean difference did not exceed 0.35 points for any analyzed parameter, as outlined in Table 3.

**Table 3 - Comparison of the mean scores of the NOC Nursing Outcomes between the evaluators of the patients with IPM ND undergoing THA. Porto Alegre, RS, Brazil, 2013.**

<b>Nursing Outcomes</b>	<b>Evaluator 1</b>	<b>Evaluator 2</b>	<b>Difference (CI 95%)</b>	<b>p-value</b>
<b>Body positioning: self-initiated</b>	1.79 (±1.33)	1.81 (±1.38)	0.02 (-0.02 - 0.07)	0.329
<b>Mobility</b>	1.00 (±0.00)	1.00 (±0.00)	0.00 (0.00 - 0.00)	1.000
<b>Pain level</b>	3.76 (±1.22)	3.76 (±1.22)	0.00 (0.00 - 0.00)	1.000
<b>Knowledge: prescribed activity</b>	3.12 (±0.53)	3.05 (±0.65)	0.07 (-0.06 - 0.21)	0.284
<b>Fall prevention behavior</b>	2.28 (±0.69)	2.41 (±0.89)	0.13 (-0.08 - 0.33)	0.210

\*p-values obtained from Student's t-test.

### **Discussion**

The study aimed to assess the clinical applicability of Nursing Outcomes (NOs) in patients undergoing Total Hip Arthroplasty (THA). The outcomes were monitored to observe changes in patient health status over time, focusing on five domains: Body Positioning, Mobility, Pain Level, Knowledge about prescribed activity, and Fall prevention behavior. (NANDA International, 2013)

The Body Positioning: self-initiated Outcome demonstrated a progressive increase in mean scores, indicating consistent improvement over the evaluation period. This aligns with clinical protocols recommending specific positioning to prevent prosthesis displacement, emphasizing the importance of nursing support in patient care activities. (Bulechek et al., 2010)

Similarly, Mobility showed significant improvement, consistent with literature findings highlighting mobility as crucial for functional activities post-THA. Nursing assessments included observations of proper positioning during transfers and weight distribution, essential for safe patient movement. (Alecrim et al., 2011)

Although Pain Level did not show a statistically significant difference, it remained a vital aspect of patient care, often considered the fifth vital sign. Patients' perception of pain significantly decreased postoperatively, indicating successful pain management strategies. (Tastan et al., 2014)

Knowledge about prescribed activity demonstrated significant improvement, likely influenced by preoperative educational activities and provided manuals. Such interventions enhance patients' understanding of postoperative care, contributing to their overall recovery. (Hospital de Clínicas de Porto Alegre, 2013)

Fall prevention behavior significantly improved throughout the evaluation period, emphasizing patient safety as a primary nursing concern. Despite caregiver presence during hospitalization, establishing fall prevention programs postoperatively remains crucial due to patient susceptibility and functional limitations. (Gonzalez et al., 2009)

Interobserver agreement between evaluators was high, indicating consistent assessments across the study. Standardized classifications facilitate evidence-based practice, enhancing care quality and documentation comprehensiveness. (Andrade & Chianca, 2013)

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In conclusion, monitoring patient progress through standardized classifications aids evidence-based practice, improving care quality across diverse clinical settings. (Young & Buvanendran, 2014)

### **Conclusion**

In conclusion, the utilization of Nursing Outcomes Classification (NOC) proved valuable in assessing the clinical progression of orthopedic patients with Impaired Physical Mobility (IPM), demonstrating its applicability in this context. Through the evaluation of outcomes encompassing functional health, perceived health, and patient knowledge domains, the status of the diagnosed condition could be effectively monitored over time. The consistency of evaluations, as evidenced by comparing mean scores between evaluators, further supported the reliability of using NOC in this setting.

However, limitations such as the small sample size, limited coverage of NOC, and constraints in selecting outcomes for different populations hindered the validation process using standard psychometric criteria. Consequently, the generalizability of these findings may be limited.

For practice implications, it is recommended to construct and validate conceptual and operational definitions tailored to specific contexts, along with providing training for nursing teams. Prior development of these activities before NOC implementation can facilitate its integration into clinical practice and encourage evaluation of intervention effectiveness through outcome monitoring. Additionally, optimizing the timing of outcome evaluations can enhance the impact of these findings.

Further research is warranted to establish the validity of NOC in diverse populations and practice contexts. Comparative studies with other populations and exploration of NOC's effectiveness in different clinical settings would contribute to advancing its applicability and utility in nursing practice.

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