


# Correspondence of nurses' and physiotherapists' records for orthopedic patients with the Nursing Outcomes Classification

*Correspondência dos registros de enfermeiros e fisioterapeutas para pacientes ortopédicos com a Nursing Outcomes Classification*

*Correspondencia entre registros de enfermeras y fisioterapeutas para pacientes ortopédicos con la Clasificación de Resultados de Enfermería*

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## ABSTRACT

**Objective:** To evaluate the correspondence of the terms found in nurses' and physiotherapists' records for orthopedic patients with the Nursing Outcomes Classification (NOC).

**Method:** A descriptive study carried out in a university hospital in southern Brazil. The sample consisted of 392 records of 49 patients submitted to Total Hip Arthroplasty (THA). Data collection was retrospective in the electronic health record. Data was analyzed and compared with the NOC outcomes using the cross-mapping method.

**Result:** The most prevalent outcomes were the following: Pain Level, Falls Occurrence and Mobility. There was sharing of outcomes between the two categories, except for Falls Occurrence and Respiratory Status. Conclusion: Standardizing nurses' and Physiotherapists' records according to the NOC can improve the quality of the clinical documentation of the outcomes of patients undergoing THA.

**Keywords:** Nursing process. Orthopedic Nursing. Outcome assessment, health care. Physical therapy speciality. Orthopedics.

## RESUMO

**Objetivo:** Avaliar a correspondência entre os termos encontrados nos registros de enfermeiros e fisioterapeutas para pacientes ortopédicos com a Nursing Outcomes Classification (NOC).

**Método:** Estudo descritivo realizado em um hospital universitário. A amostra foi de 392 evoluções para 49 pacientes submetidos à Artroplastia Total de Quadril (ATQ). A coleta de dados foi retrospectiva em prontuário eletrônico. Os dados foram analisados e comparados com os resultados da NOC, segundo o método de mapeamento cruzado.

**Resultado:** Identificaram-se 10 resultados da NOC, sendo os mais prevalentes: Ocorrência de quedas, Mobilidade e Nível de dor. Houve compartilhamento de resultados entre as duas categorias, com exceção da Ocorrência de quedas e Estado respiratório.

**Conclusão:** Padronizar os registros de enfermeiros e fisioterapeutas segundo a NOC pode aprimorar a qualidade da documentação clínica dos resultados dos pacientes submetidos à ATQ.

**Palavras-chave:** Processo de enfermagem. Enfermagem ortopédica. Avaliação de resultados em cuidados de saúde. Fisioterapia. Ortopedia.

## RESUMEN

**Objetivo:** evaluar la correspondencia entre los términos encontrados en los registros de enfermeras y fisioterapeutas para pacientes ortopédicos con la Clasificación de Resultados de Enfermería (*Nursing Outcomes Classification*, NOC).

**Método:** estudio descriptivo realizado en un hospital universitario del sur de Brasil. La muestra consistió en 392 registros correspondientes a 49 pacientes sometidos a artroplastia total de cadera (ATC). La recopilación de datos fue retrospectiva en el registro de salud electrónico. Los datos se analizaron y compararon con los resultados de la NOC por medio del método de mapeo cruzado.

**Resultado:** los resultados más frecuentes son los siguientes: Nivel del dolor, Caídas y Movilidad. Hubo intercambio entre las dos categorías, a excepción de Caídas y de Estado respiratorio.

**Conclusión:** La estandarización de los registros de enfermeras y fisioterapeutas según la NOC puede mejorar la calidad de la documentación clínica de los resultados de los pacientes sometidos a ATC.

**Palabras clave:** Proceso de enfermería. Enfermería ortopédica. Evaluación de resultados en la atención de salud. Fisioterapia. Ortopedia.

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## INTRODUCTION

Total Hip Arthroplasty (THA) is a procedure increasingly used for the population with orthopedic problems, especially due to osteoarthritis, considering the longer life expectancy and the consequent increase in the number of active and independent older adults<sup>(1)</sup>. This surgery is indicated when conservative treatment fails, providing an improvement in quality of life, functional capacity, and reduction of pain. It was one of the most prevalent surgeries in the Unified Health System (*Sistema Único de Saúde, SUS*) in recent years<sup>(2)</sup>.

The assistance provided to patients undergoing THA requires the work of a multidisciplinary team that acts in harmony in order to obtain the best outcomes, namely, reducing pain and recovering articular function. For such an end, mobility care and prevention of complications are essential. Nursing acts in care providing rest of the injured articulation and positioning of the affected limb in abduction and neutral position with the help of pillows and cushions. It also intervenes in facilitating self-care, maintaining suction drains, and controlling pain, among other activities<sup>(3)</sup>. On the other hand, physiotherapy intervenes directly in the patient's first motor activities, such as sitting, walking, getting out of bed, and in indicating auxiliary devices such as walkers, for example<sup>(4)</sup>.

The interventions performed by the health professionals must be recorded in the patient's medical record. In the clinical practice, nurses document the Nursing Process, with the identification of the diagnoses based on the assessment performed. Subsequently, they establish goals to be achieved by the patient, interventions to achieve these goals and, after their implementation, they evaluate the results obtained. For the stages of diagnosis, interventions and results, Nursing relies on standardized language systems<sup>(5)</sup>.

The physiotherapists' records include physiotherapeutic diagnosis and prognosis, therapeutic plan, and evolution of the client's/patient's physical functional health condition; however, they do not use standardized terminology. The incorrect or incomplete evaluation of the patient's outcomes hinders identifying and measuring the impact of the interventions on health care<sup>(6)</sup>.

In order to standardize the terminology and criteria necessary to measure and assess the outcomes from the Nursing interventions and to define the care goal before the implementation of the interventions, the Nursing Outcomes Classification (NOC) has been developed since 1990 by researchers at the University of Iowa. These are states, behaviors or perceptions of the individual, family or

community, measured during a continuum in response to a Nursing intervention<sup>(7)</sup>.

It should be noted that the NOC allows sharing of outcomes by different disciplines in the health area; although it emphasizes those that are more responsive to the Nursing interventions, it offers different indicators that can be more sensitive to measure the actions of another professional category<sup>(8-9)</sup>.

Studies carrying out cross-mappings of Nursing diagnoses and interventions in patients undergoing THA have already been conducted<sup>(8-11)</sup>. However, with respect to the NOC outcomes, it was not possible to find studies in the Nursing field using this method with this population with records of other professions, such as physiotherapy<sup>(9-11)</sup>.

In view of the above, the guiding question defined for this study was the following: Do the terms contained in the records of nurses and physiotherapists in the medical charts of patients undergoing THA correspond to those found in the NOC?

Based on this question, this study aimed to assess the correspondence between the terms found in the records of nurses and physiotherapists regarding orthopedic patients and the Nursing Outcomes Classification (NOC).

The relevance of this study is to deepen the knowledge on the clinical evolution of the patient, through the use of a standardized classification. At the same time, by assessing the correspondence, the study contributes to the definition of the outcomes identified by Nursing and Physiotherapy, facilitating clinical decision-making, with a focus on patient outcomes.

## METHODS

A descriptive study conducted at a large university hospital in southern Brazil, accredited by the Joint Commission International. The institution has 870 beds, distributed in more than 60 specialties. The target population of this study were medical records of patients undergoing THA. These patients receive multidisciplinary treatment for pain relief, restoration of the articular function and symptom control after surgery, implementing interventions in the physiological, psychosocial and educational domains. In addition, the patients undergo one physical therapy session per day and the other procedures related to positioning and mobility are performed by the trained Nursing team. This program aims to improve quality of life and patient education as a way to facilitate hospital discharge. In this model for the Nursing and Physiotherapy professionals, there is a minimum

record of the daily evolution for each patient in the following structure: *subjective, objective, interpretation and conduct*<sup>(8)</sup>. In 2018, 152 patients underwent THA in this hospital.

The sample was calculated using the PEPI (Programs for Epidemiologists) program, version 11.65. Considering a confidence coefficient of 90%, the population of 152 patients undergoing THA in 2018, a random error of 5%, and a 7.1% prevalence of Nursing Outcomes reported in medical records<sup>(12)</sup>, a minimum of 49 records were obtained for this study. To select the 49 medical records, the *List Randomizer* program was used to randomly select patients with the following inclusion criteria: patients undergoing THA (primary or revision), of both gender, aged 18 years old or over, with at least four patient evolution notes made by nurses and physiotherapists in their medical records or even hospital discharge, of whom the records referring to the post-operative period in the surgical inpatient unit were assessed, totaling 392 evolutions, 196 for each category. No exclusion criteria were established.

Data collection was retrospective in electronic medical records, and was carried out from January to February 2019. In the first stage, it consisted in identifying the content of the progress notes by consulting the online medical record. Subjective and objective data were consulted in order to verify the records of signs and symptoms presented by the patients, being later transcribed in a form created for this purpose, in the Microsoft Office Excel 2007 software, on the research project computer.

A pilot study was carried out to refine the data collection instrument, with the assessment of 10 medical records from 2018, and these medical records were not included in the final sample. The data were collected by the researcher.

To organize the data, content normalization was performed, which deals with spelling checkers, verification of synonyms, adequacy of verb tenses, uniformity of gender (female, male), number (singular, plural) and exclusion of pseudo-terminological expressions, which are defined as elements that appear in a casual manner in speech, but that do not designate particular concepts, being considered as "terminological waste"<sup>(13)</sup>.

Cross-mapping was performed by comparing the terms found in the records of nurses and physiotherapists documented in the medical charts of the patients after THA to the NOC outcomes. Thus, the following rules were used for mapping: 1) separate the terms, using keywords, looking for similarity between them with the NOC Domains and Classes; 2) select in the Class, which best expresses the term examined, an outcome of the NOC, based on the similarity

between the terms recorded and the definition of the outcome; 3) select the indicator(s) similar to the specification of the term identified in the evolution notes. The rules for cross-mapping were adapted for the NOC according to the proposal by Lucena and Barros, 2005<sup>(14)</sup>.

This study was submitted to ethical approval under the CAAE No. 89738418.5.0000.5327, and a term of commitment for the use of data was signed, with the commitment to use the information only for research purposes, respecting the principles of confidentiality and anonymity. The research was approved by the Ethics and Research Committee of the HCPA under number 2018/0597, in compliance with the provisions of Resolution No. 466/12 of the National Health Council (*Conselho Nacional de Saúde, CNS*).

## ■ RESULTS

A total of 392 evolution notes were analyzed, in which 77 terms recorded for patients undergoing THA were normalized. Of these, 24 were identified as subjective data and 53 terms were identified as objective data. In the evolution notes, reports related to pain, wounds, mobility and falls stood out. Regarding the sample, most were men (56%), with a mean age of 63.55 ( $\pm 10.87$ ), with osteoarthritis being the main surgical indication (81.6%).

The mapping of the 77 records of nurses and physiotherapists based on the similarity between the terms reported and the definition of the outcome and their respective indicators allowed identifying a total of 10 outcomes of this taxonomy, with sharing among eight outcomes: (2102) Pain Level, (1102) Wound healing: Primary intention, (0703) Infection Severity, (0208) Mobility, (0210) Transfer Performance, (0202) Balance, (0200) Ambulation: walking, and (0222) Gait. The nurses exclusively recorded the (1912) Falls Occurrence outcome, and the Physiotherapists recorded the (0415) Respiratory Status outcome.

The terms recorded by the nurses (Chart 1) and by the physiotherapists (Chart 2) and their respective correspondence with the NOC outcomes and indicators are described in Charts 1 and 2.

Next, the prevalence of the outcomes according to the NOC is described. The *Falls Occurrence* outcome was present in 100% of the nurses' records, followed by Pain Level (83.6%). In the physiotherapist's records, the *Mobility* outcome had a 100% prevalence in the evolution notes, followed by *Pain Level* (54.6%). These and other findings are described in Table 1.

Terms recorded by the nurses	NOC Outcomes	Indicators
<p>O: SW looking good, bruises around, no drainage                      O: SW with dressing externally cleaned                      O: SW with bleeding dressing                      O: SW with edema                      O: SW with excellent healing stage                      O: SW without phlogistic signs                      O: SW with mild hyperemia and edema                      O: Portovac drain with serosanguineous drainage                      O: Portovac drain with sanguineous drainage                      O: Portovac drain draining small amounts of sanguineous secretion                      O: Portovac drain, 380 ml sanguineous                      O: Portovac drain with 100 ml sanguineous output                      O: Narrow passage of the portovac drain with small amount of sanguineous drainage</p>	<p>(1102)                      Wound healing:                      Primary intention</p> <p>(0703)                      Infection severity</p>	<p>(11021) Skin approximation                      (112013) Wound edges approximation                      (110214) Scar formation                      (110202) Purulent drainage                      (110203) Serous drainage                      (110204) Sanguineous drainage                      (110205) Serosanguineous drainage                      (110206) Sanguineous drainage from drain                      (110207) Serosanguineous drainage from drain                      (110208) Surrounding skin erythema                      (110209) Surrounding skin bruising                      (110209) Periwound edema                      (110210) Increase skin temperature</p> <p>(070305) Purulent drainage                      (070303) Pain</p>
<p>S: Reports pain improvement                      S: Denies pain at the moment of the assessment                      S: Reports pain to controlled mobilization with analgesia                      S: Reports 10 on the pain scale, like a "twinge" in the RLL                      S: Reports pain in the RLL                      S: Reports 10 on the pain scale in the SW                      S: Reports a lot of pain during the movements when conducting the physical therapy                      S: Reports 6 on the pain scale in the SW                      S: Reports pain after sponge bath                      S: Reports nausea                      S: Denies pain at the moment                      S: Reports 8 on the pain scale in the SW                      S: Reports 7, throbbing pain, on the pain scale in the SW                      O: VAS 0/10                      O: No pain at the moment</p>	<p>(2102)                      Pain Level</p>	<p>(210201) Reported pain                      (210227) Nausea</p>

**Chart 1** – Terms, outcomes and indicators according to the NOC mapped in the evolution notes of nurses for patients undergoing THA. Porto Alegre/RS, 2019

Terms recorded by the nurses	NOC Outcomes	Indicators
O: Inappropriate positioning of the hip when trying to turn on the side O: Uses the bed trapeze to sit O: Gait training O: Walks with the aid of a walker O: Difficulty maintaining post-operative positioning O: Postural hypotension when getting out of the bed for gait training O: With risk of falls O: Walks with the aid of crutches	(0208) Mobility	(02080) Balance (020809) Coordination (020810) Gait (020802) Body positioning performance (020805) Transfer performance (020806) Walking (020814) Moves with ease
	(1912) Falls Occurrence	(191202) Falls while walking (191204) Falls from bed
O: Impaired gait O: Keeps bed wheels locked, railings up O: Morse = 45, 50, 60, 70, 75, 85, 110	(0210) Transfer performance	(021009) Transfers from one surface to another while lying (021001) Transfer from bed to chair (021002) Transfer from chair to bed (021003) Transfer from chair to chair
	(0202) Balance	(020202) Maintains balance while sitting without back support (020212) Maintains balance while rising from sitting position (020201) Maintains balance while standing (020203) Maintains balance while walking
	(0200) Ambulation: walking	(020002) Walks with effective gait (020003) Walks at slow pace (020004) Walks at moderate pace (020010) Walks short distance (< 1 block) (020201) Maintains balance while standing (020203) Maintains balance while walking (020211) Posture
	(0222) Gait	(022201) Steadiness of gait (022202) Balance while walking (022203) Walking posture (022204) Walks in straight line (022205) Length of stride (022215) Limping

**Chart 1** – Cont.

Source: Research data, 2019.

S: Subjective. O: Objective.

Terms recorded by the physiotherapists	NOC Outcomes	NOC Indicators
<p>S: Denies pain</p> <p>S: Reports a lot of pain when being mobilized</p> <p>S: Reports mild hip pain</p> <p>S: Reports mild discomfort in the SW</p> <p>S: Reports gastric discomfort</p> <p>S: Reports nausea</p> <p>S: Reports 4 on the pain level (VAS) in the SW</p>	<p>(2102)</p> <p>Pain Level</p>	<p>(210201) Reported pain</p> <p>(210227) Nausea</p>
<p>S: Reports using a walker during the day</p> <p>S: Reports having done the exercises proposed</p> <p>O: Walks with ease</p> <p>O: Walks with the aid of a walker</p> <p>O: Walks around the room</p> <p>O: Walks across the entire length of the room</p> <p>O: Walks in the hallway</p> <p>O: Walks with the aid of a walker to the bathroom</p> <p>O: Walks with good performance</p> <p>O: Walks with the aid of crutches</p> <p>O: Walks with slow steps</p> <p>O: Returns to bed</p> <p>O: Moves from bed to chair</p> <p>O: Gait training</p> <p>O: Chair sitting</p> <p>O: Orthostasis</p> <p>O: Walks with the assistance of the orthopedics team</p> <p>O: Postural hypotension</p>	<p>(0208)</p> <p>Mobility</p>	<p>(02080) Balance</p> <p>(020809) Coordination</p> <p>(020810) Gait</p> <p>(020802) Body positioning performance</p> <p>(020805) Transfer performance</p> <p>(020806) Walking</p> <p>(020806) Moves with ease</p>
	<p>(0210)</p> <p>Transfer performance</p>	<p>(021009) Transfers from one surface to another while lying</p> <p>(021001) Transfer from bed to chair</p> <p>(021002) Transfer from chair to bed</p> <p>(021003) Transfer from chair to chair</p>
	<p>(0202)</p> <p>Balance</p>	<p>(020202) Maintains balance while sitting without back support</p> <p>(020212) Maintains balance while rising from sitting position</p> <p>(020201) Maintains balance while standing</p> <p>(020203) Maintains balance while walking</p> <p>(020211) Posture</p>
	<p>(0200)</p> <p>Ambulation: walking</p>	<p>(020002) Walks with effective gait</p> <p>(020003) Walks at slow pace</p> <p>(020004) Walks at moderate pace</p> <p>(020010) Walks short distance (&lt; 1 block)</p> <p>(020014) Walks around room</p>
	<p>(0222)</p> <p>Gait</p>	<p>(022201) Steadiness of gait</p> <p>(022202) Balance while walking</p> <p>(022203) Walking posture</p> <p>(022204) Walks in straight line</p> <p>(022205) Length of stride</p> <p>(022207) Speed appropriate for activity</p>

**Chart 2** – Terms, outcomes and indicators according to the NOC mapped in the evolution notes of physiotherapists for patients undergoing THA

Terms recorded by the physiotherapists	NOC Outcomes	NOC Indicators
S: Reports redness around the SW O: Portovac drain around the SW area O: Bleeding from the SW O: Portovac drain with high sanguineous drainage	(0703) Infection severity	(070305) Purulent drainage
	(1102) Wound healing: Primary intention	(110204) Sanguineous drainage (110208) Surrounding skin erythema (110206) Sanguineous drainage from drain (110207) Serosanguineous drainage from drain
S: Denies dyspnea	(0415) Respiratory Status	(041514) Dyspnea at rest (041515) Dyspnea with mild exertion

**Chart 2** – Cont.

Source: Research data, 2019.

S: Subjective. O: Objective.

**Table 1** – Prevalence of Nursing Outcomes according to the NOC, mapped in the evolution notes of nurses and physiotherapists for patients undergoing THA. Porto Alegre/RS, 2019

Domains	Classes	NOC Outcomes	N(Nurs)	(%)	N(Physio)	(%)
Health knowledge and behavior	Risk control and safety	(1912) Falls Occurrence	196	100	-	-
Perceived health	Symptom status	(2102) Pain Level	164	83.6	107	54.6
Physiological health	Tissue integrity	(1102) Wound healing: Primary intention	113	57.6	7	3.5
	Immune response	(0703) Infection Severity				
		(0208) Mobility				196
Functional health	Mobility	(0210) Transfer performance				
		(0202) Balance	22	11.2		
		(0200) Ambulation: walking (0222) Gait				

Source: Research data, 2019.

**DISCUSSION**

This was the first study to cross-map a standardized Nursing terminology with another professional category. In addition, most cross-mapping studies are related to the NANDA-I Nursing Diagnosis Classification<sup>(15)</sup> and to the NIC Nursing Interventions Classification<sup>(3)</sup>; this study was a pioneer in using the NOC for orthopedic patients<sup>(9)</sup>.

Among the 10 mapped NOC outcomes, *Mobility*, *Transfer performance*, *Balance*, *Ambulation: walking*, *Gait*, are present in domain I, *Functional Health*, in the *Mobility* class, defined as: "outcomes that describe the physical mobility and restricted movement sequelae of an individual"<sup>(7)</sup>.

The *Pain Level* outcome was included in Domain V - *Perceived Health*, in the *Symptom Status* class which defines "outcomes that describe the indications of a disease, injury or loss of an individual"<sup>(7)</sup>. And finally, the *Falls Occurrence* NOC outcome is found in Domain IV - *Health Knowledge and Behavior*, in the *Risk Control and Safety* class, defined by "outcomes that describe an individual's safety status and/or actions to prevent, limit or control the identifiable threats to health"<sup>(7)</sup>. These domains represent the monitoring of the outcomes of the patient in post-operative THA from the perspective of nurses and physiotherapists.

The *Falls Occurrence* outcome showed a prevalence of 100% in the nurses' records and was absent in the

physiotherapists' records. According to the NOC, this outcome refers to the number of times the individual falls<sup>(7)</sup>. The Morse Scale, used at the study site, is a scale for assessing the risk of falls and is composed of six assessment criteria: *falls history, secondary diagnosis, ambulatory aid, intravenous therapy, gait, and mental status*. According to the total score, patients are classified as with high, medium or low risk of falling<sup>(16)</sup>. This verification aims to improve patient safety, as well as to qualify systematized Nursing care, with a focus on preventing falls and the resulting harms. In the Nursing practice, the precise identification of these and other risk factors for falls improves nurses' reasoning, so that they can determine interventions and care with a focus on preventive measures and patient safety<sup>(16)</sup>. For these reasons, there was possibly a higher prevalence of this outcome in the Nursing records.

Although the records of the physiotherapists do not include the *Falls Occurrence* outcome, it is known that there is concern on their part to avoid this adverse event. Although the interventions were not the main focus of this study, physiotherapists provide patient mobilization guidelines that are also aimed at minimizing the risk of falls<sup>(4)</sup>. It is possible that aspects that influence the occurrence of falls, such as balance, functionality and increased muscular resistance, were present in other indicators of Nursing outcomes.

Currently, pain is considered the 5<sup>th</sup> Vital Sign<sup>(8)</sup>. The prevalence of the pain level outcome was 83% for nurses and 54% for physiotherapists. Such an assessment can be related to the level of care of the patient at risk of acute pain. However, the pain experience is singular, and each patient learns to deal with it<sup>(17)</sup>. Before surgery, chronic pain and reduced mobility are more complicating factors in the activities of daily living. Then, the pain becomes acute due to the surgical procedure<sup>(17)</sup>.

Accurate pain assessment was fundamental to select the correct analgesia and the interventions to control pain. In a study setting, part of the patients who underwent THA received analgesia through an epidural catheter in the immediate post-operative period, which justifies the mild pain identified in the assessment of the *Pain Level* outcome in patients undergoing this surgery<sup>(8)</sup>. In this sense, it is understood that the NOC is applicable to the clinical practice, since it facilitated the monitoring of the patient's progression<sup>(17)</sup>.

It is worth noting that a patient with acute pain after arthroplasty is unable to make the necessary movements for rehabilitation due to the presence of pain. It is up to nurses and physiotherapists to ensure that the patients have adequate analgesia, to encourage them to do the exercises, as well as to stimulate getting up from the bed safely,

in addition to offering devices that facilitate mobilization. The *Mobility Nursing* outcome refers to the ability to move purposefully through the environment, independently, with or without an auxiliary device<sup>(7)</sup>. In the THA post-operative period, physiotherapy interventions directly reflect on the recovery of the individual's functionality, and the earlier the physiotherapy begins, the faster the functional recovery, avoiding post-operative complications such as prosthesis dislocation, infection and vascular and nerve injuries, minimizing the occurrence of falls, as well as the psychocognitive consequences (depression and somatization) of reduced mobility and pain<sup>(18)</sup>.

In a study conducted at the Porto Alegre Clinical Hospital with 21 patients in the THA post-operative period that followed the in-hospital progress of the *Mobility* NOC outcome, a significant improvement in the mean outcome ( $p < 0.001$ ) was identified when comparing the first and the last assessment. The initial mean value by the NOC Likert scale was 1, and the final mean reached by the patient was 3.47 ( $\pm 1.3$ ). It is expected that, from six months after surgery, gait is recovered; however, it is recommended to use auxiliary devices, such as crutches and a walker, in cases where patients are unsure about carrying out their activities independently<sup>8</sup>. Thus, it is suggested that the mobility outcomes be evaluated and recorded periodically because, as the outcomes of the patients improve, the dose of the interventions may decrease, also providing support to assess the evolution of the level of dependence of the patient undergoing THA.

In the *Transfer performance* outcome, which is defined as *the ability to move the body independently, with or without an auxiliary device*, the professionals verify the proper positioning when transferring from and to the chair and vice versa; analyzing if the patient performed the first step with the operated limb and if the leg was kept straight with weight distribution aided by crutches or by a walker<sup>(7-8)</sup>. So that in the *Ambulation: walking* outcome, which is defined as *personal actions to walk from one place to another independently, with or without an auxiliary device*, it is verified if the patient can already walk around the bedroom or go to the bathroom using an auxiliary device. Nurses observe if the patient walks, reducing the patient's level of dependence on Nursing. On the other hand, physiotherapy perceives the *Gait* outcome as the *ability to walk with the correct body alignment, with a smooth gait cycle and at a steady pace*, observing if it is correct, assessing the coordination of the patient's steps<sup>(7-8,18)</sup>.

The *Wound healing: Primary intention* and *Infection Severity* outcomes had a prevalence of 57% for nurses and 3% for physiotherapists. A study that evaluated the surgical wound of orthopedic patients showed that the *Wound healing: Primary intention* NO showed progressive improvement in



the indicators of skin approximation, drainage, surrounding skin erythema, edema, increase skin temperature and foul wound odor when comparing the averages between the first and the last day of assessment<sup>(19)</sup>.

Within the scope of the Nursing practice, the records prioritized the monitoring of the surgical wound due to the concern with the risk of infection for patients in the post-operative period of THA<sup>(19)</sup>. Intrinsically, when the healing status is monitored, the presence of signs and symptoms of infection is also assessed. Nurses must monitor the evolution of the SW, which includes the following, among other actions: measuring the incision, observing the wound tissue, paying attention to reepithelization, the integrity of the suture line, the exudate, which can possibly drain, and the palpation of the incision, paying attention to collagen deposition<sup>(20)</sup>. This demonstrates that the NOC can favor the earlier identification of the patient's level of impairment and enable the implementation of care to achieve expected outcomes, being an alternative to assess the effectiveness of care. In this sense, monitoring the outcomes of the evolution of the surgical wound is essential, as it directly reflects on the THA post-operative period and on functional rehabilitation.

The record of the *Respiratory Status* outcome draws the attention, present only in the evolution notes of the physiotherapists. It is known that this activity is also performed within the scope of the Nursing practice, especially during the verification of vital signs or of the evidence of changes in the breathing pattern. According to the indicators assessed, 'dyspnea at rest' and 'dyspnea with mild exertion' show that the physiotherapists assess both the patient's tiredness after the exercises and also the post-surgical respiratory status. This is important to determine the level of complication related to THA that the patient can present<sup>(18)</sup>. In fact, the multidisciplinary performance in obtaining the patient's outcomes makes it possible to increase the quality of the clinical assessment, as well as to early identify the level of impairment of the patient's clinical status, aiming at more accurate diagnostic assessments.

The indicators mapped in this study make up the completeness of the identified outcome, which can be used by nurses and physiotherapists to the extent that they want to measure a patient's health outcome. Not all indicators are applicable in the practice, and only the clinical decision of the professional can be paramount in assessing the patient's outcome.

Based on these findings, the NOC, in collaboration with the NIC, seems to be able to measure the outcomes expected by the physiotherapists; however, new studies need to be carried out to determine the impact of Physiotherapy interventions on the mapped outcomes.

The use of an outcomes classification in the clinical practice can provide scientific support for the professional and increase patient safety. The NOC is the first standardized and comprehensive classification used to develop the outcomes obtained by the patients as a result of the Nursing interventions. Despite emphasizing the results that are more responsive to the Nursing actions, other fields may consider them useful to assess the effectiveness of their own interventions, both independently and in multidisciplinary teams with nurses, a fact that was identified in this study<sup>(12)</sup>.

The limitations of this study include a relatively small sample, composed of individuals from a single hospital. In addition, the evaluation notes of Nursing and Physiotherapy students and teachers, even Nursing technicians, were not evaluated, a fact that could maximize these findings. Furthermore, no psychosocial aspects were found in the recorded data. However, this did not detract from the quality of cross-mapping. For these reasons, the generalization of the findings must be done with caution.

## ■ CONCLUSION

This study identified that the terms reported by the nurse and the physiotherapist corresponded to the NOC, and that the outcomes are similar. 10 NOC outcomes were identified, the most prevalent of which were *Falls Occurrence*, *Mobility* and *Pain Level*. The outcomes were shared between the two categories, with the exception of *Falls Occurrence* and *Respiratory Status*. Standardizing nurses' and physiotherapists' records based on the NOC can improve the quality of the clinical documentation of the outcomes of patients undergoing THA.

The NOC outcomes can be a strategy to assess the effectiveness of the interventions by different professionals in patients undergoing Total Hip Arthroplasty, contributing to identify the impact of care, facilitating communication between them.

Continuing the study, the cross-mapping will need to be validated in order to maximize the diagnostic accuracy and be transferred to the clinical practice. For future studies, it is suggested that the relationship between Physiotherapy and Nursing interventions and the NOC Nursing outcomes be investigated. This research brought innovation in the method of cross-mapping, improving the rules proposed in the literature for the analysis of electronic health records, focused on outcomes. In addition, as implications for teaching and care, it offers the opportunity for the standardized NOC terminology to be used in order to identify the outcomes of patients after multidisciplinary interventions.

## REFERENCES

1. Boldt JG, Cartillier JC, Machenaud A, Vidalain JP. Long-term bone remodeling in ha-coated stems: a radiographic review of 208 total hip arthroplasties (THAs) with 15 to 20 years follow-up. *Surg Technol Int*. 2015;27:279-86.
2. Ministério da Saúde (BR) [Internet]. Brasília: Ministério da Saúde; c2019-2020 [cited 2019 Nov 10]. Informações de saúde (TABNET); [about 1 screen]. Available from: <http://www2.datasus.gov.br/DATASUS/index.php?area=02>
3. Bulechek GMB, HK, Dochterman JM. NIC - Classificação das Intervenções de Enfermagem. 5 ed. Rio de Janeiro: Elsevier; 2010.
4. Barros EC. Cuidados e orientações ao paciente submetido a artroplastia de quadril. Florianópolis: Perse; 2017.
5. Conselho Federal de Enfermagem (BR). Resolução nº 429, de 11 de junho 2012. Registro das ações profissionais no prontuário do paciente, e em outros documentos próprios da enfermagem, independente do meio de suporte – tradicional ou eletrônico. *Diário Oficial da União*. 2012 jun 8;149(110 Seção 1):288-9.
6. Conselho Federal de Fisioterapia e Terapia Ocupacional (BR). Resolução nº 414, de 19 de maio de 2012. Obrigatoriedade do registro em prontuário pelo fisioterapeuta, da guarda e do seu descarte e dá outras providências. *Diário Oficial da União* 2012 mai 23;149(99 Seção 1);110-1.
7. Moorhead S. NOC - Classificação dos Resultados de Enfermagem. 6 ed. St. Louis: Elsevier; 2018.
8. Silva MB, Almeida MA, Panato BP, Siqueira APO, Silva MP, Reisdorfer L. Clinical applicability of nursing outcomes in the evolution of orthopedic patients with impaired physical mobility. *Rev Latino-Am Enfermagem*. 2015;23(1):51-8. doi: <https://doi.org/10.1590/0104-1169.3526.2524>
9. Silva NCM, Oliveira ARS, Carvalho EC. Knowledge produced from the outcomes of the "Nursing Outcomes Classification - NOC": integrative review. *Rev Gaúcha de Enferm*. 2015;4(36):104-11. doi: <https://doi.org/10.1590/1983-1447.2015.04.53339>
10. Nonnenmacher CL, Ávila CW, Mantovani VM, Vargas MAO, Echer IC, Lucena AF. Cross mapping between the priority nursing care for stroke patients treated with thrombolytic therapy and the nursing interventions classification-NIC. *Int J Nurs Knowl*. 2016 [cited 2016 Nov 15];28(4):171-7. doi: <https://doi.org/10.1111/2047-3095.12147>
11. Morais SCR, Nóbrega MML, Carvalho EC. Cross-mapping of results and Nursing Interventions: contribution to the practice. *Rev Bras Enferm*. 2018;71(4):1883-90. doi: <https://doi.org/10.1590/0034-7167-2017-0324>
12. Nomura ATG, Silva MB, Almeida MA. Quality of nursing documentation before and after the Hospital Accreditation in a university hospital. *Rev Latino-Am Enfermagem*. 2016;24:e2813. doi: <https://doi.org/10.1590/1518-8345.0686.2813>
13. Pavel SN, D. Handbook of terminology: Gatineau: Public Words and Government Services; 2001.
14. Lucena AF, Barros ALBL. Mapeamento cruzado: uma alternativa para a análise de dados em enfermagem. *Acta Paul Enferm*. 2005;18(1):82-8. doi: <https://doi.org/10.1590/S0103-21002005000100011>
15. NANDA International. Diagnósticos de enfermagem da NANDA-I: definições e classificação 2018-2020. 11ª. ed. Porto Alegre: Artmed; 2018.
16. Severo IM, Kuchenbecker RS, Vieira DFVB, Lucena AF, Almeida MA. Risk factors for fall occurrence in hospitalized adult patients: a case-control study. *Rev Latino-Am Enfermagem*. 2018;26:e3016. doi: <https://doi.org/10.1590/1518-8345.2460.3016>
17. Rodriguez Acelas AL, Mantovani VM, Canon Montañez W, Engelman B, Silva MB, Almeida MA. Evaluation of acute pain in patients undergoing total hip arthroplasty: a cohort study. *Int J Nurs Knowl*. 2020;31(2):145-9. doi: <https://doi.org/10.1111/2047-3095.12257>
18. Lima BLTS, Santos JNN, Coutinho ML, Sampaio TCFV. Estudo comparativo da funcionalidade do paciente submetido à artroplastia total de quadril. *Rev Interdisc Ciênc Méd*. 2017;1(1):96-109.
19. Menna Barreto LN, Silva MB, Engelman B, Figueiredo MS, Rodriguez-Acelas AL, Canon-Montañez W, et al. Evaluation of surgical wound healing in orthopedic patients with impaired tissue integrity according to Nursing Outcomes Classification. *Int J Nurs Knowl*. 2019;30(4):228-33. doi: <https://doi.org/10.1111/2047-3095.12233>
20. Rodriguez-Acelas AL, Reich R, Almeida MA, Crossetti MDGO, Lucena AF. Nursing outcome "severity of infection": conceptual definitions for indicators related to respiratory problems. *Invest Educ Enferm*. 2016;34(1):38-45. doi: <https://doi.org/10.17533/udea.iee.v34n1a05>

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