

## Validation of Mapping of Care Actions Prescribed for Orthopedic Patients onto the Nursing Interventions Classification<sup>1</sup>

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This study mapped the 52 nursing care actions prescribed for orthopedic patients onto Self-care Deficit: bathing and/or hygiene, Impaired Physical Mobility and Risk for Infection, according to the Nursing Interventions Classification (NIC). The study was developed at a University Hospital in Porto Alegre, Brazil, using the Delphi Technique as the content validation method, considering a level of 70% of agreement among experts. Data were analyzed through descriptive statistics. Twenty-two experts validated the mapping of 51 nursing care actions onto 56 NIC interventions in two rounds. The objective was achieved because only one mapped care action did not reach the established level of agreement. None of the mapped care actions reached 100% consensus, which evidences the various possibilities of comparison and the importance of validation studies.

Descriptors: Nursing Process; Validation Studies; Nursing Diagnosis; Nursing Care; Orthopedic Nursing; Classification.

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## **Validação do mapeamento de cuidados prescritos para pacientes ortopédicos à classificação das intervenções de enfermagem**

Este trabalho teve como objetivo validar o mapeamento dos 52 cuidados de enfermagem, prescritos para pacientes ortopédicos com a Classificação das Intervenções de Enfermagem (NIC), referente aos diagnósticos déficit no autocuidado: banho e/ou higiene, mobilidade física prejudicada e risco de infecção. O estudo foi desenvolvido no Hospital de Clínicas de Porto Alegre, utilizando-se o método de validação de conteúdo por meio da aplicação da Técnica Delphi, considerando-se 70% de concordância entre juízes. Os dados foram analisados por meio de estatística descritiva. Participaram do estudo 22 juízes que, em duas rodadas, validaram o mapeamento de 51 cuidados de enfermagem com 56 intervenções da NIC. É possível afirmar que o objetivo foi alcançado, visto que apenas um cuidado mapeado não atingiu a concordância estabelecida. Nenhum dos cuidados mapeados atingiu consenso de 100%, evidenciando as várias possibilidades de comparação e a importância dos estudos de validação.

Descritores: Processos de Enfermagem; Estudos de Validação; Diagnóstico de Enfermagem; Cuidados de Enfermagem; Enfermagem Ortopédica; Classificação.

## **Validación del mapeo de cuidados de enfermería prescritos para pacientes ortopédicos con la clasificación de las intervenciones de enfermería**

Este trabajo tuvo como objetivo validar el mapeo de los 52 cuidados de enfermería prescritos para pacientes ortopédicos con la Clasificación de las Intervenciones de Enfermería (NIC), referente a tres diagnósticos: déficit en el autocuidado (baño y/o higiene), movilidad física perjudicada y riesgo de infección. El estudio fue desarrollado en el Hospital de Clínicas de Porto Alegre, utilizándose el método de validación de contenido por medio de la aplicación de la Técnica Delphi, considerándose 70% de acuerdo entre jueces. Los datos fueron analizados por medio de estadística descriptiva. Participaron del estudio 22 jueces que, en dos rodadas, validaron el mapeo de 51 cuidados de enfermería con 56 intervenciones de la NIC. Es posible afirmar que el objetivo fue alcanzado, ya que apenas un cuidado no alcanzó la relación establecida. Ninguno de los cuidados alcanzó un consenso de 100%, colocando en evidencia las varias posibilidades de comparación y la importancia de los estudios de validación.

Descriptorios: Procesos de Enfermería; Estudios de Validación; Diagnóstico de Enfermería; Atención de Enfermería; Enfermería Ortopédica; Clasificación.

### **Introduction**

The increased use of nursing diagnoses in nurses' professional practice led to the need of developing a universal and understandable classification that standardized nurses' interventions and would be congruent with the systematization process of patients' care<sup>(1)</sup>.

In this context, a group of researchers at the University of Iowa in the United States, in 1992, launched the first issue of the Nursing Interventions Classification (NIC), a taxonomy that includes activities

performed by nurses. It proposes to standardize the nomenclature of nursing treatments; enlarge knowledge of the connection between diagnoses, interventions and results; develop a computerized nursing and health care system; teach nursing students to make decisions; determine the cost of care delivery; plan the resources necessary to professional practice; create a language to communicate functions that are exclusive to nursing and link it to other health care systems<sup>(2-3)</sup>. NIC currently includes 514 nursing interventions, structured in seven

domains and 30 classes. Each intervention has a title, a definition and a series of activities that are specific actions or behaviors that nurses perform in their professional practice<sup>(4)</sup>.

An intervention can be defined as any treatment based on the judgment and clinical knowledge of a nurse, aiming to increase the patients' results<sup>(3)</sup>. Interventions proposed to each nursing diagnosis are classified as 'priority', 'suggested' and 'additional optional', taking into account their affinity with the diagnosis in question. The priority interventions (first level) constitute the interventions with a greater chance to remedy the diagnosis; the suggested interventions (second level) are interventions that have a chance to solve the diagnosis but not as good a one as the priority ones; and the additional optional (third level) are those that are applied only to some patients with the diagnosis in question<sup>(3)</sup>.

NIC interventions can be related to the nursing diagnoses of the North American Nursing Diagnosis Association (NANDA) and to the results of the Nursing Outcomes Classification (NOC), and are complementing terminologies that aim to contribute to the process of standardization of care delivered in hospitals at an international level.

Based on the importance of this process and on the NIC proposal, this study was developed to contribute to the implementation of this classification in care practice, aiming to strengthen and value nursing care. This study is based on the results of a previous study in which three nursing diagnosis (ND) were identified: Self-care Deficit: Bathing/Hygiene, Impaired Physical Mobility and Risk for Infection. These were prevalent in adult orthopedic patients undergoing total hip arthroplasty (THA) or knee (TKA) at the Hospital das Clínicas in Porto Alegre (HCPA). The nursing care procedures prescribed by nurses in the facility's computerized system were identified for each of these three diagnoses<sup>(5)</sup>. The 52 identified nursing care activities were mapped onto NIC interventions and activities<sup>(6)</sup>. Therefore, the study aimed to validate the previous nursing care mapping considering the levels of interventions suggested by NIC.

This study contributes to the construction of knowledge about the nursing process and classifications, focusing on the Nursing Interventions Classification (NIC), directed to professional practice, teaching and research with a view to support its use in electronic patients' files and written documentation, aggregating advancements for Brazilian nursing.

## Method

This is a quantitative study to validate content<sup>(7)</sup> through the application of the Delphi technique. This technique permits obtaining consensus in a group regarding a certain phenomenon<sup>(8)</sup>. The group is composed of experts, that is, professionals effectively engaged in the field in which the study is developed. The use of this tool demands three basic conditions: respondents' confidentiality, statistical representation of the distribution of results and feedback of the groups' answers to be reevaluated in subsequent rounds<sup>(9)</sup>. There is no guideline establishing a minimum level of consensus<sup>(10)</sup>, though, it is recommended that a minimum of 70% of agreement should be reached at the final stage of the Delphi technique<sup>(11-12)</sup>. Based on this recommendation, we adopted 70% as the minimum level for consensus to be obtained by the experts in the validation of the mapped care actions.

The validation was carried out by a group of experts composed of Brazilian nurses invited to participate in the study. Inclusion criteria included: knowledge about Nursing Interventions Classification (NIC) (considering participation in course/training, research including NIC or development of this subject in undergraduate and/or graduate teaching); professional experience of at least two years; and agreement to participate in all stages of the study. The following exclusion criteria were considered: inadequately filling out the questionnaires and/or returning them after the scheduled date.

Experts were selected through contact by e-mail with Brazilian nursing schools and graduate nursing programs and also by direct contact with faculty members who published scientific articles about this subject. A total of 52 nurses were invited to participate and 34 agreed to serve as judges.

The data collection instrument was sent by e-mail or mail according to each participant's choice. This instrument included: a questionnaire to characterize the participant, instructions of how to fill it out, charts with the 52 prescribed nursing care actions and mapping of NIC interventions and activities, a conceptual outline (developed by the researchers), a three-point scale (agree, partially agree and disagree) and a column for observations. Twenty-six out of 34 instruments returned within the established date and a minimum consensus of 70% was reached for 31 of the 52 mapped nursing care actions.

Data were analyzed through descriptive statistics and the percentage of agreement between experts

related to the mapping was determined. The care actions that did not reach 70% of agreement were mapped again and sent to the experts for a second evaluation. The second mapping process took into account the experts' suggestions, some rules proposed in the literature<sup>(13-15)</sup> and NIC orientation regarding the choice of adequate interventions for each NANDA nursing diagnosis. Twenty-six instruments were sent in this second evaluation and 22 returned within the established date. A minimum level of 70% of agreement was reached for 20 of the 21 mapped nursing care actions.

The researchers collected data between September 2006 and February 2007. The study was approved by the Research Committee at the Federal University of Rio Grande do Sul (UFRGS), Nursing School and the Research Ethics Committee/GPPG at HCPA. The instruments sent by e-mail, and which were completed and returned, were considered tacit agreements to participate in the study. Those who received the instrument by mail signed a free and informed consent form.

## Results

Fifty-two nurses were contacted and 34 agreed to serve as judges in the study. Twenty-two participated up to the end of the study and 21 (95.5%) were female. Ages varied between 25 and 58 years, with an average age of 40 years. The majority, 17 (77.3%), work in the state of São Paulo and the remainder in Minas Gerais (2), Paraíba (1), Rio de Janeiro (1) and Paraná (1). Half were doctors; 31.81% Masters, 13.63% were specialists and one had a bachelor's

degree in nursing (4.54%). In relation to the criterion of knowledge concerning NIC, 14 (63.63%) respondents reported attendance of courses/training and 11 (78.57%) of these also reported the use of the Classification in their teaching activities and/or in research. Only four (18.18%) reported its use in their care practice. Regarding their professional work, the majority were included in more than one field, 12 (54.54%) teach, nine (40.9%) were involved in research, eight (36.36%) in patient's care and three (13.63%) performed administrative functions.

Two rounds of the Delphi Technique were carried out to validate the mapping. In the first round, 26 (76.47%) out of 34 sent instruments returned within the established date. Among the 52 mapped care procedures sent for validation, 31 (59.61%) reached the minimum level of 70% of agreement, eight referred to the nursing diagnosis Bathing/Hygiene, seven to Risk for Infection and 16 to Impaired Physical Mobility. One of the care actions in this last diagnosis was mapped with two interventions, totaling 17 mapped interventions. Twenty-four nursing interventions were mapped onto 21 prescribed care actions in this second round.

In addition to the three levels of connection between the NANDA nursing diagnoses and NIC<sup>(4,6)</sup> interventions, we added a fourth one, called "other interventions". This last level contains care actions mapped to interventions that are not included in the NANDA-NIC connections proposed in the classification.

Tables 1, 2 and 3 present the final result of the mapping of NIC interventions to the three studied diagnoses.

Table 1 – Final result of the validation of the mapping of NIC interventions according to levels of interventions for care prescribed in the ND Self-care Deficit: Bathing/Hygiene. Porto Alegre, Brazil 2007

Nursing diagnosis Self-care Deficit Bathing/Hygiene		
Prescribed care actions at the HCPA	Mapped Intervention	Validated intervention
Self-care assistance: toileting	Bathing <sup>1</sup> Self-care assistance: bathing/hygiene <sup>1</sup>	Therapy with exercises: deambulation <sup>2</sup> (94%)
Conduct hygiene after each evacuating bowel	Bathing <sup>1</sup>	Self-care assistance: intimate hygiene <sup>4</sup> (82%)
Assistance in the shower	Self-care assistance: bathing/hygiene <sup>1</sup>	Self-care assistance: bathing/hygiene <sup>1</sup> (93%)
Take the patient to shower	Bathing <sup>1</sup> Self-care assistance: bathing/hygiene <sup>1</sup>	Bathing <sup>1</sup> (88%)
Administer sponge bath	Bathing <sup>1</sup>	Self-care assistance: bathing/hygiene <sup>1</sup> (82%)
Orient patient	Teaching: individual <sup>2</sup>	Support in decision making <sup>3</sup> (68%)
Check vital signs	Vital signs monitoring <sup>4</sup>	Vital signs monitoring <sup>4</sup> (76%)
Perform oral hygiene	Oral health maintenance <sup>4</sup>	Oral health maintenance <sup>4</sup> (76%)
Communicate signs of pain	Pain management <sup>4</sup>	Pain management <sup>4</sup> (81%)

The numbers indicate the level of intervention according to NIC (1-priority, 2- suggested, 3-additional optional, 4 - other). The percentages between parentheses indicate the index of final agreement among the experts.

Thus, we observe the nine care actions related to the ND Self-care Deficit: Bathing/Hygiene were mapped onto nine NIC interventions: three (33.33%) priority, one (11.11) suggested, one (11.11%) additional optional and four (44.44%) with another level of intervention.

Table 2 – Final result of the validation of the NIC interventions mapping according to the levels of interventions for prescribed care to the ND Risk for Infection. Porto Alegre, Brazil 2007

Nursing diagnosis Risk for Infection		
Care actions prescribed at the HCPA	Mapped intervention	Validated intervention
Apply dressings	Wound care <sup>2</sup>	Incision site care <sup>3</sup> (88%)
Implement routine care with survey of relief	Care with probes and drains <sup>3</sup> Care with probes: bladder <sup>3</sup>	Infection management <sup>1</sup> (70%)
Promote safety and rest	Environmental management: safety <sup>4</sup> Environmental management: comfort <sup>4</sup>	Environment management: safety <sup>4</sup> (82%) Environment management: comfort <sup>4</sup> (82%)

The numbers indicate the level of intervention according to NIC (1-priority, 2-suggested, 3-additional optional and 4-other). The percentages between

parentheses indicate the level of agreement among the judges.

Table 3 – Final result of the validation of the NIC interventions mapping according to the levels of interventions for prescribed care to the ND Impaired Physical Mobility. Porto Alegre, Brazil

Nursing diagnosis Impaired Physical Mobility		
Care actions prescribed at the HCPA	Mapped intervention	Validated intervention
Sit patient on a chair	Positioning <sup>1</sup>	Positioning <sup>1</sup> (76%)
Assist patient to sit on the chair	Positioning <sup>1</sup>	Therapy with exercises: deambulation <sup>2</sup> (93%)
Check vital signs	Neurological monitoring <sup>3</sup>	Vital signs monitoring <sup>4</sup> (76%)
Communicate signs of pain	Pain management <sup>3</sup>	Pain management <sup>3</sup> (82%)
Promote safety and comfort	Environmental management: safety <sup>4</sup> Environmental management: comfort <sup>4</sup>	Environmental management: safety <sup>4</sup> (87%) Environmental management: comfort <sup>4</sup> (87%)
Communicate behavioral and/or affection change	Behavior modification <sup>4</sup>	Behavior modification <sup>4</sup> (70%) Reality orientation <sup>4</sup>
Implement routine protocol for prevention of pressure ulcers	Pressure ulcer prevention <sup>4</sup>	Skin surveillance <sup>3</sup> (88%)

The numbers indicate the level of intervention according to NIC (1-priority, 2-suggested, 3-additional optional and 4-other). The percentages between parentheses indicate the level of agreement among the judges.

## Discussion

Of the 22 experts who participated in the two rounds, 18 (81.81%) had graduate degrees and the majority teach and research. Thus, this a very qualified group committed to academic activities. In relation to the use of NIC in their professional practice, 16 (72.72%)

reported its use in teaching activities and/or research and only four (18.18%) reported its use in care delivery. The reason is that NIC is a relatively new classification, which requires further studies about its viability and use in clinical practice<sup>(2)</sup>.

In the first round, 31 (59.61%) of the 52 care actions prescribed were adequately mapped in the experts' evaluation. However, an expressive number (40.38%) of care actions were considered inadequately mapped, which justified the need for validation.

After analysis of the returned instruments in the study's second round, a minimum consensus of 70% and maximum consensus of 94% were obtained for 20

of the 21 nursing care actions. Only the mapping of the care action "orient the patient" related to the diagnosis Self-care Deficit: Bathing/Hygiene reached agreement below the proposed level (68%). We considered that a third round of evaluations was not needed because only one nursing care action had not reached the expected minimum consensus but was close to it. Additionally, the analysis of justifications regarding disagreement to the suggested mapping revealed that some judges disagreed with the prescription of this care action for the diagnosis in question, not with the suggested mapping. We also took into account the difficulty of carrying out a new mapping for this care action considering the NIC possibilities of classification.

Of the 21 care actions re-mapped in the second round, ten kept the same intervention, eight differed only in the selected activities and two were not altered in relation to the initial mapping. In this case, we observe that the care action "verify vital signs" related to the ND Self-care Deficit: Bathing/Hygiene and "promote safety and comfort" related to the ND Risk for Infection, did not reach consensus in the first round because the judges disagreed whether the care actions were adequate to the diagnoses. After orientation sent in the instrument in the second round stressing the study's purpose and describing the functioning of the hospital's computer system, the judges agreed with the proposed mapping.

This study revealed that the 52 care actions prescribed by the nurses at the HCPA through the computer system for adult patients who underwent total hip or knee arthroplasty are similar to the NIC activities/interventions for the diagnoses Self-care Deficit: Bathing/Hygiene, Risk for Infection and Impaired Physical Mobility. Hence, the conclusion is that the NIC interventions include the prescribed nursing care actions, which confirms their validity as a nursing intervention classification.

These findings permit qualifying care delivery and the nursing documentation in the patients' files since the nursing diagnoses have already been identified in diverse populations. Risk for Infection is indicated as prevalent in different studies, whether in hospitalized elderly patients<sup>(16)</sup>, adults in intensive therapy units<sup>(17)</sup> or in patients in the preoperative of esophageal surgeries. All these have increased environmental exposure to pathogens<sup>(18)</sup>.

The 52 prescribed care actions were mapped onto 56 NIC interventions, totaling 22 (39.29%) priority interventions, 10 (17.85%) suggested interventions, seven as (12.5%) additional optional, and 17 (30.36%)

are categorized as other interventions. The fact that some procedures were mapped onto more than one intervention can be attributed to differences between the terminology used in the nurses' prescriptions and that of NIC and to the classification itself, which contains similar activities for different interventions<sup>(19)</sup>. A difference of nomenclature is also observed between the last two NIC issues<sup>(3-4)</sup>. For instance, the intervention "oral health maintenance" in the third issue becomes "oral health promotion" in the 4<sup>th</sup> issue. A more relevant situation for this study is the difference in the NANDA-NIC level of intervention, as it occurs with the intervention "therapy with exercise: deambulation". This intervention was classified as suggested in the 2004 issue<sup>(3)</sup> but this same intervention becomes priority in the 2008 version<sup>(4)</sup>.

The result of the validation reveals that the majority of care actions (67.85%) were mapped with the NIC interventions proposed for the three studied nursing diagnoses. The high percentage of care actions mapped to other interventions can be attributed to the diversity of factors related to the studied NDs<sup>(19)</sup>, as is the case of "pain management" for the Self-care Deficit: Bathing/Hygiene. Pain is one of the factors related to this diagnosis since patients usually experience pain of moderate to severe intensity in the postoperative of THA or TKA<sup>(20)</sup>. The literature itself indicates that in addition to the diagnosis, the factors related to the defining characteristics need to be observed in the NANDA-NIC connection<sup>(3)</sup>.

Another aspect to be considered in relation to the number of interventions categorized as "others" is that there was no concern in analyzing the frequency with which these care actions were prescribed for the studied patients. That is, some of these procedures were prescribed to few patients and were not significant in the context of prescriptions. For instance, the care action "communicate behavioral and/or affection change" was prescribed only once and mapped to the intervention "behavior modification"<sup>(5)</sup>. It reflects the inadequacy of the computerized prescription system that is constantly updated based on studies and observations of nurses' clinical practice.

On the other hand, the nursing care "verify vital signs" is largely prescribed and was included in the prescription referent to three studied NDs, because it is linked to all NDs in the hospital's Computerized Prescription System. Consequently, it was predominantly mapped to the level "other interventions" because it was difficult to map it to the levels of intervention proposed in the NANDA-NIC connection.

## Final Considerations

This study validated the mapping of nursing care actions prescribed at the HCPA onto the nursing interventions of the NIC classification for the three prevalent NDs identified in patients who underwent THA and TKA. At the end of the study it was possible to state that this objective was achieved since only one of the 52 mapped nursing care actions did not reach the minimum level of agreement of 70% among judges.

This study is in agreement with the NIC proposal and that described in the literature<sup>(2)</sup>, which highlights the possibility of seeking a computerized use of this classification. In the HCPA, nursing diagnoses are included in the computerized system and follow the NANDA taxonomy, but nursing care actions are not standardized yet. Thus, this study sought to contribute to the updating of this system, including in it the NIC activities/interventions.

None of the mapped care procedures reached 100% consensus in the validation process. This evidences the various possibilities of comparison and

the importance of validation studies. As nursing seeks a common language to describe and communicate its practices, validation studies in the field improve the accuracy of mappings.

The Delphi technique was adequate for the purpose of this study, was economically viable and allowed the participation of professionals highly qualified in a theme in which research is still incipient. However, this technique requires the availability of participants to analyze the material in different rounds, which is not always possible within the established timeframes. Some participants withdrew from the study and as a result there was loss of important information.

We concluded at the end of this study that the use of NIC as a standardized terminology to describe prescribed nursing care actions is possible because it proved to be adequate in the HCPA context. Therefore, we suggest that similar studies be carried out in other facilities to verify whether NIC is adequate at an international level with a view to favor documentation and communication among professionals and contribute to the advancement of nursing.

## References

- Guimarães HCQCP, Barros ALBL. Classificação das Intervenções de Enfermagem. Rev Esc Enferm. USP 2001 junho;35(2):130-4.
- Napoleão AA, Chianca TCM, Carvalho EC, Dalri MCB. Análise da produção científica sobre a Classificação das Intervenções de Enfermagem (NIC) de 1980 a 2004. Rev Latino-am Enfermagem 2006 julho-agosto; 14(4):608-13.
- McCloskey JC, Bulechek GM. Classificação das Intervenções de Enfermagem (NIC). 3ª ed. Porto Alegre: Artmed; 2004.
- McCloskey JC, Bulechek GM. Classificação das Intervenções de Enfermagem (NIC). 4ª ed. Porto Alegre: Artmed; 2008.
- Almeida MA, Longaray VK, De Cezaro P. Diagnósticos de enfermagem prevalentes e cuidados prescritos para pacientes ortopédicos. Online Braz J Nurs. [periódico na internet] 2006 [acesso em 30 de abril de 2007]; 5(3). Disponível em: <http://www.uff.br/objnursing/index.php/nursing/article/view/502/115>
- Almeida MA, Longaray VK, De Cezaro P, Barilli SLS. Correspondência entre cuidados para pacientes com problemas ortopédicos e a Classificação das Intervenções de Enfermagem. Rev Gaúch Enferm 2007 dezembro; 28(4):480-8.
- Turato ER. Tratado da metodologia da pesquisa clínico-qualitativa: construção teórico-epistemológica, discussão comparada e aplicação nas áreas da saúde e humanas. Petrópolis (RJ): Vozes; 2003.
- Faro AM. Técnica Delphi na validação de intervenções de enfermagem. Rev Esc Enferm USP 1997 agosto; 31(2):259-73.
- Giovinazzo R. Modelo de aplicação da metodologia Delphi pela internet: vantagens e ressalvas. Rev Adm on line [periódico na internet] 2001 [acesso em 10 de fev 2006]; 2(2). Disponível em : URL:[http://www.fecap.br/adm\\_online/art22/renata.htm](http://www.fecap.br/adm_online/art22/renata.htm).
- Keeney S, Hasson F, McKenna H. Consulting the oracle: ten lessons from the Delphi Technique in nursing research. J Adv Nurs 2006; 2(53):205-12.
- Grant JS, Kinney MR. Using the Delphi technique to examine content validity of nursing diagnosis. Nurs Diag 1992; 3(1):12-22.
- Perroca MG, Gaidzinski RR. Sistema de classificação de pacientes: construção e validação de um instrumento. Rev Esc Enferm USP 1998 agosto; 32(2):153-68.
- Coenen A, Ryan P, Sutton J. Mapping nursing interventions from a hospital information system to the Nursing Intervention Classification (NIC). Nurs Diag 1997;8(4):145-51.
- Delaney C, Moorhead S. Synthesis of methods, rules, and issues of standardizes nursing intervention language mapping. Nurs Diag 1997;8(4):152-6.
- Lucena AF, Barros ALBL. Mapeamento cruzado: uma alternativa para a análise de dados em enfermagem. Acta Paul Enferm 2005;18(1):82-8.
- Almeida MA, Aliti GB, Franzen E, Thomé EGR, Unicovsky MR, Rabelo ER et al. Diagnósticos de enfermagem e intervenções prevalentes no cuidado ao idoso hospitalizado. Rev Latino-am Enfermagem [periódico na Internet]. 2008 Ago [citado 2009 Jun 01]; 16(4):707-11. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-11692008000400009&lng=pt](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692008000400009&lng=pt). doi: 10.1590/S0104-11692008000400009
- Carvalho EC, Martins FTM, Dalri MCB, Canini SRMR, Laus AM, Bachion MM et al. Relações entre a coleta de dados, diagnósticos e prescrições de enfermagem a pacientes adultos de uma unidade de terapia intensiva. Rev Latino-am Enfermagem [periódico

- na Internet]. 2008 Ago [citado 2009 Jun 01]; 16(4):700-6. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-11692008000400008&lng=pt](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692008000400008&lng=pt). doi: 10.1590/S0104-11692008000400008.
18. Lopes AER, Pompeo DA, Canini SRMS, Rossi LA. Diagnósticos de enfermagem de pacientes em período pré-operatório de cirurgia esofágica. *Rev Latino-am Enfermagem* [periódico na Internet]. 2009 Fev [citado 2009 Jun 01]; 17(1):66-73. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-11692009000100011&lng=pt](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692009000100011&lng=pt). doi: 10.1590/S0104-11692009000100011.
19. Lucena AF. Mapeamento dos diagnósticos e intervenções de enfermagem de uma unidade de terapia intensiva [Dissertação]. São Paulo (SP): Esc Paulista Med/UFSP; 2006.
20. Hill N, Davis P. Nursing care of total joint replacement. *J Orthopaedic Nurs* 2000; 4:41-5.