The use of the NOC classification system in intensive care

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ABSTRACT

Aim: The evaluation of using cardiopulmonary class outcomes of the NOC classification system in relation to the 00031 NANDA-Int. Ineffective Airway Clearance diagnosis, in order to test the use of NNN classification systems by nurses in real clinical workplaces of intensive care.

Methods: General nurses evaluated the usability of the NOC classificatory system outcomes (4th edition, 2008), which they would use in their clinical workplaces in the relation to the nursing diagnosis 00031 NANDA-Int. Ineffective Airway Clearance (NANDA-I, 2009–2011, transl. Kudlová, p. 360). They evaluated the outcomes into a recording list using the Likert scale. For the comparison of NOC outcomes evaluation by nurses from individual clinical workplaces, the Pearson chi-square test for independence was used after the basic statistical processing (arithmetic mean, median, standard deviation).

Results: Research did not prove statistically significant differences amongst nurses' (n = 65) evaluation with outcomes 0412; 0415; 0416; of the cardiopulmonary class of the NOC classification system.

Conclusion: The survey research brought partial results to the IGA MZČR NF 12078-4/2011 project which supports implementation of NIC classification system into the surgical and anaesthetic nursing care in the environment of clinical practice in the Czech Republic.

KEY WORDS

NNN Classification, Ineffective Airway Clearance, Intensive Care, Airway

INTRODUCTION

Facilitating breathing ranks among life-saving priorities and indicates an admission of a patient to a ward with intensive nursing care. Precisely determined nursing diagnoses and appropriately selected interventions could significantly affect the outcomes of nursing care and the general condition of a patient with breathing difficulties. The nursing diagnoses affect specific outcomes not only in the development of the client's medical condition, but also in other important determinants, such as economic indicators: duration of hospitalisation, disease impact and death, etc. It is possible to test the economic indicators when sensitive measurement tools are used in diagnostics and outcomes, when databases with a standardised terminology are used (Lavin et al., 2004, p. 76). What seems to be the optimum solution is the use of standardised 3N Alliance terminology (NANDA Int., NIC, NOC, hereinafter referred to as NNN), which was transformed in 2000. Experts agree this to be a major step towards the use of a unified nursing language (Marečková, 2007, p. 28). This interconnection supports the linkage between the many aspects of an individual/client's, family, group/community problem with the expected outcomes and selection of intervention affecting the problem (Moorhead et al., 2011, p. 5). Using a standardised terminology may improve nursing documentation, including the electronic version, provided a systematic validation and nursing education are carried out and they are gradually implemented in the clinical practice (Müller-Staub, 2009, p. 10). Müller-Staub appeals for precision in using standardised terminology. The linkage between NNN facilitates critical thinking in assessment, planning, and evaluation and is the groundwork for evidence-based heath care. Using an effective clinical assessment by the nurse in the decision-making process in care planning with Out-come-Present-State-Test model (hereinafter referred to as OPT) is only possible when using a standardised terminology. OPT model includes (Kautz et al., 2006, p. 130) structures linked to the NNN terminology, because it systematically takes into consideration the clinical assessment in the theoretical context. It also includes reflection of the nurse's clinical judgement with emphasis on the outcomes

when identifying the nursing diagnosis and specification of nursing interventions leading up to the nursing outcome. What is improved is the nurse's clinical judgement in the field of nursing care outcomes (Butcher, Johnson, 2011, p. 15). It is reasonable to test the linkage of the components of the NNN classification systems as a highly-developed model of standardised terminology for a possible implementation in the Czech nursing environment. However, the implementation itself should be carried out with consideration and with taking the appropriate steps (Müller-Staub et al., 2007, p. 703).

AIMS
The aim is to assess the usability of outcomes from the cardiopulmonary class of the NOC classification system (4th, 2008, p. 130) in real clinical conditions with a selected NANDA nursing diagnosis 00031 Ineffective airway by general nurses at workplaces providing intensive nursing care about airway.

SAMPLE
The total of 16 outcomes from the cardiopulmonary class of the NOC classification system (4th, 2008, p. 130) was evaluated by 65 respondents – general nurses, out of which 20 (n31%) were general nurses from intensive care follow-up departments (hereinafter referred to as ICFD), 18 (n28%) were nurses from intensive care units (hereinafter referred to as ICU) and 27 (n41%) general nurses from anaesthesiology and resuscitation departments (hereinafter referred to as ARD) from the Hospital Uherské Hradiště (see Tab. 1). The survey research was approved by the hospital management and the management of wards in question where intensive nursing care is provided to patients with difficult breathing and airway problems. In view of the research nature, no approval by the ethical committee was necessary.

METHODOLOGY
The data collection was executed in February – March 2012. General nurses evaluated the usability of outcomes of the cardiopulmonary class of the NOC classification system (4th, 2008, p. 130), which they would actually use at their clinical workplace in connection with the NANDA-Int. nursing diagnosis 00031 Ineffective Airway Clearance for a running assessment of the nursing outcome in airway management. The evaluation of NOC outcomes usability was performed using a recording list with Likert scales. There were 16 outcomes of the NOC (Nursing Outcomes Classification, 4th ed., 2008, p. 130) cardiopulmonary class with their respective codes (see Tab. 2). The NOC outcome had been translated into Czech by a professional. To analyse the data for statistical processing (arithmetic mean – μ, median – Me, standard deviation SD), the Pearson's chi-squared test was used for the contingency table and significance level was set at 5% (p ≤ 0.05).

RESULTS
Basic statistical processing and the Pearson's chi-squared test for the contingency table did not prove significant statistical differences in the evaluation of usability of outcomes coded 0412, 0415, 0416 of the cardiopulmonary class of the NOC classification system at the ICFD, ICU, and ARD clinics of the Hospital Uherské Hradiště (See Tab. 2). The NOC classification system cardiopulmonary class outcomes 0410, 0409, 0413, 0414, 0401, 0411, 0402, 0403, 0404, 0405, 0406, 0407, 0408 proved statistically significant deviations in the evaluation of usability at the ICFD, ICU, and ARD clinics of the Hospital Uherské Hradiště (see Tab. 2).

The cardiopulmonary class outcomes 0411, 0402, 0403 of the NOC classification system reached μ over 4, but the distribution of evaluation of usability was statistically significant at different workplaces.

DISCUSSION
The results of the above mentioned survey research show three outcomes coded 0412, 0415, 0416 of the cardiopulmonary class of the NOC classification system (4th ed., 2008, p. 130), which the nurses would use for a running assessment of the nursing outcomes in care for airway, if the 00031 NANDA-Int. Ineffective Airway Clearance was diagnosed, regardless of the clinical workplace (ICFD, ICU, ARD) at the Hospital Uherské Hradiště. The electronic resources EBSCO host, PubMed and BMČ did not offer any relevant information to compare the survey research in the field of intensive care for airway in adults. Validation, implementation and the use of each of the components of the standardised NNN terminologies are referenced several times in foreign as well as domestic studies. The research published so far supports the claim about implementation of standardised terminology and most of them deal with validation, comparison and concordance of the most common nursing diagnoses in relation to nursing interventions and nursing outcomes. Validation of the nursing diagnoses, one of which is also 00031 Ineffective Airway Clearance (NANDA-Int., transl. Kudlová, 2010, p. 360) is dealt with by a Brazilian team of Zeitoun et al. (2007, p. 1417–1426). Seganfredo (2011, p. 34–41) deals with validation of standardised NOC terminology in two common nursing diagnoses at surgical clinic and the ICU in critical patients. Verification of the ten most common nursing diagnoses in intensive care is the topic of Brazilian

authors Marini et al., (2011, p. 56–67). Comparison of ten most common nursing diagnoses, interventions and sensitive outcomes in client with cardiac failure is the aim of a research by Scherb et al. (2011, p. 13–21). Lopes (2009, p. 76–88) focuses on validating NIC interventions in connection with the NOC outcomes in the nursing diagnosis Excess Fluid Volume. Lunney et al. (2010, p. 161–166) searches for an agreement in identification of relevant diagnoses, interventions and outcomes amongst patients in long-term care after cerebral injury. In their paper, Stefanová and Marečková

(2010, p. 143) deal with the different findings of risk factors of the nursing diagnosis 00047 in choosing four NOC areas and six NIC interventions. Müller-Staub et al. (2007, 702–713) investigate the topic of guided clinical judgement in support of initial implementation of a standardised terminology. Vörösová (2007, p. 66–70) presents the results of nursing management of chronic confusion using a selected array of NNN in geriatric care. Boledovičová (2007, p. 5–9) describes the creation of a practical manual for using standardised NN terminology in neonatal nursing. Ahern (2003, p. 32)

Table 1 Breakdown of the group of general nurses

Category	Frequency	Cumulative frequency	Relative frequency	Cumulative relative frequency
ICFD	20	20	31 % (30.76)	30.7692
ICU	18	38	28 % (27.69)	58.4615
ARD	27	65	41 % (41.53)	100.00

Table 2 Statistical evaluation of usability of NOC outcomes

NOC outcome code	μ	Me	SD	p*
0410	3.908	5	1.343	0.000001
0409	3.185	3	1.402	0.000935
0413	3.170	3	1.506	0.000000
0414	3.538	4	1.552	0.000000
0401	3.538	4	1.469	0.000000
0411	4.369	5	0.821	0.000002
0412	**4.508**	**5**	**0.753**	**0.30273**
0415	**4.462**	**5**	**0.831**	**0.326263**
0402	4.046	4	1.152	0.003381
0403	4.015	4	1.023	0.022750
0404	2.738	3	1.384	0.000032
0405	3.077	3	1.266	0.02092
0416	**3.492**	**4**	**1.134**	**0.140545**
0406	3.031	3	1.172	0.016780
0407	3.400	3	0.932	0.024005
0408	2.877	3	1.442	0.002742

*Significant outcomes of the NOC cardiopulmonary class 0412, 0415, 0416 is in bold.

Notes: Code and name of the evaluated cardiopulmonary classes of the NOC classification

0410	*Respiratory Status: Airway Patency*	*0403*	*Respiratory Status: Ventilation*
0409	*Blood Coagulation*	*0404*	*Tissue Perfusion: Abdominal Organs*
0413	*Blood Loss Severity*	*0405*	*Tissue Perfusion: Cardiac*
0411	*Mechanical Ventilation Response: Adults*	*0416*	***Tissue Perfusion: Cellular***
0412	***Mechanical Ventilation Weaning Response: Adults***	*0406*	*Tissue Perfusion: Cerebral*
0415	***Respiratory Status***	*0407*	*Tissue Perfusion: Peripheral*
0402	*Respiratory Status: Gas Exchange*	*0408*	*Tissue Perfusion: Pulmonary*

supports the implementation of a uniform NNN terminology in nursing care planning.

CONCLUSION

The research results enhance nurses' awareness of the necessity to implement a unified nursing language, of the existence and linkage of the NNN standardised terminology. The research identifies three NOC outcomes with codes 0412, 0415, 0416, which the nurses would actually use in real nursing environment in one particular hospital to assess the nursing outcome in airway management with the NANDA-Int. nursing diagnosis 00031 Ineffective Airway Clearance. The results of the research will be further used in order to observe the usability of nursing interventions and activities of the NIC classification system (of the 5th, 2008 and 6th, 2013, editions), in connection with the subsequent steps in the implementation of classification systems into the environment of intensive and surgical nursing care in the Czech Republic. We are aware of the necessary precision in using standardised NNN terminology and we admit the research has its limitations. Amongst these are the small sample size, nurses' awareness of standardised terminology and using nursing diagnosis in clinical practice, the number of clinical workplaces with intensive care, translation of the originals of NNN classification systems and mainly verification of their validity in the Czech nursing environment.

REFERENCES

AHERN, C. K. 2003. Applying Standardized Nursing Language to Three Cardiac and Pulmonary Rehabilitation Programs in Rural Setting. *International Journal of Nursing Terminologies and Classification.* 2003, vol. 14, no. 4, p. 32. ISSN 1541-5147.

BOLEDOVIČOVÁ, M. et al. Použitie Aliance NNN v neonatologickom ošetrovateľstve. In BUŽGOVÁ, R. a SIKOROVÁ, L. (eds.) *Ošetřovatelská diagnostika a praxe založená na důkazech II. Nursing diagnostics and evidence based practice II.* Ostrava: University of Ostrava, 2008. p. 5–9. ISBN 978-80-7368-499-0.

BUTCHER, H., JOHNSON, M. 2012. Use of linkages for clinical reasoning and quality improvement. In Johnson, M. et al. *NOC and NIC Linkages to NANDA-I and Clinical Conditions, Support Critical Reasoning and Quality Care.* 3rd ed. Iowa: Mosby Elsevier, 2012. p. 11–23. ISBN 978-0-323-07703-3.

KAUTZ, D. et al. 2006. Using NANDA, NIC, and NOC (NNN) Language for Clinical Reasoning with the Outcome-Present-State-Test (OPT) Model. *International Journal of Nursing Terminologies and Classification.* 2006, vol. 17, no. 3, p. 129–138. ISSN 1541-5147.

LAVIN, M. A., et al. 2007. A Dialogue on the Future of Nursing Practice. *International Journal of Nursing Terminologies and Classification.* 2007, vol. 18, no. 3, p. 74–83. ISSN 1541-5147.

LOPES, J., et al. 2009. A pilot Study to Validate the Priority Nursing Interventions Classification Interventions and Nursing Outcomes Classification Outcomes for the Nursing Diagnosis Excess Fluid Volume in Cardiac Patients. *International Journal of Nursing Terminologies and Classification.* 2009, vol. 20, no. 2, p. 76–88. ISSN 1541-5147.

LUNNEY, M., et al. 2010. Consensus-validation study identifies relevant nursing diagnoses, nursing interventions, and health outcomes for people with traumatic brain injuries. *Rehabilitation Nursing: The Official Journal of the Association of Rehabilitant Nurses.* 2010, Vol. 35, no. 4, p. 161–166. ISSN 0278-4807.

MAREČKOVÁ, J. 2007. Klasifikace ošetřovatelských diagnóz NANDA. In HANZLÍKOVÁ, A. (eds.). *Klasifikačné systémy a štandardizácia terminologie v ošetrovateľstve.* Martin: Osveta, 2007. p. 13–28. ISBN 978-80-8063-242-7.

MARINI, M. et al. 2011. Evaluation of the Accuracy of Nursing Diagnoses in a Brazilian Emergency Service. *International Journal of Nursing Terminologies and Classification.* 2011, vol. 22, no. 2, p. 56–67. ISSN 1541-5147.

MÜLLER-STAUB, M. et al. 2009. Evaluation of the implementation of nursing diagnoses, interventions, and outcomes. *International Journal of Nursing Terminologies and Classification.* 2009, vol. 20, no. 1, p. 9–15. ISSN 1541-5147.

MÜLLER-STAUB, M. et al. 2007. Meeting the criteria of a nursing diagnosis classification: Evaluation of ICNPs, ICF, NANDA and ZEFP. *International Journal of Nursing Studies* [online]. 2007, vol. 44, č. 5 [accessed 12. 12. 2011]. Available at: http://journalofnursingstudies.com.

NANDA International NURSING DIAGNOSES: Definitions & Classification 2009–2011.(ed). HERDMAN, H. Oxford: Willey-Blackvell, p. 308, 419. ISBN 978-1-4051-8718-3.

NANDA ošetřovatelské diagnózy definice & klasifikace 2009–2011. (ed). HERDMAN, H. Translation KUDLOVÁ, P. 2010. 1st Czech ed. Prague: Grada Publishing, 2010. 456 p. ISBN 978-80-247-3423-1.

Nursing Outcomes Classification (NOC). 2008. MOORHEAD, S., JOHNSON, M. et al. (eds). Iowa: Mosby, Elsevier, p. 130. ISBN 978-0-323-05408-9.

SEGANFREDO, H. D., ALMEIDA, M. A. Nursing Outcomes Content Validation According to Nursing Outcomes Classification (NOC) for Clinical, Surgical and Critical Patients. *Revista Latino-Americana de Enfermagem.* [online]. 2011, vol. 19, no. 1 [accessed 2011-12-12]. ISSN 0104-1169. Available at: http://scielo.br.

SCHERB, C. A. 2011. Most Frequent Nursing Diagnoses, Nursing Interventions, and Nursing-Sensitive Patient Outcomes of Hospitalized Older Adults with Heart Failure. *International Journal of Nursing Terminologies*

and Classification. 2011, vol. 22, no. 1, p. 13–21. ISSN 1541-5147.

STEFANOVÁ, P., MAREČKOVÁ, J. 2010. NOC a NIC klasifikace u pacientů s ošetřovatelskou diagnózou riziko porušení kožní integrity – 00047. In BUŽGOVÁ, R., JAROŠOVÁ, D. (eds.). *Ošetřovatelský výzkum a praxe založená na důkazech.* Ostrava: University of Ostrava, 2010. p. 143. ISBN 978-80-7368-694-9.

VÖRÖSOVÁ, G. 2007. Vybrané súbory NNN v geriatrickom ošetrovateľstve. In ARCHALOUSOVÁ, A. (eds.). *Cesta k profesnímu ošetřovatelství.* Opava: Silesian University in Opava, 2007. p. 66–70. ISBN 978-80-7248-413-3.

ZEITOUN, S. et al. 2007. Clinical validation of the signs and symptoms and the nature of the respiratory nursing diagnoses in patients under invasive mechanical ventilation. *Journal of Clinical Nursing.* 2007, vol. 16, no. 8. Available at: http://ncbi.nlm.nih.gov Doi; 10.1111/j. 1365-2702.2006.01632.x

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