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Effects of Terminology Based Documentation on Nursing

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Abstract. The aim of this literature review was to discover what the effects are of the standardized nursing documentation. The material used for conducting was drawn from CINAHL, PubMed and Cochrane databases. The search was confined to relevant electronically retrievable studies with links to full text and published in the English language in 2007-2008. These criteria yielded 19 studies. The results indicate that there are mainly positive effects when using nursing terminologies in documenting patient care.

Keywords: documentation, nursing records, nursing care plans, terminology (MeSH), nursing documentation (HOIDOKKI)

1. Introduction

The movement from paper-based to computer-based nursing documentation has been going on for the last 15 years. Still, many researches have revealed insufficient and scattered documentation in nursing care. [1, 2] It has also been pointed out that even if nurses do have electronic systems in use, they do not have enough time for documenting according to the nursing process. [3] Insufficient documentation endangers patient safety, security, well-being as well as the continuity of care. [4, 5]
When using nursing diagnosis, patient's individual needs are assessed and it is then easier for nurses to decide on more specific nursing interventions. Using nursing diagnosis as a tool to visualize patients' needs help nurses to think reflectively and to focus on nursing care planning. The usage of the nursing process also alleviates interaction between nurses. [6] According to a recent literature review [7] standardized nursing documentation showed more positive than negative effects with respect to quality, the nursing process and terminology use, knowledge level and acceptance of computer use in nursing documentation.
The aim of this literature review was to discover what the effects are of the standardized nursing documentation. In other words, the main focus of interest is the effects of the use of nursing terminologies in documentation.

2. Materials and methods

Information retrieval for this study was conducted in August 2008 on the three main databases of nursing literature: CINAHL, PubMed and Cochrane. The aim was to find publications dealing with both nursing documentation and standardized documentation. The major keywords used were *nursing documentation*, *nursing care plan*, *nursing records*, *standardized* and *terminology* with or without Boolean operator AND, and also with or without " ". [7]

The searches on each database used the same inclusion criteria: the articles to be included in the review were to have been published between 2007 and 2008, in the English language and provide links to the full text. The titles and abstracts returned by the search were read and assessed. Articles concerning nursing care or nursing practices, interventions, information system implementation projects or development programmes were excluded. When using different keyword combinations in the CINAHL database the search returned 20 studies. The PubMed database returned 215 studies. The search result from the Cochrane Library from all Cochrane products was 579 studies. All the titles and/or abstracts of these articles were manually screened to assess their relevance. In some cases the entire article had to been skimmed. When stating the limit "articles published in last two years" the PubMed database gave four articles from the end of 2006. Once all articles or abstracts found from the databases had been read and duplicates eliminated, there was 19 studies remaining for the analysis.

After reading the articles they were assessed and classified according to their main outcomes. The five categories used for classification are as follows: content of documentation, nursing process, terminology cross-mapping, EBP (evidence based practise), documentation of diseases and need of education. They were further classified according to their effects. The aim was to discover what kind of effects, positive or negative, the standardized documentation has.

3. Results

The most often (n=14) used terminologies were NANDA-I (previously named the North American Nursing Diagnosis Association, now NANDA International), NIC (the Nursing Interventions Classification) and NOC (the Nursing Outcomes Classification), abbreviated in some studies as NNN. ICF (the International Classification of Functioning, Disability and Health), ICNP (the International Classification of Nursing Practice), MDS (the Minimum Data Set), PNDS (the Perioperative Nursing Data Set) as well as SNOMED-CT (the Systematized Nomenclature of Medicine Clinical Terms) were each used in two studies.

Four of these studies were conducted by Müller-Staub *et al.* [8, 9, 10, 11] and on two occasions they used Q-DIO (the Quality of Diagnoses, Interventions and Outcomes) for auditing the nursing documentation. [9, 11] Killeen and Imogene [12] have presented the King's Conceptual System as a framework for nursing which helps nurses to organize the elements of the nursing process.

Five studies [13, 8, 10, 11, 14] highlighted the positive effects of the content of nursing documentation. In addition, there were also negative effects or inadequacies in documentation. In three studies [12, 15, 16] the nursing process was the focus of interest. For instance, Burkhart & Sommer [16] found that standardized terminology usage helps students to update and apply nursing concepts in nursing practice.

In three studies terminologies were cross-mapped between each other. SNOMED-CT and NOC [17] cross-mapped over 90 %, and PNDS cross-mapped with SNOMED-CT [18] 100 %. Also, NMDSN (the Nursing Minimum Data Set for the Netherlands), ICF and ICNP [19] cross-mapped well between each other.

In four studies [20, 21, 22, 23] concerning documentation of different diseases and in two studies concerning documentation according to EBP guidelines [24, 25] there were only positive effects. Furthermore, five studies [16, 15, 9, 26, 14] stated the importance of education. Studies of the review are summarized in Table 1.

4. Discussion

Standardized nursing documentation has raised questions and discussion among health care personnel. It is also an area that has not been studied from many different points of view. For these purposes we searched three key databases to locate the latest researches concerning standardized nursing documentation. However, in spite of an in-depth search strategy, it is possible that some important publications have been overlooked.

According to this review the effects of terminology based nursing documentation are mainly positive. In the NNN system, Clancy *et al.* [13] reported such positive effects like easy of use, time saving, adequate number of choices for diagnoses and paper savings. According to Keenan *et al.* [15] and Kumar [21] NNN can be used to transform and standardize nursing practice. NNN also facilitates multidisciplinary communication. [21] Also Thoroddsen and Ehnfors [14] found statistically significant improvements in documentation. They discovered that the use of nursing assessment, diagnosis and interventions, and documented signs, symptoms and etiologies increased. The negative effect was missing patient outcomes.

In 2006 Müller-Staub *et al.* [8] found significant improvements in documentation, even if signs, symptoms and aetiology were inaccurate. A year later they [9] concluded that after educational interventions the implementation of NNN resulted in a higher quality of nursing diagnosis, nursing interventions and patient outcomes. Later they tested an audit instrument [11] to ensure the quality of documentation of nursing diagnoses, interventions and outcomes. Also documentation of different groups of patients improves when using standardized nursing documentation. [20, 21, 22, 23] Additionally, standardized nursing languages can be used as a framework in researching and developing EBP guidelines. [24, 25]

Even if the nursing process has been taught in nursing schools for decades, it has not been used systematically, and has therefore been forgotten. Updating the care plan and choosing the proper outcomes and interventions has been difficult. [13] The nursing process highlights the care of patients. When assessing the nursing diagnosis, by looking at the expected outcomes and planned interventions, implementing the plans and evaluating the actual outcomes, we can make the nursing we do for and with the patient visible. [12] To make this possible we need educational interventions, supportive training programmes and lectures both for nurses and nursing students. [16, 15, 9, 26, 14]

5. Conclusion

Undoubtedly, standardized nursing documentation improves the quality of documentation of patient care. Using standardized nursing documentation means documenting using the nursing process alongside uniform nursing terminology. Through these systems we make nursing visible. But we cannot do it without adequate resources. Implementation of computerized nursing record systems needs administrative support in terms of time, a sufficient quantity and quality of educators and enough computers in every unit of an organisation.

In addition, more research of standardized nursing documentation is needed. To improve patient care and the continuity of care we need, for example, health care personnel's assessments of standardized nursing documentation a few years after their implementation. Also, the impact on standardized nursing documentation concerning nursing practices, nursing intensity, patient guidance along with the quality of care are internationally important research areas.

Table 1. Study outcomes and positive (+) and negative (-) effects of standardized documentation (N=19)

Study outcomes	Reference	Terminology	+	-	Comments
Content of documentation	[8]	NNN	x	x	High satisfaction, easy and effective. Doubts as to whether it improves care-plan updating. Choosing outcomes, interventions difficult
	[18]	NNN	x	x	Interventions, outcomes more often documented, signs and symptoms, aetiology, nursing diagnoses inaccurate
	[20]	ICNP, ICF, NANDA, ZEFP[1]	x	x	NANDA is internationally the most often used and researched terminology for nursing diagnosis, only NANDA fulfilled all classification criteria
	[21]	NNN, Q-DIO	x		Measures reliably the quality of documentation
	[23]	NANDA, NIC, FHP[2]	x	x	Statistically significant improvements in documentation, measurable patient outcomes missed
	[19]	NNN, Q-DIO	x		Higher quality of documentation, useful audit tool
Nursing process	[13]	nursing process	x		Describes the nature of nurse-patient interactions which leads to treatment and goal attainment
	[12]	NNN	x		Can transform nursing practice
	[7]	NNN	x		Students develop critical thinking skills
Terminology cross-mapping	[9]	NMDSN, ICF, ICNP	x		ISO standard facilitates cross-mapping, several nursing diagnostic concepts can be mapped when using NMDSN, ICF and/or ICNP
	[17]	SNOMED-CT, NOC	x		Terminologies cross-mapped over 90 %, after improvements more robust referencing system
	[25]	PNDS, SNOMED-CT	x	x	Terminologies cross-mapped 100 %, differences in hierarchical levels
EBP	[11]	NNN	x		Can be used in research and development of EBP guidelines
	[14]	NNN	x		Standardization of nursing activities and reliable EBP nursing diagnosis can be created
Documentation of diseases	[10]	MDS	x		Accurate documentation of epilepsy/seizure disorders both in paper and computerized versions of MDS
	[15]	NNN	x		Facilitates and supports communication between nurses, assists in standardizing knowledge for nursing practice e.g. of diabetics
	[16]	NIC, ICNP	x		Proper nursing languages for recording nursing care of stroke patients
	[24]	PNDS	x		Optimal tool for perioperative nurses to enhance the care of surgical patients
Need of education	[7]	NNN	x		Students develop critical thinking skills
	[12]	NNN		x	Limited resources. Implementing terminologies needs effort, education strategy, uniform usage
	[19]	NNN, Q-DIO	x		Education and evaluation support nurses
	[22]	NIC	x		Revealed the most common nursing interventions and areas in need of education
	[23]	NANDA, NIC, FHP	x		Much educational effort and nurse managers' support

[1]ZEFP, Nursing Diagnostic System of the Centre for Nursing Development and Research,
[2]FHP, Functional Health Patterns

References

[1] Ehrenberg A, Birgersson C. Nursing documentation of leg ulcers: Adherence to clinical guidelines in a Swedish primary health care district. Scand J Caring Sci 2003; 17: 278-284.
[2] Buhr GT, White HK. Quality Improvement Initiative for Chronic Pain Assessment and Management in the Nursing Home: A Pilot Study. J Am Med Dir Assoc 2006; 7: 246-253.
[3] Kim YJ, Park HA. Analysis of nursing records of cardiac-surgery patients based on the nursing process and focusing on nursing outcomes. Int J Med Inf 2005; 74: 952-959.
[4] Voutilainen P, Isola A, Muurinen S. Nursing documentation in nursing homes – state-of-the-art and implications for quality improvement. Scand J Caring Sci 2004; 18: 72-81.
[5] Nilsson UB, Willman A. Evaluation of Nursing Documentation. Scand J Caring Sci 2000; 14: 199-206.
[6] Axelsson L, Björvell C, Mattiasson AC, Randers I. Swedish Registered Nurses' incentives to use nursing diagnoses in clinical practice. J Clin Nurs 2006; 15: 936-945.
[7] Saranto K, Kinnunen UM. Evaluating nursing documentation – research designs and methods: systematic review. J Adv Nurs 2009; 65(3): 464-476. Accepted for publication 11/2008.
[8] Müller-Staub M, Lavin MA, Needham I, van Achterberg T. Nursing diagnoses, interventions and outcomes – application and impact on nursing practice: systematic review. J Adv Nurs 2006; 56(5): 514-531.
[9] Müller-Staub M, Needham I, Odenbreit M, Lavin MA, van Achterberg T. Improved Quality of Nursing Documentation. Results of a Nursing Diagnoses, Interventions, and Outcomes Implementation Study. Int J Nurs Terminol Classif 2007; 18(1): 5-17.
[10] Müller-Staub M, Lavin MA, Needham I, van Achterberg T. Meeting the criteria of a nursing diagnosis classification: Evaluation of ICNP, ICF, NANDA and ZEFP. Int J Nurs Stud 2007; 44(5): 702-713.
[11] Müller-Staub M, Lunney M, Lavin MA, Needham I, Odenbreit M, van Achterberg T. Testing the Q-DIO as an Instrument to Measure the Documented Quality of Nursing Diagnoses, Interventions, and Outcomes. Int J Nurs Terminol Classif 2008; 19(1): 20-27.
[12] Killeen MB, Imogene MK. Viewpoint: Use of King's Conceptual System, Nursing Informatics, and Nursing Classification Systems for Global Communication. Int J Nurs Terminol Classif 2007; 18(2): 51-57.
[13] Clancy T, Delaney CW, Morrison B, Gunn JK. The Benefits of Standardized Nursing Languages in Complex Adaptive Systems Such as Hospitals. J Nurs Admin 2006; 36(9): 426-434.
[14] Thoroddsen A, Ehnfors M. Putting policy into practice: pre- and posttests of implementing standardized languages for nursing documentation. J Clin Nurs 2007; 16: 1826-1838.
[15] Keenan GM, Tschannen D, Wesley ML. Standardized Nursing Terminologies Can Transform Practice. J Nurs Admin 2008; 38(3): 103-106.
[16] Burkhart L, Sommer S. Integrating Preventive Care and Nursing Standardized Terminologies in Nursing Education: A Case Study. J Prof Nurs 2007; 23(4): 208-213.
[17] Lu DF, Park HT, Ucharattana P, Konicek D, Delaney C. Nursing Outcomes Classification in the Systematized Nomenclature of Medicine Clinical Terms. A Cross-Mapping Validation. Comput Inform Nurs 2007; 25(3): 159-170.
[18] Westra BL, Bauman R, Delaney CW, Lundberg CB, Petersen C. Validation of Concept Mapping Between PNDS and SNOMED CT. AORN Journal 2008; 87(6): 1217-1229.
[19] Goossen W. Gross-Mapping Between Three Terminologies With the International Standard Nursing Reference Terminology Model. Int J Nurs Terminol Classif 2006; 17(4): 153-164.
[20] Hardie NA, Garrard J, Gross CR, Bowers SE, Rarick JO, Bland P, Leppik IE. The Validity of Epilepsy or Seizure Documentation in Nursing Homes. Epilepsy Res 2007; 74(2-3): 171-175.
[21] Kumar CP. Application of Orem's Self-Care Deficit Theory and Standardized Nursing Languages in a Case Study of a Woman with Diabetes. Int J Nurs Terminol Classif 2007; 18(3): 103-110.
[22] Lee E, Lee M, Jung O.B. Mapping of Nursing Records into the NIC and the ICNP in a Korean Oriental-Medicine Hospital. Comput Inform Nurs 2006; 24(6): 346-352.
[23] Westendorf JJ. Utilizing the Perioperative Nursing Data Set in a Surgical Setting. Plast Surg Nurs 2007; 27(4): 181-184.
[24] Kautz DD, Van Horn ER. An Exemplar of the Use of NNN Language in Developing Evidence-Based Practice Guidelines. Int J Nurs Terminol Classif 2008; 19(1): 14-19.
[25] Kim Y, An M, Park J, Jung H, Kim Y, Chang B. New Method of Realization of Nursing Diagnosis Based on 3N in an Electronic Medical Record System. In Kuhn K. et al. (Eds) MEDINFO 2007, IOS Press.
[26] Shever LL, Titler M, Dochterman J, Fei Q, Picone DM. Patterns of Nursing Interventions Use Across 6 Days of Acute Care Hospitalization for Three Older Patient Populations. Int J Nurs Terminol Classif 2007; 18(1): 18-29.

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