

Preparing Nurses to Use Standardized Nursing Language in the Electronic Health Record

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Abstract. Research demonstrated nurses' education needs to be able to document nursing diagnoses, interventions and patient outcomes in the EHR. The aim of this study is to investigate the effect of Guided Clinical Reasoning, a learning method to foster nurses' abilities in using standardized language. In a cluster randomized experimental study, nurses from 3 wards received Guided Clinical Reasoning (GCR), a learning method to foster nurses in stating nursing diagnoses, related interventions and outcomes. Three wards, receiving Classic Case Discussions, functioned as control group. The learning effect was measured by assessing the quality of 225 nursing documentations by applying 18 Likert-type items with a 0-4 scale of the measurement instrument "Quality of Nursing Diagnoses, Interventions and Outcomes" (Q-DIO). T-tests were applied to analyze pre-post intervention scores. GCR led to significantly higher quality of nursing diagnosis documentation; to etiology-specific nursing interventions and to enhanced nursing-sensitive patient outcomes. Before GCR, the pre-intervention mean in quality of nursing documentation was = 2.69 (post-intervention = 3.70; $p < .0001$). Similar results were found for nursing interventions and outcomes. In the control group, the quality remained unchanged. GCR supported nurses' abilities to state accurate nursing diagnoses, to select effective nursing interventions and to reach enhanced patient outcomes. Nursing diagnoses (NANDA-I) with related interventions and patient outcomes provide a knowledgebase for nurses to use standardized language in the EHR.

Keywords: Electronic Health Record; Guided Clinical Reasoning; NANDA nursing diagnoses; nursing interventions; outcomes.

1. Introduction

Escalating costs and legal cases require health care disciplines to develop measures so that the quality of discipline-based services can be compared across settings and localities [1]. Also nurses are mandated to describe, document and evaluate their contribution to health care [2]. The naming of nursing phenomena and representing these phenomena in a standardized manner is a challenge for the nursing profession. To describe and ensure cost effective, high quality, appropriate outcomes of nursing care delivered across settings and sites, standardized terms and definitions are required. Classifications provide such standardized language [3-6]. Without classifications, nursing has had difficulties in communicating clinical problems – nursing phenomena – in a clear, precise, or consistent manner [7].

In many countries, nursing documentation is part of the patient health care record and health laws require the documentation of medical and nursing treatments. Patients' health problems, which nurses take care of, the nursing interventions performed and the evaluation of the care given must be documented. Therefore, the nursing portion of the record is a means not only to document and compare, but also to ensure and improve nursing care quality [2]. Classifications representing standardized nursing language need to be implemented in practice. Nurse managers perceive the selection of a classification system as difficult, because only few findings were available about the criteria classifications should fulfil.

Even though classifications were developed, many nurses have not been trained to use standardized language [8-11]. Deficiencies in accurately stating and documenting nursing diagnoses, and to relate them with nursing interventions and outcomes were reported [12]. Accurate diagnoses are a prerequisite for choosing diagnostic-specific interventions, intending to affect favorable nursing-sensitive patient outcomes. Coherence among diagnoses, interventions, and outcome classifications, displayed in evidence-based linkages, is crucial. Clinical information systems rely on classifications, and data aggregation and evaluation is facilitated when clinical information systems incorporate standardized nursing language. Further investigation of implementing and evaluating nursing classifications was urgently recommended [13].

Objectives

The aim of this study was to evaluate the effect of consecutive Guided Clinical Reasoning and Classic Case Discussions in assisting nurses to accurately state nursing diagnoses and to link them with interventions and outcomes, in order to be prepared for using standardized nursing language in the Electronic Health Record (EHR).

Material and Methods

The effect of consecutive Guided Clinical Reasoning and Classic Case Discussions in assisting nurses to more accurately state nursing diagnoses and to link them with interventions and outcomes was evaluated in a clinical study. In a cluster randomized, controlled experimental design, nurses from 3 wards of a Swiss hospital participated in Guided Clinical Reasoning to enhance diagnostic expertise. Three wards functioned as control group. The control group received Classic Case Discussions to support utilization of NANDA-I nursing diagnoses. The quality of totally 444 documented nursing diagnoses, corresponding interventions and outcomes was evaluated. An independent sample of 222 at pre- and 222 at post intervention was chosen because this study focuses on nurses' performance in accurately stating nursing diagnoses, choosing and performing effective nursing interventions and on achievement of nursing sensitive patient outcomes. Nursing documentations were assessed at baseline and three to seven months after the study intervention. The time span for sampling was the same for the intervention and for the control group. None of the wards was aware of group allocation and nursing documentations were drawn from the archives to guarantee blinding. The study intervention consisted of monthly Guided Clinical Reasoning of 1.5 hours for the period of five months (in the year 2005). Guided Clinical Reasoning employs real cases of hospitalised patients to facilitate critical thinking and reflection. It is an interactive method, using iterative hypothesis testing by asking questions to obtain diagnostic data, by asking for signs and symptoms seen in the patient, and by asking about possible etiologies and linking them with effective nursing interventions. Accurate nursing diagnoses and effective nursing interventions were stated for the patient cases and controlled by use of the NNN-Classification outlined in a textbook. The effect of the study intervention was analyzed by assessing the quality of documented nursing diagnoses, interventions and outcomes, applying 18 items of the Q-DIO, and tested by T-tests and mixed effects model analyses.

Results

A statistically significant improvement in stating accurate *nursing diagnoses*, including improvements in assigning signs/symptoms, and correct etiologies coherent to the di-

agnoses, was found. Before Guided Clinical Reasoning (GCR), the mean score of the intervention group was 2.69 (SD = 0.90) compared with 3.70 (SD = 0.54, $p < 0.0001$) at post intervention. In the control group the baseline mean score in nursing diagnoses was 3.13 (SD = 0.89) compared with 2.97 (SD = 0.80, $p = 0.17$) in the second measurement.

We also found a statistically significant increase in naming concrete *nursing interventions*, showing what intervention will be done, how, how often, and by whom. The interventions were formulated coherently and related to the etiologies of the nursing diagnoses; and they included documentation of the etiology-specific interventions performed. Before Guided Clinical Reasoning the mean score of the intervention group was = 2.33 (SD = 0.93) compared with 3.88 (SD = 0.35, $p < 0.0001$) at post intervention. In the control group, the baseline mean score was = 2.70 (SD = 0.88) compared to 2.46 (SD = 0.95, $p = 0.05$), in the second measurement.

Nursing outcomes also showed statistically significant improvements in the intervention group. The outcomes were observably and measurably formulated. The outcomes were better than at pre-intervention and than in the control group, and contained descriptions of attained improvements in patients. Before Guided Clinical Reasoning, the mean score of the intervention group was = 1.53 (SD = 1.08) compared with 3.77 (SD = 0.53, $p < 0.0001$) at post intervention. In the control group, the baseline mean was = 2.02 (SD = 1.27) compared to 1.94 (SD = 1.06, $p = 0.62$) in the second measurement.

Discussion

The focus of today's healthcare is on high quality patient outcomes. Being able to state accurate nursing diagnoses, and to choose effective nursing interventions and outcomes is a prerequisite for nurses to promote high quality nursing care and for documenting it in the EHR. In our study higher quality nursing diagnosis documentation and etiology-specific nursing interventions were related with significant improvements in patient outcomes documentation. The literature supports our results of the control group: Often, nurses were not competent diagnosticians, lacking critical thinking skills and not being able to evaluate and document care [9, 14]. Deficiencies regarding nursing diagnostic content were previously reported [15, 16]. In our study GCR was more effective than Classical Case Discussions in assisting nurses to accurately state nursing diagnoses and to link them with interventions and outcomes. This study provides evidence that carefully implementing classifications into clinical practice can lead to enhanced, accurately stated nursing diagnoses, coherent nursing interventions and outcomes.

Conclusions

Accurately stating diagnoses, linked with coherent interventions is important to reach favorable patient outcomes. We conclude that merely stating diagnostic titles is insufficient to capture patients' needs. Only etiology specific diagnoses are the basis to choose effective nursing interventions, leading to better outcomes. Our findings support the use of NANDA-I, NIC and NOC (NNN) because a) only the NANDA-I diagnoses contain allocated signs/symptoms and etiologies and b) only these three classifications contain determined and tested linkages between diagnoses, interventions and outcomes. These classifications are monodisciplinary in nature. Their advantage is that they describe nursing in conceptually driven ways. A disadvantage of monodisciplinary can be seen in the specialty of nursing language. While many terms in the NNN are

interdisciplinary (e.g. pain, incontinence), others are nursing specific (self-care assistance, constipation management). For multidisciplinary collaboration, this implies that other professionals need to learn understanding nursing language in a similar way as nurses understand medical language.

To prepare nurses for using standardized nursing language into the EHR, they must have clinically applicable knowledge about nursing classifications. Based on the results of this study, we suggest rethinking the methods to implement nursing diagnoses, interventions and outcomes and to apply and further evaluate GCR.

Implications from this study can be drawn for the electronic health record. Based on the results of this thesis we suggest the use of NNN for electronic nursing documentation. To attain favourable patient outcomes, nursing diagnoses must be linked with interventions, specific to an identified etiology, and nursing-sensitive patient outcomes must be identified. High quality software programs contain such evidence-based and automated linkages between diagnoses, interventions and outcomes. The software should also provide links between the nursing assessments; the nursing diagnoses and related nursing progress notes. The Q-DIO is useful as an audit tool and is recommended for development as an integrated feature in the electronic health record. We conclude that implementation of NANDA-I diagnoses, related interventions and nursing-sensitive patient outcomes led to higher quality of nursing documentation. Standardized nursing language reflects and communicates nursing's work. When used for documentation purposes, standardized nursing language permits data aggregation for subsequent evaluation of nursing-sensitive patient outcomes, essential in the measurement of the quality and cost effectiveness of nursing care.

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