

Identifying Barriers for Implementation of Computer Based Nursing Documentation

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Abstract. This study was undertaken in the planning phase for the introduction of a comprehensive computer based nursing documentation system at Erlangen University Hospital. There, we expect a wide range of difficult organizational changes, because the nurses currently neither used computer based nursing documentation nor did they follow strongly the nursing process model within paper based documentation. Thus we were eager to recognize potential pitfalls early and to identify potential barriers for digital nursing documentation. In a questionnaire study we surveyed all German university hospitals for their experience with the implementation of computer based nursing documentation implementation. We received answers from 11 of the 23 hospitals. Furthermore we performed a questionnaire study about expectations and fears among the nurses of four pilot wards of our hospital. Most respondents stated a positive attitude towards the nursing process documentation, but many respondents note technical (e.g. bad performance of the software) and organizational barriers (e.g. lack of time).

Keywords. Barriers, Implementation, Nursing Process Documentation, NIS, Germany

Introduction

The cyclical nursing process model comprises nursing assessment, nursing diagnoses, desired outcome and care planning, implementation (care delivery) and evaluation (reassessment) and roots back to work of I. J. Orlando [1]. It has been standardized by American Nursing Associations [2] and promoted for computerized nursing information systems (NIS) already in the 90s [3] and prompted the development of classifications for Nursing diagnoses (e.g. NANDA [4]), interventions (NIC, ICNP) and outcomes (NOC). Research reports and professional reports stress the fact that the Nursing process is not well accepted by the practitioners [5–8] and there are a number of organizational and non-organizational problems and prerequisites regarding the implementation [9–13].

In Germany computer based NIS or computer assisted documentation of care according to the nursing process model are only partially implemented. Previous surveys from 2002 [14] and 2007 [15] which were distributed to more than 2000 institutions (2007 return rate 270 = 12.4%) showed, that although the installations of NIS in Germany increased from 7% in 2002 to 28% (58 institutions) in 2007, often

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only documentation of procedures and interventions was covered. Nursing diagnoses documentation for example was only established in 70% and mostly restricted to few wards of the responding institution.

Erlangen University Hospital EUH planned to implement computer-based nursing documentation with the goal to improve documentation quality, to unify different paper based and computerized information sources and to benchmark care services. The Soarian module Plan of Care (PoC) should assist general assessment (EPA-AC assessment), nursing problem/diagnosis (NANDA), goal (AIR goals), intervention planning and documentation (LEP interventions) and evaluation. This led to the design of a survey among German university hospitals to identify technical and non-technical barriers for the potential implementation of computer based nursing documentation (Q1). In addition a second questionnaire was distributed inhouse among EUH nursing staff to identify the expectations and fears of our own nurses regarding computer-based nursing documentation (Q2). We wanted to answer the following questions:

Q1: Which experiences have German University Hospitals with computer based nursing documentation?

Q1.1 How is the nursing documentation realized?

Q1.2 What are the main barriers, goals and prerequisites for the implementation of NIS?

Q2: What are the users expectations regarding the following topics:

Q2.1: How is the attitude and knowledge regarding the nursing process documentation?

Q2.2: Do nurses perceive a need to change the nursing documentation?

Q2.3: What are the main barriers regarding the implementation?

1. Material and Methods

The external questionnaire comprising 10 questions for the CIO and another 10 questions for the nursing director was distributed by email to the management of 23 German university hospitals in April 2012. The questionnaire included open questions about the status of NIS implementation and the nursing documentation process as well as closed question checking for presumed barriers of implementation, realized goals of the implementation and essential prerequisites for successful implementation. These barriers, goals and prerequisites of IT-Implementation were identified from literature [9–13].

A paper based internal questionnaire was circulated among all nursing staff of four EUH pilot wards in the departments of otorhinolaryngology, neurology, surgery and palliative medicine, who were scheduled to receive the new Soarian PoC modules later. Questionnaires were distributed to the staff and returned through a closed box on every ward. The internal questionnaire comprised scale and items of the nursing attitude scale of Bowmann [16]. To assess user opinions and user needs (Q2.2) we used a combination of open and closed questions. For Q2.3 we identified presumed relevant barriers and success factors for computer based nursing documentation in literature [7,8,17–20]. The internal questionnaire was checked for reliability with a Cronbach alpha of 0.730 which meets the requirements of Nunnally (>.70) [21]. Data was analyzed using SPSS 15.0©.

2. Results

2.1 Q1 Electronic nursing documentation at 12 German University Hospitals

The return rate for the external survey was 11/23 (48%), we received answers from the University Hospitals of Leipzig, Hannover, Magdeburg, Dresden, Münster, Frankfurt, Rostock, Aachen, Leipzig, Bonn, Cologne and Potsdam (table 1). All eleven hospitals have implemented computer based NIS. In six hospitals the nurses document the complete nursing process digitally, in three only parts of the nursing process are documented. In six cases the nursing process documentation was implemented before introducing a NIS (two hospitals did not answer this question). The survey results demonstrate that ten hospitals use a NIS which is integrated into the clinical information system, namely commercial nursing modules such as Soarian Plan of Care, I.S-h. med nursing or Orbis Care which form an integral part of the electronic patient record. Only one Hospital implemented a stand-alone NIS (Hinz Nancy), which offers special functionality only for nurses. There, the IT management reports that different systems for nurses and medical staff lead to difficulties and double documentation.

Table 1. Overview of nursing documentation in German University Hospitals

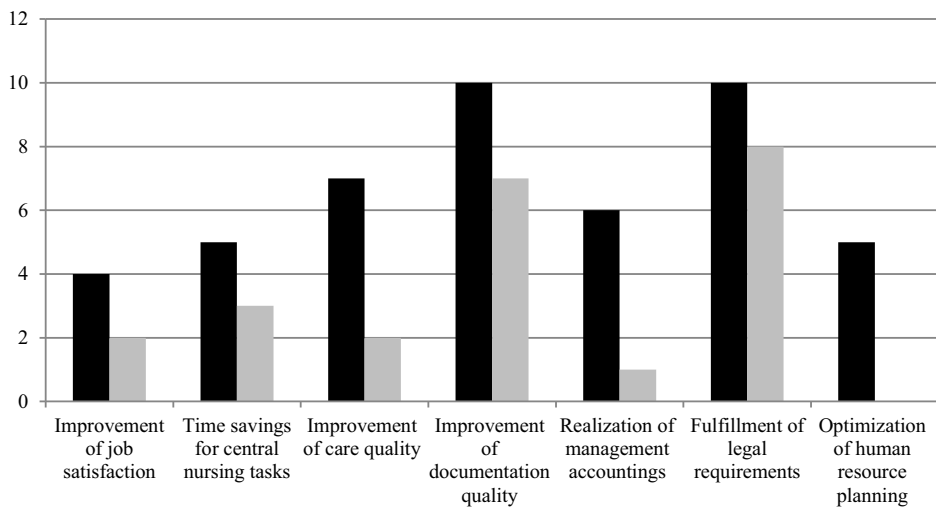
University Hospital	NIS in use	Coverage	Type of computer-based NIS	Scope of computer-based documentation
Hannover	Yes	58	Hinz Nancy	Complete nursing process
Dresden	Yes	All wards	Agfa Orbis PDOK	Complete nursing process
Aachen	Yes	51	Siemens Medico WNPM	Nursing assessment and intervention documentation
Magdeburg	Yes	8	Imeso KAS IcuData	Complete nursing process
Cologne	Yes	No answer	Agfa ORBIS Openmed	--
Münster	Yes	59	Agfa Orbis medical Care	Complete nursing process
Leipzig	Yes	All wards	IS-H / i.s.h.med	Decubitus and complex interventions - no digital process documentation
Potsdam	Yes	All wards	Siemens Soarian Plan of Care	Complete nursing process
Frankfurt a. M.	Yes	All wards	Agfa Orbis medical care	Complete nursing process
Bonn	Yes	All wards	No answer	Wound, decubitus and fall prevention documentation Paper-based nursing process documentation
Rostock	Yes	60	SAP is-h med Pflege	No answer

Among IT directors, the most frequently mentioned barriers for implementation were lack of motivation for nursing process documentation, insufficient technology for data collection at the bedside and the unclear financial benefit at a high cost. Further barriers were lack of flexibility for adjustments, lack of understanding of physicians and a lack of interfaces between ICU and normal wards. From point of view of the IT management the main success factors are development of a uniform nursing

terminology, a multidisciplinary project-team and the definition of clear objectives. Two IT directors mention that responsibilities have to be very clear and a high acceptance and motivation of nurses is required for successful implementation.

We also asked for objectives of the NIS implementation and if these objectives had been reached. Results in figure 1 show that, potentially due to the mentioned barriers, it seems difficult to effectively realize several of the objectives of the computer-based nursing documentation such as improved quality of care, better cost and performance benchmarks (management accounting), or improved resource planning in these eleven examined German university hospitals.

Figure 1. Objectives (black) and achievements (grey) of NIS implementation



2.2 Q2: User expectations towards computer-based nursing process documentation

97 questionnaires have been distributed among the nursing staff of four EUH wards, 65 questionnaires (67%) were returned, namely 21 from surgery, 18 from neurology, 15 from otorhinolaryngology and 11 from palliative medicine. Ninety percent of the nurses have a “good” or “very good” knowledge about the nursing process documentation. Most nurses agree that the nursing process has advantages for the patient and improves nursing care, but nearly all stated that the nursing process involved both too much paper work and time consumption (table 2). The majority also agreed with the statement that they are ready to practice the nursing process. Interestingly they also see problems in the implementation of the nursing process.

Table 2. Nurses attitude regarding the principles and practice of the nursing process

	Strongly disagree	Disagree	Agree	Strongly Agree	Don´t know
The nursing process improves nursing care	4	10	24	21	0
It is easy to define care priorities using the nursing process	3	11	23	14	1
The staff will never accept the nursing process	9	20	13	2	1
It´s introduction will cause problems	0	6	25	21	0
The nursing process improves nursing care	3	11	23	19	1
The nursing process involves too much paper work	8	0	25	23	2
The nursing process is too time consuming	2	10	29	16	0
I am willing to be involved with the nursing process	4	4	26	23	0

From point of view of the future system users the most important organizational barrier is the lack of time for documentation (fig 2). Furthermore the nurses named mainly technical barriers like bad software performance, insufficient hardware and a high error rate of the nursing documentation system. As personal barriers the lack of knowledge about hardware and software (PoC) is mentioned. Factors which seem not to impede computer based nursing documentation are missing knowledge about the nursing process, intransparency of the implementation process or missing motivation.

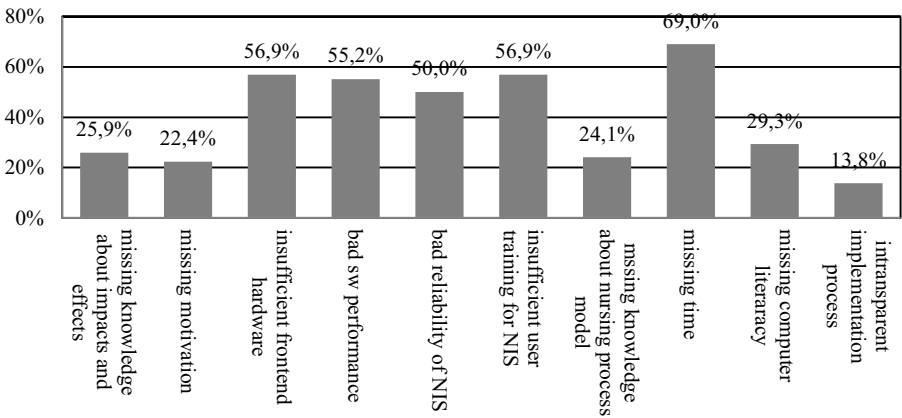


Figure 2. Barriers for implementation of computer based nursing documentation

3. Discussion

Compared to 28% in the previous 2007 survey [15] we can state that in 2012 one hundred percent of the responding German university hospitals have adopted some kind of computer based nursing documentation, mostly as a module from the vendor of the central clinical information system. But only 55% have implemented the complete nursing process model documentation. The most impeding factors seen by the IT administration were missing motivation for nursing process documentation, insufficient technology for bedside data collection and missing financial benefits associated with huge costs. It is striking that goals such as improved care quality, improved benchmarking data and optimized resource planning have mostly not been realized. The early detection of problems assists IT- and nursing management to define realistic goals for the implementation project. Moreover it is possible to recognize and to reduce the fears of the nursing practitioners. In our case, resulting consequences comprised e.g. a comprehensive training program for the nurses and the evaluation of several different hardware devices for bedside documentation.

The discrepancy between installed NIS and complete nursing process documentation corresponds with end users opinion that the nursing process model is associated with too much paper work and time consumption. Some barriers perceived by the end users, such as insufficient frontend hardware correspond with barriers seen by the IT management, others such as bad reliability or system performance as well as insufficient user training should be observed closely and demonstrate a gap between IT management and end user perceptions. It is difficult to assess the dissemination and actual utilization of nursing documentation according to the nursing process model from literature. A Medline search for “nursing process model” (all fields) yields merely 23 publications and only 6 publications date within the last five years. It seems that most recent work in this area comes from the Scandinavian countries with sources from Finland reporting a national standard with integration into the electronic health record [22]. Other researchers however seem to still perform studies to define how much of the nursing process model has been realized in regular nursing documentation, reporting e.g. for Korea that various categories of nursing assessments have been documented in 52 to 82% of the cases with a mean of 69% [23]. Compared with this data German university hospitals demonstrate a good standing with 55% having implemented the nursing process model within the NIS.

There have been previous studies, also in Germany [17,24] which demonstrated at least partially reduced time consumption and more complete care planning when introducing a NIS to support the nursing process model documentation. Barriers regarding missing time seen among EUH nurses may be an indicator for differences among NIS implementations resulting in potential misalignment between the NIS and its working environment.

4. Conclusion

When talking about NIS and the nursing process model we should clearly distinguish between one and the other. It can be expected that nursing documentation modules as a component of the clinical information system will be used more and more also in Germany. But the positive effects of such documentation centered applications should not be overestimated considering objectives such as improved benchmarking or

resource planning which have often not been achieved. This corresponds to a recent publication stating the same for an intensive care documentation system [25].

In comparison however, it is not yet clear if complete documentation according the nursing process model will become a widespread option. Similar to the idea of the problem oriented medical record given by Weed [26] most nurses agree that the nursing process model is advantageous for the patient but it's full implementation is hindered by technical obstacles and missing time resources.

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