Topics for Continuous Education in Nursing Informatics: Results of a Survey Among 280 Austrian Nurses

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Abstract. Background: Nurses are increasingly confronted with IT-based systems as part of their daily work. However, they often lack basic competencies in managing these complex systems. Objectives: To analyze the need for continuous education in health informatics among Austrian nurses. Methods: Survey within five of the largest healthcare organizations in Austria. Overall, 280 nursing practitioners with IT responsibilities and nursing managers from middle and top management participated. Results: Participants assessed five topics (IT project management, IT in nursing, eHealth, nursing terminologies, and computer science basics) as important for continuous education in health informatics. Top management rated the importance of most topics higher than middle management did. Nursing practitioners gave ratings in between middle and top management. Conclusion: Austrian nursing practitioners with IT responsibilities and nursing managers see a need for continuous education in health informatics. This supports findings of international recommendations of nursing informatics continuous education. There is, however, a lack of suitable opportunities for continuous education in Austria.

Keywords. nursing informatics, competency-based education, needs assessment

1. Introduction

Health care nowadays is unthinkable without the use of modern information and communication technologies. In Austria, nurses and other health care professionals routinely use IT-based tools such as electronic medical records, computerized physician order entry systems, patient data management systems or mobile documentation tools in their daily work. In the future, also health information exchange between institutions will have an increasing impact on nursing [1]. Managing these complex socio-technical information systems and the increasing volume of patient information is not a trivial task [2]. Studies show challenges related to introduction and use of IT systems in nursing, such as inefficient workflow support [3], low usability [4] and limited evidence on the impact of nursing IT on quality of care and patient outcome [5].

These problems at least partly originate in the fact that nurses and other health care professionals have insufficient competencies in dealing with these challenges; they seem to have difficulties, for example, to express their requirements, to contribute to system

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implementation and system testing, to prepare for IT-based workflow changes, and to establish an adequate change management and communication policy.

Often, other professional groups such as health informaticians who are adequately trained for these types of clinical IT projects thus coordinate these projects in hospitals. However, such projects have a higher chance to succeed with close end-user involvement. Therefore, clinical IT projects seem not well manageable without a close cooperation between IT staff (both in the IT department of the health care organizations and at the vendors side) and clinical staff (such as nurses and other health care professionals).

When we look at the situation in Austria, nurses are mostly not well equipped to contribute to system analysis, system specification, system selection, system implementation, and system evaluation, as informatics competencies are quite limited among Austrian nurses. Nursing informatics competencies are typically not part of nursing education, nor do adequate continuous education opportunities exist. We see the same situation in Germany and Switzerland [6].

In other countries, nursing informatics seems much better integrated in nursing education and continuous education. For example, countries such as Australia [7] offer an own career option for nursing informatics. This is not the case in Austria. However, also in Austria, more and more nurses contribute to IT projects and need additional IT-related competencies.

We were thus interested in better understanding whether nurses with IT responsibilities and nursing managers themselves see a need for further education in nursing informatics, and if yes in which topics. The objective of this study is thus to analyze the needs for continuous education in health informatics among nurses in Austria. Our motivation was to use this information to design a tailored continuous education program in health informatics for nurses and other health care professionals.

2. Methods

Chief nursing managers of five of the largest Austrian health care organizations (AUVA, GESPAG, SALK, KAGES, Tirol Kliniken) were contacted. All agreed to participate. A survey was prepared, covering 5 major topics and 52 sub-topics of nursing informatics.

The list of topics and sub-topics was developed based on a literature review of international recommendations on health informatics education of several institutions, including: Australian Health Informatics Education Council [7], Global Academic Curricula Competencies for Health Information Professionals [8], Technology Informatics Guiding Education Reform [9], Canadian Association of Schools of Nursing [10] and International Medical Informatics Association [11].

For each topic and sub-topic, we asked the following question: "Would you be interested in continuous education for nursing staff involved in IT projects?"

For the five major topics, a yes/no answer was possible. For the 52 sub-topics, a 4-point scale was used to document the answer (1 = not interesting, 4 = interesting).

The survey was distributed in all five participating health care institutions using a snowball system. The survey was organized as online-based survey; only in one health care institution, paper-based questionnaires were used. Nursing managers on different hierarchical levels as well as nursing practitioners involved in IT projects were invited to participate. Participation was voluntary and fully anonymous. Survey results were analyzed using SPSS.

3. Results

Overall, 330 questionnaires were returned, with responses coming from nurses in a broad range of professional positions. First results of this broader survey have already been published [12]. Now, for this paper, we focus on a more detailed analysis of the responses of nurses with additional IT responsibilities and of nurses in middle or higher management roles. These roles were chosen, as the continuous education program that we planned would target nurses with IT responsibilities, so we were interested in their opinion. Also, as middle and top management have to approve such education, we also were interested in their judgment. Overall, 280 respondents came from these groups and were thus included in the analysis. Table 1 shows the participants and their professional position.

Table 1. Survey participants and their professional position

Professional position	Number of participants	%
Nurses in direct patient care with additional IT responsibilities (e.g. IT key user)	51	18,2%
Middle nursing management (e.g. nursing ward manager)	201	71,7%
Senior nursing management (e.g. nursing director, nursing manager)	28	10,0%

For all five main topics, the overall answers showed high interest for continuous education: IT in nursing (overall interest: 92% of all responses); IT project management (85%); eHealth technologies (85%); nursing terminologies (83%); computer science basics (81%).

Figure 1 shows the answer regarding the five main topics for each surveyed professional role. All three groups show comparable support for all five topics. Nurses with additional IT responsibilities show least interest in nursing terminologies and computer science basics. Middle management shows least interest in computer science basics and eHealth technologies. Top management shows least interest in computer science basics and IT project management.
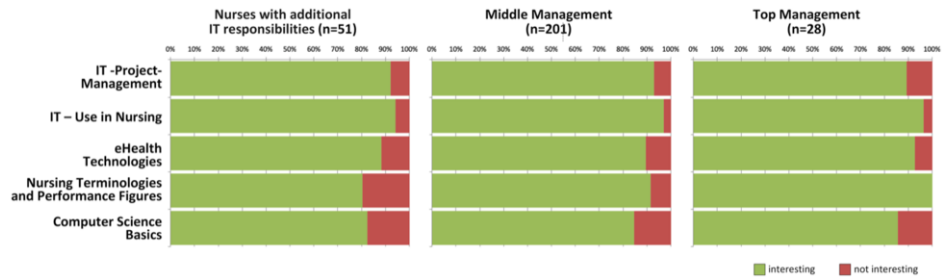

Figure 1. Interest in continuous education for five main topics in health informatics, dependent on the professional role of survey participants (n = 280). To highlight the trends, the category "no answer" is not presented. Only yes/no answers were possible for these five major topics.
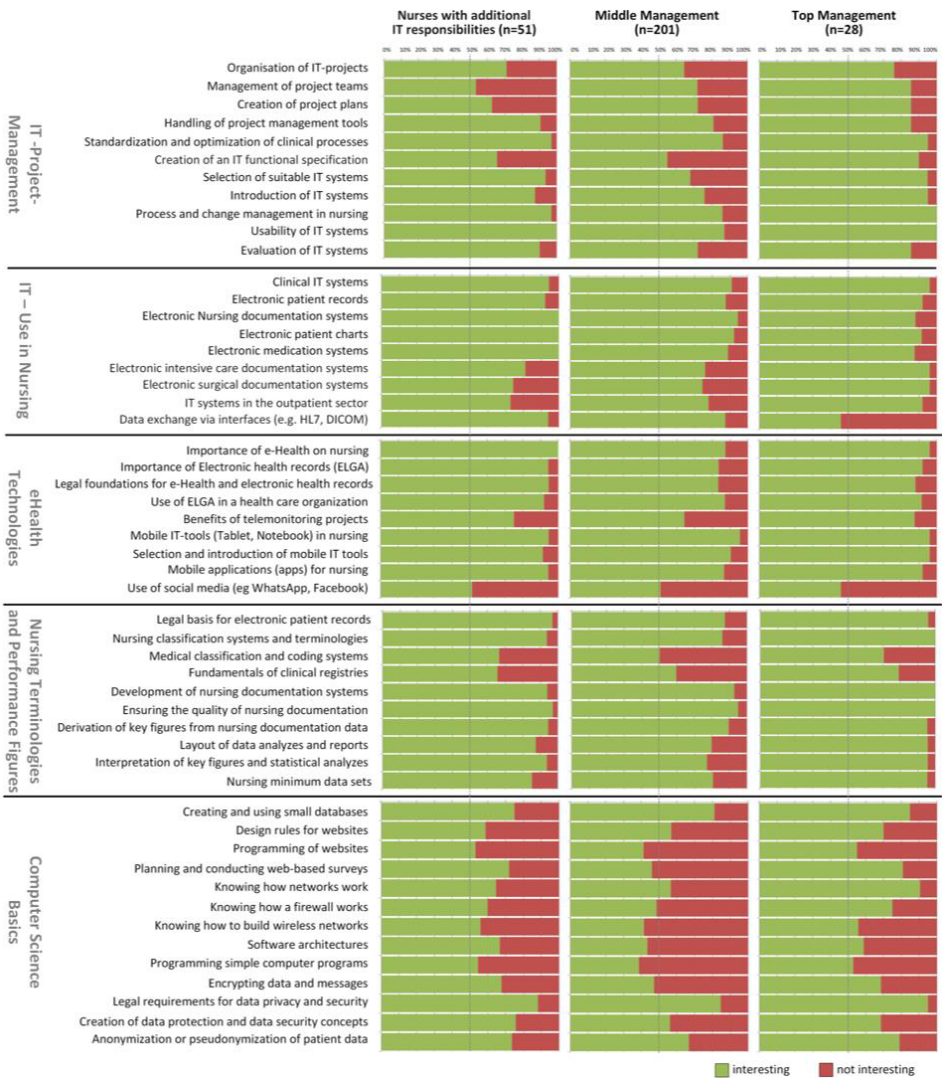
Figure 2. Interest in continuous education for 52 sub-topics in health informatics, dependent on the professional role of survey participants (n = 280). To highlight the trends, the category "no answer" is not presented. Answers of 1 (interesting) and 2 (partly interesting) are combined and presented in green; answers 3 (partly uninteresting) and 4 (uninteresting) are combined and presented in red.

Figure 2 shows the answers of the 280 respondents for the 52 sub-topics. To allow better identification of the most interesting topics, answers were classified in "interesting" versus "not interesting", and "no answer" responses were omitted. These answers were comparable between the five participating health care institutions, thus sub-group analysis is not presented.

Results show some differences between the professional roles. For example, demand for nursing terminologies was 80% for nurses with IT duties, 92% for nurses in middle management and 100% for nurses in higher management. In general, as Figure 2 shows,

top management considered most of the topics of higher importance than middle management did. Nurses with IT responsibilities showed larger interest in most topics compared to middle management, but a bit less than top management.

Several sub-topics reached highest interest among all participants. Here is a list of sub-topics with highest support over all three groups, ordered according to topic:

- IT project management: Standardization and optimization of nursing workflow; process and change management in nursing; usability of IT systems.
- IT use in nursing: Electronic patient records; electronic nursing documentation systems; electronic medication systems.
- eHealth technologies: Importance of eHealth on nursing; importance of electronic health records; mobile IT tools in nursing.
- Nursing terminologies: Legal basis for electronic patient records; development of nursing documentation systems; ensuring the quality of nursing documentation.
- Computer science basics: Creating and using small databases; legal requirements for data privacy and security.

A sub-group analysis of "no answers" showed some interesting differences between the three groups. The mean percentage of "no answers" over all sub-topics was 25% for nurses with additional IT responsibilities, 19% for middle management, and only 15% for high management. This indicates that the higher the position, the more clear is the opinion on interesting topics. Items with highest "no answers" percentages were "creation of an IT functional specification" for nursing with additional IT responsibilities (38% "no answer"), "electronic surgical documentation systems" for middle management (44%) and "Programming simple computer programs" for higher management (26%), indicating topics the different professional roles are probably not familiar with and thus cannot judge.

4. Discussion

Our survey supported a clear interest in continuous education in the indicated topics and sub-topics. We included only nursing practitioners with IT responsibilities as well as middle and top nursing managers in the analysis. We focused on these group as we see this group as target audience and important stakeholder for a planned continuous education program in health informatics. A survey with nursing practitioners without IT responsibilities may certainly have yielded different results.

All groups showed high interest in most of the presented topics. Interest correlated with the professional position: Top nursing managers mostly showed a stronger interest in most topics than middle nursing management. This may reflect a better understanding of the strategic benefits and challenges of eHealth technologies in nursing, as responded to these challenges demands well-trained nursing work force.

Nurses practitioners with IT responsibilities also showed high interest in most sub-topics. Their preferences, however, differed partly from that of top nursing managers. For example, while top management showed interest in project management and IT specifications, nursing practitioners did show much lower interest in this. In turn, nursing practitioners showed large interest in interfaces (such as HL7) which was not a topic of interest for top managers. This may reflect the different – operational versus strategic –

perspectives of information management in nursing. All groups showed quite consistently less interest in topics related to basics of computer science. Here, respondents did not consider basic computer skills as needed to deal with complex application such as electronic patient records.

The strength of this survey is the relatively large number of 280 participants from five of the largest health care organizations in Austria. As a limitation, we used a convenience sample and no random sample as well as a snowball system to recruit participants. Mostly participants with interest in eHealth topics may have volunteered to participate in the survey; this may have led to a selection bias, resulting in higher demand for continuous education. On the other side, the answers were identical in all five participating institutions, indicating some validity of findings. Our survey participants came from larger health care organizations; outpatient and home-care nurses were not included in this survey.

Our results are supported by recent larger study to develop nursing informatics core competencies for nurses in the DACH region (Germany, Austria, Switzerland) [6]. In this study, based on a literature survey, an expert survey and expert focus groups with 87 experts, 24 core nursing informatics competencies were developed and validated for five different nursing professional roles (such as clinical nurse or nursing manager). In this study, highest rated competency areas for nursing managers were, among others, nursing documentation (including terminologies), process management, and project management. Highest rated competencies for clinical nurses were nursing documentation (including terminologies), data protection and security, information management in nursing, and IT and ethics. The recommended core competencies were thus quite comparable with our results. While this DACH study was based on expert opinions, our survey was based on opinions of nursing practitioners and nursing managers, both surveys together thus providing a good few on needed competencies.

On an international scale, nursing informatics has already been recognized as an important factor for future innovation in health care [13]. However, nursing graduates have been found to be inadequately prepared for nursing informatics [14]. International position papers stress the need to provide nurses with nursing informatics competencies and propose to define Chief Nursing Informatics Officer (CNIO) as new nursing management role [15]. Our survey thus seems quite timely, as it reflects the competencies needed to build up a competent nursing informatics workforce.

In our survey, corresponding to these proposals, nursing managers showed large interest in continuous education for their workforce. However, in Austria, there is a lack of suitable opportunities for continuous education in nursing informatics. Table 2 summarizes some of these opportunities, with focus on part-time programs. The master program at UMIT just started and was built, among others, on the results of this survey.

All master programs typically require a bachelor degree. Nursing education in Austria is just moving toward academic degrees, so many nursing practitioners without bachelor degree cannot enroll in these master programs.

Table 2. Some opportunities for part-time continuous education in nursing informatics in Austria.

University	Name of program	Comments	Source
University for Health Sciences, Medical Informatics and Technology (UMIT)	3-day short introductory course "Applied Nursing Informatics"	Offered since 2012, addresses nurses with interest in IT	www.umit.at/pflegeinformatik
University for Health Sciences, Medical Informatics and Technology (UMIT)	2,5-years part-time master program "Health Information Management"	Online-based program. Targets nurses and other health care professionals with bachelor degree, as well as graduates from technical studies.	www.umit.at/him
University of Applied Sciences St. Pölten	2-years part-time master program "Digital Health"	Addresses "health experts", including nurses with bachelor degree, as well as graduates from technical studies.	https://www.fhstp.ac.at/de/studium-weiterbildung/medien-digitale-technologien/digital-healthcare
FH Joanneum Graz	2-years part-time master "eHealth"	Addresses, among others, medical-technical or management graduates (with IT knowledge) and graduates from technical studies.	https://www.fh-joanneum.at/ehealth/master

5. Conclusion

Austrian nursing practitioners and nursing managers show a strong interest for continuous education in health informatics. This supports findings of other international surveys. There is, however, a lack of suitable opportunities for continuous education in Austria.

The results of the survey have been used to design a new master program in Health Information Management at our University [16]. This master program is fully online and thus especially suited for continuous education of health care professionals. We will carefully monitor the participants and their professional background in the future to determine whether this educational offer is accepted among nurses and other health care professionals.

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