Promoting the Use of Nursing Terminology Classification Among Nursing Students- An Action Study

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Abstract

Background: Nursing terminology classification enables us to express nursing knowledge in a manner that can be shared across disciplines and care settings. Nursing educators in Israel are committed to training students toward integrating and promoting the use of nursing terminology. This study will display the process of promoting the use of nursing terminology classification among nursing students.

Objectives: To display the process of training nursing students toward integrating and promoting the use of nursing terminology, by using tools that were especially developed for this purpose: a pocket booklet and an intranet site.

Methods: It is an action study. Two innovative tools were developed the tools were distributed among 50 nursing students, to be used in their clinical practice. At the end of their clinical practice, the students filled a questionnaire for the tools' evaluation.

Results: The pocket booklet was a successful tool; whereas, the intranet site was less successful, since it was not accessible to the student nurses on the wards.

Conclusion: This study can serve as an example of how nurses can lead changes in the nursing profession. The use of appropriate, useful, friendly and secured tools in nursing education can provide a more professional way of learning for the benefit of the nursing profession and the health customers.

Keywords: Action study; Teaching methods; Nursing terminology; Nursing students; Nursing care plan

Introduction

The 21st century is witnessing considerable changes in health care professions. As the 18th century was marked by the industrial revolution that changed the world, the 21st century is characterized by the digital revolution, affecting every area of performance in each profession. The health care system is undergoing fundamental changes in order to deliver enhanced quality and safety health care. One of the major changes includes developing information systems to facilitate the transformation of the paper-based patient chart into an Electronic Health Record (EHR) system [1]. EHR plays a critical role in sharing information and knowledge within and across care settings and representing health record data in a consistent way [2].

The use of standardized language by physicians has a long tradition; whereas, in nursing, data has been buried in a narrative, under structured format, in which aggregation is difficult. Consequently, nurses have been under represented in the communication of healthcare data. The care nurses provide, to sustain life, alleviate suffering, enable recovery and promote health, should be seized within the standardized language and electronic health record. Nurse researchers have recognized the need for a systematic classification and description of nursing interventions so that the contribution of the nursing profession to patient care is recognized and understood [1,3].

Method

This study will display the process of promoting the use of nursing terminology classification among nursing students.
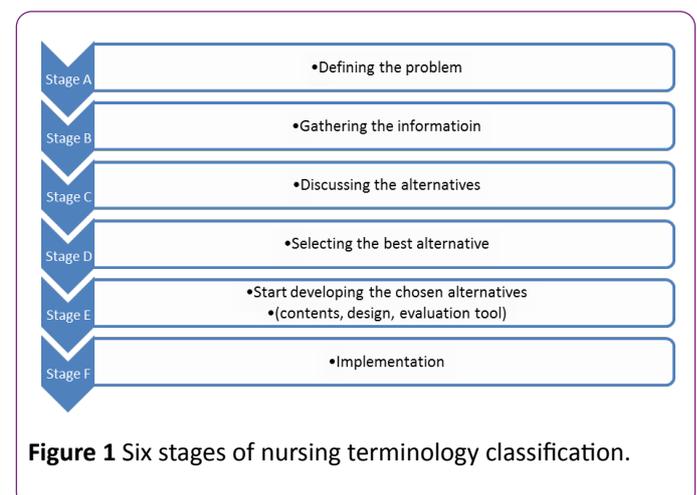

Figure 1 Six stages of nursing terminology classification.

This study is an action study [4], which includes six stages: A. Defining the problem B. Gathering information C. Discussing alternatives D. Selecting the best alternative E. Working on the preferred solutions and F. Implementation. Finally, we will present the evaluation of our study (**Figure 1**).

Stage A- defining the problem

Nursing terminology classification: Nursing terminology classification enables us to express nursing knowledge in a manner that can be shared across disciplines and care settings. Ultimately, it aids in the evaluation of the effectiveness and quality of nursing care and nursing interventions provided to patients. The use of classification makes it possible to obtain all of the contextual elements of the nursing care process and document nursing care provided to patients. Documentation in such a manner enables determination of which interventions are more effective than others in order to achieve certain nursing outcomes [1,3,5]. It is a critical process which leads to improved nursing quality and working efficiency and increased nursing professionalism and responsibility [6]. Standardization of terminology within electronic health records provides benefits to the patient, the organization and the nursing profession [3]. Patients benefit from continuity of care by improved communication between clinicians and organizations benefit by being able to measure nursing care and its impact on patient care.

Standardization efforts in nursing have been an ongoing process since the 1970's, that were triggered by the need to develop a means of documenting nursing practices. The need of a uniform language in nursing, with the evolving use of EHR, in order to integrate nursing concepts with computer systems, has led to the development of a range of different terminologies to support different purposes and needs. It is a demanding process which requires substantial methodological and technological knowledge as well as cultural experience in terminology development work [7]. The North American Nursing Diagnosis (NANDA) has been a driving force in the development of diagnostic classifications in nursing to support clinical judgment and knowledge development. It is internationally the most widely implemented classification of nursing diagnoses [8]. NANDA diagnoses are used to identify human responses to risks, injury or health promotion. Nurses use a critical thinking process to diagnose these human responses. NANDA has evolved from an alphabetical listing in the mid 1970's to a conceptual system that guide classification of nursing diagnoses in a taxonomy with three levels [3].

Nursing Interventions Classification (NIC) is a comprehensive set of research based nursing interventions nurses perform. NIC facilitates the analysis of the impact of activities on patient outcomes. It consists of seven domains in nursing. In order to support worldwide implementation, it has been translated into many languages. NIC interventions are used in EHR implementation of plans of care, critical pathways, patient education and data sets for the evaluation of care at the individual or unit level [3].

The use of Nursing Outcomes Classification (NOC) enables nurses to assess the effectiveness of interventions and to determine the outcomes of the care they provide to patients. NOC has also been translated to many languages to support worldwide implementation [1].

The Clinical Care Classification (CCC) System is a standardized, coded nursing terminology that identifies the separate elements of nursing practice. The CCC offers a unique framework and coding structure for documenting the plan of care following the nursing process in all health care settings [9]. It also has a new mobile friendly Web tool which is available as a mobile friendly web site, viewable with any mobile device or smart phone. It is standardized coded terminology designed to assess, document and classify nursing practice in Electronic Health Record. It is designed for electronic processing and interoperability of nursing and allied healthcare data and information to other systems [10].

Teaching nursing terminology: Research studies on standardized language have not focused on the perspective of nursing students, who are our future nurses. The use of standardized language promotes nursing students' decision making, within their clinical practice, by enabling critical thinking [3,11] and helps them describe their patient care. The competent use of standardized language by student nurses makes them more capable to adapt themselves to a computerized patient record system [1], and will facilitate future graduates' transition to the EHR system in the healthcare settings. The use of standardized nursing interventions in nursing in Israel has been used more as an educational strategy for strengthening the students' critical and analytic thinking. One of the problems of nursing students is the application of nursing theoretical concepts into clinical practice.

The nursing students in Israel are required to build a patient treatment program which is based on standardized nursing terminology; however, there is no Hebrew textbook of nursing terminology and nursing students have difficulties in understanding the English language since it's not their mother tongue. All the above, makes it difficult for students to reach the goal of building a patient treatment program.

The main aim of this study was to promote the use of nursing terminology among our nursing students in Israel. The authors wanted to achieve this goal by planning a project that would encourage nursing students throughout all the stages of their clinical experience to use nursing classification at the different clinical sites. The main research question in achieving the above aim was: What are the best tools that could help students promote and implement nursing classification knowledge?

Stage B: Gathering the information

In order to gather information concerning the research main aim, the authors interviewed three nursing educators, at two nursing academic centers, about the necessity of building a new tool. They emphasized the issue of building an adequate working tool for the nursing students which should be suitable, feasible, flexible and friendly for their daily use.

The authors also tried to gather information about the different nursing classification systems in order to decide which system and tool would enable the students to implement the information they learned in the classroom into different clinical situations. Multiple nursing terminology and classification systems have been developed to establish a standardized way to articulate nursing. Originally, some of these systems were developed for paper based documentation and have transitioned to EHR systems [12]. Common interdisciplinary terminologies include the Systemic Nomenclature of Medicine-Clinical Terms(SNOMED-CT), Logical Observation Identifiers Names and Codea (LOINC) and ABC Codes Within nursing, the Clinical Care Classification System (CCC), International Classification of Nursing Practice (ICPN), Nursing Intervention Classification (NIC), Nursing Outcome Classification (NOC), Omaha System, Perioperative Nursing Data Set (PNDS) and Nanda International (NANDA). The number of nursing classification systems available present a challenge. Technologies developed using the principles of human factors that fit within the nursing workflow, support nurse acceptance and use of these systems [12].

Nursing students learn the different nursing classification systems and the difference between them, in the framework of their studies. They are also taught how to develop a treatment plan according to the nursing process based on the classification of nursing diagnosis, nursing interventions and nursing expected outcomes. This includes broad and comprehensive information which is difficult to memorize and learn by heart. We were interested in giving our student nurses a tool which would make it easier for them to build a nursing care plan to improve the quality of patient care. Therefore, the authors tried to decide which tools would best fulfill the students' needs at the clinical experience.

Stage C: Discussing the alternative tools

We wanted to implement a tool that would be friendly, accessible and constantly attainable to the students. A tool that would help students' development of their analytical skills, critical thinking ability and to develop students' clinical judgement in order to better prepare them to take on increasingly complex care management. We considered the different alternatives trying to check the advantages and disadvantages of each tool in order to reach a decision of which tool would suit our student population best.

Four different alternatives were considered, and the advantages and disadvantages of each tool were examined. The tools considered were: 1) Simulations 2) A pocket booklet adapted for use in clinical experience 3) A web site that could also be used as a smartphone application 4) Workshops.

Today, nursing education programs are making major capital investments in alternative learning strategies such as developing simulation centers. Simulation is a situation made to resemble clinical practice as closely as possible. It can be used to teach theory, assessment, technology and skills [13,14]. Simulation in the classroom, before the first clinical practice, was and still is one of the tools used to prepare nursing students for their clinical experience. However,

simulations are not ongoing and not real situations. They also have limited realistic human interaction and sometimes are not taken seriously by students [14]. We wanted our students to deal with real situations which are usually more complicated than situations prepared for simulation.

As for workshops, they are created around clinical cases with the intention to be as educational and proactive as possible. This allows participants to take an active part in the discussions. However, similar to simulations, the student is not dealing with a real clinical situation. On the other hand, the pocket booklet and the web site were meant for use in real situations and could be used at all clinical sites.

Summary: Since simulations and workshops are not used to deal with real clinical situations, whereas the pocket booklet and website could be used at all clinical sites, we decided to examine the idea of a pocket booklet and a web site for the benefit of all our nursing students.

Stage D: Selecting the best alternative

Today, increasing numbers of healthcare professionals are using smartphones and apps in daily clinical care. These apps hold great potential for improving clinical practice; therefore, the authors thought that they could design a smartphone application for the students' use in their clinical practice. Two problems aroused with this idea: safety and accessibility.

Safety: The adoption of smartphone technology in hospital settings has raised concerns about distraction, data security breaches, infection hazards from bacteria on devices and even misplaced devices [15], thereby threatening patient safety. Professor Papadakos says: "You walk around the hospital and what you see is not funny in terms of professional staff texting, surfing the Web and playing games, my gut feeling is lives are in danger" [15]. Industries have placed technological limits on using devices for personal use. The Israeli Ministry of Health wrote guidelines on the use of smartphones, not allowing the use in all clinical areas [16]; therefore, students are not allowed to use smartphones in all clinical areas. Some nursing schools don't allow the use of smartphones in the clinical area at all.

Accessibility: Our study involved students undertaking BSN nurse training programs on two different campuses with three different student populations-Secular Jewish, Arab and Jewish ultra-orthodox students. Many of the Jewish ultra-orthodox students don't have smartphones for religious reasons, so using the application for them was irrelevant.

Therefore, we decided to develop a culturally sensitive tool adapted for use in clinical experience which would serve both the secular and ultra-orthodox student populations: a pocket booklet, based on the Clinical Classification Systems [10]. The booklet is easy to use, comfortable and in the pocket at all times. In addition, we developed a website for the non-orthodox student population who wish to use their smartphones in clinical practice. Both tools, the app and the booklet, seemed suitable for clinical practice. They seemed easy to use, comfortable and in the pocket at all times. Although the authors originally thought that the website app

would be designed for the secular student nurses and the booklet for the Jewish ultra-orthodox students, they decided to enable both of the student populations to use both tools in order to evaluate which of the tools are favored by the different groups of students (some ultra-orthodox students do use apps). All this was done with the cooperation of the academic staff and in consultation with the end-users- the students.

Stage E: Start developing the chosen alternatives

The final decision was to choose two solutions: A pocket size booklet and an intranet site, while the CCC terminology by Prof Saba [10] would serve as the basis of our project. It is important to note that the authors decided to plan and build these two tools with the same principles and design (diagnosis, interventions and expected outcomes) where the information would be concise and brief. The first step was to decide which and how much of the nursing terminology contents should be included into the two chosen solutions and how to present it in a friendly and useful way. All of the nursing data was divided into three categories: nursing diagnosis, nursing expected outcomes and nursing interventions. According to the basic assumptions, that the information should be concise and brief, the nursing diagnoses were divided into nine central groups: Exchange, Communication, Relating, Valuing, Choosing, Moving, Perceiving, Knowing and Feeling [17]. Each nursing diagnosis group had a few sub-groups according to its contents. The expected outcomes and interventions were derived from these subgroups. The authors had some difficulties choosing the correct items for each sub group, therefore, they had a few brainstorming meetings with professional nursing educators in order to make these decisions.

Due to the fact that our language in Israel is Hebrew, and our students prefer to use their mother tongue, we had to adapt the booklet to our students' needs. It was crucial to present the information needed in an organized table in order that the search for the right diagnosis would be carried out easily and quickly, especially since we expected the students to use the tool in the different clinical fields.

After the decision was made, the next step was to translate all the data into Hebrew and adapt it to the Israeli situation so that it would be convenient and easy to understand. A crucial point that was constantly on the researcher's mind was that the end users, the nursing students, would have to use the tool and if it would not be developed according to their needs, they would not use it and all of the hard work put into the project, would be in vain.

The tools' design: The basic structure of each page consisted of a table divided into three: Nursing Diagnosis, Nursing Outcomes and Nursing Interventions. Each of the nine sub-groups of the nursing diagnosis had a different color and its page was numbered.

Preparing the tools: After receiving the needed budget for the pocket booklets, an order was made through a graphic company.

The website was built with wix.com including a code access for the students. All the data was presented with the same design as the booklet.

Preparing the evaluation method: The evaluation of the intranet site and the booklet, was performed by a written questionnaire. The initial step was to assess the students' use of the new tools and their satisfaction of its use. We built a short questionnaire consisting of four closed questions and one open question. The questionnaire was divided into two parts; each part included the same questions for each tool.

The four closed questions included: 1) What is your overall satisfaction with the tool? 2) How would you describe the advantages\disadvantages of the tool? 3) Has the use of the tool improved the quality of your work? 4) How often did you use the tool?

The open question included: Please describe your overall satisfaction with the tool?

Stage F: Implementation of the tools

The process of planning started in 2014. The assessment of the situation and the development of the intranet site and the booklets took approximately one year.

As soon as the booklets and the intranet site were ready, we initially introduced the tools to the student nurses' educators who were very enthusiastic about these new tools. After getting their consent, the tools were introduced to the students which included a demonstration on how they should be used. It's important to emphasize that at the very beginning, the students were very enthusiastic about the tools, especially the booklets.

Results

Three months after the implementation stage of the booklet and intranet site, an evaluation questionnaire was distributed to the students.

The process: The questionnaire was given to fifty nursing students at two academic centers. The responsive rate was low; only twenty-five student nurses responded (50%). Probably due to the fact that the timing was not suitable; it was at the end of the semester and the students were busy with their final course exams.

Characteristics of the respondents

90% were women; 60% were in their second year of studies, 40% were in their third and fourth year of studies.

Results of the evaluation

Students' evaluation of the pocket booklet and intranet site. Answers to the closed questions (**Table 1**).

Table 1 Students' responses to the closed questions.

S. No	Questions	Questions' scale	Students' answers to questions about the booklet	Students' answers to questions about the intranet site
1	What is your overall satisfaction with the tool?	A scale of 1 to 5, from "not satisfied at all" (1) to "very satisfied"(5).	80% of respondents expressed high satisfaction with the tool (score of 5 on the scale).	90% of respondents indicated that they did not use this tool at all.
2	How would you describe the advantages \ disadvantages of the tool	A scale of 1 to 5 for each item, ranging from "do not agree at all"(1) to "highly agree"(5). Easy to learn, easy to use, fast and responsive, available, aesthetic, saves time, provides information.	The students gave a mean score of 4.5 for each of the criteria: easy to learn, easy to use, available, aesthetic, saves time, provides information. The criteria of rapid response, received the highest score (5).	90% of respondents indicated that they did not use this tool at all.
3	Has the use of the booklet improved the quality of your performance at work?	A scale of 1 to 5, from "did not improve at all"(1) to "improved very much"(5).	The mean score was 4 for improved the quality of your performance, in terms of improved quality of care.	90% of respondents indicated that they did not use this tool at all.
4	How would you describe the frequency of your use of the tool?	A scale of 1 to 5, from "no use at all"(1) to "regular daily use" (5).	The mean score was 4 for using the booklet on a daily basis.	90% of respondents indicated that they did not use this tool at all.

Citing's of the students' answers to the open question for the booklet

"Please describe your overall satisfaction with the tool":

"I used the pocket booklet daily. It helped me tremendously and saved me a lot of searching time for information. It's always in my pocket".

"The pocket booklet is very convenient for use and beneficial, a totally effective learning tool which is extremely helpful."

"The pocket booklet is written excellently and concise. I personally used it a lot during my clinical experience".

"Thank you, it really helped me".

"Excellent booklet, nurses and clinical instructors asked me for a copy of it".

Students' answers to the Intranet site

Answers to the closed questions: 90% of the respondents indicated that they did not use this tool at all.

Citing's of the students' answers to the open question: "Please describe your overall satisfaction with the tool":

"The site is not accessible to us on the wards (no Wi-Fi)".

"It would be nice if we were given tasks to do on the site, so it would be more embedded into my memory and I would be more aware of it".

"I forgot about this tool".

"It is not accessible".

Discussion

The implications of theories are often not readily apparent to student nurses even though they are a part of the nursing core educational program. It seems that student nurses still have difficulty applying theory to practice [18]. The authors tried to find a partial solution to this problem. They developed a pocket booklet and an intranet site to facilitate the students' application of nursing theoretical concepts into clinical practice in an effort to partially reduce the gap between nursing theory and practice. The main theme of this project of research was the need for innovation to be integrated for the benefit of the nursing students. This article described the process of innovation; the development of two different tools for use on the wards: a pocket booklet and an intranet site through an action study. An action study is typically undertaken in a school setting, searching for solutions to everyday, real problems experienced in schools, or looking for ways to improve instruction and increase student achievement [19].

The results showed high satisfaction of the pocket booklet. The nursing literature emphasizes the benefits of using a booklet, like the Japanese who used a comfort care booklet that improved nursing home staff's perspectives on palliative care [20]. The authors believe that there were two main reasons for the above: 1. the tool was built to be useful and friendly according to the TAM (technology acceptance model) theory [21]. 2. The project was well planned.

The second tool, use of the intranet site, was unsuccessful. This result may be explained by the fact that there was not enough implementation and instruction of the tool and that the tool was not accessible to the student nurses on the wards. Maybe due to epidemiological reasons such as infection hazards and the threat it may impose on patients'

safety, the idea of using a cell phone in clinical practice should be reconsidered [15].

We must admit that one limitation of the research is that the response rate of the evaluation survey was low, due to the exam period at the end of the semester.

Conclusion

The importance of this study is in describing and evaluating the process of change through an action study. It can serve as an example of how nurses can lead change in the nursing profession. We recommend: 1. to reexamine the issue of students' use of the web during their clinical experience. 2. to plan a research project that would compare the outcomes of students using the pocket booklet tool to the outcomes of students not using the pocket booklet. 3. To plan a study examining the student cultural diversity concerning level of religiosity and using websites.

The authors believe that the use of appropriate, useful, friendly and secured tools in nursing education could provide a more professional way of learning for the benefit of the nursing profession and the health customers.

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References

1. Noh HK, Lee E (2015) Relationships among NANDA-I diagnoses, nursing outcomes classification, and nursing interventions classification by nursing students for patients in medical-surgical units in Korea. Int J Nurs Knowled 26: 43-51.

2. Meum T (2013) "Lost in translation": The challenges of seamless integration in nursing practices. Int J Medi Info 82: e200-e208.

3. Lundberg C, Warren J, Brokel J, Bulechek G, Butcher H, et al. (2008) Selecting a standardized terminology for the electronic health record that reveals the impact of nursing on patient care. Online J Nurs Informatics 12.

4. Mills G (2011) Action research: A guide for the teacher researcher. Upper Saddle River: Prentice Hall, USA.

5. Maas ML, Delaney C (2004) Nursing process outcome linkage research: issues, current status, and health policy implications. Medical Care 42: 11-40.

6. Hao ATH, Wu LP, Kumar A, Jian WS, Huang LF, et al. (2013) Nursing process decision support system for urology ward. Int J Med Inform 82: 604-612.

7. Thoroddsen A, Saranto K, Ehrenberg A, Sermeus W (2009) Models, standards and structures of nursing documentation in European countries. Stud Health Technol Inform 146:327-331.

8. Falk J, Björvell C (2012) Does the use of a classification for nursing diagnoses affect nursing students' choice of nursing interventions? Nurs Inform 108.

9. http://www.nursinglibrary.org/vhl/pages/CCC_System.html

10. Saba VK (2016) Clinical Care Classification System Mobile-Friendly Web Tool. CIN 34: 57-59.

11. Lunney M (2006) Helping nurses use NANDA, NOC, and NIC: Novice to expert. J Nurs Adm 36: 118-125.

12. Strudwick G, Hardiker NR (2016) Understanding the use of standardized nursing terminology and classification systems in published research: A case study using the International Classification for Nursing Practice®. Int J Med Infor 94: 215-221.

13. Rabia K (2014) Simulation in nursing education: An evaluation of students' outcomes at their first clinical practice combined with simulations. Nurse Education Today 34: 252-258.

14. Rauen CA (2004) Simulation as a teaching strategy for nursing education and orientation in cardiac surgery. Crit Care Nurs 24: 46-51.

15. http://www.the-hospitalist.org/hospitalist/article/125425/smartphones-present-both-risks-and-opportunities-hospitalists

16. http://www.health.gov.il/Subjects/radiation/cell_phone/Pages/default.aspx.

17. Berman AT, Synder S, Frandsen G (2016) Kozier & Erb's Fundamentals of Nursing: Concepts, Process and Practice. (10th edn). Pearson Education, UK.

18. Carpenito-Moyet LJ (2010) Invited paper: Teaching nursing diagnosis to increase utilization after graduation. Int J Nurs Term Class 21: 124-133.

19. https://www.brown.edu/academics/education-alliance/sites/brown.edu.academics.education-alliance/files/publications/act_research.pdf

20. Nakanishi M, Miyamoto Y, Long CO, Arcand M (2015) A Japanese booklet about palliative care for advanced dementia in nursing homes. Int J Palliat Nurs 21: 385-391.

21. Davis FD (1986) A technology acceptance model for empirically testing new end-user information systems: Theory and results.