Nursing Informatics 2016 W. Sermeus et al. (Eds.) © 2016 IMIA and IOS Press. This article is published online with Open Access by IOS Press and distributed under the terms of the Creative Commons Attribution Non-Commercial License. doi:10.3233/978-1-61499-658-3-324

# Changing Educational Paths in an Informatics Course According to the Needs and Expectations of Nursing Degree Students

# Zulma A. GONZÁLEZ<sup>1</sup>, María B. SCHACHNER , María A TATTONE, Sonia E. BENÍTEZ

Health Informatics Department of Hospital Italiano de Buenos Aires

Abstract Informatics education in the nursing career varies in each curriculum, and directly impact in training and future development of nurses in the professional field. While the proposed curriculum is based on essential minimum content for professional training, it was necessary to update it according to current technological development, considering the different profiles of students and practice settings, labor and academia. The pedagogical proposals were redesigned in two informatics courses of a Bachelor of Science in Nursing (BSN) at Hospital Italiano de Buenos Aires. We adapted the curricula tailored on prior knowledge, educational path and needs of the students identified and made explicit by them at the beginning of the courses. At the end of the courses, the students surveyed said that the changes were appropriate

Keywords. Nursing Informatics, Computer science education, Nursing education, Information literacy, Nursing curriculum

## 1. Introduction

The 20th century it has been called the 'age of information'. And it is considered that the current will be described as the era of the 'information process' since it is one of the most valuable contemporary resources as well as also the ability to use it effectively [1]. Historically, the processing of information has been the subject of nurses and integral part of their profession, but since the information technologies and communication were included as tools in hospitals, professional practice; access to information in a timely manner, decision making, monitoring and evaluation of nursing care were significantly modified [2]. 'Information literacy' represents the ability to recognize when information is needed in addition to knowing locate it, evaluate it and use it. As informatics skill means being able to effectively and efficient use technological devices as needed [1]. The level of information literacy and technologies management required for nurses is the expected of any professional of this century with education, so if using them in the professional field increases more and more, possessing proper training is necessary. Nevertheless, these conditions are not met in all cases [3]. Therefore, we consider it essential that both nursing organizations and institutions of formal education to review its curriculum proposals and educational objectives and encourage of digital skills hope the future professionals develop, increasing the computer and informational

<sup>&</sup>lt;sup>1</sup> Hospital Italiano de Buenos Aires, Juan D. Perón 4190 (C1181ACH) Buenos Aires, Argentina, Tel. (5411) 4959-0200 ext. 5778; E-mail: zulmaa.gonzalez@hospitalitaliano.org.ar

training, according to the different recommendations [4]. In this regard, some training paths of nursing students have been modified according to technological advances in the field of health, promoting the development of those digital and informatics skills necessary for professional performance. While the literature realizes the different arguments and positions on the incorporation and development of these skills in undergraduate education, inclusion of them in nursing training programs has not been mass, resulting in some limited cases or varied [5-6]. Nor abound studies evaluating the competences of nursing students [7].

Being able to compare the different curricular and pedagogical approaches in the field of computer science undergraduate training in nursing and, to analyze the recommended practices according to the literature, promotes the review and updating content to enrich teaching towards academic quality in line with the demands of today's professional field training. This paper describes the findings of a pilot project of content review and updating in two educational informatics courses in a Baccalaureate Science in Nursing, according to the needs and expectations of students and from teaching strategies and educational decisions carried out.

#### 2. Methods

Hospital Italiano de Buenos Aires (HIBA) is a highly complex university hospital with a 150-year history. It belongs to a health nonprofit network with an infrastructure of 750 beds. In addition, 1500 nurses, 2800 doctors and 1900 employees works at the organization. It possesses a research institute and a University Institute (UI) that offers university education in health sciences, between them nursing. Degree in nursing takes place over five years. After the first three years the student gets an intermediate diploma that qualifies for professional practice as registered nurse, and can continue studying for two more years and graduate with a degree in nursing. The computer science course is part of the curriculum, featuring four courses (Basic computer science I and II and Applied computer science I and II) on four of the five years program. The teaching staffs of each subject review and update every semester the proposals and pedagogical objectives with a strong focus on innovation. Figure 1 shown the structure of the courses' contents:



Figure 1: Contents of basic and applied computer science courses of the Nursing degree program at HIBA

Student groups are characterized by heterogeneous in age and educational paths partly due to socio-economic and labour conditions that determine the choice of nursing profession in Argentina, influenced by the need to be able to enter the labour market as quickly as possible. In the 3-year program students groups are formed by pupils whose age is usually between 19 and 40 years. In the program of two years remaining to get the nursing degree, the age range in some cases amounting to more than 50 years (for this training program, the UI also accepts nurses of other academic institutions). Accordingly, prior knowledge of students about the field of basic computing and informatics nursing as well as use of technology skills fluctuate, generating the need to adapt the pedagogical proposal at the beginning of each courses, in a way that provide comprehensive and relevant training for all recipients.

The development and adaptation of the pedagogical proposal, was carried out during the first semester of 2015. The teaching staff reviewed the educational contents of the two subjects: Basic computer science II and Applied computer science II and then the results of the evaluation surveys of the previous year (the surveys are conducted at the end of each course and research on: student satisfaction, teaching strategies and performance, relevance of subject content, educational resources and assessment, among others). With the aim to collect students' perceptions and expectations about the informatics courses, we held face-to-face meeting and debate with each group for exploratory purposes. Then, we recorded what happened and compared the findings with the subjects' evaluation surveys of 2014, redesigning the proposal of contents according to a) student's needs and expectations, b) curriculums review of other universities that provide Nursing degrees and include informatics in their programs, c) minimum curriculum content pursuant to the recommendations of the International Medical Informatics Association (IMIA) on Education in Health Informatics as part of Nursing programs [8], and feasibility. The updated version of the program was communicated to UI and after approval to the students, and then applied to the courses of the 2015 first semester. At the end of the semester, subjects' satisfaction surveys were administered again, implemented via online questionnaires, conducted with 'Google form®' and available in the online learning platform (Moodle®) of the UI.

## 3. Results

Students accepted with enthusiasm to participate in the program update. The modifications consisted of deepening of content already seen in previous informatics subjects and the introduction of new ones. Nineteen students answered the surveys of the 32 students. Eighteen (95%) of the students expressed being Very satisfied/satisfied with the course general proposal, It is worth noting 12 of the participants (63%) considered the classes were new learning facilitators, and 17 responders (90%) expressed the courses' contents were Very relevant/ relevant for their academic and professional training. The contents highlighted were

- a) search and access information,
- b) web 2.0 tools, and c) electronic nursing record.

The same topics were suggested in the exploratory instance (face-to-face meeting). All of the students expressed the evaluations agreed with the class contents and approach and the comprehension by the students joint with their professional practice environments. Regarding the least liked of the course, most complained about

the infrastructure and logistics (poor internet signal, lack of computers availability or maintenance), and they proposed the improvement of these aspects. Finally they suggested if students have previous knowledge of basic computer science, the courses should be 'optional'.

#### 4. Discussion

We described the experience of updating and adapting the content of informatics courses for nursing degree students, according their needs and expectations, and teaching strategies. When we asked about satisfaction, they responded satisfactorily but some students proposed to change the mandatory nature of the courses. Youngest students with IT background tended to believe that the course should be optional. Students with basic knowledge (usually they resume studies years after the first diploma in nursing) wish to receive instruction on topics related to computer operation or office tools. We included topics that responded to their academic needs, job placement needs and to the recommendations on the levels of knowledge and skills expected developed by healthcare professionals [8].

The speed with which technologies are developed has led to daily appears a new version of a more intelligent, efficient and usable computerized system. The use of computer and technology information has expanded to health information systems and therefore to nursing. Currently, the nursing profession is based more and more on knowledge and technologies where the nurse acts as coordinator among all the information [9-10]. Then, more than ever, the review regarding what to teach about computer science to our nursing students is a discussion that we cannot afford to miss. The debate on the integration of computer science at different levels of nursing training occurs internationally and there are different positions and therefore, different proposals [6-11] Concerning this situation, there is many nursing training institutions where computer science is not even part of the curriculum [5]. Our greatest challenge was to design an updated curriculum, adapted to the students' needs and expectations and related with their development in the professional field. In this experience, we actively engaged students to propose alternatives to its own learning path. The resulting educational proposals reduced the gap between their expectations and the content of current courses. We consider this is a valuable and challenging experience for instructors to continue investigating and enriching the future of education in nursing and informatics

## References

- J.P. Sewell, Thede LQ. Informatics and Nursing: Opportunities and Challenges. 4<sup>th</sup> edition, Wolters Kluwer Health/Lippincott Williams & Wilkins, Philadelphia, 2013.
- [2] H.F. Marin, Nursing informatics: current issues around the world. Int J Med Inf. 2005 Dec;74(11 12):857-60.
- [3] S. Garde, D. Harrison, E. Hovenga, Skill needs for nurses in their role as health informatics professionals: a survey in the context of global health informatics education. Int J Med Inf. 2005 Dec;74(11-12):899-907.
- [4] M. Tellez, Nursing informatics education past, present, and future. Comput Inform Nurs CIN. 2012 May;30(5):229-33.
- [5] L.M.P. Sanches, R. Jensen, M.I. Monteiro, M.H.B. Lopes, Informatics teaching in undergraduate nursing programs at Brazilian public institutions. Rev Lat Am Enfermagem. 2011 Dec;19(6):1385-90.
- [6] I. Madsen, E. Cummings, E.M. Borycki, Current Status for Teaching Nursing Informatics in Denmark, Canada, and Australia. Stud Health Technol Inform. 2015;216:1016.

Z.A. González et al. / Changing Educational Paths in an Informatics Course

- [7] J. Choi, J.E. De Martinis, Nursing informatics competencies: assessment of undergraduate and graduate nursing students. J Clin Nurs. 2013 Jul;22(13-14):1970-6.
- [8] J. Mantas, E. Ammenwerth, G. Demiris, A. Hasman, R. Haux, W. Hersh, et al. Recommendations of the International Medical Informatics Association (IMIA) on Education in Biomedical and Health Informatics. First Revision. Methods Inf Med. 2010 Jan 7;49(2):105-20.
- [9] A. Gonen, D. Sharon, A. Offir, L. Lev-Ari, How to enhance nursing students' intention to use information technology: the first step before integrating it in nursing curriculum. Comput Inform Nurs CIN. 2014 Jun;32 (6): 286-93.
- [10] S.R. Hartranft, T. Garcia, N. Adams, Realizing the anticipated effects of the clinical nurse leader. J Nurs Adm. 2007 Jun;37(6):261-3.
- [11] L.M. Nagle, K. Crosby, N. Frisch, E. Borycki, L. Donelle, K. Hannah, et al. Developing entry-to-practice nursing informatics competencies for registered nurses. Stud Health Technol Inform. 2014;201:356-63.

328