



Educational technology in care management: technological profile of nurses in Portuguese hospitals

Tecnologia educacional na gestão de cuidados: perfil tecnológico de enfermeiros de hospitais portugueses

Tecnología educacional en la gestión de la atención: perfil tecnológico de los enfermeros en los hospitales portugueses

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ABSTRACT

Objective: To identify the technological profile of nurses in Portuguese hospitals. **Method:** A quantitative exploratory study conducted in two hospitals in the northern region and one in the central region of Portugal. The sample was randomly selected and included 960 nurses. **Results:** Of the participants, 420 (46.1%) used computers, 196 (23.4%) reported having knowledge about using computers for teaching, 174 (21.1%) used computers to teach, 112 (15.1%) recognized that using computers can be a technological means to supplement classroom training, 477 (61.6%) would like to receive training on using computers, and 382 (40.9%) reported self-learning of information technology. In relation to distance education, 706 (74.9%) reported they were familiar with it and 752 (76.4%) indicated an interest in participating in training using this modality. **Conclusion:** Organizations should be mindful of the technological profile shown by this group of nurses and look for ways to introduce educational technologies in the management of care.

DESCRIPTORS

Education, Nursing; Educational Technology; Nursing Informatics.

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INTRODUCTION

The use of new information technologies in health has brought significant changes to the education paradigm for health in nursing, promoting new ways of teaching and producing knowledge and driving new behaviors among health professionals. Technological advances have influenced work processes in health, even in the nursing field, and induced changes in various professional contexts. In the context of education, these innovations are reflected in the creation of virtual learning environments (VLE).

In a climate of exponential growth of knowledge, it seems appropriate to reflect on the access, locations, and means that professionals use to share and disseminate information, especially in education, and information technology is one of the effective ways⁽¹⁾.

The literature points to the need to invest in adopting distance learning techniques that enable and promote self-learning. From this perspective, it is felt that these methodologies should be implemented in different organizational contexts and health and educational institutions.

Information is an important element in the decision-making process of professionals and improvements in nursing practice. Nursing informatics is a key component in health care because it includes comprehension, skills, and tools that enable sharing and using data that is classified and organized in such a way as to bring greater awareness and understanding of nursing issues to health⁽²⁾.

Given the rapid technological progress in our day, nurses should equip themselves with technological means and use them carefully and consciously in favor of building a new proactive image, becoming active and participating professionals who use these new technological resources to promote new forms of health care.

Learning information and communication technologies (ICT) increasingly appear to be a current resource for social education needs⁽³⁾.

This study is part of the project Contributions of Information Technologies in Nursing Management, which is part of the Research Unit of the Nursing School of Porto (Escola Superior de Enfermagem do Porto) The motivation behind this study was to understand the sensitivity of a representative group of nurses who use information and communication technologies, as well as the use of distance learning as a strategy for training professionals who will subsequently provide more quality in patient care.

The objective was to characterize the technological profile of the nurses at three Portuguese hospital centers. Gaining knowledge about the technological profile of nurses becomes important in planning and organizing the activities to be developed according to their expression. This knowledge will enable the development of teaching strategies in managing nursing care that contribute to the implementation of new technological resources for patients. Nurses have an important role in giving assistance to the population that uses health care. The use of the computers and

educational technologies by nurses can contribute to the effectiveness of care, monitoring, and providing orientation to patients in an innovative way, and also to using distance learning resources.

METHOD

This is a descriptive and qualitative study with a quantitative approach. The study was conducted in two hospitals in the northern region and one in the central region of Portugal, which were characterized respectively as hospitals A, B and C. The study followed the rules of conduct referred to in the Declaration of Helsinki and current national legislation for research involving human subjects. A letter of partnership was signed under the protocol between the Nursing School of Porto (Escola Superior de Enfermagem do Porto) and the hospitals referred to on June 15, 2012 under Official Letter No. 465 of Jun/26/2012 and No. 876 of Mar/06/2013.

The sample selection was performed randomly the survey was distributed to 30% of the nurses in each inpatient service area. The head nurses handed the questionnaires to the professionals who were on duty on the morning shift until the percentage was reached. An envelope was also provided for the nurses to put their questionnaires in, before or after being filled in, and the lead nurses gave them to the investigator.

The study included 960 nurses who are working in these institutions and who agreed to be part of the study by signing the written consent form.

Data collection took place in the year 2013. A questionnaire adapted from a technological and e-learning profile questionnaire⁽⁴⁾ was prepared, and consent for its use was obtained from the author. The questions related to the technological profile of the nurses and included variables related to age, gender, years of professional experience, academic training, position, and areas of specialization, followed by 11 closed questions related to the use of information technology and distance learning.

Data analysis was performed using descriptive statistical resources, namely measurements of central tendency and dispersion.

RESULTS

CHARACTERIZATION OF THE POPULATION

Of the 960 nurses who participated in the study, 278 (29%) were from hospital A, 458 (47.7) from hospital B, and 224 (23.3) from hospital C. As for gender 788 (82.1%) were female and 172 (17.9%) were male. The ages ranged between 24 and 60 years old, with most being 28 or 29 years old (184 - 19.2%). With regard to years of experience, 226 (23.6%) of the nurses had been working in the profession for 6 or 7 years.

Regarding post undergraduate specializations and positions, 620 (64.6%) of the nurses had no specialization, and the areas most represented were medical-surgical with 151 (15.7%) and community nursing with 84 (8.8%).

Regarding academic training, 782 (81.5%) of the participants were undergraduate, while the rest had other levels of training with the most, 112 (11.7%), having a post undergraduate degree.

CHARACTERIZATION OF THE USE OF EDUCATIONAL TECHNOLOGIES BY NURSES

Table 1 shows the distribution of these nurses in relation to the use of technological means.

Table 1 - Distribution of nurses in relation to the use of technological means. Porto, Portugal, 2013.

Technological Means	Frequency	Percentage
Computers	420	43.8
CDs/DVDs	96	10.0
Web	8	0.8
E-mail	6	0.6
Discussion groups	2	0.2
Videconferencing	1	0.1
All	379	39.5
Total	912	95.0
Did not answer	48	5.0
Total	960	100.0

Table 1 shows that most of the nurses (420 - 43.8%) used only computers, followed by 379 (39.5%) who reported using all the technological means provided to access information and do research.

Regarding the existence of prior knowledge of the use of these technological means for teaching, 545 (56.8%) nurses said they had such knowledge. However, most (196 -20.4%) singled out computers as being the best-known technological means.

As for the application of technological resources in teaching, of all the participants who said that they had used all the means, 174 (18.1%) used computers, 29 (3%) discussion groups, 19 (2.0%) the web, 15 (1.6%) videoconferencing, 15 (1.6%) other means, nine (0.9%) e-mail, and four (0.4%) chat.

Table 2 shows the distribution of nurses when asked if the technologies presented could be a means to supplement classroom training.

Table 2 shows that most nurses (451 - 47%) indicated that the various technologies can be used to supplement classroom training; among these, 112 (11.7%) considered the computer to be the technology most used for this purpose.

In response the question about whether they would like to receive training in these technologies, 477 (49.75%) nurses confirmed their interest in receiving training to increase their IT skills, while 171 (17.8%) said they would like to be trained in all the technologies mentioned: computers, CDs/DVDs, the web, email, chat, discussion groups, and videoconferencing. It should also be mentioned that 164 (17.1%) respondents did not answer this question.

Table 2 - Distribution of nurses related to technological means as tools in classroom training. Porto, Portugal, 2013.

Technological Means	Frequency	Percentage
Computers	112	11.7
CDs/DVD	17	1.8
Web	14	1.5
E-mail	8	0.8
Chat	6	0.6
Discussion groups	34	3.5
Videconferencing	85	8.9
Other	11	1.1
All	451	47.0
Total	742	77.3
Did not answer	222	23.1
Total	960	100.0

When asked whether they had internet at home, most (774 - 80.5%) said "Yes" and 54 (5.6%) did not answer. The type of connection most used by the nurses was a Wi-Fi access modem (265 - 27.6%), followed by 238 (24.8%) who used the local area network (LAN), 197 (20.5%) the company Netcabo, and 125 (13.0%) an asymmetric digital subscriber line (ADSL). Of the entire group, 36 (3.8%) use an integrated services digital network (ISDN), five (0.5%) did not know, and 58 (6.0%) did not answer.

Table 3 presents the distribution of nurses when asked about how they acquired their computer skills.

Table 3 - Distribution of nurses as to how they acquired information technology knowledge. Porto, Portugal, 2013.

Acquisition of computer knowledge	Frequency	Percentage
Self-learning	382	39.8
Specific course	342	35.6
Learning with friends	41	4.3
College course and learning with friends	171	17.8
Total	937	97.6
Did not answer	24	2.5
Total	960	100.0

Almost half of the nurses (382 - 39.8%) learned individually about how to use computer tools, and 342 (35.6%) had some kind of training.

The nurses were also asked if they were familiar with the concepts of distance/e-learning, and 706 (73.5%) responded negatively. Regarding their participation in any distance/e-learning initiatives, most 725 (75.5%) had never participated.

With regard to the interest of this group of nurses in participation in training activities using distance learning, 752 (78.3%) expressed an interest.

DISCUSSION

The characterization of the population regarding gender is similar to other studies⁽⁵⁻⁶⁾ that also identified most participating nurses as female. The predominance of females among nursing staff reflects the very organization of the profession, both nationally and internationally. The finding that most were 28 or 29 years of age and had 6 or 7 years of professional experience was in agreement with other studies⁽⁵⁻⁶⁾.

Regarding academic degrees, most of the group (782 - 81.5%) had an undergraduate degree^a and 112 (11.7%) had a post undergraduate degree. This agrees with the findings of another study⁽⁵⁾. An important point raised by the results of the present study of the relationship of nurses to the use of technology in nursing actions is that undergraduate nursing courses need to rethink their curricula so that they meet practical needs, especially with regard to the application of technology in nursing care⁽⁷⁾.

In a study of the main lines of research that have taken place in the last four years in the field of educational technology in Portugal, particularly in the field related to Web 2.0, the results revealed that the Web 2.0 tools most studied in the publications analyzed were social networks (such as Facebook and Hi5) and Google tools (such as Google Docs)⁽⁸⁾.

This was also analyzed in the present study, where the group of nurses was questioned about their use of computers, CDs/DVDs, the Web, e-mail, chat, discussion groups, and videoconferencing. Of all the nurses, 545 (56.8%) said they knew about and had already used these means for education.

In the field of health, particularly in nursing care, it is important to understand how nurses face the transformations that arise in their everyday practice of caregiving in light of embedded technologies and that this has implications for their attitudes and behavior. It is essential to know the impact of such changes on the provision of comprehensive, quality care to patient⁽⁹⁾.

When asked if the technologies presented could provide means to supplement classroom training, 451 nurses (47%) mentioned that computers, the CDs/DVDs, the Web, email, chat, discussion groups, and videoconferencing could be used for this purpose. In another study carried out with students for whom distance learning had been implemented, they answered that they preferred current methods of teaching over traditional methods, and many added that both methods should be used together for greater efficiency in teaching and learning⁽¹⁰⁾. In another study, a comparison was made between using only classroom teaching methodology and a mixture of classroom teaching. The researchers concluded that the mixed teaching methodology allowed students (health professionals) to acquire skills and competencies throughout the implementation period, balancing the differences as part of the learning process⁽¹¹⁾.

A study carried out with the nursing students⁽¹²⁾ yielded results similar to those obtained in the present study. Many of the nurses (477 - 49.7%) indicated that they felt it was necessary to acquire more knowledge, particularly in information technology and the use of computers, stressing that they would like to be trained in these technologies. Considering that 382 (39.8%) owed their computer skills to self-learning and the majority had the advantage of having internet connections at home, would make this training easier. Reinforced training of computer skills and their integration in the training of future nursing professionals are aspects that are essential for achieving better information management and use of information technologies in health institutions.

With respect to familiarity with distance learning, 706 nurses (73.5%) said they were not familiar with this area, and 725 (75.5%) had never participated in any initiatives of this type. Another study also found that some of the study participants showed lack of familiarity with these technologies⁽¹³⁾. The difficulties mentioned in another study with a group of nurses in a distance learning course were as follows: difficulty accessing the Internet, lack of knowledge in technology, lack of time, the simultaneous accumulation of teaching and assistance activities, and the need to reconcile work activities and personal life⁽¹⁰⁾.

Some studies have also shown that the technological resources of distance learning enhanced classroom education and that nowadays information and communication technologies are used in classroom education to support teaching and learning processes^(10,14). These studies have also revealed that participants were interested in participating in distance learning. Virtual learning environments are an essential tool for consolidation of distance learning, which operates on computer systems that have access to the Internet, with the purpose of supporting tasks carried out by information and communication technologies. This was also observed in the present study, in which 752 (78.3%) nurses expressed interest in participating in training activities with resources for distance education. In a study on the introduction of social media in the development of educational activities by enabling interaction between students and teachers outside of classrooms, it was concluded that social media, in the opinion of students and teachers, can be an ally in the development of pedagogical actions⁽¹⁵⁾.

Distance learning can be used as a device to promote health care networks. Studies that have reported on health care education experiences in courses supported by virtual learning environments have shown that, in addition to eliminating geographical barriers, pedagogical proposals with distance learning are not limited to transmitting knowledge, but also support students in learning to learn, and learning to do, in a flexible way, shaping their autonomy in relation to space, time, pace, and learning method. Furthermore, online discussions made possible with the use of distance learning, streamlining of different kinds of meetings, expansion of

^a The undergraduate degree in Nursing in Portugal also grants an undergraduate degree and has a total of 240 ECTS (European Credit Transfer and Accumulation System). It lasts for 4 academic years/8 semesters. It enables a person to develop professional activity in educational institutions, health centers, hospitals, health clinics, maternity facilities, nursing homes, kindergartens, and daycares.

study resources, and collective constructions that would not occur in classroom settings have allowed the development of knowledge, skills, and relationships that give new meaning to exercising professional roles⁽¹⁶⁻¹⁸⁾.

CONCLUSION

The characteristics of the nurses in this study are marked by the following components: female predominance, age of around 29 years old, most with 7 years of professional practice, but no completion of specialization courses. Of those with a specialization, the most representative was medical-surgical. Most of the nurses had already used computers and other technological means, including CDs/DVDs, the Web, e-mail, discussion groups, and videoconferencing, already had knowledge of the use of these media for teaching, and had already used them. Most of the nurses said that all the technologies mentioned can be a means to supplement classroom training. However, they pointed out that they would like most of all to be trained in the use of computers. Almost all of them had internet connections at home, and Wi-Fi access modems were the most common connection

type. There was a balance between those claiming that they owed their computer skills to self-learning and those who mentioned that they have taken training courses.

These results indicate that there is a need to invest in distance learning techniques to enable and promote self-learning by nurses. In addition, during their continuous education, nurses should receive, among other areas, knowledge that will make it possible for them use new information and communication technologies.

This data indicates that organizations should focus their attention on the training and education needs mentioned by this group of nurses, in order to introduce and implement technological resources in various organizational contexts and health institutions.

Faced with this new reality, it is important to formulate health and education policies as an essential means of promoting adequate understanding of, training in, and application of educational technologies in care management. The challenge is for nurses to be increasingly able to use information technology to improve the care process for patients and families and to implement innovative educational processes.

RESUMO

Objetivo: Identificar o perfil tecnológico de enfermeiros de hospitais portugueses. **Método:** Estudo exploratório quantitativo, realizado em dois hospitais da região norte e um da região central de Portugal. A amostra foi aleatória e contou com 960 enfermeiros. **Resultados:** Dos partícipes 420 (46,1%) utilizavam o computador, 196 (23,4%) referiram que têm conhecimento da utilização do computador para o ensino, 174 (21,1%) utilizaram o computador para ensino, 112 (15,1%) reconhecem que a utilização do computador pode ser um meio tecnológico para completar a formação presencial, 477 (61,6%) gostariam de receber formação sobre a utilização do computador e 382 (40,9%) referiram autoaprendizagem em informática. Em relação ao ensino a distância 706 (74,9%) relataram que não estão familiarizados e 752 (76,4%) referiram interesse em participar em formações nesta modalidade. **Conclusão:** As organizações devem estar atentas ao perfil tecnológico que se desenha neste grupo de enfermeiros e procurar formas de introduzir as tecnologias educacionais na gestão de cuidados.

DESCRITORES

Educação em Enfermagem; Tecnologia Educacional; Informática em Enfermagem.

RESUMEN

Objetivo: Identificar el perfil tecnológico de los enfermeros en los hospitales portugueses. **Método:** Un estudio exploratorio cuantitativo realizado en dos hospitales en la región norte y la región central de Portugal. La muestra se seleccionó de forma aleatoria e incluyó 960 enfermeros. **Resultados:** De los 420 participantes (46,1%) utilizan el computadora, 196 (23,4%) reportaron haber tenido conocimiento del uso de la computadora para la enseñanza, 174 (21,1%) utiliza la computadora para la enseñanza, 112 (15,1%) reconoce que el uso de la tecnología informática puede ser un medio para complementar la formación presencial, 477 (61,6%) les gustaría recibir capacitación en el uso de la computadora y 382 (40,9%) informaron de auto-aprendizaje en la computación. En relación con la educación a distancia 706 (74,9%) reportaron no están familiarizados y 752 (76,4%) indicaron su interés en participar en esta modalidad de formación. **Conclusión:** Las organizaciones deben tener en cuenta el perfil tecnológico que señala este grupo de enfermeras y buscar maneras de introducir tecnologías de la educación en gestión de la atención.

DESCRIPTORES

Educación en Enfermería; Tecnología Educacional; Informática Aplicada a la Enfermería.

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