

Profile, competencies and digital fluency of nurses in the Professional Improvement Program

PERFIL, COMPETÊNCIAS E FLUÊNCIA DIGITAL DOS ENFERMEIROS DO PROGRAMA DE APRIMORAMENTO PROFISSIONAL

PERFIL, COMPETENCIAS Y DOMINIO DIGITAL DE LOS ENFERMEROS DEL PROGRAMA DE PERFECCIONAMIENTO PROFESIONAL

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ABSTRACT

A descriptive exploratory study conducted in the city of São Paulo, which aimed to identify the profile, competencies and digital fluency of nurses in the Professional Improvement Program in handling technology at work. The population, composed by 60 nurses in the program, answered a questionnaire with data about profile, digital fluency and professional competencies. The participants were found to be: 95.0% female, 61.7% between 23 and 25 years old, 75.0% from public schools, 58.3% enrolled in cardiovascular nursing, 98.3% had contact with computing resources during graduation, 100.0% had a computer at home, 86.7% accessed the internet daily, 96.7% used Messenger and 58.3% had an intermediate level of knowledge and skill in computing. Professional competencies required for technology management referred to knowing how to be innovative, creative, and updated to identify and manage software and to use technological resources.

DESCRIPTORS

Education, nursing
Education, nursing, continuing
Professional competence
Technology
Nursing informatics

RESUMO

Estudo descritivo, exploratório, realizado na cidade de São Paulo, que objetivou identificar o perfil, as competências e a fluência digital do enfermeiro aprimorando para uso da tecnologia no trabalho. A população composta por 60 aprimorandos do Programa de Aprimoramento Profissional respondeu um questionário com dados sobre o perfil, a fluência digital e as competências profissionais. Verificou-se que 95,0% dos participantes eram do sexo feminino, 61,7% na faixa etária entre 23 a 25 anos, 75,0% graduados em escolas públicas, 58,3% cursando enfermagem cardiovascular, 98,3% teve contato com recursos computacionais na graduação; 100,0% possuía computador em casa; 86,7% acessava a *internet* diariamente; 96,7% utilizava o Messenger e 58,3% apresentava grau intermediário de conhecimento e habilidade em informática. As competências profissionais requeridas frente à tecnologia referiram-se ao saber ser inovador, criativo, atualizado para conhecer e gerenciar programas e saber utilizar os recursos tecnológicos.

DESCRIPTORIOS

Educação em enfermagem
Educação continuada em enfermagem
Competência profissional
Tecnologia
Informática em enfermagem

RESUMEN

Este estudio descriptivo, exploratorio realizado en Sao Paulo, tuvo como objetivo identificar el perfil, las competencias y el dominio digital del enfermero para el uso de la tecnología en el trabajo. La población fue compuesta por 60 profesionales del Programa de Perfeccionamiento Profesional que respondió a un cuestionario con datos sobre el perfil, el dominio digital y las competencias profesionales. El resultado demostró que 95% de los participantes eran del sexo femenino, 61,7% tenían entre 23 y 25 años, 75% provenían de escuelas públicas, 58,3% estudiaron enfermería cardiovascular; 98,3% tuvo contacto con recursos informáticos en el pregrado; 100% tenía una computadora en casa; 86,7% accedía a *internet* diariamente; 96,7% utiliza el MSN y 58,3% tenía un nivel intermedio de conocimiento y habilidad en informática. Las competencias profesionales requeridas ante la tecnología se referían al hecho de saber ser innovador, creativo, actualizado, para conocer y gestionar programas, y saber utilizar los recursos tecnológicos.

DESCRIPTORIOS

Educación en enfermería
Educación continua en enfermería
Competencia profesional
Tecnología
Informática aplicada a la enfermería

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INTRODUCTION

In the last decades, the transition from the industrial economy to an information economy has brought changes both in culture and in the way of life of society. Information and technology have become the driving forces of these changes⁽¹⁾ and intellectual capital has become relatively more important than physical capital, thereby bringing about implications in the political, economic, educational, social and technological contexts⁽²⁾.

Nowadays, it is hard to mention a profession that can dispense with technology. In healthcare, technological advances generate direct impacts on organizations and professions in the sector⁽³⁾. Because nursing is a profession composed of a specific body of knowledge and whose highest representativeness lies in healthcare, it cannot avoid the impacts generated in this new society⁽¹⁾.

Given the great advance of information and communication technologies, informatics has become an essential tool for the development of nursing⁽¹⁾. Its use boosts rapid access to information and knowledge expanded worldwide, trespassing even geographical distances in order to facilitate the development of various activities⁽⁴⁾. Technology, through computational resources, supports nurses in professional practice in different areas: education, care, research and management⁽⁵⁾.

Considering the relevance of this context, and reflecting on the impact of technology not only in nursing practice but also in everyday life and in the current social scenario, there is the need to identify digital fluency and competencies in the face of technologies of nurses in an improvement program, who are part of a generation that grew up with technology and supposedly uses it more easily and with higher skills.

The Improvement Program (PIP) of the Ministry of Health of the State of São Paulo is a scholarship program for several health-related professional categories, except for medicine. It aims to empower the participant to act in a qualified and differentiated way, promoting improvement of professional performance through the opportunity to access new theoretical knowledge and through emphasis on specific practices, as well as by stimulating the development of a critical and comprehensive view of the Unified Health System (UHS), directing his actions to improve the health conditions of the users. It also seeks to improve the training process of the participants, considering UHS guidelines and principles, in order to develop a comprehensive and integrated understanding of the different activities and work processes at the institution participating in the program⁽⁶⁾.

Because most of the participants are newly graduated nurses, it is known that they have just had access to

computational resources during graduation, since new technologies had been applied in nursing education. In accordance with the National Curricular Guidelines for Undergraduate Nursing Courses, nurses should be skilled in communication and information technologies, that is, it is imperative that every nursing professional has informatics and technology skills at work. Therefore, it is not only about mastering the operational use of technology, but also about developing competencies to apply them in professional practice⁽⁷⁾.

This study aimed to characterize the profile, digital fluency and professional competencies of nurses in the Professional Improvement Program of the city of São Paulo required to handle technology applied to nursing.

METHOD

This is a descriptive exploratory study conducted with nurses belonging to the Nursing Professional Improvement Program in the city of São Paulo, SP, Brazil in 2009/2010. From the five institutions affiliated with the program, there were 71 nurses; the sample consisted of 60 nurses from three of the institutions.

The research project was submitted to the Ethics Committee in Research of the *Instituto Dante Pazzanese de Cardiologia* and was approved under Protocol number 3834/2009 for the preservation of ethical issues related to research involving humans⁽⁸⁾.

The inclusion criterion was: nurses regularly enrolled in the Professional Improvement Program (PIP) in 2009/2010. The exclusion criterion was: professionals enrolled in the program from areas other than nursing.

Data collection was conducted between October/2009 and March/2010, using a questionnaire consisting of open and closed-ended questions, divided into three parts: the first contained the characterization of the subject profile; the second had the identification of digital fluency of the nurse through Piconez's structured instrument⁽⁹⁾; and the third had an open-ended question identifying the competencies required by the nurse to deal with technology applied to nursing work processes.

Data were grouped and related according to the study objectives, analyzed in absolute rates and percentages, and presented in tables. Answers to the open-ended question were categorized for further qualitative analysis.

For the analysis of professional competencies of nurses regarding digital fluency, Manfredi's⁽¹⁰⁾ and Antunes⁽¹¹⁾ frameworks were used, which consider that all knowledge about technology must have a practical application to qualify work or to transform nature through work.

Given the great advance of information and communication technologies, informatics has become an essential tool for the development of nursing.

RESULTS

In the characterization of the demographic profile, 57 out of 60 nurses (95%) were female. The white color prevailed (50; 83.3%) and 55 (91.7%) were single. Ages ranged from 20 to 28 years old, with a mean of 23.4 years of age.

Regarding the distribution of nurses based on undergraduate institution and region of origin, it was found that 53 (88.3%) were from the southeast, and graduated from public (39; 65%) and private (14; 23.3%) institutions. Three (5%) were from the south, two (3.3%) from the northeast and two (3.3%) from the midwest, none were from the north; these nurses could return to their regions, bringing with them and implementing new actions in their places of origin. Regarding professional improvement courses, most subjects studied nursing in cardiology (35; 58.3%), as shown in Figure 1.

Regarding digital fluency, 59 (98.3%) reported that they had contact with computing resources during undergraduate courses, all (60; 100%) had a computer at home, 50 (83.3%) had already bought a computer, 52 (86.7%)

reported accessing the Internet daily, and 49 (81.7%) did so in their own homes. Fifty-eight (96.7%) cited MSN Messenger (The Microsoft Network)[®] as the most used virtual environment. When asked about the level of knowledge and skill in informatics, 35 (58.3%) nurses rated it as intermediate, 19 (31.7%) as basic, and six (10%) as advanced.

Among the 24 questions for self-assessment of knowledge and technical skill when handling computers, four questions generated 100% positive responses. On average, 51.7 (86.2%) of the participants responded *knowing or being able to* develop such activities. Table 1 presents the responses that stood out, both negatively and positively. The question of *knowing what a plug in is and how to install it* was the one that caused the largest number of negative responses (36-60%).

Multiple choice questions were also asked related to informatics knowledge, for which only one alternative was correct, such as *Which software must be installed on the computer in order to open files with the .pdf extension?* Out of the four questions, only one had a proportion of correct answers exceeding 50% (Table 2).

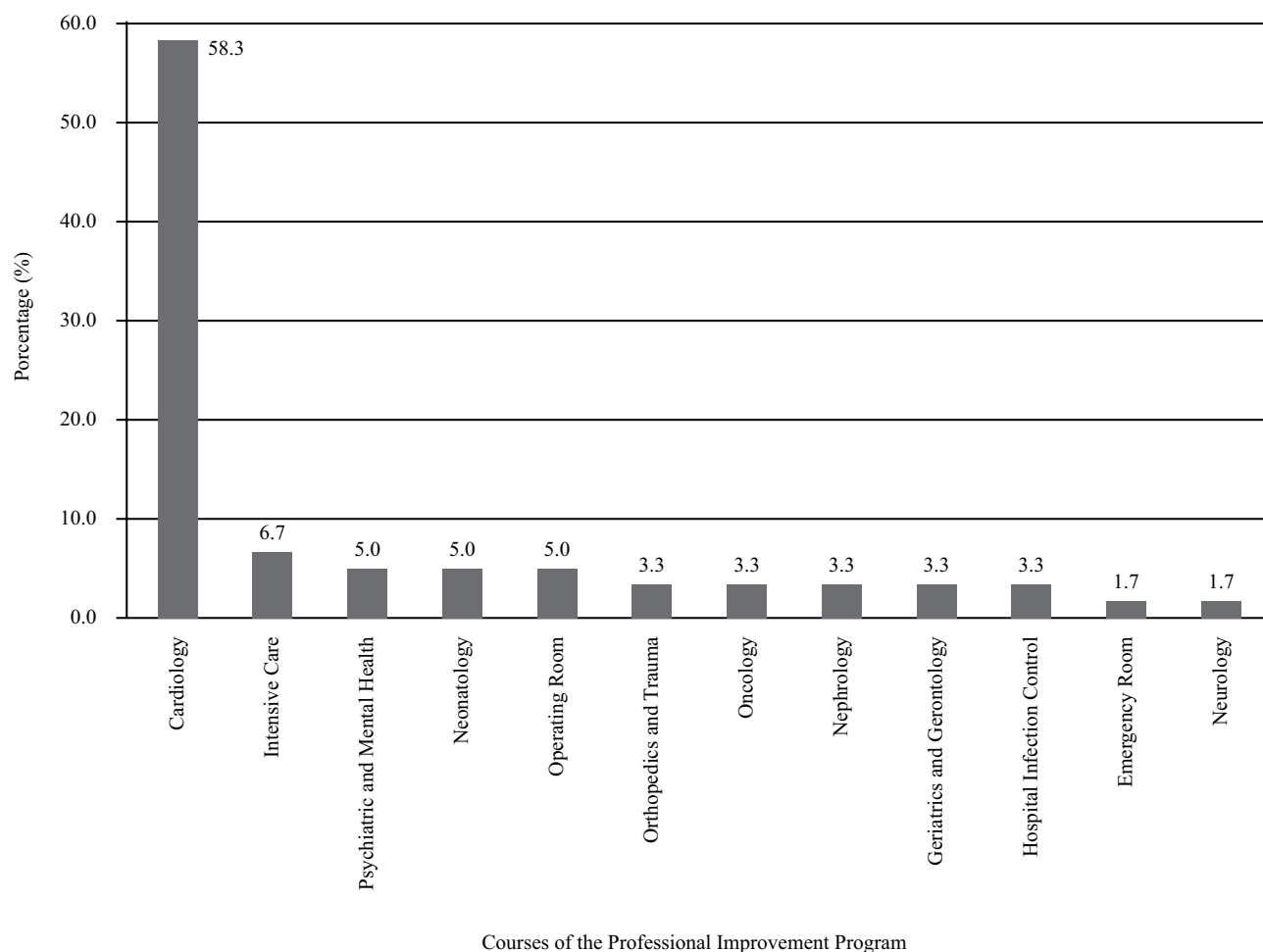


Figure 1 – Percentage distribution of nurses according to the courses of the Professional Improvement Program – São Paulo, SP, Brazil, 2010

Table 1 – Self-assessment of knowledge and technical skill in informatics of nurses studied - São Paulo, SP, Brazil, 2010

Knowledge and technical skill in informatics	Yes		No	
	N	%	N	%
Am I able to create a folder or document file on my desktop?	60	100	0	0
Am I able to copy or move files to a folder?	60	100	0	0
Do I know how to reconfigure my computer's clock?	60	100	0	0
Am I able to send, exclude, reply and print emails	60	100	0	0
Am I able to unzip a zipped file?	45	75	15	25
Do I know how to sign up to and cancel online discussion?	42	70	18	30
Do I know how to participate in online discussion groups (netiquette)?	38	63.3	22	36.7
Do I know what a <i>plug in</i> is and how to install it?	24	40	36	60

Table 2 – Assessment of nurses' knowledge in informatics - São Paulo, SP, Brazil, 2010

Knowledge in informatics	Correct alternative		Incorrect alternative		Did not answer	
	N	%	N	%	N	%
Which software must be installed in order to open.pdf files?	58	96.7	2	3.3	0	0
What is the name of the set of rules to live together in cyberspace?	26	43.3	29	48.3	5	8.3
What is the name of the file with the most frequently asked questions and answers about some topic?	23	38.3	31	51.7	6	10
Which address is the one that allows access to the web page?	9	15	50	83.3	1	1.7

Regarding the use of technology in nursing, 59 (98.3%) participants reported its use in the profession as possible. The area of use most recalled area was research (57-95%), followed by education (55-91.7%), management (53-88.3%) and assistance (49-81.7%).

In order to analyze the answer about nurses' professional competencies regarding the applicability of technology in nursing work processes, the competencies of *learning to know*, were used, that is, acquiring competencies in understanding, mastering the knowledge instruments themselves, developing skills to construct knowledge, exercising thoughts, attention and memory, selecting information that can be effectively contextualized in the reality and being able to express themselves through different languages⁽¹¹⁾.

Knowing how to be included personality and character traits that dictate behaviors in social work relationships (productivity, initiative, communication, openness to innovation and changes, learning new values of quality, competitiveness), and *knowing how to do* underlines the requirement of intervention or decision in situations (knowing how to work in a team, being able to solve problems and performing new diversified work)⁽¹⁰⁾.

Out of the 134 (100.0%) classified answers, the competence of *learning how to know* was mentioned in 68 (50.7%), *knowing how to do* in 41 (30.6%) and *knowing how to be* in 25 (18.7%). In the dimension of *learning how to know* (68-50.7%), the following were cited: knowing and managing software (23-33.8%), having basic informatics knowledge

and resources (18-26.5%), updating oneself, empowering oneself (13-19.1%), and knowing concepts and features of computing and technology (10-14.7%), as well as the importance of knowledge of the English language (3-4.4%) and of the information systems, particularly the aspects of safe and ethical use of technology (1-1.5%).

The dimension of *knowing how to do*, from a technical nature, pointed to the need of knowing how to use tools (20-48.8%), facilitating work (5-12.2%), agility (4-9.7%), searching for information (4-9.7%) and training (3-7.4%), among other answers (5-12.2%).

And finally, in the dimension of *knowing how to be*, there were 25 (40%) responses, especially being interested, curious, innovative, attentive to novelty, totaling ten (40%) responses. The importance of the professional being intelligent and having logical reasoning was also cited in five (20%) responses; being open, ready to accept changes and innovations in five (20%). In three (12%), the need for prior experience was mentioned. Communication (1; 4%) and interactive (1; 4%) skills, closely related to technology, were each cited in a response.

DISCUSSION

Regarding characterization by sex, 57 (95%) nurses were female, confirming the predominance of females in the Professional Improvement Program and the nursing profession as a whole. Age ranged from 20 to 28 years old, a mean of 23.4 years old. The population of the state capital

was composed of young adults, a result consistent with the profile of nurses throughout the state of São Paulo⁽⁶⁾. Moreover, this was the age group expected, since all had just graduated (60; 100%) and most came from public institutions (45; 75%). Some studies show that the age profile of students in public universities is due to the fact that young people enter the university right after the end of secondary school, which differs from the age profile of the graduates of private schools, where most students are workers⁽¹²⁾.

Among courses taken, it was found that the demand for improvement in tertiary care within the hospital remains predominant, specifically in cardiology (35 to 58.3%), intensive care (4 to 6.7%), among others, suggesting a higher shortage of skilled professionals in sectors in that level of attention.

Another factor to consider is that, despite coming from public institutions, many nurses mentioned lack of practical experience that enabled security in practice, which the improvement course develops, because it is exactly a form of in-service teaching, which promotes improvement of professional performance through the opportunity to access new knowledge and theoretical emphasis on specific practices⁽⁶⁾.

Regarding digital fluency, 59 (98.3%) had contact with computing resources during graduation. The discipline of nursing informatics was introduced into the curriculum of nursing courses in the early 1990s, but today the literature shows that nursing students already have basic informatics knowledge when they enter the university. It was also found that all (60; 100%) had a computer at home, a rate higher than the one found in a study with graduate students (82.9%)⁽¹³⁾.

In the 1990s, access to the international network of computers led to a change of habits regarding the use of computers, especially in the household⁽¹⁴⁾. Indeed, in this study, 52 (86.7%) nurses accessed the internet daily, and the primary place of access was in the home itself (49; 81.7%). However, the fact of having easy access does not necessarily mean that nurses are digitally included⁽¹³⁾; they also need to know how to create significant *things* with the technological tools, and not just know how to handle them⁽¹⁵⁾.

When asked about their level of knowledge and skill in informatics, there was a predominance of intermediate (35; 58.3%), followed by basic (19; 31.7%) and advanced (6; 10%) levels, which diverged from another study that reported a higher rate at the basic level (59; 48%), followed by intermediate (55; 44.7%) and advanced (9; 7.3%)⁽¹³⁾. Perhaps this is explained by the fact that nurses, when starting an improvement program, aspire for personal and professional changes, bring expectations of their professional qualification, acquire specific knowledge that enables them to develop activities relevant to their level of technical and scientific knowledge, and to meet the demands of the labor market⁽¹⁶⁾.

The current job market is very competitive and requires more experience and professional training. The PIP presents another strategy for professional training, qualifying them

for the practice within the health service⁽¹⁷⁾. Autonomy, initiative, problem-solving ability, creativity, mastery of informatics and other languages are basic features and requirements for those who long to enter the labor market⁽¹⁸⁾. Additionally, the institutions have been requiring a professional profile in constant development, to keep up with technological innovations that emerge at an increasingly accelerated pace⁽¹⁹⁾, which may have contributed to this difference in levels of informatics knowledge among nurses of the improvement program and nursing students.

Among the questions related to this theme, all nurses (60; 100%) reported being able to create a folder or file on the desktop, copy or move files to a folder, reset the computer clock and send, delete, reply and print e-mails. The question about knowing what a *plug-in* is and how to install it was the one that generated the most negative responses (36; 60%). These findings demonstrate that nurses of the improvement program have knowledge and ability to handle the computer.

The great challenge is to understand the use of informatics resources in nursing practice and to develop technological competencies to interact more easily with other professionals, using resources more appropriate to each situation, including their strengths and limitations⁽¹⁸⁾.

As for virtual environments, it was found that most nurses in the improvement program (58; 96.7%) used MSN Messenger (The Microsoft Network)[®] for instant messaging, which does not mean that they used it for professional practice. Another study⁽¹³⁾ reported that the most used internet resource during graduation was e-mail (95.9%) and this finding was higher in comparison to the present study (52; 86.7%). Importantly, in the latter, its application is associated with education.

Regarding the competencies, out of the total 134 responses, the competence of *learning how to know* was mentioned in 68 (50.7%), *knowing how to do* in 41 (30.6%) and *knowing how to be* in 25 (18.7%). As for *learning how to know*, it should be noted that knowing the technological resources was cited for the purpose of assisting in research, searching websites, databases, etc. In healthcare practice, the use of electronic records aims to improve patient care and, in education, facilitates the use of technological resources to educate in service.

The dimension of *knowing how to do*, technical in nature, pointed to the need for dominating the use of the tool to facilitate the work, optimize time and increase productivity, which are determining factors in the capitalist world of work.

In the dimension of *knowing how to be*, the personal requirements of being interested, curious, innovative, attentive to novelty, open, ready to accept change, and to face innovations were also often cited.

That denotes that these young nurses have had contact in the use and mastery of technological resources and, although 59 (98.3%) stated that they could use technology in the profession, the areas most remembered were research (57; 95%) and education (55; 91.7%); management (53; 88.3%) and care (49; 81.7%) had lower rates. This may be explained by the fact that the computer has a direct connection with the fields of research and education, as its use helps with performing queries in libraries and virtual databases, writing of the research, to the preparation of a class.

It is known that access to computing resources during graduation is recent, and new technologies have been introduced in nursing education. According to the National Curricular Guidelines for Undergraduate Nursing Courses, nurses should be skilled in communication and information technologies, that is, it is imperative that every nursing professional has informatics and technology skills at work⁽⁷⁾.

Finally, some resources are being implemented in nursing care and still require large investments, such as the electronic record. It is also important to note that, because they are recently graduated, the nurses of the improvement program may not have practical experience in management and 40 (66.7%) confirmed having never taken a distance

course, indicating that they are not using all of the technological resources available.

CONCLUSION

This study shows that nurses of the improvement program have already incorporated some technologies in their daily lives, however, they still do not have enough knowledge in technology to successfully achieve the expected results in the application of their work in nursing practice.

The competencies needed still refer to *knowing how to learn* continuously, considering that technological advances are a reality in the current market, followed by *knowing how to do*, that is, an act using technological tools that facilitates work and optimization of time and resources. Finally, *knowing how to be*, incorporating different modalities of interactivity through the use of technologies, is needed.

The study also showed that the newly graduated nurses today have digital fluency, requiring new educational, supervision and improvement of knowledge and skills in order to develop work processes permeated by technology, from their preceptors in the Professional Improvement Programs or from the staff nurses.

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