



THE USE OF INFORMATION TECHNOLOGY AND COMMUNICATION AMONG TEACHERS IN THE LIGHT OF GROUNDED THEORY

USO DA TECNOLOGIA DA INFORMAÇÃO E COMUNICAÇÃO ENTRE DOCENTES À LUZ DA TEORIA FUNDAMENTADA NOS DADOS

EL USO DE TECNOLOGÍAS DE LA INFORMACIÓN Y COMUNICACIÓN ENTRE MAESTROS A LA LUZ DE LA TEORÍA FUNDAMENTADA

Kamila Nethielly Souza Leite¹, Sérgio Ribeiro dos Santos², Smalyanna Sgren da Costa Andrade³, Ana Aline Lacet Zaccara⁴, Karen Krystine Gonçalves de Brito⁵, Sheila da Costa Rodrigues Silva⁶

ABSTRACT

Objectives: analyzing the speeches of teachers about the use of information technologies and communication as a resource of the teaching-learning process of Grounded Theory and draw up a representative model from conceptual map. **Method:** an exploratory study of a qualitative approach developed with teachers of a federal university in João Pessoa/PB. The speeches were analyzed according to the Grounded Theory and the concept map was drawn with the help of the program Cmap Tolls version 5.6. **Results:** the speeches generated categories of causal conditions, inherent, intervenients and consequences related to Information and Communication Technologies (ICT) in teaching-learning process in nursing. **Conclusion:** combine nursing education to the virtual environment innovates, while streamlines the way of teaching. **Descriptors:** Teachers; Educational Technology; Nursing Education; Internet.

RESUMO

Objetivos: analisar os discursos dos docentes sobre a utilização das tecnologias da informação e comunicação enquanto recurso do processo de ensino-aprendizagem à luz da Teoria Fundamentada nos Dados e elaborar um modelo representativo a partir de mapa conceitual. **Método:** estudo exploratório com abordagem qualitativa desenvolvido com docentes de uma instituição federal de ensino superior de João Pessoa/PB. Os discursos foram analisados à luz da Teoria Fundamentada nos Dados e o mapa conceitual foi elaborado com auxílio do Programa Cmap Tolls versão 5.06. **Resultados:** os discursos geraram categorias sobre as condições causais, inerentes, intervenientes e conseqüências relacionadas às Tecnologias da Informação e Comunicação (TIC) no processo de ensino-aprendizagem em Enfermagem. **Conclusão:** aliar a formação em enfermagem ao ambiente virtual inova e ao mesmo tempo dinamiza a forma de ensinar. **Descritores:** Docentes; Tecnologia Educacional; Educação em Enfermagem; Internet.

RESUMEN

Objetivos: analizar los discursos de los profesores en el uso de tecnologías de la información y la comunicación como recurso del proceso de enseñanza-aprendizaje a la luz de la Teoría Fundamentada y la elaboración de un modelo representativo de un mapa conceptual. **Método:** un estudio exploratorio con enfoque cualitativo desarrollado con los profesores de una universidad federal en João Pessoa/PB. Los discursos fueron analizados según la Teoría Fundamentada y el mapa conceptual se elaboró con la ayuda del programa Cmap Peajes versión 5.6. **Resultados:** los discursos han generado categorías de condiciones causales, inherentes, intervenientes y consecuencias relacionadas con las Tecnologías de Información y la Comunicación (TIC) y en el proceso de enseñanza-aprendizaje en enfermería. **Conclusión:** combinar la educación de enfermería para el entorno virtual innova, mientras agiliza la forma de enseñar. **Descriptor:** Los Maestros; Tecnología Educativa; Enfermería Educación; Internet.

¹Nurse, Master Teacher of Nursing, Integrated Colleges of Patos/FIP. Patos (PB), Brazil. Email: ka_mila.n@hotmail.com; ²Nurse, Professor, Graduate Course/Graduate Nursing Program, Federal University of Paraíba/ PPGENF/UFPB. João Pessoa (PB), Brazil. Email: srsantos207@gmail.com; ³Nurse, Doctoral Student, Graduate Nursing Program, Federal University of Paraíba/PPGENF/UFPB. João Pessoa (PB), Brazil. Email: nana_sgren@hotmail.com; ⁴Nurse, Doctoral Student, Graduate Nursing Program, Federal University of Paraíba/PPGENF/UFPB. João Pessoa (PB), Brazil. Email: anazaccara@hotmail.com; ⁵Nurse, Doctoral Student, Graduate Nursing Program, Federal University of Paraíba/PPGENF/UFPB. João Pessoa, Brazil. Email: karen.krystine@hotmail.com; ⁶Nurse, Master Teacher of Public Health, Integrated Colleges of Patos/FIP. Patos (PB), Brazil. Email: sheilarodrigo@hotmail.com

INTRODUCTION

Advances in science and technology imply profound changes in higher education. One is the adoption of avassalante way of information and communication technologies (ICT), both by society, as well as in academia, becoming thus subject, processes and products.¹ This allows you to experience the digital era from the a new social phenomenon that is the speed of technological change in different contexts, including educational environment.

The use of ICT allows teachers to explore the different learning styles of students. With so many features at their fingertips, the teacher can use from them to customize their classes in order to provide students with the exercise of their autonomy, while write or discuss in the forums, where participate in chats and when they work in groups or individually.²

Yet there is little information of use in nursing education. This is often due to ignorance or lack of preparation of teachers, which is comparable to the behavior of staff from other areas of knowledge or lack of availability or access to cyber resources.

Nursing study in using Grounded Theory (DFT) sensations described as discomfort and insecurity in the use of digital technologies, due to the limited approach of individuals with these resources during the training process. This coupled with exorbitant amount of elements present in the computer network, can sometimes cause concern about the handling tool and the accuracy and reliability of the information on the network.³

Other research found that the content of the curriculum and the development of computer skills in nursing have been discussed in scientific literature. Although the importance of these skills has been recognized worldwide, it is not yet widely incorporated in undergraduate curricula in nursing or graduate studies in different countries.⁴

Thus, the problem that motivated this study sought to answer the question: Information and communication technologies are used as a resource to strengthen the teaching and learning nursing program? From this question, there was motivation to investigate the relevance of the use of network resources of computers

by nursing teachers in higher education institution in order to be a current theme with few approaches in this field of knowledge.

It is proposed to reflect on the need to develop educational policies that strengthen training and meets the demands of healthcare organizations that need qualified professionals and connected to the network information. Given this reality, emerges the need to know the vision of teachers in relation to ICT as a teaching resource, aiming to analyze the speeches of teachers on the use of information technologies and communication as a resource in the teaching-learning process to the Theory based on the data and draw up a representative model from the conceptual map.

METHOD

Study from the dissertation << **The use of information and communication technologies by nursing teachers and difficulties in the teaching-learning process** >>, presented at the Federal University of Paraíba, 2014.

This is an exploratory study of a qualitative approach developed with Nursing Course faculty of the Federal University of João Pessoa/PB. Inclusion criteria were: effective teachers who worked at the institution for at least one year agreement and willingness to participate.

The number of teachers has not been established initially, since the method of approach of Grounded Theory (DFT) or Grounded Theory does not adopt a statistical sampling. Thus, the amount of this subject reference is determined by the theoretical saturation, as the data are being collected, they were concurrently subjected to analysis.

The data saturation criterion allows convergences and divergences of the information collected leading to repetition of the content of the speeches, satisfying the researcher.⁵ Sampling was achieved after the completion of the 12th interview. We used a semi-structured interview technique with three guiding questions: *What are the ICT that you use as a resource to strengthen the teaching-learning process? What difficulties do you face in the use of ICT in the institution?*

The analysis occurred through constant comparative process that according to the

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theory, we seek information from an emerging concept. The collection and analysis of data took place between February and May 2013, simultaneously resulting in saturation, that is, at which the researcher can not formulate new categories.

The steps were: *open coding, axial coding and selective coding*. The analysis process consists in conceptualizing collected data. These data initially constitute preliminary codes, passing the conceptual codes and then the categories and the categories can converge into phenomena;³ therefore, there was collection and coding of data, theoretical sampling, preparation of memorandums and formulation of core categories .

The speeches were expressed by the letter P (Party) and sequential numbering order of the interview for easy identification of discursive passages and preserve the identity of the subjects (P1, P2, P3 ...). To develop this concept map used the free program Cmap Tolls version 5.6.

The study was approved by the Research Ethics Committee of the Health Sciences Center, under CAAE: 11625313.5.0000.5188. Participants were informed about the purpose of the study by signing the Informed Consent, as established by Resolution 466/2012 of the National Health Council - NHC, which regulates research involving human subjects. It was emphasized the guarantee of confidentiality, voluntary participation, no harm by not participating in the study or time of withdrawal. The survey did not offer predictable health risks.⁶

RESULTS AND DISCUSSION

The speeches generated the categories below. At the end of classes, a representative model was formulated to better understand the findings.

◆ Causal conditions

◆ Resistance to the use of new technologies

Below are some teachers of faults fragments about the resistance in using ICT in teaching and learning:

[...] Moodle, the university releases the platform for us to work, but who are professors trained to work with the platform? (P.1).

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[...] Of course we realize, especially teachers who are no longer at the university a very high strength and a little afraid, because many times the student ends up providing information that did not have access yet, then the faculty young people have to deal with various technologies, they discover before us, bringing information and we will you seek to deepen (P.5).

[...] I believe that the professor who may have 10 or 15 years of teaching activity, he is not a professor turned to technology area (P.12).

Some teachers suggest some resistance to using ICT resources more intensely in the educational process due to lack of preparation and training or even think that virtual education should not be applied in health care since the care moves through the human contact. Use the internet allows clarification of certain procedures, medicines, among other facilities, contributing to the student in training and consequent improvement of care.

Another point is the little investment in periodic training of teachers to enjoy the benefits that the use of technologies such as Moodle, with a specific timetable in the disciplines, can help most critical learning and less bank of nursing students, ie Student becomes more active in the pursuit of knowledge and the teacher's role is modified to mentor that assists the construction of knowledge of modifying the classic setting of the lecture.

The internet facilitates access to information, which is seen as an advantage by teachers of a study in a public university in southern Brazil. But this ease of access brings with it some risks such as lack of security in data transmission and the difficulty to select the contents to be worked with students.⁷

The quantity and diversity of information society in the twenty-first century makes the teacher feel a little unsafe and must admit that they do not have absolute answers to all questions, not able to have access to all information that is on the internet. Faced with this question, it is important that teachers are prepared for the questioning, helping students develop a critical awareness through the exchange of knowledge between student and teacher.⁸

◆ Structural mishaps to the insertion and maintenance of the use of technologies

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Following speeches about the difficulties imposed by the use of ICT in the educational process:

[...] First the internet here always falls, yesterday lacked energy three times here in the morning when I was accessing missed. The physical structure of the university is very failure (P.2).

[...] The maintenance of optical cabling university needs to be reviewed and maintained more often. [...] A strengthening of the communication technology sector (TECOM) through the retrofitting of the physical structures and a resizing of TECOM own structure in order to allow greater access, better support the educational activities by professors (P.3).

[...] The use of the network at the university is very slow and falls a lot in the department and still has the environment with few computer labs (P.5).

[...] At the university we are working falls energy, this building here is very susceptible to this, the connection is low, and the use of some programs and systems it does not run or is very slow hindering the use of this technology (P.7).

[...] A shortage of material resources and, above all, human resources, we have only three people that support all Health Sciences Center, so that it is not enough to account for the existing demand (P.11).

The teachers reported that other difficulties in using ICT in the university are related to the physical structure, problems connecting to the Internet and the lack of it in classrooms. The structural problems and maintenance on the network could be solved from investments in this area, but it is necessary to have commitment of the institution to deliver improvements to education. It is not only the teacher who must fulfill his role as an educator, but it takes good physical structure and material resources for effective teaching or success.

The university has little technology in the nursing area for teaching practice. The facilities of electronic equipment that must support the network computers do not have good condition and the sector responsible for the maintenance has few employees, making it difficult to periodic review. This leads to flaws in the internet connection and even problems with electrical power, ie the university infrastructure needs to be modified and improved.

Structural problems bring consequences to the nursing faculty, wearing them in their workplace, because the use of computers is almost essential. Connection failures and

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power cause insecurity to use the equipment, affecting the preparation or ongoing classes, as well as the maintenance of scientific research.

Comparative survey of private university professor of the south side of São Paulo showed that they have a positive attitude to the use of ICT in academic activities, but 63% of them stated that the institution should invest in infrastructure for effective appropriation of teaching resources.⁸

The nursing faculty to assimilate the use of ICT in some academic activities, have easy access to many features of ICT and familiarity in computer use, but there are still unknown types of education or low-dispersive among them.⁸ In addition, the lack of engagement of universities in the technologies that might be complementing, assisting, facilitating and benefiting the quality education that is proposed by all educational institutions. They should therefore be revised education policy to invest the resources of ICT in teaching and learning.⁸

These results reaffirm how Higher Education Institutions (HEIs) from Brazil are still far from effective execution of the tools of ICT in relation to the world that makes daily use of more advanced form of that experienced in the teaching of nursing education practice in the national context. Provide basic resources like internet access and the Moodle platform for teachers and material resources as notebook and data show it is not enough to point the university concerned as institutional quality model.

◆ Inherent conditions

◆ Low ability in the management of new technologies

Below professor's testimonials fragments concerning the recognition of the lack of preparation to use the virtual learning environment (Moodle):

[...] I believe that the university; we have problems because professors have not been prepared to use these technologies (P.4).

[...] I think it's a task of coordination of undergraduate and graduate students and department heads sensitization of teachers for us to expand the use of this Moodle feature (P.7).

[...] A resistance due to ignorance of the potential of this tool, I think we used inappropriately by not being trained. [...] Directed questions the lack of knowledge of the system (Moodle), lack of training,

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training to use the system as a potential (P.8).

Teachers reaffirm the lack of preparation to use the Moodle tool, demonstrating the need to learn. As has been said in the course of this study it is necessary mobilization on the part of teachers, students, department, course coordination and changes in teaching political projects to actually be inserted workload of up to 20% contained in the Law of Directives and Bases Education in semi-presential classes through the virtual learning environment.

Study shows that technological resources need to be used in nursing disciplines to launch new learning environments through virtualization. This media and modulates the process of teaching and learning as it rethinks the technicalities and passivity method and reverberates more critical learning model, active and autonomous. Technological tools are elements of knowledge and culture that contribute to determining new modes of perception and student criticality.²

◆ Insertion of technologies in the teaching-learning process in nursing

The following statements from professors about the link between education and technology to advance the science of nursing:

[...] What I could see outside the university today is that already have software for venipuncture, software that works with the physical examination; both software (program) as part of the hardware. [...] In the area of pediatrics specifically today we already have that baby is cyanotic, crying, sweating and presenting this whole process controlled with software (P.1).

[...] With respect to the nursing teachers notice that there is still the use of that information and communication technology, it is practically incipient (P.3).

To change the reality exposed these statements, it is necessary that educational institutions know the benefits that ICTs enable the training, such as autonomy, study flexibility, new ways of teaching methodologies; and new forms of assessment of learning. For this, the nursing education is challenged to prepare new professionals to practice to knowledge and skills in a complex medium, emerging and technologically sophisticated.

Research states that information and communication technology must be inserted into nursing curricula to change the educational process and improve the quality

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of professionals.⁹ Therefore universities are encouraged to teacher training towards qualifications in doctoral courses available by the institutions themselves in graduate studies programs. Thus, professors have the opportunity to advance to higher levels of academic careers and improve their academic practice.

◆ Intervient conditions

◆ The teaching interest is essential to the use of technology

The speeches allow realize that the academic body must be interested in the effective use of ICT in teaching and learning:

[...] For you to make use of Moodle you need a whole strategy to assemble the room to mount the contents of the discipline, have to make the student get used to it because it is a strategy that has been used think for two to four teachers here in the nursing program (P.1).

[...] Some courses have not much changed the teaching strategy. [...] The use of technology to a scare or they have a resistance, they cannot use, use as little as possible the e-mail (P.4).

Lack of knowledge about the various information and communication technologies, interfere in various ways to streamline and improve educational performance through theoretical and practical technological resources. Research states that the lack of motivation to modify methods already outlined over the years is a hindrance to the success of ICT in educational environment.¹⁰ Therefore, current changes are needed and emerging institutions of higher education, breaking the accommodation of barriers and undoing Traditional methodologies of non significant learning.

Nevertheless, the institution itself is not solely responsible for the absence of the use of ICT. It takes greater teacher awareness to the inclusion of innovative tools and facilitating the teaching-learning process.¹¹ Education should monitor the progress of information not to remain aloof and distant era of technology. Specifically in this study, the use of ICT in the nursing program is still in its infancy.

For effective integration of Moodle system in nursing disciplines it is necessary to organize and prepare the menus of disciplines to better enforcement tool. It is also necessary that not only one or two teachers apply this new modality; it should be included in all subjects in order to be

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paid the curriculum. The integration of technology in the early stages facilitates the formation, allowing theoretical, practical and technological knowledge.

Study affirms the need for higher education institutions adopt investment policies in teacher technology training and students, as well as in the implementation of infrastructure for the development of virtual education projects structured pedagogical proposals enabling the construction of skills, abilities and knowledge in the areas technology information and education using new teaching strategies.¹²

Accordingly, it emphasizes the ICT in the teaching and learning as the orientation of students on the conscious use of the Internet in order to not only play, but learn research on reliable databases, evaluate information, reflect and acquire knowledge scientific area. Study of nursing students suggests that Internet use in academic research is realized as an indispensable tool for quick and easy access to information. Thus enhances the formation of the student, leaving him better prepared for the labor market.¹³ In addition, the formation of new thinking is healthy in college, whereas the teacher to make students familiar with networking opportunities in research and acquisition Reliable knowledge to generate academic productivity.

◆ Organ development effort for professional qualification

Ahead are the testimonials showing that the university seeks accompany advances in science and technology, in a slow, but steady:

[...] In recent years sought to empower professors (doctorate) and the university itself encouraged this. I even criticize it, because it happened in a disorderly manner, because despite need of training, left many people (teaching). Before he had a scale for this, but the funding agencies have given the impetus for this improvement. [...] We realize that those who had no training had several losses, the first was that if the person did not have a qualification of a PhD could not star in, for example, no research project. [...] The salary issue, the less qualified you are over the salary is shameful! So these factors have led the university to invest in training teachers to do (PhD). It's the only way we have to earn more and to have recognition (P.5).

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[...] The very CAPES and CNPq have too stimulated the production of research (P.10).

The main agencies responsible for investments in universities are the Higher Education Personnel Improvement Coordination (CAPES) and the National Council for Scientific and Technological Development (CNPq) that promote incentives for development of teachers in teaching and research. These bodies are important because they provide a means for teachers to reach higher levels, as well as allow this to happen at the university itself without any need to shift to other national research centers or facilitate the visit to different countries to better qualifications in specific areas.

The teacher training also serves as motivation, because the higher the degree, the teacher has more right to coordinate and direct scientific research projects with scholarship students.¹⁴ In addition, the salary issue is another factor that interferes with this educational process, since the remuneration also serves as an incentive and professional recognition.

◆ Consequences of the phenomenon

◆ Improving learning and effectiveness of the teaching-learning process

The speeches below claim that ICTs bring about more substantial learning due to tools provide means auditory, visual and interactive attractions that are allowing greater retention of information:

[...] The professors need to make use of this feature to improve the skills, improve student understanding, to improve their performance as a teacher. [...] I think the vast majority of students approved the interaction between student and teacher increases also using information and communication technology (P.2).

[...] Over the past five years, we notice a huge difference, professors before or bound a computer, now use this technology and has difficulty when they seek to learn, because they need to use that information technology and communication time all to be able to adapt to this new reality, which is the process of teaching and learning that is directly related to technology (P.9).

It is visible how much ICT is present in people's lives and addictive resources. It is essential in education to further transform forms of education by enhancing the actions of students, especially in relation to qualified practice through training and use of more sophisticated objects.

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The use of computer resources as an effective tool in the teaching-learning process and the implementation of this instrument in the educational environment has been used since the elementary schools and secondary to university education. To this end, there is need for basic skills on computer, which can become a hindrance to the averse to computer technology, which is constantly changing.⁸

It is essential that the institution invests in the continuing education of professors in undergraduate courses in nursing so that they can be prepared in the face of constant

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demands that the function requires, as technology advances daily and it takes is allied to this process.¹⁵ Thus, authors state that the knowledge necessary for the exercise of teaching are multiple, which will require a mobilization of teachers in order to learn the necessary skills.¹⁶

Ahead, the concept map is configured as a synthesis of discourses, showing that the use or not of ICT in the teaching-learning process in Nursing (Figure 1).

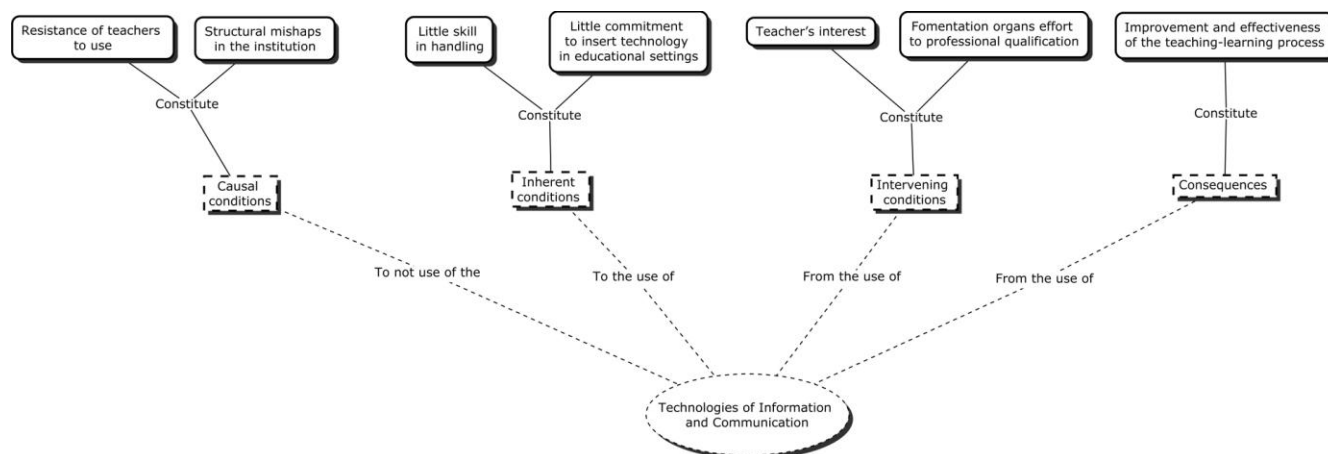


Figure 1. Representative model from the professor's speeches on Information and Communication Technologies analyzed in the light of Grounded Theory.

FINAL REMARKS

ICTs enable many theoretical and practical benefits to teachers in the teaching-learning process. Despite being a strictly classroom teaching, nursing graduation allying themselves to the teaching method in a virtual environment, innovates while streamlines the way of teaching. Technological tools provide new ways of learning and brings critical as seeking knowledge.

The difficulties when using ICT in nursing education occur mainly with regard to lack of financial investment and pedagogical university study policies. In addition, the lack of preparation of teachers and nursing students to use technologies is barriers to overcome to achieve positive results in student learning.

Moodle is a teaching strategy that can change the way of acquiring knowledge, how to assess the student and maturity of his thought. It allows moments of collective and individual learning, interaction, questions or interpretation of texts guided by the teacher. The way of teaching the teacher modifies and student learning mode opens up a new perspective.

The technologies have achieved the educational process in higher education to improve their quality. Perhaps the limitation of this study is in the data saturation technique for acquiring sample was considerably reduced in the guided method. So it is encouraged quantitative studies in this area to awaken the academic community, the education system and society of the need to improve teaching with technological resources in all sectors.

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Corresponding Address

Smalyanna Sgren da Costa Andrade
Universidade Federal da Paraíba
Cidade Universitária – Campus V
Centro de Ciências da Saúde
Programa de Pós-Graduação em
Enfermagem
CEP 58051-900 – João Pessoa (PB), Brazil