Objective: to analyze the national scientific production about the limits and the possibilities of nursing distance e-learning, by the use of computer technology. Method: integrative review from the questioning << What is the knowledge produced about the limits and possibilities of nursing distance e-learning, using the computer technology? >> in the databases LILACS, MEDLINE and ERIC. As criteria for inclusion, articles with at least one nurse researcher, full text and original, available between 2008 and 2013 were used. Results: 13 publications were analyzed, and from them 90% were produced by nursing; highlighting 2008 publications, with 61.5%; the English language with 61% and Brazil with 46.1% of. Conclusion: the scientific production revealed that the distance e-learning seems to be as effective as face-to-face method. It is believed that research that analyzes this interface, have great contribution to the qualification of professional nursing. Descriptors: Health Sciences; Education in Nursing; Distance e-Learning; Nursing.

RESUMO
Objetivo: analisar a produção científica nacional acerca dos limites e das possibilidades do ensino da enfermagem na modalidade a distância, pela utilização da tecnologia computacional. Métodos: revisão integrativa a partir do questionamento << Qual o conhecimento produzido acerca dos limites e possibilidades do ensino da enfermagem na modalidade a distância, através da utilização da tecnologia computacional? >> nas bases de dados LILACS, MEDLINE e ERIC. Adotou-se como critérios de inclusão artigos com no mínimo um pesquisador enfermeiro, texto completo e original, disponibilizados entre 2008 e 2013. Resultados: foram analisadas 13 publicações, destas, 90% produzidas pela Enfermagem; em destaque o ano de 2008 com 61,5%; o idioma inglês com 61% e o Brasil com 46,1% das publicações. Conclusão: a produção científica revelou que o ensino a distância parece ser tão eficaz quanto o método presencial. Acredita-se que pesquisas que analisam esta interface muito contribuem para a qualificação do profissional de enfermagem. Descriptors: Ciências da Saúde; Educação em Enfermagem; Educação a Distância; Enfermagem.
INTRODUCTION

The nursing education has suffered several modifications and is presented with new face before the current scenario. These modifications occur on the influence of technological advancement, which presents new opportunities for the teaching and learning process. Among these innovations, there are the development of distance e-learning (DeL) through the use of computers.

Distance e-learning was established in the national scene under the Decree Law 5,622 of December 19, 2005 being characterized as educational mode in which the processes of teaching and learning happen from the use of media and information and communication technologies, with students and teachers developing educational activities in places or several times.¹

The use of technology opens a range of possibilities for education service, through educational proposals that incorporate health professionals on contextualization of information, communication and technology, while promoting the transfer of knowledge and upgrading human resources. The use of resources through the computer facilitates communication, promotes the interaction of content and reduces obstacles to the cognitive process of knowledge acquisition.²

In this sense, Nursing is appropriating this teaching mode in their undergraduate and graduate degrees, enabling easy access, temporal and spatial flexibility, reducing costs and new technologies knowledge. It is undeniable the contribution of education mediated by the computer and relevance of studies reported in the scientific world the use of information technologies by nursing professionals.

With the above, this study aims to:

- Analyze the national scientific production about the limits and the possibilities of nursing distance e-learning, by using computer technology.

METHODOLOGY

To achieve the objective proposed by this study, the method of integrative review was chosen, since this research mode allows its final product showing the current state of knowledge of the topic investigated, implementation of effective interventions in healthcare and cost reduction, as well as the identification of gaps that lead to the development of future research.³

This study was conducted from the following question: What is the knowledge produced about the limits and possibilities of nursing distance e-learning, through the use of computer technology?

For selection of the studies the electronic databases were consulted: Latin American literature and Caribbean Health Sciences (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE) and Education Resources Information Center (ERIC). On that occasion, the following inclusion criteria were adopted: articles produced by at least one nurse researcher; from online journals with full text free access; available from 2008 to July 2013; that cover the virtual education by a computer and distance e-learning modalities. As a criterion for exclusion, the review articles were eliminated.

To search the productions in LILACS and MEDLINE databases, the following combinations of Health Sciences descriptors (DeCS) were used, with the help of the AND Boolean operator, “nursing education and distance e-learning”; “nursing and distance e-learning”.

The recovered articles in more than one database were counted only once. They have been refined through the limits: Portuguese, English and Spanish available electronically with free access to full text and methodology used. The total number of articles published during the established period were twenty. After reading of the abstracts and reading of the articles, only eight of the twenty articles, were according to the inclusion criteria. From the excluded articles, three were review articles and nine were out of the objective proposed.

Following the limits and selection criteria, we obtained copies of eight articles selected and we perform a thorough reading of each study, aimed at structuring the information pertinent to the development of review for the achievement of the proposed objectives.

For searching in ERIC database, we use the combination of the keywords: “nursing and education” and “nursing and distance e-learning”. The articles published in the proposed period, available in full text, publication type of the original article, resulting in 18 articles, were selected. From them, three were repeated and ten did not reach the objective proposed. Thus, five articles were selected in the ERIC database.

For the collection of data, an instrument to extracted the following information was used in this research: database, article title, authors, professional education, year of publication, Journal of publication, country of...
origin, language, purpose and results, the type of publication, methodological and characteristics of the article and analysis of methodological rigor.

In the quality of selected studies evaluation, there were two instruments used: the first adapted from Critical Appraisal Skills Programme (CASP) - critical reading skills program, part of the "Public Health Resource Unit - PHRU elaborated by the University of Oxford in 2002.4

The PHRU classifies the studies according to the following scores: 06 to 10 points (good methodological quality and reduced bias) and a minimum of 5 points (satisfactory methodological quality, however with increased risk of bias). In this study, we chose to use only the articles classified in 6 to 10 points. The second instrument was the Hierarchical Classification of Evidence to Evaluate the Studies.5 At the end of the analysis of these two instruments, the final

sample of this review consisted of thirteen articles.

From this phase, the categorization of studies on the data obtained was held, related to the object and the results of the studies, to be described and analyzed.

On the realization of the several approaches of teaching nursing by a computer, four thematic categories were listed: skills for navigating virtual environments; Advantages; Challenges; and Responsibility and learning management.

**RESULTS**

The analysis of the articles included in the review was initiated in order to identify data regarding the database, article title, authors, professional education and year of publication, as shown in Figure 1.

<table>
<thead>
<tr>
<th>Study number</th>
<th>Database</th>
<th>Title</th>
<th>Authors</th>
<th>Professional education of the authors</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LILACS</td>
<td>Distance e-learning in sterilization processes of materials</td>
<td>Quelhas, Lopes, Ropoli</td>
<td>Nursing, Pedagogy, Computer Science</td>
<td>2008</td>
</tr>
<tr>
<td>2</td>
<td>LILACS</td>
<td>Distance e-learning in the discipline of Law, Ethics and Nursing practice</td>
<td>Camacho</td>
<td>Nursing</td>
<td>2009</td>
</tr>
<tr>
<td>3</td>
<td>LILACS</td>
<td>Evaluation of a distance e-learning course about hepatitis C</td>
<td>Jacomini, Piai</td>
<td>Nursing</td>
<td>2008</td>
</tr>
<tr>
<td>4</td>
<td>LILACS</td>
<td>Distance e-learning about cardioversion and defibrillation for nurses</td>
<td>Sanches, Lopes</td>
<td>Nursing</td>
<td>2008</td>
</tr>
<tr>
<td>5</td>
<td>LILACS</td>
<td>Experience of nursing students in disciplines in distance e-learning</td>
<td>Alves, Cogo</td>
<td>Nursing</td>
<td>2008</td>
</tr>
<tr>
<td>6</td>
<td>MEDLINE</td>
<td>The effectiveness of web-based and face-to-face continuing education methods on nurses' knowledge about AIDS: a comparative study</td>
<td>Khatony, Nayery, Ahmadi, Haghani, Julkunen</td>
<td>Nursing, Statistics</td>
<td>2009</td>
</tr>
<tr>
<td>7</td>
<td>MEDLINE</td>
<td>Challenges and opportunities in graduate nursing education by distributed learning in Canada and Brazil</td>
<td>Molzahn, Macdonald, Banister, Starzomski, Brown, Gamroth, Paskulin, Silveira</td>
<td>Nursing, Computer Science</td>
<td>2009</td>
</tr>
<tr>
<td>8</td>
<td>MEDLINE</td>
<td>Evaluation of an Online Graduate Nursing Curriculum: Examining Standards of Quality</td>
<td>Avery, Cohen, Walker</td>
<td>Nursing</td>
<td>2008</td>
</tr>
<tr>
<td>9</td>
<td>ERIC</td>
<td>Improving Technological Competency in Nursing Students: The Passport Project</td>
<td>Edwards, Connor</td>
<td>Nursing</td>
<td>2011</td>
</tr>
<tr>
<td>10</td>
<td>ERIC</td>
<td>Critical Thinking Dispositions in Online Nursing Education</td>
<td>Carter</td>
<td>Nursing</td>
<td>2008</td>
</tr>
<tr>
<td>11</td>
<td>ERIC</td>
<td>Process-Based Assessment for Professional Learning in Higher Education: Perspectives on the Student-Teacher Relationship</td>
<td>Bergström</td>
<td>Nursing</td>
<td>2010</td>
</tr>
<tr>
<td>12</td>
<td>ERIC</td>
<td>Teacher and Student Behaviors in Face-to-Face and On-Line</td>
<td>Cragg, Dunning, Ellis</td>
<td>Nursing</td>
<td>2008</td>
</tr>
</tbody>
</table>

English/Portuguese
J Nurs UFPE on line., Recife, 8(Suppl. 2):3709-17, Oct., 2014 3711
Courses: Dealing with Complex Concepts

<table>
<thead>
<tr>
<th>Study number</th>
<th>Journals</th>
<th>Origin country and language</th>
<th>Objective</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Revista da Escola de Enfermagem da USC</td>
<td>Portuguese Brazil</td>
<td>To develop and evaluate a distance course on Basic Concepts in Sterilization Processes, Materials for nurses, through the Internet.</td>
<td>Analyzing the evaluations of both the students as judges, it is concluded that the course was successful, due to the right choice of pedagogical proposal and the learning environment. In addition, the course content was suitable and relevant to the professional practice.</td>
</tr>
<tr>
<td>2</td>
<td>Revista Brasileira de Enfermagem</td>
<td>Portuguese Brazil</td>
<td>To describe the insertion of the discipline of Law, Ethics and Nursing online Practice on the undergraduate course in Nursing.</td>
<td>Establishment of development of teaching strategies articulated with the programmatic content of the discipline through the tools available in the virtual environment. Aiming at developing critical and reflective of future professional nurse in that teaching must always be student-centered. The Del is a viable strategy for continuing education for future health professionals. The theme, content and form of presentation were considered adequate. The time of the student's dedication to the course and to guarantee access to the computer should be best scaled.</td>
</tr>
<tr>
<td>3</td>
<td>Revista de Investigación y Educación en Enfermería</td>
<td>Portuguese Brazil</td>
<td>To evaluate a distance e-language course about hepatitis C directed to nursing students.</td>
<td>As for the course evaluation by students, the vast majority presented favorable opinion, with good acceptance of the methodology used and good performance during the course.</td>
</tr>
<tr>
<td>4</td>
<td>Revista Brasileira de Enfermagem</td>
<td>Portuguese Brazil</td>
<td>To develop and evaluate a distance course on Cardioversion and Defibrillation using the virtual learning environment.</td>
<td>Prior knowledge of computing, facilities in managing the time, need for greater dedication, sense of students to come across the discipline, facilities to express their idea in discussions through chats and comparison to face-to-face classroom. The method based on the web seems to be as effective as face-to-face method on continuing education of nurses.</td>
</tr>
<tr>
<td>5</td>
<td>Revista Gaúcha de Enfermagem</td>
<td>Portuguese Brazil</td>
<td>To investigate the experience of students of nursing course to attend a distance discipline.</td>
<td>The authors argue that, despite</td>
</tr>
<tr>
<td>6</td>
<td>BMC Medical Education</td>
<td>English Iran</td>
<td>To compare the efficacy of both courses in improving nurses’ knowledge about AIDS.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Revista Gaúcha Enlish</td>
<td>Sharing experiences</td>
<td>The authors argue that, despite</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Distribution of articles inserted in the study, according to the database, article title, authors, professional education and year of publication.

It is observed that in the professional education of the authors, nursing predominated with 36 (90%). This fact is justified in order to have been one of the inclusion criteria of the study, which provided a satisfactory quantitative articles in this theme produced by nurses. It is worth mentioning also publications with lead author in the areas of computer science, statistics and pedagogy, appearing in four (10%) of the articles, as shown in Figure 1.

With regard to the period of the publication, 2008 and 2009 were the ones who had more publications pertinent to the thematic, with 61.5% (n=8) and 23.1% (n=3), respectively. It was possible to verify the decrease of publications in 2010, 2011, 2012 and 2013. It should be noted that no explanation has been found for the decrease in the number of publications in such years, since this modality is increasingly present in the nursing education area. It is valid to point out that 2013 only until the month of July was considered.
Oliveira CDB, Vasconcelos MF de, Santos SR dos et al.

Nursing education by a computer: integrative...

The main reasons for abandonment can be placed into two categories, personal reasons (related to the life or work commitments) and the reasons of the program (usually present goals). It is suggested that students usually present gains in their critical thinking as a function of the college experience.

According to figure 2, the selected articles are distributed in 09 journals, highlighting the Revista Gaúcha de Enfermagem, Revista Brasileira de Enfermagem, The Journal of Educators Online e Journal of Distance Education, both with 15.4% (n=2) of publications included in this review. From these, The Journal of Educators Online and Journal of Distance Education, are magazines that are specific to the area of learning by computer, especially publications for distance e-learning.

With respect to the language of the documents, the texts were published in English 61.5% (n=8) and Portuguese 38.5% (n=5). Regarding the country of origin of the articles, the most prominent obtained were: Brazil, with 46.1% (n=6) of publications, followed by the United States of America, with 30.8% (n=4). Other countries that have published in the theme, though less frequently were Canada, Sweden and Iran, all with 7.7% (n=1) of representativity in the articles.

**DISCUSSION**

The articles constituting the starting point for analysis and discussion proposed by this study enabled a thorough and attentive view, to identify evidence of each study examined, represented by thematic pillars “skills to browsing in virtual environments”, “vantages” and “Challenges”, “responsibility and management of learning”, through there was the possibility of noting pertinent considerations on the subject in focus.

**Skills to browsing in virtual environments**

Some tools are used to replace the face-to-face education by education in virtual environment created for distance courses and over time has been diversified. The
characteristics of these resources vary, some have as a priority the pedagogical communication, others are more interactive, but they use facilities, being some applications easier to use, but there are also other more restricted and specific difficulties of access and use by the student.

In the study Evaluation of a distance e-learning course about hepatitis C, the participants, both tutors as students, felt difficulty in working in the virtual environment due to the constant maintenance, causing even the impossibility of access.⁶

Other studies also identified the lack of knowledge about technology in general, by some advisers, as well as the little computer knowledge and levels of support required for studying online,⁷ there are as obstacles to the development of the tasks of the distance courses, through the navigation in virtual environments.⁸

In the meantime, the online courses must be easy to use with coherences in information and free from errors whenever possible. One of the most common mistakes that hamper students’ browsing in this universe, emphasized the insufficient use of hyperlinks, especially, those who describe the directions of activities located in another part of the course to provide a direct link, is one of the most common mistakes that hinders browsing by students.⁹

These approaches show the need for knowledge of the telematics resources and their use to support of online courses, establishing that the lack of a relationship of interaction promoted and supported by technological resources can affect performance as well as determine the abandonment of the students. Thus, the educational institutions must encourage and abandonment of the students. Thus, the educational institutions must encourage and combine the use of hyperlinks in the universe of a distance course, since most of the students who are looking for this method, is already a nurse, while minimizing the need to travel and move around.

A considerable quantity of nursing students chooses distance e-learning programs due to the flexibility of offerings. These flexible options allow students to enter their studies within the context of their occupations, whether at work, at home or in the family, as well as the possibility of access programs while minimizing the need to travel and move around. In Brazil, the flexibility is essential for the development of a distance e-learning course, since most of the students who are looking for this method, is already a nurse, while they look for an opportunity to get an educational growth.¹⁴

◆ Challenges

The increase in demand of registration in nursing programs for distance e-learning, the diversity of students and the different cultural and socioeconomic contexts, are some of the obstacles that the professor must attend in order to meet the specific learning needs. The resistance of the professors and students is considered one of the greatest barriers to implementation of a distance course. Many students initially resisted the program, due to reside in rural addresses and possess internet access dialed to access the course program. However, after implementation, these students have received massive support by joining this type of education, which improved retention rates of students in the first semester⁷.

Another difficulty in distance education is the lack of spontaneous exchanges and quick recognition of professor of a student’s
difficulty in understanding the programmatic content. However, the big challenges mentioned by students were: inaccessible college and little knowledge about technology, in general, by some advisors. Some students are still feeling certain frustration due to the inability to sites of instruction or work with necessary learning content online.

The abandonment of the e-learning course has been identified as a problem since there is a high evasion rate in function of the labour and family activities, as well as barriers of the course and issues of motivation that can be associated with the quality of the didactic material used for execution of tasks.

The main reasons for abandonment can be placed into two categories: i) personal reasons (related to the life or work commitments); ii) reasons of the program (related to learning style and/or compatibility with the career).

Para que o ensino à distância tenha êxito indica-se alguns problemas a serem solucionados, tais como: a necessidade de supervisão prática dos cursos, encontrar maneiras de facilitar a interação, equilibrar a carga de trabalho do corpo docente e necessidade de criar serviços de apoio aos estudantes.

For distance learning success, there are some problems to be solved, such as: the need for supervision practice of the courses, find ways to facilitate interaction, balance the workload of teaching staff and need to create support services to students.

Responsibility and management of learning

The evaluation process plays an important role in the student-teacher relationship, which also influences the learning process and, in particular, has implications for the role that students expect their teachers perform. In the role of the teacher, in distance learning, the power relationship shows more openness than authoritarianism, but also reveals greater demands on the learner to take responsibility for their own learning. This openness encourages a change in reasoning, considered positive, opposite to a traditional learning approach, which makes the student supporting their learning.

An example of students effectively involved in acquiring knowledge is discussed in study where the authors point out that through asynchronous discussion tools, the students put a summary of the various stages of an assignment that were working and each student given and received comments about his work in this discussion group. This activity probably resulted in the increased level of interaction and learning, in which the student is primarily responsible for the pursuit of knowledge.

The student must have greater responsibility for their learning experiences, there are constructivist authors who believe that the own student should choose the problems to be studied. In this case, the teacher’s role would be to help them generate relevant and interesting problems to their reality.

In the process of interaction between students, exchanges of ideas through the questions and positions concerning the proposed theme should appear, so that the group becomes a guide of new directions being investigated. Thereby, the tutor becomes responsible to guide the resolution of these issues, which require flexibility and compromise. In this context, the use of the internet in academic research is consolidated as an essential instrument for quick and easy access to information. Thus, it improves the process of developing the knowledge and training of the nursing student, influencing in their insertion in the labour market.

It is important to understand that the change of attitude of the student, passing the act more autonomous and participative manner in relation to the professor, is advantageous to the learning process. Especially when it comes to distance education as it is configured as methodology linked to construction of knowledge by the person who sets out to learn and not centered on the teacher, which prints the knowledge.

CONCLUSION

New paradigms are generated by the use of Del and considered futuristic study strategies become reality, appearing learning with the use of new technologies. In this context, the Del gains importance as it meets the demands of certain professionals, in particular the professional nurse, due to its difficulties and limitations.

This study showed a scientific production that reveals the distance learning with effectiveness similar to face-to-face method. Among the positive points in articles, the opportunity of students reaching higher levels of knowledge construction, accessibility during 24 hours and interactivity are highlighted.

The process of critical observation of the studies identified the need to address the obstacles related to the use of technology. The limiting factors cited by most studies
refer to the ability browsing in virtual environments, due to obstacles like little computer knowledge, constant maintenance not being possible the online browsing and high rate of abandonment of the course.

It is considered that there are still many gaps in the production of knowledge on the topic. It is believed that research that analyze this interface, greatly contribute to the qualification of professional nursing in distance education.

REFERENCES


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