Analysis of Brazilian publications on distance education in nursing: integrative review

Análise das publicações nacionais sobre educação a distância em enfermagem: revisão integrativa

Análisis de las publicaciones nacionales sobre educación a distancia en enfermería: revisión integradora

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ABSTRACT

Objective: To analyze the publications that focus on distance education in nursing in Brazil from 2010 to 2016. **Method**: Integrative review of the literature with data collection in June 2016 in the following databases: LILACS, MEDLINE via PUBMED, CINAHL and SCOPUS. For the data analysis and interpretation, the thematic categorization was chosen. **Results**: We selected 18 articles for discussion, whose textual analysis permitted the construction of three thematic categories: use of virtual technologies for distance education in nursing; construction of virtual learning environments with the aid of virtual technologies for distance education in nursing; and evaluation of the learning process through virtual technologies for distance education of nurses. **Conclusion**: Distance Education stands out as an effective teaching-learning strategy in this type of education in Brazilian nursing, focused mainly on the improvement and complement of traditional teaching.
Descriptors: Nursing Education; Distance Education; Nursing; Educational Technology; Continuing Education in Nursing.

RESUMO

Objetivo: analisar as publicações que enfocam a educação a distância na enfermagem no Brasil de 2010 a 2016. **Método:** Revisão integrativa da literatura com coleta de dados no mês de junho de 2016 nas seguintes bases de dados: LILACS, MEDLINE via PUBMED, CINAHL e SCOPUS. Para análise e interpretação dos dados, optou-se pela categorização temática. **Resultados:** Selecionados 18 artigos para discussão, cujas análises textuais permitiram a construção de três categorias temáticas: uso das tecnologias virtuais na educação a distância na enfermagem; construção de ambientes virtuais de aprendizagem com auxílio de tecnologias virtuais na educação a distância na enfermagem; e avaliação do processo de aprendizagem por intermédio das tecnologias virtuais na educação a distância de enfermeiros. **Conclusão:** a EAD evidencia-se como uma estratégia efetiva de ensino-aprendizagem nesta modalidade de educação na enfermagem brasileira, voltada principalmente para o aperfeiçoamento e complemento do ensino tradicional.
Descritores: Educação em Enfermagem; Educação à Distância; Enfermagem; Tecnologia Educacional; Educação Continuada em Enfermagem.

RESUMEN

Objetivo: analizar las publicaciones que enfocan la educación a distancia en Enfermería en Brasil de 2010 a 2016. **Método:** Revisión integradora de la literatura con colecta de datos en el mes de junio de 2016 en las siguientes bases de datos: LILACS, MEDLINE vía PUBMED, CINAHL y SCOPUS. Para análisis e interpretación de los datos se optó por la categorización temática. **Resultados:** Fueron seleccionados 18 artículos para discusión, cuyas análisis textuales permitieron la construcción de 3 categorías temáticas: uso de las tecnologías virtuales en educación a distancia en enfermería; construcción de ambientes virtuales de aprendizaje con auxilio de tecnologías virtuales en educación a distancia en enfermería; y evaluación del proceso de aprendizaje por intermedio de las tecnologías virtuales en educación a distancia de enfermeros. **Conclusión:** EAD se

evidencia como una estrategia efectiva de enseñanza-aprendizaje en educación a distancia en enfermería brasileña, orientada principalmente para el perfeccionamiento y complemento de la enseñanza tradicional.

Descriptores: Educación en Enfermería; Educación a Distancia; Enfermería; Tecnología Educativa; Educación continua en enfermería.

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INTRODUCTION

Distance Education (DE) is characterized by a teaching-learning process in which the relationship between teacher and student does not occur on physical plane. This strategy, besides allowing the use of technologies in education, stimulates multidirectional communication and the exchange of experiences/knowledge among the related subjects, while always aiming at the student as protagonist and the teacher as mediator of this process[1].

Its teaching methodology must preserve all the qualities of a good education, enabling the individual to develop cognitive, social, emotional, professional and ethical capacities[2].

In Brazil, Article 1 of Decree No. 5,622, dated December 19, 2005, which regulates article 80 of the Law on Guidelines and Bases of National Education, defines DE as:

> Educational modality in which pedagogical didactic mediation in the teaching/learning processes occurs with the use of information and communication technologies and with students and teachers developing educational activities in diverse places and times[3].

This modality of education is in the process of expansion in the national territory, which allows the population greater access to initial and continuing education, because it breaks with the difficulties imposed by time and space. Public and private educational institutions have been adapting to its use, with the purpose of reducing the difficulties encountered by the student to attend face-to-face courses, such as: locomotion, geographic dispersion and working hours[4].

In the health field, DE presents itself as a possibility to optimize the education process, as it favors the advancement of these professionals through the use of new learning strategies such as training, continuing improvement and updating[3].

Advances of society necessitate the individual to be constantly updated to develop both his daily personal and work activities. With the processes of change that are occurring rapidly in the social sectors, health is undergoing moments of great transformations, in which human resources that correspond to the needs and demands of the health services are indispensable. Thus, professionals are motivated to participate in this process of change and realize the importance of a constant search for knowledge and its contribution to quality care[5].

In this sense, the incorporation of DE contributes to an enhancement of permanent education programs, since it enables the development of the worker and, consequently, the health institution itself. It is important to highlight that inserting DE into the programs of permanent health education enables a large number of trained professionals to be reached, which favors the formation of subjects with a critical-reflexive attitude and genuinely committed to the quality of health practices[5].

Significant progress in this teaching modality has been observed in Brazilian nursing regarding the availability of material in virtual environments, training courses and undergraduate courses. This allows for greater interactivity, as well as dissemination of information, content updating and professional growth[2].

In addition to the progressive use of technological resources in health care and nursing, the amount of information available and necessary for multi-professional and interdisciplinary improvement is growing. Electronic records and dissemination of health information contribute to ensuring greater use of technology, thereby providing the opportunity and responsibility to produce and use information appropriately. This ensures that new knowledge becomes a reliable subsidy in support of education, research, practice and management in nursing[6].

In view of the above panorama, this study aims to: analyze the publications that focus on Nursing distance education in Brazil through references available in the main databases from 2010 to 2016.

This analysis will strengthen understanding regarding the development process of DE in Nursing and enable the identification of possible knowledge gaps in the subject matter.

METHOD

To achieve the objectives of the research, a systematic review of the literature was carried out following eight steps: (1) elaboration of the research question; (2) literature search; (3) selection of articles; (4) extraction of data; (5) methodological quality assessment; (6) synthesis of the data; (7) evaluation of evidence quality; and (8) writing and publishing the results[7].

All these steps were performed to elaborate this study, which had as its guiding axis the following question: what scientific evidence is available in the literature about Nursing distance education in Brazil?

The search took place on June 5, 2016 in the following databases: LILACS (Latin American and Caribbean Literature in Health Sciences), MEDLINE (Medical Literature Analysis and Retrieval System online) via PUBMED, CINAHL (Cumulative Index to Nursing and Allied Health Literature) and SCOPUS, using the following descriptors and Boolean operators: *educação em enfermagem* OR *ensino em enfermagem* [education in nursing OR teaching nursing] AND *educação a distância* [distance education] AND *enfermagem* [nursing].

The inclusion criteria were that the references should meet the proposed objective and consider distance education in Nursing. Theses, dissertations and literature reviews were excluded. Analysis of the references was based on the publications of the last seven years (from 2010 to 2016), seeking to update the latest publication on the subject.

A flowchart that demonstrates the process of selecting and including articles is presented in Figure 1.
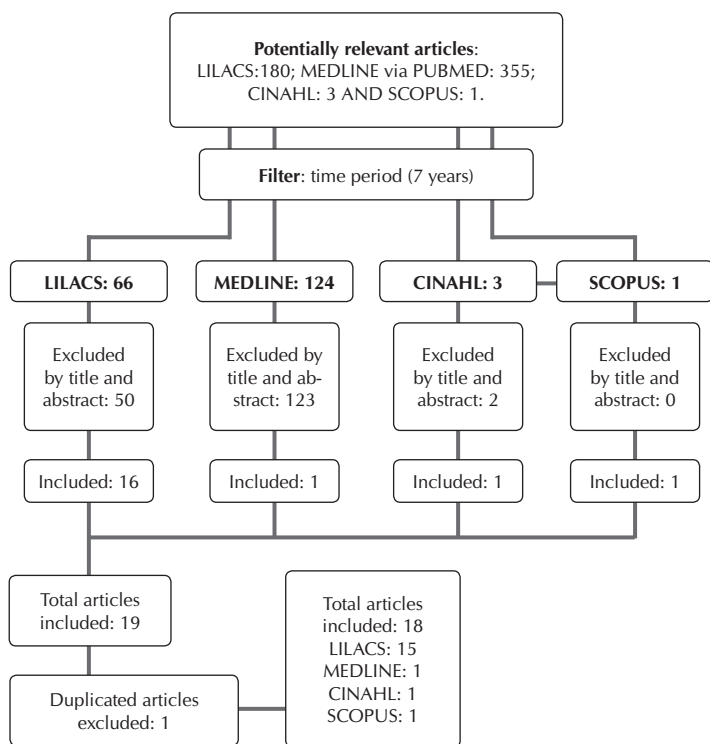
Figure 1 – Selection of the articles included in the study

After selection of the articles, an analytical reading was made underscoring: year, place, title, author, objectives, method, essence of the study, and recommendations of the authors. The presentation of the results and discussion of the data obtained was made in a descriptive way. Thematic categorization was chosen for the data analysis and interpretation.

RESULTS

A total of 18 articles were selected for discussion, after applying the inclusion criteria. The studies characterized according to author, place, period, year, objectives and method are presented in Chart 1.

Regarding the place of origin of the 18 publications, the majority 15 (83.3%) were developed in São Paulo, 1 (5.6%) in Rio Grande do Sul, 1 (5.6%) in Brasília and 1 (5.6%) in Minas Gerais. This data is relevant, since it shows that distance education in the nursing field was widely studied and developed in the state of São Paulo during the period analyzed.

Concerning the year of publication, 3 (16.7%) references were found in 2010, 1 (5.6%) in 2011, 2 (11.1%) in 2012, 5 (27.8%) in 2013, 3 (16.7%) in 2014, 3 (16.7%) in 2015 and 1 (5.6%) in 2016. It can be stated, based on these data, that there was progress in studies on this subject in the period 2010 to 2016, especially with regard to the virtual technologies used in the teaching-learning process.

Regarding the type of publication in terms of the methodological approach, 5 (27.8%) references made descriptive and exploratory studies, 4 (22.2%) reports of experience, 3 (16.7%) developed cross-sectional studies, 2 (11.1%) conducted a case study, 2 (11.1%) developed a quasi-experimental study and 2 (11.1%) performed applied research.

Chart 2 presents the essence of the content of the studies into distance education and the nursing area in Brazil.

Analyzing the essence of the study contents showed that 8 (46%) references addressed the construction of virtual learning environments for distance education in nursing, 5 (27%) emphasized the use of virtual technologies in this modality of education and 5 (27%) dealt with the evaluation of learning processes by undergraduate and graduate students and by nursing professionals.

Regarding the recommendations of the studies, 5 (27.7%) pointed out the need for the development of new information technologies, 2 (11.1%) suggested implementing the educational projects in the distance modality on a specific platform (5.5%) emphasized the importance of expanding discussions about safe working practices in the hospital environment, 1 (5.5%) emphasized the need for future research on the perception of students and teachers as educational indicators in learning, 1 (5.5%) indicated the need for other studies that provide support for the role of a mediator tutor (MT) in educational forums. However, 8 (44.4%) studies did not make recommendations.

Chart 1 – Characterization of the studies published from 2010 to 2016

Author\Local\Journal\Year	Objectives\Method
Silva LMG, Gutiérrez MGR, De Domenico EBL\ São Paulo\ Acta Paul Enferm\2010	Objectives: To describe how the Moodle virtual teaching environment was structured for an educational program focused on the prevention of Surgical Site Infection (SSI). Method: Experience report
Silva APSS, Pedro ENR\ Rev. Latino-Am. Enfermagem\ Rio Grande do Sul\ 2010	Objectives: To analyze how autonomy is developed in the process of knowledge construction among nursing students in the context of learning mediated by educational chat in a virtual learning environment. Method: Case study
Marziale MH, Zapparoli AS, Felli VE, Anabuki MH\ São Paulo\ Rev Bras Enferm\2010	Objectives: To implement and evaluate a structured interactive training program in the health promotion model for the appropriate use of gloves in the administration of intravenous drugs. Method: Quasi-experimental study

To be continued

Chart 1 (concluded)

Author\Local\Journal\Year	Objectives\Method
Xelegati R, Évora YDM\ São Paulo\ Rev. Latino-Am. Enfermagem\2011	Objectives: To develop a Virtual Learning Environment (VLE) on management in adverse events for the permanent education of nurses inserted in health services. Method: Applied research, based on information processing theory
Rabeh SAN, Gonçalves MBB, Caliri MHL, Nogueira PC, Miyazak MY\São Paulo\ Rev. enferm. UERJ\2012	Objectives: To construct and validate the educational intervention for topical therapy in chronic wounds to be implemented/delivered in Virtual Learning Environment (VLE) to undergraduate Nursing students. Method: Descriptive and exploratory study
Alves ED, Ribeiro LSN, Guimarães DCSM, Costa CMA, Peixoto HM, Martins EF et al\ Brasília\Rev Eletr Enf\2012	Objectives: To analyze the use of Moodle Portfolio in teaching and learning processes used in undergraduate and postgraduate courses in health. Method: Case study
Rodrigues RCV, Peres HHC\ São Paulo\ Rev Esc Enferm USP\2013	Objectives: To develop and evaluate a Virtual Learning Environment (VLE) aimed at continuing education in nursing. Method: Applied research based on the methodology of Galvis Panqueva
Grossi MG, Kobayashi RM\ São Paulo\ Rev Esc Enferm USP\2013	Objectives: To describe the construction of a Virtual Learning Environment (VLE) in a social network for the implementation of DE for nurses of the Education Group at a public hospital specializing in cardiology. Method: Experience report
Salvador ME, Sakumoto M, Marin HF\ São Paulo\ J. Health Inform\2013	Objectives: To verify the access and performance of nursing undergraduate students to Moodle, from the Nursing Information Technology Discipline. Method: Cross-sectional study
Prado C, Silva IA, Soares AVN, Aragaki IMM, Shimoda GT, Zaniboni VF et al\ São Paulo\ Rev Esc Enferm USP\2013	Objective: To report the experience of nursing in tele-breastfeeding of the National Telehealth Program in Brazil in the São Paulo Nucleus. Method: Experience report
Okagawa FS, Bohomol E, Cunha IC\ São Paulo\ Acta Paul Enferm\2013	Objectives: To identify managerial competences developed in the specialization course in distance education nursing management module (EDGE), based on statements by the students who concluded it. Method: Cross-sectional study
Godoy SCB, Guimarães EMP, Assis DSS\ Minas Gerais\ Esc Anna Nery\ 2014	Objectives: To evaluate the permanent distance education for the nursing team of the Basic Health Units. Method: Descriptive and exploratory study
Casteli CPM, Casteli C, Leite MMJ\São Paulo\ Rev Bras Enferm\2014	Objectives: To evaluate the data contained in the Computerized System of Continuing Education in Nursing (SIEC), from the perspective of specialist nurses. Method: Descriptive and exploratory study
Masson VA, Ribeiro RL, Hipólito MCV, Tobase L\São Paulo\ REME \2014	Objectives: Describe the development of virtual learning objects for teaching the history of Nursing. Method: Experience report
Alves VL, Bohomol E, Cunha IC\ São Paulo\ Acta Paul Enferm\2015	Objectives: To analyze the participation of students in the Web café forum of the specialization course in Nursing Management, distance module. Method: Descriptive and exploratory study
Alves VLS, Okagawa FS, Parra JFG, Bohomo E, Cunha ICKO\ São Paulo\ REME\2015	Objetivos: Analisar a participação dos alunos no fórum Webcafé no curso de especialização em Gestão em Enfermagem, modalidade à distância. Método: Estudo descritivo e exploratório
Gonçalves MBB, Rabeh SAN, Terçariol CAS\ São Paulo\ Rev. Latino-Am. Enfermagem\ 2015	Objectives: To evaluate the contribution of distance learning to expand the knowledge of nursing teachers and nurses linked to the teaching of public and private higher education institutions, on the evaluation of chronic wounds. Method: Quasi-experimental study
Avelino CC, Borges FR, Inagaki CM, Nery MA, Goyatá SL\ São Paulo\ Acta Paul Enferm\2016	Objectives: To develop and evaluate a course in the Moodle Platform on nursing diagnoses, interventions and results, according to the International Classification for Nursing Practices (ICNP). Method: Cross-sectional study

Chart 2 – Characterization of the studies on Distance Education (EAD) in Nursing in Brazil, from 2010 to 2016

Study Title	Distance Education and Nursing
Virtual learning environment in continuing education in nursing	The use of Moodle virtual technology as a teaching strategy allowed updating on the theme, critical and reflexive positioning of nurses and joint construction of proposals for action in work processes with a focus on the prevention of Surgical Site Infection (SSI).
Autonomy in the process of knowledge construction of nursing students: the educational chat as a teaching tool	The discussions in educational chat in nursing education allowed the dialogical relationship between teacher and student and between the students, which made possible the construction of new knowledge, making the teaching-learning process richer. In this way, this tool offers a complement to face-to-face teaching, enabling the student to act as an autonomous, creative and critical nurse.
Workplace Accident Prevention Network: a distance education strategy	The use of an interactive tool (website) facilitated the application of the educational strategy in the workplace, making possible a change in behavior among nursing workers regarding the use of gloves for the administration of intravenous drugs.
Desenvolvimento de ambiente virtual de aprendizagem em eventos adversos em enfermagem	The development of a virtual learning environment on adverse event management aimed to contribute to the conscientization of nurses regarding the types of events, risk factors, classification and incidence, promoting quality and safe nursing care.
Construction and validation of a virtual educational module for topical therapy in chronic wounds	Construction of the Distance Education module allowed the use of guidelines for clinical practice with a view to the diffusion of up-to-date knowledge for nursing care to the patient with chronic wound and to the topical therapy to be implemented by the student; this tool being considered adequate during validation.
Moodle-folio for teaching in health and nursing: evaluation of the educational process	The Moodle platform was used for the storage of individual and collective portfolios, providing significant satisfaction to students, as it allows the monitoring of the teaching-learning process with a more collective and democratic involvement and the production of knowledge.
Development of a virtual learning environment in nursing about cardiorespiratory resuscitation in neonatology.	The creation of the virtual environment called ENFNET, as a complementary learning tool to traditional nursing education, had the objective of enabling the participant to experience the care of a newborn in a situation of cardiorespiratory arrest; it was an efficient way to build knowledge, foster student autonomy in the search for and expanding of content and professional training.
The construction of a virtual learning environment for distance education: an in-service educational strategy	The construction of the Virtual Learning Environment (VLA) by the nurses of the education group allowed the development of technological, educational and cardiology specific skills, in search of better practices in the work processes.
Use of Moodle in the Discipline of Informatics in Nursing	The use of Moodle was a complementary method to face-to-face teaching, offering the student an instrument of reinforcement and continuity of the teaching process beyond the university environment.
Telebreastfeeding in the National Telehealth Program in Brazil: the experience of Telenursing	The creation of Tele-breastfeeding by a multi-professional team aimed to train professionals of the Family Health Strategy (FHS) in relation to breastfeeding, aiming to subsidize knowledge, attitudes and skills that generate criticism and reflection, in order to contribute to a potentially significant learning process.
Skills developed in a specialization course in nursing management at a distance	The use of distance education by the students of the distance education specialization course in nursing (EDGE) contributed to the development of managerial skills in nursing, expressing the potential of distance education as an educational tool to improve professional qualifications.
Evaluation of the training of nurses in basic health units through telenursing	The use of telenursing in the process of training professionals assists workers in their daily practice, as well as facilitates service and enables the exchange of information between professionals and teaching and research institutions.
Evaluation of the Computerized System of Continuing Education in Nursing	The Computerized System of Continuing Education in Nursing (SIEC) was positively evaluated by the specialists, as a tool that assists in the daily work and in the decision process that is indispensable for the participation of nurses in the development of this in an active manner.
Construction of virtual learning objects for teaching the history of nursing	The creation of this educational project, in which the resources of the Prezi platform were used, enabled the creation of virtual learning objects for the complementation of face-to-face classes, aiming at facilitating learning in an innovative way of teaching the history of nursing.
Postgraduate education in distance nursing: evaluation from the students' perspective	The two distance courses, from the perspective of the students, have contributed to improve the professional performance and the development of managerial competences, this being a training tool for nurses that aims to foment the transformation of the management scenario of Brazilian nursing.
Virtual interactivity: virtual forum web café in a nursing management course	The creation of the Web café Forum in the distance nursing management course made possible the interactivity between students of different professional realities and regional poles, this was an innovative proposal.

Chart 2 (concluded)

Study Title	Distance Education and Nursing
Contribution of distance education to the knowledge of nursing professors about evaluation of chronic wounds	Participation in the virtual update course on evaluation of chronic wounds for nursing care offered through the Moodle Virtual Learning Environment (VLE) positively impacted the knowledge of nursing professors and nurses linked to higher education.
Development of a course in the Virtual Learning Environment about CIPE®	The development of the course on the Moodle Platform took place through the use of technologies to disseminate knowledge about CIPE®, helping in the professional training of nursing undergraduates and in the permanent education of nurses.

The studies showed that virtual tools are used in distance education in nursing as a teaching-learning strategy, aiming at the prevention of surgical site infection and workplace accidents, adverse event (AE) management and nursing care for newborns and patients with chronic wounds, in order to complement the traditional teaching, as well as to encourage the exercise of the students' autonomy and the production of new knowledge.

From this perspective, the selected articles were divided into three thematic categories: 1) Use of virtual technologies for distance education in nursing; 2) Construction of virtual learning environments with the aid of virtual technologies for distance education in nursing; 3) Evaluation of the learning process through virtual technologies for distance education of nurses.

DISCUSSION

Category 1 - Use of virtual technologies for distance education in nursing

Virtual technologies are instruments that allow new possibilities to interact and create spaces favorable to the teaching-learning process. These tools are increasingly present in undergraduate and postgraduate courses in nursing, as they act as facilitators in the process of building student knowledge.

The use of virtual technologies in distance education in nursing is more frequent in the Southeastern region of Brazil than in other regions[8-9], as shown in the study that used this modality of teaching to identify the managerial competencies of students attending the Specialization in nursing management. This fact can be justified by the greater concentration of universities and other educational centers in this region[10].

International implications of the use of distance education methods have shown an impact on the enhancement of nursing competences, as pointed out by a study carried out in Brazil on the use of these methods for building and maintaining competencies among nursing managers[8].

Among the virtual education technologies addressed in the articles selected in the present study, Moodle, videoconference, teleconsulting (online or offline) and the Web café forum were highlighted.

Regarding the use of Moodle as a virtual learning tool, it was underscored that it performs well for the implementation of online activities, such as the availability of didactic material, classes, exercises, activities, animations, videos, and other possibilities. The use of this resource outside the classroom can offer the undergraduate nursing student an instrument of reinforcement and continuity of the teaching process beyond the university environment[11].

Regarding the use of videoconferences and teleconsulting as technologies for the assistance of health professionals, it was observed that such tools allow an approximation of the university to the basic health units, as well as the sharing of questions present in clinical practice. These learning instruments have a positive impact on the qualification of primary care professionals, as well as on the resolution of problems pertinent to nursing practice in the daily work of these professionals[12].

The implementation of educational chat allows the development of autonomy in the process of knowledge construction among nursing students through the management and development of responsibility for their own learning[13].

Another tool used in distance learning is the Web café. A Virtual interactivity study shows the contribution of this type of forum as a promising tool that enables interaction between students from different regions and realities[14].

Category 2 - Construction of virtual learning environments with the aid of virtual technologies for distance education in nursing

The process of constructing educational programs in a virtual learning environment (VLE) requires mediating tools to enable availability of resources and activities to be worked on with the learners. In the selected studies, the tools adopted for the interaction were: Moodle and TelEduc platforms, website, among others.

In the process of constructing the educational environment with the help of Moodle, the possibility of ordering tasks and the resources made available facilitated the process of organizing and creating the activities of each stage of the educational program project[15]. Moodle allows the use of daily forums, chats, quizzes, wiki-type texts, etc., with flexible content[16].

Regarding the development of websites, it has been found to provide good results as an innovative strategy for training professionals in health institutions, but it has limitations because it is expensive online educational material, which possibly intimidates new initiatives to create VLE in nursing[17]. Another study involving the construction of a website for guidance to parents and/or caregivers of infants required a great deal of time to plan and design[18].

As for the construction process of the educational program through the TelEduc platform, it is observed that, in a study carried out in São Paulo, the authors highlighted the need to re-adjust TelEduc regarding the presentation format and digital media resources after expert analysis[19].

A study carried out in a cardiology referral hospital in São Paulo described the experience of constructing a VLE in the social network for the implementation of DE. The process began with searches in social networks not requiring financial investment, a

determining requirement for the selection of the NING social network. After choosing NING, the educator nurses made their activities available in NING, in the form of modules, using the NING space and Etherpad (online tool that supports collective work)[20].

In addition, for the implementation of the DE by the educator nurses, there was a need for institutional, political and pedagogical investment, as well as a proposal for continuous qualification of the institution's employees[20].

After construction of the VLE for DE, the beginning of activities can occur in different manners, and it is important to choose the most practical and interactive form. A study conducted at the Nursing School of the Federal University of Alfenas developed a course on the International Classification for Nursing Practices (CIPE®) in four phases: analysis; design and development; implementation; and evaluation. However, the design and development phase, despite being one of the first stages, was flexible and therefore it allowed eventual adjustments as necessary, through which it was possible to evolve according to the needs presented by the course participants[21].

Nurses have developed distance learning courses, websites, educational software, virtual learning environments, and other means that provide interactive and innovative options to share knowledge, thus adapting to new educational methodologies. The VLE in nursing can be used both during graduation and as a tool to collaborate with permanent education programs of health institutions with the goal of improving nursing care. It is worth mentioning the existence of a wide range of themes pertinent to care that can be learned and discussed in virtual environments, which makes it possible to reach various specialties[17,22].

In this context, telenursing – the use of technologies, telephone, computer or video – is used to promote and support health care and education when participants are at a distance; its construction is a theme that must be inserted in the undergraduate and training courses for Nursing professionals, with the objective of developing technical and scientific skills, prioritizing human interaction and respecting the individuality of the human being[23].

In the general context, nursing educators prioritize the use of the Moodle platform on the basis of which various attractive techniques of online learning are listed to facilitate the student's interaction with this technology. The use of virtual environments in education enables flexibility in teaching, making it more modern and dynamic, permeable to the demands and needs of the context in which the students are inserted[24].

Category 3 - Evaluation of the learning process through virtual technologies for distance education of nurses

Virtual learning environments demonstrate the vertiginous technological advancement of society in the last few centuries as they have turned into real virtual classrooms accessed via the web. The primary responsibility of VLEs is to overcome physical distance and facilitate communication between participants. From this perspective, these environments can be used in different contexts, namely: undergraduate and postgraduate courses and even in continuing education services[25].

Distance Education through VLEs, is an option for the updating and training of professionals as it has been proven to be effective, while optimizing time and offering flexible hours[15,26].

Research carried out in various countries adhered to this modality of teaching, in different fields of action, with positive results. An experimental study conducted in Spain with 169 physicians showed that the use of VLE to mediate on-line training in palliative care with professionals working in primary health care contributed to increasing the knowledge of participants[27].

The adherence of higher education institutions to new communication technologies allows them to distance themselves from conventional classrooms, as well as from daily physical contact with students, and opt for new methods of developing the learning process[25]. However, it should be emphasized that DE must be used according to the laws that regulate its operation, requiring constant evaluation of the effectiveness of the technologies used, which is paramount for the quality of the process.

A study carried out by the University of Brasilia (UnB) aimed at analyzing the efficacy of portfolios used in virtual learning environments called Moodle Portfolio (set of records of stages and phases, experiences as processes and products of online learning). The portfolios were supervised by teachers and tutors of the group registered in the research directory of CNPq under the name of *Laboratório de Educação, Educação a Distância e Promoção da Saúde – LEPS* [Education Laboratory, Distance Education and Health Promotion]. This virtual environment was available in all nursing undergraduate subjects[25]. The use of Moodle Portfolio revealed a significant degree of student satisfaction as it was considered an important tool for the teaching-learning process. The students showed commitment and responsibility, thus favoring relevant theoretical and practical contributions to the training of the future participants[25].

In the conception of nursing professors, undergraduate students and nurses, the Moodle VLE enables the exchange of experiences and active discussion about nursing practices in clinical situations, both with respect to the formal theories and to the subjective aspects of the themes involved in the care process, thereby considered extremely relevant as a tool for the context of permanent education[15].

Despite the many advantages exposed, there are some challenges in choosing DE. One of these refers to the fact that there is no teacher in charge and making demands, as in the conventional model, but a participatory management of the educational process. In this case, the interest and commitment of the student are crucial to the efficiency and benefits of teaching[25].

The development of a VLE is carried out by a multidisciplinary and specialized team, so that all available resources are harnessed and the environment is attractive and pleasant. Studies show that it is essential for nurses to participate in the development of DE-oriented information systems, and this participation must be active and aware, in order to emphasize the daily situations of the professional, considering verbal and non-verbal language appropriate to the context[28].

In addition to the students' posture, studies confirm that the tutor plays an important role in distance education in facilitating and structuring individual cognitive networks, which makes it possible to create spaces for the collective construction of knowledge between students and teachers. Tutors also exert a strong influence on students' performance and interaction[29,14].

For nursing information systems to act as positive agents for the profession, planning, organization, evaluation and analysis of the effective contribution are necessary[28].

Research performed after completing a distance course offered to nursing professors in the state of São Paulo found a significant improvement in the overall performance of the participants and, therefore, it is inferred that participation in this course had a positive impact on the knowledge of these professionals[27].

In the general context of the articles, evaluation of the teaching-learning process based on the use of information technologies in distance learning was carried out through the application of questionnaires with the target public at the beginning and end of each course or discipline and, therefore, the feedback from the participants of this teaching method was crucial to evaluate its effectiveness and possible need to improve the techniques used.

Study limitations

As a limitation of the study, it is noteworthy that no articles were identified that reported knowledge gaps related to the different forms of assessment that can be adopted to analyze the performance of the students involved in distance education in nursing.

Contribution to Nursing, health or public policy

The contribution of this study to the nursing area arises from the synthesis of the results described in the articles analyzed on the construction, use and evaluation of virtual learning technologies in the academic or hospital environment. This compilation can contribute to evaluate the current models of distance education, as well as favor the development of new proposals that aim to transform students, professionals or academics into active subjects.

CONCLUSION

DE has proven to be an effective teaching-learning strategy in the training of Brazilian nurses, mainly aiming to improve and complement traditional teaching, which favors the production and exchange of knowledge, as well as stimulating autonomy.

It is a method that allows teaching in different health scenarios and currently attends the need to constantly search for information. However, in order for this model of education to be considered truly efficient, it is essential to consider some fundamental factors: the quality of the contents offered and the establishment of an active teaching environment that allows interaction among the participants.

Thus, the present study achieved the proposed goal of analyzing the literature related to DE in nursing, in view of the interest in understanding how this process is currently occurring and consequently contributed to the formulation of quality distance education. This research has the potential to foster the production of further studies, which will highlight the different methods of analyzing the performance of participants in the teaching-learning strategy. In addition, the use of this education model should be expanded into other nursing contexts, in search of a possible standardization of this pedagogical methodology.

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