

Strategies for teaching evidence based practice in nursing education: integrative review

Estratégias para o ensino da prática baseada em evidências na formação de enfermeiros: revisão integrativa

Estrategias para la enseñanza de la práctica basada en la evidencia en la educación de enfermería: una revisión integradora

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This study aims to identify strategies for the teaching of evidence based practice in the different levels of nursing training. It is an integrative review carried out in the PubMed, CINAHL and LILACS databases. Studies in English, Portuguese and Spanish, published in nursing journals from January 2007 to October 2016 were included. Sixty-eight references were identified, and thirteen primary studies met the inclusion criteria. The teaching strategies identified were the mediation of the teaching-learning process in the practice scenario and strategies resulting from information and communication technologies, in addition to the reorientation of the educational matrix. The strengthening of the teaching-service integration, the training of Master and PhD nurses to act as consultants for the implementation of the EBP in health organizations, and the reflection on the teaching performance were presented as eminent contributions to the training of nurses of advanced practices. The evidences identified can support teaching alternatives for strengthening the training of nurses anchored in scientific knowledge. They can also support the discussion of the theme in the scope in Latin America and the Caribbean, where studies on this topic are incipient.

Descriptors: Evidence based nursing; Nursing research; Nursing teachers; Nursing education.

Este estudo tem como objetivo identificar estratégias para o ensino da Prática Baseada em Evidências nos diferentes níveis de formação dos enfermeiros. Trata-se de uma revisão integrativa, cuja busca ocorreu nas bases PubMed, CINAHL e LILACS. Foram incluídos estudos em inglês, português e espanhol, publicados em periódicos de enfermagem, no período de janeiro de 2007 a outubro de 2016. Foram identificadas 68 referências, e atenderam aos critérios de inclusão 13 estudos primários. Estratégias identificadas para o ensino foram a mediação do processo ensino-aprendizagem no cenário da prática e as estratégias propiciadas pelas tecnologias de informação e comunicação, além da reorientação da matriz educacional. O fortalecimento da integração ensino-serviço, a formação de enfermeiros Mestres e Doutores para atuarem como consultores para a implementação da PBE nas organizações de saúde, e a reflexão sobre a atuação docente apresentaram-se como eminentes contribuições para a formação do enfermeiro de práticas avançadas. As evidências identificadas podem apoiar alternativas de ensino para o fortalecimento da formação do enfermeiro ancorado em conhecimento científico consubstanciado; também, elas podem apoiar a discussão do tema no âmbito na América Latina e Caribe, onde os estudos sobre o tema são incipientes.

Descritores: Enfermagem baseada em evidências; Pesquisa em enfermagem; Docentes de enfermagem; Educação em enfermagem.

Este estudio tiene el objetivo de identificar estrategias para la enseñanza de la Práctica Basada en Evidencias en los diferentes niveles de formación de los enfermeros. Se trata de una revisión integradora, cuya búsqueda ocurrió en las bases PubMed, CINAHL y LILACS. Fueron incluidos estudios en inglés, portugués y español, publicados en periódicos de enfermería, en el periodo de enero de 2007 a octubre de 2016. Fueron identificadas 68 referencias, y atendieron a los criterios de inclusión 13 estudios primarios. Estrategias identificadas para la enseñanza fueron la mediación del proceso enseñanza-aprendizaje en el escenario de la práctica y las estrategias propiciadas por las tecnologías de información y comunicación además de la reorientación de la matriz educacional. El fortalecimiento de la integración enseñanza-servicio, la formación de enfermeros Maestros y Doctores para actuar como consultores para la implementación de la PBE en las organizaciones de salud, y la reflexión sobre la actuación docente se presentaron como eminentes contribuciones para la formación del enfermero de prácticas avanzadas. Las evidencias identificadas pueden apoyar alternativas de enseñanza para el fortalecimiento de la formación del enfermero anclado en conocimiento científico consubstanciado; también ellas pueden apoyar la discusión del tema en el ámbito en América Latina y del Caribe, donde los estudios sobre el tema son incipientes.

Descritores: Enfermería basada en la evidencia; Investigación en enfermería; Docentes de enfermería; Educación en Enfermería.

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INTRODUCTION

Evidence Based Practice (EBP) in Nursing supports clinical and managerial decision-making regarding the application of robust scientific research results to day-to-day practice. In general, the principles of Nursing care based on scientific evidence emerge in the care scenario in view of the need to better control costs, to increase the effectiveness of care through economic limitations, and also to guarantee the quality of health services provided and patient safety¹⁻³.

Nurses are expected to have the knowledge and skills to critically assess research, identify the best scientific evidence, and combine these results with their clinical expertise, patient preferences, and resources available in the health service contexts¹⁻⁴. Although being a conception normalized more than two decades ago by nursing associations in Anglo-Saxon countries - such as the *American Nursing Association* and the *American Association Nursing College* - this perspective is still incipient with regard to nurses in Latin American and Caribbean countries^{3,4}.

However, the implementation of EBP in Nursing represents a worldwide challenge¹⁻⁵, for it faces some dilemmas related to the nature of nursing research, the support given by health services for the implementation of EBP, and the competence of nurses to work with this practice^{3,6}. As nursing research is a production of knowledge that incorporates its own theories and socio-humanistic paradigms, it is mostly conducted through non-exclusive quantitative approaches or clinical trials²⁻⁹. Health organizations often do not provide quick and easy access to current nursing scientific literature, nor grant hours in the workload for the consumption of research and norms that support or institutionalize the incorporation of innovations in the process of nursing teams^{1-3,5,10}.

The limitations of the nurses' individual competence to implement EBP represent one of the most critical factors in this scenario. It is understood that the course of the action of incorporating scientific

evidence into the care practice involves attitudes beyond the presentation of alternative, scientifically safe interventions to individuals, families, and communities^{1-3,6,7}. It is a complex action that involves the critical judgment of nurses; knowledge of different research designs; acceptance of new interventions by the people assisted considering their beliefs and subjectivities; mobilization of the nursing team to change habits in their professional exercise; opinion of other categories directly involved in care, such as physicians; and identification of the availability of resources in the institution to support change^{1-3,6,7,10}. In this scenario, different skills are required from nurses in order to implement their role guided by EBP. Questions arise as to the habitual training of nurses, whether this has enabled theoretical-practical approaches to the dimensions that tune the complexity of EBP in this professional category.

However, the improvement of the qualification of the nursing professionals in their technical-scientific competence has been a topic of debate in the contemporary context, with respect to the creation of human resources in the health area^{2,4,11-13}. The stimulation to the use of research results and the approximation with the development of research is an activity to be fomented since undergraduate training^{11,12}. Besides this reality is the eminent need to induce, in Latin America and the Caribbean, a differentiated training of Nursing professionals to face the complex current demands in the health sector that emerge in a constantly changing society^{4,13}.

Ideally, professionals trained in this way would bring health care as close as possible to where people live and work, guided by specialized knowledge and critical thinking to choose and develop health products and processes based on scientifically sound and socially acceptable practices^{2,4,11-13}. It is also expected that innovative nursing professionals be a motivated agents to take on a transformational leadership^{5,10-12}. The International Nursing Council says that for the establishment of this professional profile,

i.e. the advanced practice nurse, educational training must go beyond the traditional scope, and points out the need to increase the degree of training, with levels beyond the baccalaureate such as a postgraduate master and PhD degrees^{13,14}.

In view of the contemporary challenges that require the inclusion of differentiated contents in the training, and the consubstantiation between the teaching and the experience of Nursing care based on scientifically based methods, technologies and practices, the question raised is: *What strategies can be undertaken to teach EBP at different levels of nursing education?*

There is a shortage of studies in contemporary literature reflecting on this theme from the perspective of the work of teachers, mainly due the incipience of the theme in the training scenarios^{15,16}. This study aims to identify strategies for the teaching of evidence based practice in the different levels of nursing training.

METHOD

This is an integrative review (IR), a methodological resource to gather, evaluate and synthesize scientific evidence in Nursing¹⁷⁻¹⁹. This method allows the inclusion of primary studies with different methodological approaches and research designs, not only randomized clinical trials as would be the case of a systematic review^{17,18}. An IR allows the critical evaluation of evidence and the characterization of the state of the art of the theme of interest¹⁷⁻¹⁹.

The present IR was conducted in the following stages: creation of the research question to guide the review; search for primary studies in the literature; extraction of data; evaluation of primary studies; interpretation of results and presentation of the review¹⁸. The research question for the review was: *What are the strategies used to teach EBP in the different levels of nursing training?* The PICO strategy was used to construct the question²⁰, being P taken from population (nurses at different levels of training) and I from intervention or area of interest (the teaching strategies of evidence based practice). The elements C (comparison

between intervention or group) and O (outcome) were not used.

The databases were PubMed (*National Library of Medicine National Institutes of Health*), CINAHL (*Cumulative Index to Nursing and Allied Health Literature*) and LILACS (Health Sciences of Latin America and the Caribbean). The controlled descriptors used in English for PubMed and CINAHL were [*Evidence Based Nursing*], [*Evidence based practice*], [*Associate degree nursing*]; and in Portuguese on LILACS: [*Enfermagem Baseada em Evidências*], [*Prática Clínica Baseada em Evidências*], [*Educação em Enfermagem*]. The following non-controlled descriptors in English were employed in the PubMed and CINAHL databases: [*Nursing Education, Associate*], [*Associate Nursing Education*], [*Associate Nursing Educations*], [*Education, Associate Nursing*], [*Educations, Associate Nursing*], [*Nursing Educations, Associate*]. And in Portuguese, the following non-controlled descriptors were used in LILACS: [*Ensino em Enfermagem*]. Descriptors were combined in different ways to ensure a thorough search for primary studies. The search took place in October 2016.

The analysis included studies published in English, Portuguese and Spanish, indexed in nursing journals, from January 2007 to October 2016, available in full length and presenting the description of strategies for teaching EBP. Reviews, editorial letters, and studies carried out in a specific unit or clinic were excluded. Regarding the populations investigated, primary studies that had the exclusive participation of assistance nurses or managerial nurses were excluded.

The first selection of primary studies was based on the reading, by independent peers, of titles and abstracts of the different reference lists identified in the databases. Then the surveys were thoroughly read in full length, also by independent peers. In this stage, studies that did not present the description of any educational strategy undertaken for the teaching EBP were excluded. Manual search in the references of the primary studies included in the survey

was also used. Studies that met the inclusion criteria delimited in the review were included.

The extraction of the data from the primary studies was made with an instrument used in the Brazilian literature²¹, and considered the following aspects: publication data (authors, year, journal and place of publication), objective, design, results and conclusion. The primary studies were classified according to evidence levels: level 1, meta-analysis of multiple controlled studies; level 2, individual study with experimental design; level 3, study with quasi-experimental design such as a study without randomization, with single group pre and post-test, time series or case-control; level 4, study with non-experimental design such as descriptive correlational and qualitative research or case study; level 5, case reports or data obtained systematically, of verifiable quality, or program evaluation

data; level 6, opinion of reputable authorities based on clinical competence or opinion of expert committees, which includes interpretations of information based on research, including regulatory or legal opinions²². The findings of the primary studies were organized into categories, according to the strategies adopted to teach EBP.

As for the ethical aspects, the specific information extracted from the articles was accessed through databases, not requiring authorization to use them because they were material belonging to the public domain.

RESULTS

The search resulted in 68 articles, with only three repetitions among the different sources. Thirteen primary studies met the inclusion criteria, none of which was included by manual search (Table 1).

Table 1. Bases consulted according to the amount of references retrieved, selected and primary studies included. Uberaba, Minas Gerais, Brazil, 2016.

Bases	Retrieved references	References Selected based on Titles and Abstracts	Primary Studies Included
PubMed	43	15	05
CINAHL	47	10	08
Lilacs	04	01	00
Total	94	26	13

As for the periodicals, the *Nurse Education Today Journal* (n = 3) and the *Journal of Professional Nursing* (n = 2) had the highest number of articles (Table 1).

Based in the synthesis of strategies identified for teaching EBP at different levels of nursing training, three categories were created: mediating strategies of the teaching-learning process, strategies mediated by information and communication technologies and strategies for reorientation of the educational matrix. Among the mediating strategies of the teaching-learning process, which include those that describe interventions to be implemented in the daily

activities of the teaching activity, the following were observed: discussion of clinical cases, collaborative projects between academia and the practice and reading scenario, analysis and critical review of articles (Box 2).

As for the strategies mediated by information and communication technologies, those related to the use of online environments as a driving force for the promotion of teaching EBP - the facilitation of virtual repositories of research and the dissemination of collaborative research networks - were the main aspects (Box 3).

Box 1. Characterization of the primary studies included regarding authors, year of publication, journal, study design, level of evidence and place of publication. Uberaba, Minas Gerais, Brazil, 2016.

Author(s)	Journal (year)	Design	Level	Place
Stone & Rowles ²³	Journal of Nursing Management (2007)	Exploratory descriptive	4	United States
Adams & MacCarthy ²⁴	The Journal of School Nursing (2007)	Theoretical study	6	United States
McNett, Fusilero & Mion ²⁵	Nurse Leader (2009)	Theoretical study	6	United States
Gray ²⁶	Nurse Education Today (2009)	Longitudinal descriptive	4	United States
Stiffler & Cullen ²⁷	Journal of Professional Nursing (2010)	Experience report	5	United States
Larmon & Varner ²⁸	Teaching and Learning in Nursing (2011)	Experience report	5	United States
Janke, Pesut & Erbacher ²⁹	Nurse Education Today (2012)	Experience report	5	Canada
Sortedahl ³⁰	Worldviews on Evidence Based Nursing (2012)	Experience report	5	United States
Zhang <i>et al</i> ³¹	Nurse Education Today (2012)	Pilot study	4	China
Buchholz <i>et al</i> ³²	Journal of the American Association of Nurse Practitioners (2013)	Theoretical study	6	United States
Debruyn, Ochoa-Marín & Semenik ³³	Investigación Educación Enfermería (2014)	Qualitative descriptive	4	Colombia
Hunker, Gazza & Shellenbarger ³⁴	Journal of Professional Nursing (2014)	Theoretical study	6	United States
André, Aune & Braend ³⁵	Nurse Education in Practice (2016)	Experience report	5	Norway

Box 2. Strategies identified for the teaching evidence based practice in the different levels of nursing training, corresponding to the category mediating strategies of the teaching-learning process. Uberaba, Minas Gerais, Brazil, 2016.

Mediating strategies of the teaching-learning process	Authors
To discuss, during traineeship sessions, clinical and managerial cases that allow the identification of a clinical question and the search for evidence to answer it	Stone & Rowles ²³ ; Zhang <i>et al</i> ³¹ ; André, Aune & Braend ³⁵
To create collaborative research and intervention projects among students and nurses in the practice scenario	Stone & Rowles ²³ ; Zhang <i>et al</i> ³¹ ; André, Aune & Braend ³⁵
To prepare scripts to guide students about the integration of scientific evidence into the care practice	Adams & MacCarthy ²⁴
To guide the development of skills on the writing of scientific articles and the oral presentation of research results	Hunker, Gazza & Shellenbarger ³⁴
To carry out activities that include the reading, analysis and critical review of scientific articles of different methodological delineations	Larmon & Varner ²⁸

In turn, strategies for restructuring of the educational matrix were those that addressed concepts to be included in Nursing curricula, such as the offer of complementary courses, the role of PhD nurses as

consultants, and the strengthening of partnerships between academic and assistance scenarios in the sense of increase the training of Advanced Practice Nurses (Box 4).

Box 3. Strategies identified for the teaching of evidence based practice in the different levels of nursing training, corresponding to the category of strategies mediated by information and communication technologies. Uberaba, Minas Gerais, Brazil, 2016.

Strategies mediated by information and communication technologies	Authors
To facilitate access to research by nursing students through, for example, information resources and databases	Sortedahl ³⁰ ; Debruyne, Ochoa-Marín & Semenic ³³
To disseminate research groups and collaborative networks of knowledge production and innovations to nursing students	Sortedahl ³⁰ ; Debruyne, Ochoa-Marín & Semenic ³³
To organize collaborative virtual spaces between nursing schools and/or universities so as to disseminate innovations, broaden the use of EBP and discuss difficulties for its teaching	Sortedahl ³⁰

Box 4. Strategies identified for the teaching of evidence based practice in the different levels of nursing training, corresponding to the category of strategies for restructuring of the educational matrix. Uberaba, Minas Gerais, Brazil, 2016.

Strategies for restructuring of the educational matrix	Authors
To offer complementary courses or subjects to give students the opportunity to experience the production and incorporation of research results into practice	Stiffler & Cullen ²⁷ ; Janke, Pesut & Erbacher ²⁹ ; Zhang <i>et al</i> ³¹ ; André, Aune & Braend ³⁵
To train PhD nurses to act as consultants in the development of research, evaluation and incorporation of their results in the practice of care, in hospitals or other health services	McNett, Fusilero & Mion ²⁵ ; Buchholz <i>et al</i> ³²
To incorporate in the curricula topics addressing steps for implementing EBP	Gray ²⁶ ; Larmon & Varner ²⁸ ; McNett, Fusilero & Mion ²⁵ ; Buchholz <i>et al</i> ³²
To strengthen partnerships between nursing schools/universities and health services	Gray ²⁶ ; Zhang <i>et al</i> ³¹ ; André, Aune & Braend ³⁵ ; Debruyne, Ochoa-Marín & Semenic ³²
To guide the pedagogical matrix for the Advanced Practice in Nursing in order to develop critical thinking and stimulate innovations to solve problems through a model of translational sciences that is collaborative and sensitive to sociocultural aspects	Stiffler & Cullen ²⁷ ; Janke, Pesut & Erbacher ²⁹ ; Zhang <i>et al</i> ³¹ ; André, Aune & Braend ³⁵

DISCUSSION

The studies indicated that the performance of nursing students in the practice scenarios is conducive to the approximation of scientific evidence to nursing managers and nursing teams of care units^{23,26,28}, especially when students develop research projects that have as their interface interventions that seek to solve problems identified in these scenarios.

In general, the projects were well accepted by the nursing teams, and the greatest contribution identified was the provision to workers of updated information on scientific investigations corresponding to topics that were related to clinical problems experienced in the care units^{23,26,28}.

The strengthening of the teaching-service integration was pointed out as a facilitating initiative for the greater feasibility of the teaching and the experience of EBP among Nursing students^{30,33}. However, this

integration must be guided by a curricular matrix that discusses EBP across the subjects on which the Bachelor's degree in Nursing is based²⁶⁻²⁸.

Such a curricular matrix should also offer specific complementary activities and courses, including online educational strategies³⁰ to make students experience this reality in the assistance scenarios, even if through simulations²⁸. Steps, guides and components for teaching the incorporation of scientific evidence into practice were outlined in other studies^{24,27,28,30}. The guiding components of these EBP teaching guides addressed and exemplified how to design the intervention proposal, define the keywords for the extraction of research, identify risks to the implementation of the new intervention, and evaluate the success achieved in the implementation of this new process among the nursing students^{24,27,28,30}.

The primary studies analyzed addressed the essential integration and strengthened teaching of EBP in Nursing post-graduation, and it is expected that the nurses whose training contemplates these elements become professionals with an expanded and consistent mastery in their competence to guide the implementation of EBP in care settings^{25,29,31,32,34,35}. In view of these propositions, further research is needed to verify how mediating strategies of the teaching-learning process and the use of information and communication technologies have been used to teach EBP in different places.

Through the advent of the *Internet*, collaborative virtual spaces between nursing schools and universities are presented as potentialities for higher education of EBP - with widespread access to the largest number of nurses possible, without geographical barriers.

In the context of Latin America and the Caribbean, in particular because these have an incipient production in the theme, it is inferred that the use of information and communication technologies represent resources to enable the expansion of this approach. It should be noted that timely access to specialized knowledge contributes greatly to training developments - having as an image the achievement of the training of Advanced Nursing Practice.

In training at the master and doctoral level, the scope of the profile of nursing professionals of advanced practices should be consolidated^{25,29,31,32,34,35}. The results presented help to highlight the main role that universities and nursing courses have in the differentiated training of these professionals. One of their permanent missions is to improve the quality of the services resulting from the provision of useful knowledge in a timely manner, initiatives that favor the application of the research results into care scenarios³⁷⁻⁴⁰.

Increasing the proximity between research and teaching-service has represented a complex and challenging goal. The production of research that may be articulated with the demands of care contexts

and, therefore, with their teaching, should potentially be supported by academic-institutional questions, as well as by the scientific and technological policies of a country³⁶⁻⁴⁰. A first step towards reconciling *research-teaching-care* was observed by the immersion of teachers and researchers in the health services, in a material-dialogical way, to broaden the framework of what they define as research questions⁴⁰⁻⁴².

In this perspective, the debate about new discoveries that must permeate the epistemological knowledge of Nursing and the teaching practice is crucial. Studies have pointed out that this practice presents gaps in the specific pedagogical training. Moreover, there is a disconnection between the teaching work and macro-contextual aspects, including policies that involve the creation of human resources in the health area, and a know-how that values mainly the practical experience^{41,42}. A research on how to maximize the learning of EBP among nursing students showed the transformation of teaching performance as the main enabler of reaching this condition, in association with macropolitical developments that can induce and sustain this transformation⁴³. On the other hand, policies for hospital accreditation have led to teaching-service integration⁴⁴.

On the other hand, from the perspective of Nursing students, research studies identified that when students evaluate whether training centers have made possible the effective teaching of EBP, they mention a significant gap in this training approach, and it is difficult to identify scientific evidences that are relevant to support practical changes both because of lack of research and because of poor ability in the critical judgment of these evidences.

The guidelines for the use of computational resources - identification of Boolean descriptors and proximity with databases of scientific literature on Nursing - were one of the main difficulties mentioned⁴⁵⁻⁴⁸. However, the training of reflective nurses with critical thinking capable of making complex decisions and seeking support on scientific evidence is an

increasingly pressing demand before current health demands^{49,50}.

Regarding the limitations of this review, other primary studies could be included through search in other databases. Yet, the main databases in health (PubMed) and nursing (CINAHL) were selected, although it is necessary to highlight the scarcity of investigations taking teaching strategies to overcome the challenges related to EBP as a starting point. Such scarcity is the main feature that indicates the relevance of the present study, especially when considering the little production of Latin American and the Caribbean countries, in contrast to the largest production in countries of the Northern Hemisphere.

Because the implementation of EBP is challenging worldwide, further research is needed on how nursing training has been developed for this practice. It is necessary to identify in special curricular designs that support this training guided by critical thinking.

It is also essential to discuss, in the contemporary scenario, methodologies that would best support the critical-reflexive preparation of nursing professionals, grounded on EBP. Therefore, it is necessary to develop prospective studies that evaluate the impact of incorporating these strategies into the training either in curricular subjects or in activities that are close to the working world, and their impact on the quality of the assistance provided.

CONCLUSION

The analysis of the knowledge produced on strategies for teaching EBP at different levels of nursing education made it possible the identification of strategies in the direct mediation of the teaching-learning process, propitiated by information and communication technologies to restructuring the curricular educational matrix.

Despite the limitations of this review, especially regarding the number of primary studies found, the presented evidence may be useful to discussions on the theme, as well as to support the guidance of alternatives of teaching strategies for the strengthening

nursing training of advanced practices, anchored in substantiated scientific knowledge.

We recommend future scientific research addressing the difficulties of the faculty in teaching EBP, the existing policies to support this process, the evaluation of the service-teaching integration with a view to strengthening EBP, and the larger implementation of these strategies and the results achieved along with nursing students, especially in Latin America and the Caribbean, where studies on the theme are incipient.

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CONTRIBUTIONS

Fernanda Carolina Camargo worked in the design, data analysis, writing and critical review. **Helena Hemiko Iwamoto, Gilberto de Araújo Pereira** and **Regiane Máximo de Souza** contributed in the critical review. **Luan Augusto Alves Garcia** participated in writing and critical review. **Damiana Aparecida Trindade Monteiro** contributed to data collection and critical review. **Sabrina Karla de Souza Cubas** and **Gabriela França Rosinha** participated in data collection and writing.

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