

Degree in Nursing: education through problem-based learning

Graduação em enfermagem: ensino por aprendizagem baseada em problemas

El grado en enfermería: la enseñanza-aprendizaje con base en problemas

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ABSTRACT

Objective: To describe how undergraduate courses in Nursing are using the problem-based learning (PBL). **Method:** Integrative literature review, from searches in the databases Education Resources Information Center (ERIC), Latin American and Caribbean Health Sciences Literature (Lilacs), and PubMed, from 2010 to 2015. 36 articles were analyzed. **Results:** A teaching method used in all continents, the PBL enables improvement of the critical thinking, autonomy, motivation for learning, active search attitude, ability to work in teams, and problem-solving. Difficulties and challenges relate to the training of students and teachers to understand the principles of the method. **Final considerations:** The benefits of PBL coincide with the needs of nursing training, but its applicability demands constant review in seeking to develop the skills necessary for this training. **Descriptors:** Problem-Based Learning; Nursing Education; Higher Education; Teaching; Curriculum.

RESUMO

Objetivo: Descrever como os cursos de graduação em enfermagem estão utilizando a aprendizagem baseada em problemas (ABP). **Método:** Revisão integrativa da literatura, a partir de buscas nas bases de dados Education Resources Information Center (ERIC), Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs) e PubMed, no período de 2010 a 2015. Foram analisados 36 artigos. **Resultados:** Método de ensino utilizado em todos os continentes, a ABP possibilita a melhoria do pensamento crítico, da autonomia, da motivação para a aprendizagem, da atitude de busca ativa, da capacidade de trabalhar em equipe e de resolver problemas. As dificuldades e desafios referem-se à capacitação de estudantes e professores para compreender os princípios do método. **Considerações finais:** Os benefícios da ABP coadunam as necessidades da formação do enfermeiro, mas sua aplicabilidade demanda revisão constante na busca de desenvolver a competência necessária a essa formação. **Descritores:** Aprendizagem Baseada em Problemas; Educação em Enfermagem; Educação Superior; Ensino; Currículo.

RESUMEN

Objetivo: Describir cómo el grado en enfermería está utilizando el aprendizaje con base en problemas (ABP). **Método:** Revisión integrativa de literatura, desde búsquedas en las bases de datos Centro de Información de Recursos de Educación (ERIC), Literatura Latinoamericana y Caribe en Ciencias de la Salud (Lilacs) y PubMed, en el período entre 2010 y 2015. Se analizaron 36 estudios. **Resultados:** Utilizado en todos los continentes, el método de enseñanza ABP permite la mejora del pensamiento crítico, la autonomía, la motivación para el aprendizaje, la actitud activa para búsqueda, la capacidad de trabajar en equipo y la solución de problemas. Las dificultades y desafíos se refieren a la capacitación de los estudiantes y profesores en la comprensión de los principios del método. **Consideraciones finales:** Los beneficios del ABP se adaptan a las necesidades de formación de los enfermeros, pero la aplicación del método necesita constante revisión para que se desarrollen las habilidades necesarias para esta formación. **Descriptorios:** Aprendizaje con Base en Problemas; Educación en Enfermería; Educación Superior; Enseñanza; Plan de estudios.

INTRODUCTION

Following a global trend in care transformations, Brazil initiated profound changes in the field of Health after the creation and dissemination of the Unified Health System (SUS) principles and guidelines, imposing great challenges to its professionals and training institutions since acting in this direction demands a different path than the disease- and hospital-centered health care. The pedagogical issue was not always valued as a necessary area of knowledge for the teaching-learning process in the Health field, hampering the development of changes based in innovative educational assumptions in the professional training⁽¹⁻²⁾.

Aiming at meeting the new social demands, the Law no. 9,394/1996 established the guidelines and bases for national education, which represents an important milestone to promote the reformulation of teaching. In it, the ideas of Piaget, as well as those of Vygotsky and Wallon, were revalued from the interactionist conception advocated by them, that is, the idea that knowledge is a result of the action that takes place between subject and object⁽²⁾.

Some educators, in an attempt to rescue the relevance assigned to historically accumulated knowledge, unleashed the movement of critical pedagogy, which gained momentum in the early 1980s. Originally used by the Frankfurt School, this movement currently houses a broad spectrum of philosophical reflections, with some differences in their conceptual bases. All of them, however, share the idea the school is the place to deal with social contradictions and discuss the reality, and that the decision on what to get to know depends on social needs. All aim at overcoming the dichotomy "intellectual work/manual work" and their proposal is to educate the man for and through work⁽³⁾.

Dewey (1859-1952) had his pedagogical thinking disseminated worldwide by advocating that education has an important role in the sociopolitical field and that training must be provided with a modern, scientific mentality, open to collaboration. His philosophy is evidences in the active exchange between subject and nature, which transforms both and remains open and exposed to successive crises. Each crisis is marked by the imbalance, which requires reflective thinking for balance reconstruction⁽⁴⁾. In Brazil, this movement is strengthened in the figure of Paulo Freire, who proposes the pedagogy of dialogue to develop a critical awareness of reality⁽⁴⁾.

In the face of such assumptions, the National Curriculum Guidelines of the Undergraduate Course in Nursing (DCN/ENF), defined in 2001, suggest the use of active learning method for contributing to the construction of a broader and comprehensive logic of care. This represents a great challenge, considering its scope and the lack of professional preparation to act according to such logic⁽⁵⁾. More than 15 years after its application, the institutions still traipse between advances, difficulties, and challenges, mainly related to the institutional structure and the preparation of teachers to implement such changes. Furthermore, over these years, difficulties were identified regarding the lack of clarity in the modus operandi of aspects proposed by the guidelines⁽⁶⁾. Thus, the Brazilian Association of Nursing initiated a movement aimed at a new formulation of the guidelines, with the purpose of providing greater objectivity and direction to nursing training, reinforcing its agreement with SUS principles and guidelines⁽⁷⁾.

Different teaching and learning methods are being used in this perspective, varying according to purpose, complexity, and cost. Among them, the problem-based learning (PBL), team-based learning (TBL), distance education (EAD), and simulation are highlighted⁽⁵⁾.

The PBL was proposed by Barrows in the 1960s and established at the Faculty of Medicine of the McMaster University, in Canada. Shortly after, it was adopted at the University of Maastricht, in the Netherlands. Supported by the Theory of Inquiry, of John Dewey, it is founded in a constructivist perspective especially based on the Piagetian pedagogy⁽⁴⁾. From the approach of philosophical principles underlying the PBL, one can argue that this form of learning cannot be treated as a mere technique, as it involves a change of posture in the face of the process. The concepts of questioning and dialogue, proposed by Freire, are considered essential to its development⁽⁸⁾. It should be added that this is a global trend, as there is a greater valuation of the development of professional skills from the practice due to its greater possibility of connection different abilities, such as the affective, cognitive, and psychomotor skills⁽⁹⁻¹⁰⁾.

Given the exposed, this study starts from the consideration that PBL is an active learning method, composed of important features for meeting the current needs of professional training. This method has been more frequently used in Medicine courses; in Nursing courses, however, its use is still little known and emphasized.

OBJECTIVE

To describe the PBL as it has been used in undergraduate courses in Nursing, from an integrative literature review.

METHOD

This is an integrative literature review (ILR), recognized as an important way to synthesize the knowledge produced on a particular phenomenon⁽¹¹⁻¹²⁾.

Five steps were proposed for performing this study⁽¹²⁾. The first, which refers to the problem formulation and to the selection of research question or hypothesis, was thus defined: how has the PBL been used in undergraduate courses in Nursing? In the second step – literature research –, the databases with the greater possibility of finding bibliographic material worldwide about the information sought were defined. Namely: the databases *Education Resources Information Center* (ERIC), *Virtual Health Library* (VHL) e *PubMed*. On them, the descriptors *problem-based learning* and *Nursing* were used, limited to articles in English, Portuguese, and Spanish published from 2010 to 2015. The search was carried out in February 2016. Articles that had no relation to the question of the study, literature review articles, theoretical reflections, and those that did not deal with teaching in undergraduate courses in Nursing were excluded. In total, 36 articles were analyzed, as observed in Figure 1.

In the third step (data evaluation), the articles were characterized, identifying the journals that most published on the subject, the country in which the studies were conducted, the type of study, the level of evidence, and the participants of the studies analyzed. The survey of the objectives and key results allowed answering the guiding questions. In the fourth step, several readings of the data

contained in the annotations were held, aimed at constructing the categories and analyze them critically. Results and discussion are presented following, making up the fifth step.

To define the level of evidence of the bibliographic material used, the hierarchy elaborated by the University of Arizona College of Nursing in a partnership Center for Innovation in Health and Nursing for the Advancement of Evidence-Based Practice, as follows:

- Level I – Systematic review or meta-analysis studies;
- Level II – Randomized studies and controlled clinical trials;
- Level III – Controlled clinical studies without randomization;
- Level IV – Case control study or cohort study;
- Level V – Systematic review of qualitative and descriptive studies;
- Level VI – Qualitative or descriptive study;
- Level VII – Study of opinion or consensus⁽¹³⁾.

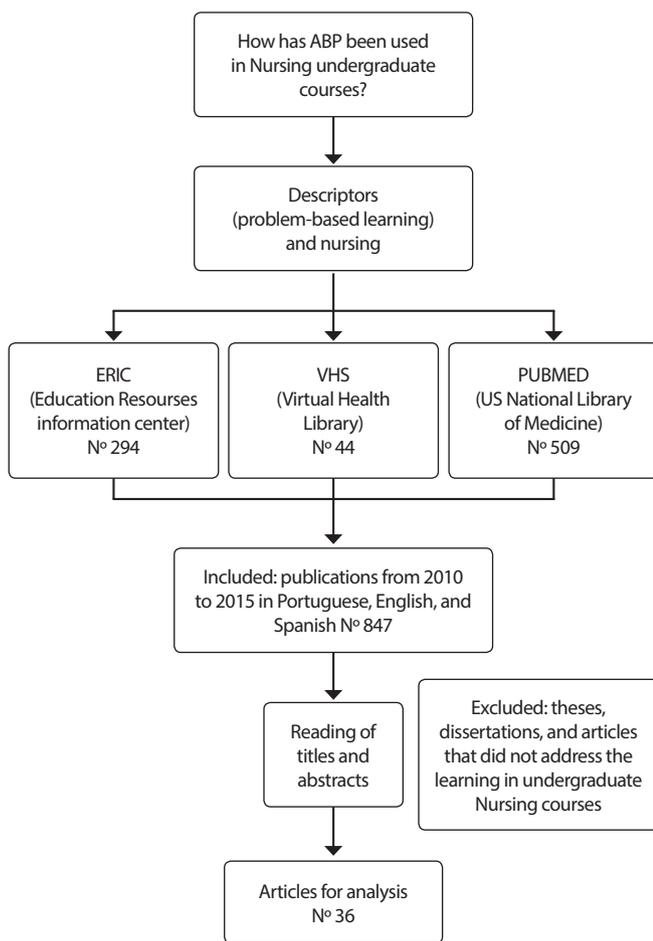


Figure 1 – Article selection flowchart

RESULTS

In Table 1, one can see that 16 (44,5%) of studies on PBL are published in the journals *Nursing Education Today*, *Nursing Education in Practice* and *Journal of Nursing Education*. Of the studies analyzed, 21 (58.5%) were conducted in China, Spain, Korea, or Canada, although we have found research on the topic in different parts of the world, covering most continents. Most studies – 28

(76.7%) – were held with students. Considering the year of publication of the articles, there were similarities as to the number of articles/year in the period analyzed. Regarding the type of study, there was a higher prevalence of the qualitative model, followed by descriptive quantitative and quasi-experimental studies, and the first two types fit in the hierarchy as level IV evidence.

The studies analyzed indicate that the use of PBL is still relatively uncommon in nursing education and this method has been used experimentally, involving only one curriculum subject, module, or topic. Others show that the PBL is incorporated into the curriculum structure and, yet, there are those that use it in association with other active education strategies or backed by some theory.

One can note, in Chart 1, that this teaching method mainly improves the critical thinking, knowledge, autonomy, and satisfaction with learning, developing the skill of active search, the ability to work in teams, the motivation, and the problem-solving ability. As negative points, there were, among other aspects, the fact this is a time-consuming and stressful process and the difficulty of adaptation of students and facilitators. Challenges refer to the preparation of students and teachers, the cultural issues involved in the method acceptance, as well as the need for constant additions of complementary strategies.

Table 1 – Percentage distribution of the articles according to the journal, country of publication, type of study, and participants, Marília, São Paulo, Brazil, 2016

VARIABLES	n	%
Journal		
Nursing Education Today	09	25
Nursing Education in Practice	04	11.2
Journal of Nursing Education	03	8.3
Revista Latino-Americana de Enfermagem	03	8.3
Others	17	47.2
Total	36	100
Country of study conduction		
China	07	19.5
Spain	07	19.5
South Korea/North Korea	04	11.2
Canada	03	8.3
Brazil	03	8.3
Australia	02	5.5
United States	02	5.5
Others (Hungary, Thailand, Turkey, Iran, Guyana, South Africa, Sweden, Malawi)	08	22.2
Total	36	100
Type of study/Level of evidence		
Qualitative/VI	12	33.4
Quantitative and descriptive/VI	08	22.3
Quasi-experimental/ III	05	13.9
Experimental/ II	03	8.3
Case report/ VI	03	8.3
Mixed method/VI	03	8.3
Cohort study/IV	02	5.5
Total	36	100
Study participants		
Students	27	75
Graduates	02	5.5
Facilitators/tutors and students	07	19.5
Total	36	100
Year of publication		
2010 – 2011	13	36.1
2012 – 2013	11	30.5
2014 – 2015	12	33.3
Total	36	100

Chart 1 – Distribution of positive and negative points identified in the results of the studies analyzed, N=36, Marília, São Paulo, Brazil, 2016

Positive points
<p>Improved critical thinking⁽¹⁴⁻²²⁾. Increased satisfaction with the learning process^(16,20). Improved self-efficacy⁽²⁰⁾. Achieving better grades in the final exam⁽²³⁾. Greater theoretical knowledge⁽²³⁻²⁴⁾. Better skills in practical activity⁽²³⁾. Expanded ability to seek knowledge by themselves^(15,17,19,25). Improved ability to take care of the patient in a holistic manner⁽¹⁵⁾. Improved ability for interdisciplinary/group work^(15,22,24,26-29). Expanded ability to lead and deal with conflicts⁽³⁰⁾. Increased social responsibility^(19,31). Development of the ability of active participation⁽¹⁹⁾. Improved problem-solving ability^(14,22,32-33). Improved motivation for learning^(24,32,34). Improved understanding of educational objectives^(27,35). Improved ability for involvement with directed evidence-based practice^(14,21,26). Positive impact on the attitude, confidence, and interpersonal collaboration⁽³⁴⁾. Improved performance⁽³⁶⁾. Expanded curiosity⁽³⁷⁾. Development of the ability to be with the other⁽²⁷⁾. Improved integration between theory and practice^(27,38). Improved autonomy for decision-making^(32,39). Autonomy in constructing knowledge^(25,39). Stimulus to the sense of responsibility⁽³²⁾. Increased ability to assimilate the contents^(38,40). Improved student-teacher relationship⁽²⁴⁾. Makes students able to interconnect knowledge and previous experiences⁽²⁵⁾. Favors the integration between basic and clinical cycles and between biopsychosocial dimensions⁽²⁹⁾. Development of the ability to make and receive criticism⁽²⁹⁾. Increased metacognition⁽³⁰⁾. Improved creativity⁽³⁰⁾. Improved self-regulation⁽³⁹⁾.</p>
Negative points
<p>Process adaptation marked by confusion and negativity⁽²²⁾. Lengthy process^(32,41). Greater workload⁽⁴¹⁾. Stressful process⁽⁴¹⁻⁴²⁾. Vague information⁽⁴¹⁾. Unclear objectives⁽⁴²⁾. Boring tutorial process, with little participation of the tutor⁽⁴²⁾. Requires domain over computer resources⁽⁴²⁾. Controlling facilitators/tutors⁽⁴³⁾. Insufficient theoretical knowledge⁽⁴²⁾. Students feel lost in the pursuit of knowledge⁽³²⁾. Changes generate insecurities⁽³¹⁾. Lack of questioning on the part of the students⁽²²⁾.</p>
Challenges
<p>Proper preparation of educational environments^(22,38). Preparation of teachers and students to incorporate the principles^(22,38). Interference of cultural aspects^(42,44). Need for constant additions of complementary strategies⁽⁴⁵⁾.</p>

DISCUSSION

One-third of the studies analyzed is published in nursing journals aimed mainly at education, showing the importance of journals that work specifically with this topic in meeting the demand for the dissemination of this line of research. Most studies were conducted with students, what seems to be justified by the fact they are the main actors in the learning process. Although studies on the use of PBL in undergraduate courses in Nursing were found in various countries, showing the global concern with new approaches on the teaching-learning process, they

have a low level of evidence, indicating that this use must be enhanced and emphasized more consistently⁽¹³⁾.

Studies indicate the use of PBL is specific subjects, modules, or topics. Its use is found in the training of students for cardiopulmonary arrest (CPA)⁽²³⁾; in the subject of medical-surgical nursing⁽⁴⁶⁾; in pediatrics⁽⁴²⁾; in the subject of ethics^(18,34); in teaching the cardiopulmonary system⁽⁴⁰⁾; in the subject of basic care in nursing⁽²⁷⁾ and surgical center nursing⁽²⁴⁾; in the teaching of nursing diagnosis⁽¹⁷⁾; in the academic subject of Health Management⁽²⁵⁾; in the first period of a course⁽³⁰⁾; in the teaching of anatomy and physiology⁽³⁸⁾; in the module of reproductive health⁽³⁹⁾; and in the care to children with bronchitis⁽⁴⁵⁾.

In a course using a traditional teaching method, a study was conducted to compare the PBL and the *5E Learning Cycle Model*, a model that has aided students in the learning of scientific evidence of fundamental concepts. Authors of this study claim that, through PBL, it is possible to improve knowledge, attitude, interest, and scientific reasoning, especially when compared to other methods⁽²⁰⁾.

Other studies, conducted in Thailand and China, sought to highlight the adaptation and perspective of students regarding PBL, respectively. It should be noted that, in these countries, the use of this teaching method is fairly recent^(22,41). In Thailand, for instance, although the PBL is in accordance with government initiatives to improve nursing education, it is not yet widely used⁽²²⁾. Similarly, the implementation of PBL in the Republic of Malawi, initiated in 2002, has been very slow throughout the country⁽⁴⁷⁾. In South Africa, the incorporation process of the method was problematic, especially regarding facilitators, who did not accept well the students' decision-making in the planning, implementation, and evaluation of activities⁽⁴³⁾.

The understanding of philosophical aspects and new roles assumed by teachers and students is considered essential for the PBL

development. Thus, a well-structured training program of teachers and students is required in the transition or implementation of PBL, in addition to structural investments, since it leads to work with small groups, meaning that information sources must be of easy access^(14,47).

Authors who studied the McMaster University, a pioneer in the implementation of PBL in Nursing and Medicine courses, state that from 1995 a collaborative network was formed between the university and the nursing schools of Mohawk and Conestoga, which started to have the PBL as a guideline in their curriculums. This movement is systematically accompanied by evaluations that indicate possible inconsistencies⁽⁴⁸⁾. Hence, strategies were

established to fill gaps left by the method, including extensive guidance for courses using the PBL, the description of a guide for facilitators, and preparation of students as to the theory and practice of PBL, based on its philosophical principles⁽⁴⁸⁾.

It appears that, in addition to the care relating to method implementation, the entire process must be followed, as the fact it is structurally organized does not guarantee its efficiency. In addition, one can get better results by appending new elements to the PBL. One could mention, for example, the study that showed the results of the integration between PBL and the simulation, favorably assessed by students⁽⁴⁰⁾.

From the idea that critical thinking and creativity are essential skills for the nurse training, a course that develops the PBL in its curriculum incorporated several other activities aimed at making progress in these aspects. Were added to the PBL the music composition, the writing of poems, and the use of role plays⁽³³⁾.

In a different path, a nursing course in Turkey, in which the PBL was introduced in 1999, performed modifications due to the inadequate number of tutors: the sessions in small groups are used to discuss the problem and raise learning issues, interspersed with sessions in large groups for the discussion of research and self-learning⁽³⁵⁾. Studies comparing courses with PBL curriculum and traditional methods showed significantly better results than those who used only the PBL^(14, 21, 38, 43).

An aspect highly valued in the articles is the critical thinking. Some studies focused on checking how the PBL contributed to this^(14, 22, 26, 46). In this perspective, the use of PBL was compared to the use of traditional lecture-based learning⁽⁴⁹⁾. A course that uses the PBL was proposed to discuss its progress regarding critical thinking⁽²³⁾. In Korea, courses that use or not the PBL were compared to highlight its contributions to critical thinking⁽¹⁴⁾. We add that the ability of professionals to maintain a high level of vigilance and clinical judgment requires, in addition to critical thinking, problem-solving and communication skills⁽⁴⁹⁾.

Critical thinking and creativity and the two main expected results of the PBL. Creativity is important to explore the different possibilities of a solution to a clinical situation, aiming at a quality nursing care⁽⁴⁸⁾. The active search of knowledge is another indispensable element in the professional training for the present since the knowledge is in constant progress and practical situations are complex, requiring creative and current solutions. For the same reasons, teamwork learning is another advantage attributed to the PBL. In addition, the method includes learning from real situations, allows the reflection in different dimensions, and integrates the contents, replacing the fragmented knowledge offered by the academic subjects, which allows an integrative and expanded approach^(15, 27). In summary, the positive points

meet the assumptions of professional training given in the curriculum guidelines for Nursing courses in Brazil, as well as in other countries over the world.

As for the negative points, one can see that the PBL process is slower than the traditional method^(32, 41). Therefore, for students and teachers used to traditional methods, one must first understand the philosophical principles underlying the PBL, demanding preparation from these actors. For those courses that already employ the method for a longer time, constant review and addition of new strategies are required to maintain its effectiveness⁽⁴⁸⁾.

Study limitations

This study has as limits the fact it worked only with articles in English, Portuguese, and Spanish and the predominance of studies with low level of evidence among those articles found.

Contributions to the field of Nursing

Results of this study contribute to reflections about the training of nurses at a time when class bodies, especially the Brazilian Association of Nursing, have been carrying out discussions aimed at new forms of teaching in Nursing courses, to break away from traditional teaching methods through the implementation of innovative proposals.

FINAL CONSIDERATIONS

The integrative review enabled the construction of a synthesis of the scientific knowledge about the PBL used in the training of nurses, in the perspective of world literature. Initially, it is postulated that the studies analyzed present low scientific evidence, indicating the need for in-depth studies on the topic.

We could conclude this is a teaching-learning method used worldwide as an alternative to the traditional teaching method. Nevertheless, in undergraduate courses in Nursing, its use is still limited and recent. Many of the articles analyzed depict the experimental use of PBL, typically comparing it to the traditional teaching method. Some articles addressing courses that use the PBL for longer indicate the need for its continuing review, as well as its association with other strategies to strengthen the essential elements for training, such as creativity and critical thinking.

The use of PBL is marked by aspects regarded as positive, which are in accordance with the requirements placed on professional training for the present, dealing with complex situations, diversity, and uncertainties. Despite the indications of the importance of its use, its application must be constantly and systematically monitored.

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