

# Evaluation of Learning and Competence in the Training of Nurses

REVIEW

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## Abstract

**Introduction:** health education becomes a more complex process since it aims to ensure the training of professionals with the knowledge, skills, attitudes and values necessary for their performance. Thus, the adoption of strategies that allow the integral evaluation of the competence is required.

**Objective:** to analyze the scientific evidence about the evaluation of learning and competence in undergraduate nursing education.

**Method:** An integrative literature review with online search in LILACS, MEDLINE, Web of Science, SCOPUS and CINAHL databases, through the following descriptors: Competence-Based Education, Nursing Education, Learning, and Assessment.

**Results:** The 18 articles selected and careful read had a synthesis and critical analysis, identifying the following thematic categories: the concept of competence; essential competence to the training of nurses; learning strategies; and evaluation. It was evidenced that, despite some polysemy around the term competence, the concept presented more similarities than differences and the nursing competence identified are similar to those recommended by the National Curricular Guidelines. It was also observed the emphasis in the learning strategies in simulated settings, and there are doubts about methods and the construction of evaluation tools.

**Conclusions:** The evaluation of learning and competence continues to be a challenge for nursing educators, and it is recognized that there are difficulties in this process. Therefore, the development of reliable evaluation tools based on criteria and indicators that can verify the performance of the student in action and their earliest possible approximation to real learning scenarios are necessary.

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## Keywords

Competency-Based Education; Education; Nursing; Learning; Evaluation.

## Introduction

In times of changes in society, which are mediated by globalization with reflexes in the field of education, competence education appears as a trend in the training of professionals in all areas. In education, there are common bonds in the sense that "any competent action implies the use of knowledge related to skills and attitudes" [1] and this competence implies the "sum of knowledge, skills, and attitudes that allow the professional to make the appropriate decisions in each case and each situation" [2].

It is known that the health education becomes a more complex process since it aims to ensure the training of professionals with the knowledge, skills, attitudes and values necessary for their performance, through the adoption of strategies that allow the integral evaluation of this competence. In this scenario, the development of competencies in the training of health professionals is shown as an innovative perspective in the training of health professionals, not only to encourage a critical reflection but also to be able to respond to the demands imposed by the current scenario of social changes and favor the development of citizenship [3].

In the area of nursing, the National Curricular Guidelines (DCNs) [4] point out competencies as being fundamental aspects for the conformation of the pedagogical projects and curricular structures of the nursing courses, becoming the guiding axis of the training of nurses in Brazil, since 2001 [5]. In this context of formation, it is worth mentioning that the term competency is notably polysemic and controversial, an indisputable fact in the national and international literature, placing education by competence as a broad and complex process [5-6]. In general, it develops as "an integrated combination of knowledge, skills, and attitudes consistent with adequate and timely performance in diverse contexts" [7].

Thus, it is necessary for the Brazilian training institutions to guarantee their graduates the acquisition of the essential competence for their performance in the context of the current Unified Health System (SUS), in order to meet the health demands of the population, as well as to contribute to the organization and excellence of health-care services. Thus, learning and specifically the evaluation process in the competence-based approach needs to be a mediating mechanism that motivates the future professional and helps them during their training.

With this, he/she will be able to master and incorporate the essential skills (knowledge, skills, and attitudes) and know how to act and know how to be in the situations arising from the work world. Competence also understood as general skills, "become increasingly relevant to the preparation of the professional and their role regarding employability and citizenship" [8].

Thus, understanding the way in which learning and assessment are placed at the current center of discussions about competence-based nursing, undergraduate courses denotes the importance of this integrative literature review in order to seek the evidence that direct the pedagogical practices and their results in the students' performance and, therefore, in the formation of the professional.

Even there is already a scientific production on the evaluation of learning in competence-based education; it is known that studies on the validation of assessment instruments are still scarce [9]. For this reason, it is understood to be relevant the dissemination and/or discussion of the process of evaluation of learning in the conception of education by competence, with the purpose of elucidating strategies more adequate to the measurement and the scope of the essential skills to the training of the nurse professional.

It is believed that the evaluation of learning and competencies contributes to the improvement of

nurses' training. This proposition guides this study, whose objective is to analyze the scientific literature evidence related to the evaluation process of learning and competence in the professional training of nurses.

## Method

This is an integrative review (RI) study, whose purpose is to integrate the synthesis of knowledge and to incorporate results of previous research that are meaningful to the practice, [10] thus providing a broad and consistent picture of the problems of interest to nursing. Therefore, the study involved six steps, namely: (1) formulation of the guiding question; (2) search or sampling in the literature; (3) data collection; (4) critical analysis of selected studies; (5) discussion of results and (6) presentation of the review [11].

After defining the question "what scientific production on the evaluation of learning and skills in nursing undergraduate courses", the literature was searched between October and November 2015, conducted by two independent reviewers, as recommended, in the following databases: LILACS (*Latin American and Caribbean Literature in Health Sciences*); MEDLINE (*Medical Literature Analysis and Retrieval System Online*); Web of Science (*Thomson Scientific/ISI Web Services*); SCOPUS and CINAHL (*Cumulative Index to Nursing and Allied Health Literature*), accessed through the CAPES Portal of Journals, including publications from January 2005 to July 2015. This temporal limitation is justified because of the greater collection of national publications on the subject, given the promulgation of the DCNs for the undergraduate nursing course in Brazil in 2001.

The Descriptors in Health (DECs) and MeSH (Medical Subject Headings da U.S. National Library of Medicine – NLM) were used: "Education Based on Competences", "Nursing Education", "Evaluation" and "Learning" with their respective synonyms in

English and Spanish, using cross-referencing between the descriptors and the "AND" Boolean operator for the controlled search.

The inclusion criteria used were: publications that addressed the theme and/or answered the guiding question, available in Portuguese, English and/or Spanish and free full text access, in the searched databases; the criteria of exclusion were articles repeated in more than one base, those in abstract format, letters to the editor, articles of reflection, monographs, dissertations and theses.

A guide instrument was developed for the extraction, organization and tabulation of the data for the selected articles constituting the sample, including, in a summarized way: identification of the article (title, reference, year and place of study), study objective, methodological aspects (research design) and main results.

The critical analysis of the synthesis of the results of this integrative review took into account the thematic aspects and the design of the research [12-13] and the attendance to the guiding question of the study, integrating them with the knowledge produced. Thus, three thematic categories of interest for this study were identified: the concept of competence, the professional competence essential to the training of nurses, and the conceptions and strategies of learning and evaluation adopted in nursing undergraduate courses descriptively presented.

## Results

The results achieved in this review are shown in tables through their numerals. **Table 1** shows the number of articles obtained in each of the databases searched and the selection of the final sample consisting of 18 scientific articles. No studies were found in the CINAHL database.

In turn, **Table 2** below characterizes the studies included in the review, containing information on the title, reference, year/place of publication and objective of the study.

**Table 1.** Number of articles according to the Database, in the period 2005-2015. Natal/RN, Brazil, 2016.

Database	Articles found	Available articles	Selected articles	Articles read in full	Concordance between the evaluators and final sample
LILACS	3	2	2	2	2
PUBMED/MEDLINE	162	2	2	1	1
Web Of Science	491	137	14	6	6
Scopus	148	45	45	10	9
Total	804	186	63	19	18

Source: Integrative review research. Natal/RN, Brazil, 2016.

**Table 2.** Characterization of selected studies, according to the title, reference, year/place and objective of the study. Natal/RN, Brazil, 2016.

Title	Year	Place	Objective of the Study
References to teaching competence in nursing [14].	2005	Brazil	To bring pedagogical references for the implementation of a project of teaching by competence in the training of nurses.
Developing a competency-based curriculum in HIV for nursing schools in Haiti [15].	2008	Haiti	To create an HIV/AIDS competency-based curriculum to be integrated into the four-year bachelor's program of four national nursing schools.
Developing Competence for Nurses and Social Workers [16].	2008	USA	To demonstrate in the literature the competencies of the nurse and the social worker in supporting family caregivers
¿Quiénes y qué pueden hacer en salud pública? Las competencias profesionales como base para la elaboración de programas en el Espacio Europeo de Educación [17]	2009	Spain	To establish a reference framework to organize public health education in Spanish university degrees according to the European Higher Education Area Guidelines.
Nursing teaching planning: educational intentions and clinical skill [18]	2009	Brazil	To characterize, in a longitudinal view, the constitution of nursing competence in undergraduate nursing courses
A survey of first-year student nurses' experiences of learning blood pressure measurement [19].	2009	United Kingdom	To describe nursing students' learning experiences to measure PA (Blood Pressure) in the skills laboratory (LH) and the stages fields.
Greater than the sum of its parts: Transition into the first year of undergraduate nursing [20]	2009	United Kingdom	Discuss the results of the 2nd phase of the Enhance Project which investigated the preparation of nursing students for their first clinical stage.
Competency-based curriculum and active methodology: perceptions of nursing students [21]	2010	Brazil	To characterize the students' perception of the teaching and learning process in the disciplines that approached the referential of critical pedagogy, competence, and active methodology.
Learning features in computer simulation skills training [22]	2010	Sweden	To investigate acquired learning with skills training using a computer simulation program.
Educación en salud: en la búsqueda de metodologías innovadoras [23]	2011	Chile	To determine state of the art about the use of innovative methodologies in learning and evaluation for the development of clinical skills in the health area.
Situational analysis of teaching and learning of medicine and nursing students at Makerere University College of Health Sciences [24]	2011	Uganda	To assess the critical shortcomings of key competencies of medical and nursing graduates at Makerere University College of Health Sciences.

Title	Year	Place	Objective of the Study
Identification of the pillars of education in the discipline of health care [25].	2012	Brazil	To verify, in a systematized and contextualized way, if the four pillars of education were contemplated in one of the disciplines offered in the integrated curriculum model.
The Effect of Pedagogy of Curriculum Infusion on Nursing Student Well-Being and Intent to Improve the Quality of Nursing Care [26].	2012	USA	To determine if "Curriculum Infusion Pedagogy" promotes the well-being of the nursing student and the intention to improve the indicators of quality of care according to the Quality and Safety Education for Nurses (QSEN) and the American Association of Colleges of Nursing (AACN).
Evaluating Undergraduate Nursing Students' Learning Using Standardized Patients [27].	2012	Canada	To examine the effectiveness of using standardized patients to improve health assessment skills among first year nursing students.
Development and validation of the competence in evidence-based practice questionnaire (EBP-COQ) among nursing students [28].	2013	Spain	Develop and validate a new measure, the Evidence-based Practice Competence Questionnaire (EBP-COQ).
The effects of a deliberate practice program on nursing students' perception of clinical competence [29].	2013	Taiwan	To examine the effects of deliberate practice and technical skill tests conducted before clinical practice on the clinical skills of nursing students.
Learning through authentic assessment: An evaluation of a new development in the undergraduate midwifery curriculum [30].	2013	Australia	To develop, test and evaluate (viability and utility) an authentic small-scale evaluation item in a clinical scenario of obstetric clinical practice.
An analysis of pre-service family planning teaching in clinical and nursing education in Tanzania [31].	2014	Tanzania	To identify gaps in family planning (FP) teaching and suggest opportunities reinforce training.

Source: Integrative review research. Natal/RN, Brazil, 2016.

Of the total sample, 72% (13) of the articles were from nursing journals and 27% (5) from periodicals of related areas. Regarding the place, 77.78% (14) were published in international journals and 22% (4) in national ones, across the different continents of the planet, namely: Asia (Taiwan/1), Oceania (Australia/1), Africa (Uganda/1 and Tanzania/1), Europe (Spain/2, United Kingdom/2, Sweden/1) and America (Brazil/4, Chile/1, Haiti/1, Canada//1 and USA/2), with emphasis on the American continent, in which there was a greater number of publications. Also, of the nine publications in the Americas region, four are Brazilian, corresponding to the years of 2005, 2009, 2010 and 2012.

Regarding the objectives, the selected studies address the importance on the competence-based education in the training of nursing professionals,

with emphasis on the design and construction of teaching projects and curricula [14-15, 17, 20, 26, 31], the definition of competencies [15-18, 24, 28], the orientation of the teaching contents [17, 21, 25, 31], learning objectives and strategies [19-23, 27, 30], as well as, the clear formulation of evaluative intentions [24] and the use of instruments [28-29] valid for the evaluation of competence acquisition. It is evident that the qualitative approach prevailed to reach the objectives in large part of the studies studied, although some sample of these studies opted for a mixed approach [26-28].

According to the description in **Table 3**, the main findings are presented according to the thematic categories identified: the concept of competence, the essential competence for the nurse's training, and the conceptions and strategies of learning and evaluation.

**Table 3.** Thematic categories resulting from the critical analysis: the concept of competence, essential competence to the training of nurses and conceptions and strategies of learning and evaluation. Natal/RN, Brazil, 2016.

Concept of competence	It involves the ability to mobilize, combine, integrate [14-15, 23, 28, 30], and apply multiple knowledge [14] and resources [25]: knowledge, skills and attitudes [23, 25-26, 28, 30]; it implies an intentional action/task [21, 28] to act/solve/confront [14, 17, 21] and obtain a performance in contexts [23, 26, 28] and in situations [14, 21], with efficiency [17] and efficacy [14, 18, 23, 26] in the practice of a profession [23].
Essential competences for the training of nurses	Competence domains: for individual and collective integral care [15, 17, 21], in communication [17, 24-25, 27], in education [17, 24], for research [17, 24, 26], for critical thinking and clinical judgment [17, 21, 23, 27], for teamwork [15, 17, 24-26], and for decision making/problem solving/management [15, 17, 23-24, 28-29].
Conceptions and strategies of learning and evaluation	Constructivist conception [14, 16, 23] based on support for the teaching and learning process, understood as a student-centered process [16, 26, 28], a meaningful learning [16] mediated by active methodologies [16, 19] and adopting the formative evaluation [14] together with the dynamics of student performance. Problem-based strategies [16, 17], case studies, role plays and group discussions [22]; with emphasis on those performed in simulated situations in standardized clinical settings [28-29].

**Source:** Integrative review research. Natal/RN, Brazil, 2016.

Regarding the concept of competence, in 11 of the articles surveyed, it was possible to clearly identify the positioning adopted by the authors [14-18, 23, 25-26, 28-30]. In the others, either the author does not present a conceptualization or its meaning, even present, it is implicitly in the body of the text, being difficult to understand.

Specifically, one of these studies had a concept of professional competence in public health [17], concerning the attitudes and capacities needed to effectively and efficiently solve community health problems. While another study defined clinical competence [29] as the ability to apply the knowledge in decision making and the psychomotor skills in nursing care and rationalize its performance.

Regarding the essential competence to the training of nurses, it is worth noting that even among the studies dealing with competence in certain areas of nursing, such as public health [17], family planning [31], infectious diseases (HIV/AIDS) [15], clinical [24] and geriatrics [16], the competence highlighted in **Table 3** are also present.

Among the learning strategies in simulated clinical scenarios include, there are, for example, the Structured Objective Clinical Examination (OSCE) [16, 23, 27] (with standardized and videotaped

patient) or in environments with computational resources [16, 23] (videotape, use of simulator programs, online discussions). Thus, most are strategies aimed at the development of skills in the measurement of BP [19], female urinary catheterization [30], intravenous catheterization [22], health evaluation [27] and other skills of advanced nursing practice [29].

In any case, the studies clarified that the use of learning strategies should stimulate active student participation [22], with due planning, simulated in scenarios as close to the nurses' work environment [15-17, 23, 28], consistent with the learning objectives and intended competencies.

Regarding the criteria, parameters and/or indicators used to evaluate the acquisition of competence intended for nurses' training, only three articles used validated instruments, although focusing on specific competence, such as the Evidence-based Practice Competence Questionnaire (EBP-COQ) [28], an instrument of self-perception that evaluates the competence (knowledge, skills and attitudes) of nursing students in EBP (Evidence-Based Practice), the Clinical Competence Questionnaire (CCQ) [29], evaluating clinical competence; and the Hartford Geriatrics Competence [16], for the

evaluation of nurses' competence in practice with family caregivers.

## Discussion

The present review confirms the strong trend of a qualitative approach in nursing teaching research, considering the methods identified in the researched studies. One of the aspects that justify this tendency is the fact that the phenomena investigated in the training of the nursing professional involve, in this process, teachers and students, complex and diversified human beings [12].

When relating the studies about the teaching by competence, it was verified its starting in the 1960s and 1970s, both in general and in the professional formation, but, more pronounced in the latter [1, 32], and thus continues to the present day, as a theme of worldwide interest [33] evidenced in the present sample, since the five continents were contemplated. This coverage of the publications on competence was also verified in a recent bibliometric study, although the authors affirm that it did not occur in the main newspapers [34].

In Brazil, the production on the thematic compared with the European countries, began two decades later, becoming part of the literature of educational discourse in higher education, especially after the publication of the DCNs [4] for undergraduate nursing courses in 2001, meaning that it is a tool still in the process of gradual materialization in the country. It is noteworthy that these results, among the nine cited in the Americas region, were identified in four Brazilian studies (in the years of 2005, 2009, 2010 and 2012).

Also, it is seen that the option for the competency-based teaching model requires a paradigm shift. [7-8, 35] In this sense, it moves from a more rational model to an innovator one, as it is the case of the competency-oriented one. For this, it is crucial to establish the profile of the professional that

one wishes to train, and it depends on a question that must be made to guide the definition of the professional competence to be acquired, namely: what does the nurse do? The next step is to define the basis for the concepts of competence and professional competence that guide the training of this health professional.

This issue demands transformations not only in updating content but also in pedagogical practices, in teaching and learning methodologies and evaluation, providing the training of nurses with the necessary competence in the rhythm of contextual changes.

Regarding the polysemy that involves the term competence, and although it is evidenced in other studies and authors mentioned earlier, it was possible to identify in this review more similarities than differences in the studies evaluated, which does not mean that there is a consensus on this theme. In this case, we recognize the polarization of interpretations about the term and its different approaches that determine different understandings, according to author, sector or country [36].

In a systematic review study on the analysis of the concept of competence and its transition in nursing, it was concluded that the attempt by academics and influential professionals to provide definitions only aggravate the understanding of the real meaning [37]. In any case, despite the difficulty of obtaining a general consensus [9], also evident in this study, the concept is an integral part of many of the principles of nursing education and it is translated as a basic condition in the construction of programs and curricula guided by the competency-based teaching model, which is important in determining learning objectives, as in the adoption of strategies of learning and evaluation in the acquisition of competence.

Regarding the domains of nurses' competence evidenced in the findings of this study (individual and collective integral care, communication, education, research, critical thinking and clinical judgment,

teamwork, and management), it was possible to verify how the concept in question is applied. From this perspective, similarities are noticeable between the competence cited with the general competence recommended by the DCNs [4] for nursing undergraduate courses in Brazil, which are: competence in health care, decision-making, communication, leadership, administration and management, and continuing education.

Similar results were found in a review study, which identified eight main categories for nursing professional competence, namely: professional practice and ethical values; nursing and intervention skills; communication and interpersonal skills; knowledge and cognitive ability; evaluation and improvement of quality of care; professional development, management; leadership and teamwork; and use of research [38].

As important as establishing the concept of competency and determining the competencies for the nurse's professional performance, it is necessary to know how to promote them during the training and to evaluate if the level achieved will allow the egress to have competent performance. In this sense, learning or evaluation activities or strategies must align with the intended competencies and favor their acquisition.

The studies indicate learning strategies with an emphasis on simulated situations, and standardized clinical settings. However, the use of these strategies, while valuable, does not discard the need for real-life experiences [8] in the course of training, because the organization of learning experiences in environments inherent to the practice of the professional practice of nurses is the desired differential in the construction of new curricula [3].

About the assessment of key competence for nurse training, competence-based education entails uncertainties, mainly related to methods and the construction of instruments, as well as the effective working ability [1] as to the student's progress about the required skills. The doubts related to competen-

cies are because they are perceptible and properly evaluated, besides described (defined).

In nursing in general, it is evident the development of studies focused on the evaluation of the product, as the case of the evaluation of the skills of graduate nurses, but there is a shortage of studies that deal with the process of this evaluation, especially in changes in the training of health professionals [39-40].

Only three of the articles, in the results of this study, used validated and constructed instruments for the evaluation of specific competence: for the Evidence Based Practice [28]; for clinical skills [29]; and to practice with elderly caregivers [16].

Although it is considered a problematic task due to the difficulties of operationalizing the concept, some instruments for evaluating the general competence of nurses have been elaborated, mostly from international studies. An example is the Nurse Competence Scale - NCS [41].

Results of studies using the scale above in the evaluation of the level of competence of final nursing students showed that the pedagogical environment during the final stage had a statistically significant positive correlation with the general level of competence [42]. Also, the authors assert that self-assessment is a basic resource for skill development, and the systematic self-evaluation should be used during training.

It is worth highlighting the recommendation to include self-assessment and self-reflection in nursing education programs as necessary elements for the evaluation of competence [13] and the need for examination of competency certification as the final exam to obtain the license to practice.

## Conclusion

According to the evidence found, despite the diversity of meanings, it is still controversial to understand the process of evaluation of learning and competence in undergraduate nursing courses,



both in training and in the education of the nurse professional. However, it is possible to affirm that there are more similarities than differences in the results of the studies analyzed.

The Portfolio and the OSCE are the most means of evaluation used in the teaching-learning process during nurses' training. Also, it was observed that the competence required in their training converge in domains or dimensions related mainly to the care process, communication, decision-making, and to critical thinking and clinical judgment, education, teamwork, and management.

Moreover, in this context of professional training, there are some difficulties recognized in the evaluation of competence, given that the innovative teaching model proposes the development of attitudes and values integrated with the knowledge to allow a competent performance, able to ensure them a qualified professional practice.

Also, the competence-based evaluation must use the principle of evaluation based on performance criteria and indicators, with a focus on demonstrating competencies in an observable work performance and fully defined from the training. Therefore, it is suggested that a valid and reliable assessment instrument must be developed, which can verify the student's performance, in action, providing an early approximation as possible together with the real learning situations.

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