Scientific Electronic Archives
Issue ID: Sci. Elec. Arch. Vol. 13 (6)
June 2020
DOI: http://dx.doi.org/10.36560/13620201075
Article link
http://sea.ufr.edu.br/index.php?journal=SEA&page=article&op=view&path%5B%5D=1075&path%5B%5D=pdf
Included in DOAJ, AGRIS, Latindex, Journal TOCs, CORE, Discoursio Open Science, Science Gate, GFAR, CIARDRING, Academic Journals Database and NTHRYS Technologies, Portal de Periódicos CAPES, CrossRef

ISSN 2316-9281

Adoption of realistic simulation for the development of practices in nursing graduation: a systematic literature review

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Abstract. The realistic simulation in nursing graduation allows for the possibility of making mistakes without risk of damage. In this way, it has been adopted in order to meet the requirements of health institutions, ensuring a quality assistance and promoting patient safety. There was performed a systematic literature review on the adoption of realistic simulation for the development of practices in nursing graduation. There were 26 articles published in the Portal of the Virtual Health Library (VHL). Of the total, 11 were analyzed after compliance with the eligibility criteria. The studies showed that the realistic simulations are applied in different ways at higher education institutions, since they show a direct influence of human and financial resources available in each institution. The new or known situations of the simulations provide significant contributions to the students, such as: acquisition of skills and abilities, development of critical-reflexive analysis of the actions in the scenarios of simulation, improvement of self-confidence. However, there were also weaknesses, such as: unprepared pedagogical approach, difficulty planning and structuring simulation scenarios. There must be investments in studies to develop strategies to solve or minimize these weaknesses, facilitating the standardization of realistic simulations and enabling their adoption mostly in the curriculum of nursing graduation.
Keywords: Simulation, Nursing Education, Nursing, Higher Education.

Contextualization and analysis

The realistic simulation is a teaching method that allows the simultaneous integration of theory and practice, the possibility of making mistakes without risk of damage, as well as redoing and analyzing the interventions made in a reality-like scenario or in a real one con-trolled. In addition, it promotes a critical-reflexive training of professionals who will be able to offer a safer and more confident care due to the techniques present in this method (Ferreira et al., 2018).

Among these techniques, there are briefing and debriefing. Briefing consists in the contextualization and guidelines regarding the simulated situation which will be experienced. While debriefing is the moment of immediate feedback with critical analysis and focus on the positive points between participants and facilitator about the experience gained during the realistic simulation (Sasso et al., 2015). In this way, the participants can assist in the prior construction of goals and reflect on them or how they could have achieved them after the experience.

Currently, there are diversified technological tools, able to promote breakdown in common forms of education (Nascimento & Magro, 2018). As a result, they increase the demands of health institutions regarding the supply of high-quality assistance that ensures patient safety.

Given this scenario, the adoption of realistic simulation in nursing graduation is considered a strategy to adjust to such changes, based on changes in the way practices are taught. In this perspective, the International Nursing Association For Clinical Simulation And Learning (2016) developed Standards of Best Practices for the implementation of realis-tic simulation in nursing theoretical and practical learning through evidence-based studies.

This articulation of theory and practice through the use of active teaching and learning methodologies meets the current needs for adoptingnew forms of teaching in the education

process of nursing professionals (Salvador et al., 2015).

Given the perceived need for evaluation of contributions of the adoption of realistic simulation for the construction of knowledge in the health area and its weaknesses, the objective of this study was to perform a systematic literature review on the adoption of realis-tic simulation for the development of practices in nursing graduation.

The present study has descriptive and exploratory nature, carried out by means of articles available on the Virtual Health Library (VHL), specifically on the Latin American and Caribbean Health Sciences Literature (LILACS) and the Nursing Database (BDEnf).

The search for articles occurred from January to February 2019. The following descriptors were used: “realistic simulation” and “Nursing”, according to the Health Sciences Descriptors (DeCS).

Twenty-six studies were found, which were analyzed through a complete and thorough reading of the full texts and, therefore, inclusion and exclusion criteria of this study were established.

Regarding the established inclusion criteria, the eligible studies were those whose databases were in Portuguese, published from 2012 to 2019 and available in full text. The exclusion criteria were repeated studies, with samples that did not address the subject studied and course completion works.

When considering only the descriptor “realistic simulation”, 40 studies were found and, when associated with the descriptor “nursing”, the search returned 26 studies. When filtering the studies according to the selection of databases, language and period of publication, there were 25 articles. Of these studies (Figure 1). To analyze the 25 studies, 15 of them were excluded. Thus, 10 were considered potentially relevant to the construction of this systematic review (Figure 1).

In relation to the experimental studies, two articles combined the quanti-qualitative approach, two studies used a quasi-experimental method, a study was descriptive, one retrospective cohort study, one was of comparative, prospective character and the other three were experience reports (Table 1).

In Table 1, the 10 selected studies show that the new or known situations of the simulations have provided significant contributions to the students, such as: acquisition of skills and abilities (100% of the studies), development of critical-reflexive analysis of their actions in the scenarios of simulation (80% of the studies) and the narrowing of the interaction of students with professors (20% of the studies).

The acquisition of self-confidence and security in the development of nursing practices was present in 100% of the articles, thus showing to minimize errors, reduce healthcare costs and maximize their performance in real situations (Valadares & Magro, 2014; Rohrs et al., 2017).

Of the analyzed studies, two (20% of the studies) emphasized the importance of constructing simulation scenarios aiming at the promotion of integration with other health professionals, making the performance in the scenarios not only of exclusivity of theoretical-practical application of
nursing, but assuring multidisciplinarity and time-liness of actions of other courses in the health area, concomitantly, providing a broad and complete knowledge on the clinical condition of the patient simulated in the scenario, preparing the student to learn how to deal with real situations of similar character (Cogo et al., 2019; Ferreira et al., 2018).

However, weaknesses were also noted in the development of simulated scenarios, since higher education institutions apply the realistic simulations differently, since they show a direct influence of human and financial resources available in each institution.

Five studies (50% of the studies) address the need for the acquisition of materials and models of high performance for contribution of learning in the scenarios and the high financial cost for the maintenance of the structure of simulation (Figueiredo, 2014; Ferreira et al., 2018; Lopes et al., 2018; Valadares & Magro, 2014; Barreto et al., 2014).

Also, as weaknesses, there was the lack of inclusion of diversified population in the scenario simulation, such as students from different courses (10% of the studies), the need for analysis of age-group as a factor intrinsically related to the performance of students considering the experience in simulated scenario (10% of the studies), need for transformation of the professor-student interaction conception (10% of the studies), difficulty in adaptability regarding the dynamics of the simulations (30% of the studies) and the need for organizational planning and structural simulation scenarios, respecting the complexity between these scenarios and requirements (30% of the studies).

Six studies (60% of the studies) also bring some weaknesses of developing practices in the simulation scenarios corresponding to aspects related to the faculty, such as the resistance of some professionals to accept the simulation as an effective practice and, there-fore, the increased need for engagement of the faculty to ensure the implementation of this teaching method. In addition, the pedagogic approach is unprepared, without experience and knowledge about the criteria inherent to the proper application of realistic simulations, mainly due to lack of investment in professional qualification of facilitators of the simulations (Valadares & Magro, 2014; Ferreira et al., 2018; Cogo et al., 2019;

Salvador et al., 2015; Barreto et al., 2014; Costa et al., 2017)

Furthermore, the analysis of the studies highlights that the methods of realistic simulations used by the analyzed institutions required enhancements, since most studies do not follow the standards established by the International Nursing Association for Clinical Simulation and Learning (INACSL) of good practice in realistic simulation, thereby demonstrating a lack of standardization in relation to methods of evaluation, according to the table below (Table 2).

From this perspective, it is valid to highlight that of the ten analyzed articles, the Interprofessional Education Enhanced by Simulation was present in nine articles (90% of the studies), the Simulation Design, in eight articles (80% of the studies), the facilitation was performed in the scenarios as highlighted by eight articles (80% of the studies), the Professional Integrity was in six articles (60% of the studies).

However, only one article (10% of the studies) conducted the Evaluation of the Participant, an element that is essential for improving service and quality of learning (INACSL, 2016). Only three articles (30% of the studies) described the Results and Objectives. In relation to Debriefing, only four (40% of the studies) have used this element for the development of simulation, even so, those that have not used it, disrespected its duration, as advocated by the international recommendations.

Table 1. Most prevalent contributions and weaknesses regarding the adoption of realistic simulation for the development of practices in nursing graduation.

Author	Method	Contributions	Weaknesses
Magro et al., 2012	Experience report	Development of attributes related to the cognitive, affective, psychomotor and attitudinal field. Contribution to the formation of critical, reflective professionals. Provision of greater safety while acting as health professionals	Performance limitation during implementation of realistic simulation, due to anxiety previously and/or during simulation, not knowing what would happen while applying the strategy
Figueiredo, 2014	Experience report	Possibility of reflective critical analysis on the right answers, difficulties and skills mastered during the procedure. Improvement of students' technical skills and competences regarding ethical-legal and patient safety aspects	iPads required to simulate real situations in nursing and scarcity of reports in the literature
Valadares e Magro, 2014	Prospective, comparative study	Broadens relationships between professor, student and patient. More active development of autonomy minimized harm to the patient during care in the real hospital setting. Increased confidence and security during care, agility and critical thinking	Lack of temporal parity between practice and theory. Some professionals were resistant to accept simulation as an effective practice. The non-frequent application of simulation throughout the semester allied to the theoretical class. The high cost of near-real scenarios
Salvador et al., 2015	Quanti-qualitative study	The student is able to learn without the risks of misconducts	Need for changing the professor and student interaction conception. Lack of adequate professor's preparation. Not obtaining structural changes in educational institutions
Costa et al., 2017	Descriptive study	Provides a previous experience of the practice, allows thinking critically and reflecting on the practice, improvement of the training process and the development of self-confidence, autonomy and satisfaction.	The unknown can generate fear and conflict. Lack of professor's experience
Rohrs et al., 2017	Quanti-qualitative study	Greater student interaction with the professor, teamwork skills development, improved communication between multiprofessional team and patient, critical thinking, intense learning experiences, and improved patient care quality and safety	Regarding the planning and structure of simulation scenarios respecting the complexity between these scenarios and the requirements for students to have feedback after each practice with discussion of actions taken
Nascimento and Magro, 2018	Quantitative, quasi-experimental study	Favors the development of competences, such as self-confidence, taking advantage of previous knowledge and past experiences and managing new or unknown situations.	Need to assess age group as a variable that can influence the learner's performance and self-confidence during the simulated scenario

to be continue...

Ferreira et al., 2018	Analytical, exploratory and quasi-experimental study	Development of varied skills and competencies required in controlled and protected environment. Empowerment of results through scenarios with working health professionals. Allows mistakes and professional growth without risking patient safety. Encourages active and reflective student participation, providing a learning environment	The non inclusion of diverse population in the simulation scenario. Faculty engagement to ensure implementation of this method. Need for expansion of the fields of scenario development. High financial cost for creation and maintaining of a simulation lab
Lopes et al., 2018	Retrospective cohort study	Development of different skills in the learner's spheres of knowledge, skills and attitudes. Assimilation and reshaping of behaviors, development of safety and confidence during the execution of routine nursing practice procedures	Need for developing teaching materials, especially that can be incorporated into digital technology, with reference to the best and most up-to-date care evidence about the procedures.
Cogo et al., 2019	Experience report	Reflection of the practice. Integration with other healthcare professionals, associated with prevention and approach to adverse events	Lack of investment in the qualification of professionals who will act as facilitators. No detailed planning of scenarios and organization at time of application

Table 2. Analysis of the studies that developed realistic simulation scenarios regarding the presence of elements inherent to the Standards of Best Practice established by the International Nursing Association for Clinical Simulation and Learning (INACSL)

Studies	Elements inherent to the Standards of Best Practice of the INACSL						
	Simulation Design	Outcomes and Aim	Facilitation	Debriefing	Participant Evaluation	Professional Integrity	Simulation-Enhanced Interprofessional Education
Magro et al., 2012	Yes	No	Yes	Yes	No	No	Yes
Valadares e Magro, 2014	Yes	No	Yes	No	No	Yes	Yes
Figueiredo, 2014	Yes	No	Yes	No	No	Yes	Yes
Salvador et al., 2015	No	No	No	No	No	No	No
Costa et al., 2017	Yes	Yes	Yes	Yes	No	Yes	Yes
Rohrs et al., 2017	No	No	No	No	No	No	Yes
Nascimento e Magro, 2018	Yes	Yes	Yes	No	Yes	Yes	Yes
Ferreira et al., 2018	Yes	No	Yes	Yes	No	Yes	Yes
Lopes et al., 2018	Yes	No	Yes	Yes	No	Yes	Yes
Cogo et al., 2019	Yes	Yes	Yes	Yes	No	Yes	Yes

Final considerations

The realistic simulations contribute to the training of nurses and improve the service and care provided to the patient. Nevertheless, some professionals still have great resistance to this methodology, which, when used in classrooms, provides greater interaction between student and professor. Therefore, it provides a better relationship between them and higher learning. Moreover, it prepared the students for problem-situations that will be encountered in the care reality.

The results indicate that the simulation favors the acquisition of clinical reasoning, once it promotes the association between theory and practice, in addition to ensuring feelings of self-confidence and critical sense. In this way, it reduces errors and optimizes the teaching-learning process, without placing individuals in risky situations.

It is clear that there is no standardized format to obtain an accurate assessment of realistic simulation, so that this happens individually in each institution. Thus, it is necessary to develop strategies aiming at establishing this initiative, which will allow raising the weaknesses and failures of the simulations, so that they can be minimized and solved.

Although each institution applies the simulation differently due to differentiations, such as financial and human resources, standardization initiatives would provide a qualification of realistic simulations. The scenarios would change, but the order and the way to evaluate the simulation would follow the same principle. In addition, it would encourage its adoption mostly in the curriculum of nursing graduation and other courses in the health area.

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