Andréa Tayse de Lima Gomes[1]
Pétala Tuani Candido de Oliveira Salvador[2]
Clarissa Fernandes Goulart[3]
Sumaya Giarola Cecilio[4]
Maria Flávia Gazzinelli Bethony[5]

Innovative Methodologies to Teach Patient Safety in Undergraduate Nursing: Scoping Review

Theme: promotion and prevention.

Contribution to the discipline: Mitigation of adverse events and improved patient safety are fundamental objectives of Nursing education, given that the key point is the inclusion of nurses trained to provide excellent care, based on disease prevention. The quality, content, and how this education is provided can have a significant impact on student safety behaviors in their upcoming clinical settings. In this scenario, the main challenge is the education of students in relation to the fundamentals of safe care, to favor development of specific knowledge and practices, regardless of the technical training intended. Therefore, it is essential for said educational action to go through the clinical landscape and the experimentation of best practices, continuously, considering the different performance scenarios in the formative path of future nurses.

ABSTRACT

Objective: This work sought to identify the innovative methodologies used to teach patient safety in undergraduate Nursing. **Materials and method:** This is a *scoping review* conducted according to the recommendations by the Joanna Briggs Institute Reviewers' Manual, through the databases: Medline/PubMed, Cumulative Index of Nursing and Allied Health, Scopus, Web of Science, Education Resources Information Center, Latin American and Caribbean Literature on Health Sciences, Catálogo de Tesis de la *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, The National Library of Australia's Academic Archive Online, Digital Access to Research Theses Europe E-Theses Portal, Electronic Theses Online Service, Repositório Científico de Acesso Aberto de Portugal, National ETD Portal, and Theses Canada. **Results:** The study included 19 studies, most of descriptive type (n = 8; 42.1 %) and quasi-experimental (n = 7; 36.8 %)

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1 ✉ https://orcid.org/0000-0003-0505-5783. Universidade Federal de Minas Gerais, Brazil. andreatayse@ufmg.br
2 https://orcid.org/0000-0002-3208-6270. Escola de Enfermagem de Natal, Universidade Federal do Rio Grande do Norte, Brazil.
3 https://orcid.org/0000-0002-9744-8658. Universidade Federal de Minas Gerais, Brazil.
4 https://orcid.org/0000-0002-4571-8038. Universidade Federal de Minas Gerais, Brazil.
5 https://orcid.org/0000-0003-0523-3973. Universidade Federal de Minas Gerais, Brazil.

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with quantative approach (n = 11; 57.9 %), conducted in the United States (n = 4; 21.1 %), in 2013 (n = 4; 21.1 %) and 2017 (n = 4; 21.1 %). The innovative methodologies used to teach patient safety in undergraduate Nursing that were highlighted included the scenario of the care practice simulated in the laboratory (n = 14; 73.7 %) and educational videos (n = 7; 36.8 %). **Conclusions:** It was identified that innovative methodologies used to teach patient safety in undergraduate Nursing were simulation, videos, staging/role playing, and films, all applied in the classroom teaching modality.

KEYWORDS (Source: DeCS)

Teaching; patient safety; methodology; educational technology; nursing education.

Metodologías innovadoras para la enseñanza de la seguridad del paciente en el pregrado de Enfermería: *scoping review*

RESUMEN

Objetivo: identificar las metodologías innovadoras utilizadas para la enseñanza de la seguridad del paciente en el pregrado de Enfermería. **Materiales y método:** *scoping review* realizada de acuerdo con las recomendaciones del *Joanna Briggs Institute Reviewers' Manual*, por medio de las bases de datos: Medline/PubMed, *Cumulative Index of Nursing and Allied Health*, Scopus, *Web of Science*, *Education Resources Information Center*, Literatura Latinoamericana y del Caribe en Ciencias de la Salud, Catálogo de Tesis de la *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, *The National Library of Australia's*, *Academic Archive Online*, *Digital Access to Research Theses Europe E-Theses Portal*, *Electronic Theses Online Service*, *Repositório Científico de Acesso Aberto de Portugal*, *National ETD Portal* y *Theses Canada. Resultados:* se incluyeron 19 estudios; la mayoría de tipo descriptivo (n = 8; 42,1 %) y casi experimental (n = 7; 36,8 %); con enfoque cuantitativo (n = 11; 57,9 %); realizados en los Estados Unidos (n = 4; 21,1 %), en el 2013 (n = 4; 21,1 %) y el 2017 (n = 4; 21,1 %). Las metodologías innovadoras utilizadas para la enseñanza de la seguridad del paciente en el pregrado de Enfermería que se destacaron fueron: el escenario de práctica asistencial simulada en laboratorio (n = 14; 73,7 %) y los videos educacionales (n = 7; 36,8 %). **Conclusiones:** se identificó que las metodologías innovadoras utilizadas para la enseñanza de la seguridad del paciente en el pregrado de Enfermería fueron simulacro, videos, escenificación/dramatización y películas, todas aplicadas en la modalidad de enseñanza presencial.

PALABRAS CLAVE (Fuente: DeCS)

Enseñanza; seguridade del paciente; metodología; tecnología educacional; educación en Enfermería.

Metodologias inovadoras para o ensino da segurança do paciente na graduação em Enfermagem: scoping review

RESUMO

Objetivo: identificar as metodologias inovadoras utilizadas para o ensino da segurança do paciente na graduação em Enfermagem. **Materiais e método:** *scoping review* conduzida conforme as recomendações do *Joanna Briggs Institute Reviewers' Manual*, por meio das bases de dados: Medline/PubMed, *Cumulative Index of Nursing and Allied Health*, Scopus, *Web of Science*, *Education Resources Information Center*, Literatura Latino-Americana e do Caribe em Ciências da Saúde, Catálogo de Teses e Dissertações da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, *The National Library of Australia's*, *Academic Archive Online*, *Digital Access to Research Theses Europe E-Theses Portal*, *Electronic Theses Online Service*, Repositório Científico de Acesso Aberto de Portugal, *National ETD Portal* e *Theses Canada*. **Resultados:** foram incluídos 19 estudos; a maioria do tipo descritivo (n = 8; 42,1 %) e quase experimental (n = 7; 36,8 %); com abordagem quantitativa (n = 11; 57,9 %); realizados nos Estados Unidos (n = 4; 21,1 %), em 2013 (n = 4; 21,1 %) e em 2017 (n = 4; 21,1 %). As metodologias inovadoras utilizadas para o ensino da segurança do paciente na graduação em Enfermagem que se destacaram foram o cenário de prática assistencial simulada em laboratório (n = 14; 73,7 %) e os vídeos educacionais (n = 7; 36,8 %). **Conclusões:** identificou-se que as metodologias inovadoras utilizadas para o ensino da segurança do paciente na graduação em Enfermagem foram simulação, vídeos, encenação/dramatização e filmes, todas aplicadas na modalidade de ensino presencial.

PALAVRAS-CHAVE (Fonte: DeCS)

Ensino; segurança do paciente; metodologia; tecnologia educacional; educação em Enfermagem.

Introduction

Since the publication of the report *To Err is Human* by the Institute of Medicine (IOM) of the United States of America (USA), in 1999, the question of patient safety has acquired global relevance. The document indicates that nearly 100,000 people die yearly in North American hospitals, arising from preventable adverse events (1).

The practices of healthcare professionals have been marked by high rates of adverse events related to surgical procedures, administration of medications, hospital-acquired infections, patient injuries, hospital care system failures, permanent injuries, and deaths. Inadequate, unsafe, and negligent practices affect between 3 % and 16 % of patients hospitalized in developed countries (2-5).

Recognizing this problem and the unintentional damage caused by health care has triggered multiple reflections, mainly about the training of health professionals, which, at times, is weakened by not keeping up with the fast pace of innovations in practice, changes in the conditions, diversity and workforce imposed in recent decades (6).

Within this context, it is established that preventing adverse events and improving patient safety are important aspects to be addressed in nursing education. The quality, content, and way this education is offered can have a significant impact on safety behaviors of students in their future clinical environments (7, 8).

Patient safety should be discussed and, especially, understood as of the undergraduate by using innovative methodologies capable of arousing critical and reflective thinking of students. This perspective has been addressed by the Brazilian Ministry of Health since the launch of Ordinance 529 of 2013, in reporting, in one of its specific objectives, the relevance of fostering the inclusion of the theme "patient safety" in technical, undergraduate and graduate health education (9).

Upon this reality, in 2011, the World Health Organization (WHO) defined, among its activities, those aimed at promoting teaching related to the principles of safe care in educating health students, with the general objective of conducting patient-centered clinical care. The following were established as specific objectives: 1) prepare students from the health care area for a safe practice; 2) inform educational institutions about key safety issues; 3) improve the basic aspects related to patient safety as a theme in all courses in the health area; 4) provide a comprehensive program to assist patient safety teaching and integrate learning of patient safety; 5) promote the development of training in patient safety (10).

To achieve these goals, it is essential that critical curriculum revisions be made to include patient safety-related activities in teaching-learning procedures to generate disciplinary change, with emphasis on integrating strategies that contribute to improving the reasoning skills and clinical judgment of students (10, 11).

Thus, the need is discussed for changes in the National Curriculum Guidelines (DCN, for the term in Portuguese) of nursing courses in Brazil that guide higher education comprehensively to contemporary evidence on patient safety. Parallel to the relevance of updating curricular contents, we understand the importance of Higher Education Institutions in following the pedagogical innovations that go beyond the traditional forms of teaching (12-14).

These innovations represent not only the insertion of novelties and technologies in teaching, but also include a change in the way of understanding knowledge. Among the characteristics of pedagogical innovations, the following stand out: rupture with the traditional mode of teaching and learning; student participation in defining pathways and criteria in the teaching and learning process; reconfiguration of personal knowledge, skills and experiences; reorganization of the relationship between theory and practice; transition from perception to conception, development and evaluation of the teaching-learning experience (15, 16).

Innovative methodologies involve the act of offering, when doing pedagogy, new possibilities, attitudes, and decision making in the classroom. By opting for this kind of pedagogical resource, educators may break with models that simply deposit information and knowledge in their students. Thus, it is relevant to discuss about innovative teaching methodologies able to facilitate understanding the pillars of patient safety in Nursing education (17, 18).

Given this, the research sought to identify the innovative methodologies used to teach patient safety in undergraduate nursing.

Materials and Method

The scoping review was conducted according to the guidelines by the Joanna Briggs Institute Reviewers' Manual, according to the theoretical scenario raised by authors in the field (19, 20). The stages followed were: 1) elaboration of the guiding question of the scoping review; 2) identification of pertinent studies; 3) screening of studies; 4) analysis of data collected; and 5) treatment, synthesis, and presentation of the results.

To structure and execute the research, a protocol was prepared with information concerning the purpose of the study, population involved in the research, formulation of the research question, eligibility criteria, strategy and bases used for data collection, defining variables for data extraction and how data would be synthesized.

Definition of the objective and the research question, as well as the selection of descriptors, synonyms and keywords used in data collection, followed the parameters of strategy P (Population), C (Concept), and C (Context). In this study, the population concerns the innovative methodologies; the concept is linked to the teaching of patient safety, and the context is undergraduate Nursing. In this sense, the research was guided by the question: what innovative methodologies have been used to teach patient safety in undergraduate Nursing?

Initially, a preliminary search was made of possible similar studies in the JBI COnNECT+, The Cochrane Library, and Prospero databases, in January 2019, which detected no protocols and/or revisions published in the same theme.

Then, we sought to identify the keywords and synonyms available in the literature by combining Health Sciences Descriptors (DeCS) - Portuguese words - and Medical Subject Headings (MESH) - English terms - components of the PCC mnemonic of this research in which: (P) Metodologia/*Methodology AND* Tecnologia educacional/*Educational technology AND* (C) Ensino/*Teaching AND* Segurança do paciente/*Patient safety AND* (C) Educação em Enfermagem/*Nursing education*. This moment involved three databases, namely: Latin American and Caribbean Health Sciences Literature (LILACS), Medline/PubMed and Cumulative Index of Nursing and Allied Health (CINAHL).

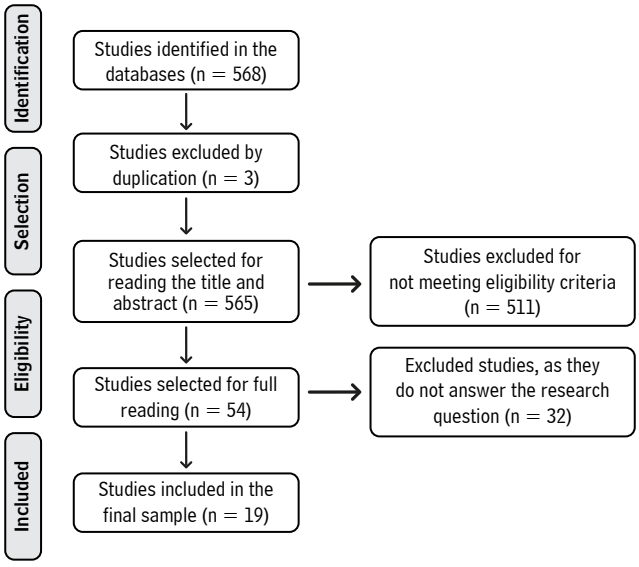
The second and third stages of this scoping review (identification and selection of relevant studies) were executed from January to February 2019 through the Medline/PubMed, CINAHL, Scopus, Web of Science, Education Resources Information Center (ERIC), LILACS, Catalog of Theses and Dissertations of the Higher Education Staff Improvement Coordination (CAPES), The National Library of Australia's (TROVE), Academic Archive Online (DIVA), Digital Access to Research Theses (DART), Europe E-Theses Portal, Electronic Theses Online Service (EThOS), Open Access Scientific Repository of Portugal (RCAAP), National ETD Portal, and Theses Canada databases to search for articles, dissertations, and theses portraying the use of innovative methodologies aimed at teaching safe care in undergraduate nursing.

The search strategies used in this research were: 1) for databases in Portuguese — (Teaching *OR* Education) *AND* (Patient safety *OR* Quality improvement) *AND* (Methodology *OR* Teaching methods) *AND* (Educational technology *OR* Computer simulation *OR* Simulation-based learning *OR* Video games *OR* Learning technology *OR* Video *OR* Open educational resource *OR* Instructional films and Video *OR* Innovations *OR* Simulation *OR* Staging *OR* Virtual patient *OR* Simulation-based environment) *AND* (Nursing Education *OR* Nursing students) and 2) for international databases — (Teaching *OR* Education) *AND* (Patient safety *OR* Quality improvement) *AND* (Methodology *OR* Teaching methods) *AND* (Educational technology *OR* Computer simulation *OR* Simulation-based learning *OR* Video games *OR* Learning technology *OR* Video *OR* Open education resource *OR* Instructional films and video *OR* Innovations *OR* Simulation *OR* Role-play *OR* Virtual patient simulation-based environment) *AND* (Education, Nursing *OR* Nursing students).

The studies were selected based on respective eligibility criteria, including scientific articles, dissertations, and theses; published in full online, which discuss the use of innovative methodologies aimed at teaching patient safety in undergraduate nursing. In turn, editorials, experience reports, theoretical essays, reflections, and reviews were excluded. No time limit was established in the search performed.

Preliminarily, the title and abstract of the studies identified were evaluated, based on pre-established eligibility criteria; then, the publications selected were retrieved for full reading, as shown in Figure 1.

Figure 1. Schematic of study selection process. Belo Horizonte-MG, Brazil, 2019



Source: Prisma — Flowchart for scoping review (adapted) (19).

Regarding the fourth stage of the research (data analysis), data were extracted from studies included in the final sample in a 2016 Microsoft Excel spreadsheet, according to the variables: year in which the study was published, country where the research was conducted, research objective, type of study, methodological approach, evidence level (21), as well as innovative methodology addressed, teaching modality in which the methodology was used, weaknesses, and potentialities inherent to the innovative methodology applied.

Lastly, the data were synthesized in descriptive manner (n and %), using Tables. Likewise, the studies were coded to facilitate understanding the final disposition of the data, in the following manner: "S" (Study), followed by Arabic numerals 1, 2, 3, ... 19, to assume the representation S1, S2, S3, ... S19.

Results

The work included 19 studies, mostly Descriptive (n = 8; 42.1 %) and quasi-experimental (n = 7; 36.8 %), with quantitative methodology approach (n = 11; 57.9 %), conducted in the United States (n = 4; 21.1 %), Australia (n = 3; 15.8 %), and Turkey (n = 3; 15.8 %) in 2013 (n = 4; 21.1 %) and 2017 (n = 4; 21.1 %).

Table 1 describes the characterization of the studies composing the sample of this scoping review according to the respective identifying codes (S1, S2, S3, ... S19), study objective, country, and year in which the research took place, type of research, Evidence level (EL), and methodological approach.

All the studies involved the application of innovative methodologies to teach safe care to undergraduate Nursing students in their classroom modality, and the innovation used most frequently was simulation (n = 14; 73.7 %), as presented in Table 1.

Table 2 exposes, quantitatively, the innovative methodologies used, associating them to the respective studies that were part of the research scope.

Table 1. Innovative methodologies applied to teaching patient safety (n = 19). Belo Horizonte-MG, Brazil, 2019

Methodologies used (study codes)	n[6]	%
Scenario of laboratory-simulated care practice (S1, S6, S8-S9, S10-S19)	14	73.7
Educational videos (S2-S4, S7, S11, S16-S17)	7	36.8
Staging/Role Modeling (S3, S5, S19)	3	15.8
Films (S8)	1	5.3

Source: Own elaboration.

Table 3 details the potentialities and weaknesses related to the innovative methodologies, approached by the studies analyzed, used to teach safe care to Nursing students.

The innovative methodologies used to teach patient safety to undergraduate Nursing students favor significantly the development of skills within a safe environment and in critical and reflexive manner, provided that the implementation of the teaching strategy is carefully planned, especially in terms of time, staff, and material resources.

6 Some studies approach the use of more than one methodology.

Table 2. Characterization of the results included. Belo Horizonte-MG, Brazil, 2019

Study code (Reference)	Study objective	Country (year)	Type/EL/approach
S1 (22)	To evaluate the effectiveness of theoretical training related with medical errors, and patient safety and practice simulation training on student knowledge and skill levels.	Turkey (2018)	Experimental/1/ quantitative
S2 (23)	To determine if using expert-simulated video during pre-learning improved the performance of simulation skills.	The United States (2018)	Quasi-experimental/2/ quantitative
S3 (24)	To explore the evaluation of undergraduate Nursing students on learning methods combined to improve communication skills in mental health Nursing.	Norway (2018)	Exploratory/2/quantitative and qualitative
S4 (25)	To examine the effects of using educational videos on the skills of Nursing students to administer parenteral medication.	Turkey (2017)	Quasi-experimental/2/ quantitative
S5 (26)	To describe the responses of undergraduate Nursing students to a role-modeling experience that simulated management of disruptions during medication administration.	Australia (2017)	Descriptive/4/qualitative
S6 (27)	To describe how Nursing students learn about patient care in acute situations through simulation, observation and debriefing exercises.	Sweden (2017)	Descriptive/4/qualitative
S7 (28)	To evaluate the effectiveness of an educational intervention program in understanding basic patient safety issues in undergraduate students of a private Nursing school attending their first clinical practice.	Chile (2017)	Quasi-experimental/2/ quantitative
S8 (29)	To determine if simulated exposure to error situations changes attitudes in a way that can have a positive impact on error prevention behaviors.	The United States (2016)	Quasi-experimental/2/ quantitative
S9 (30)	To investigate the feasibility of audiovisual recordings to increase feedback after acute patient deterioration simulations.	Australia (2016)	Descriptive/4/quantitative
S10 (31)	To compare the effectiveness of video-assisted oral debriefing and oral debriefing alone on behaviors by undergraduate Nursing students during high-fidelity simulation.	The United States (2014)	Quasi-experimental/2/ quantitative
S11 (32)	To evaluate the use of an online best-practice model to complement the teaching of clinical oral medication management skills to undergraduate Nursing students.	Scotland (2013)	Cohort/3/mixed
S12 (33)	To explore the results of developing and evaluating a simulated skills pack using a problem-based learning approach with general Nursing students.	Ireland (2013)	Descriptive/4/quantitative
S13 (34)	To evaluate the effectiveness of a drug administration clinical skills workshop to improve the drug-dose calculation skills of sophomore Nursing students to promote drug administration safety.	Italy (2013)	Descriptive/2/quantitative
S14 (35)	To determine if simulation training is an appropriate and affective teaching method to be to teach safe care in perinatal nursing.	Turkey (2013)	Quasi-experimental/2/ quantitative
S15 (36)	To provide third-year undergraduate nursing students with carefully planned exposure to a scenario that simulates a typical change in a practice setting.	Wales (2012)	Cohort/3/mixed
S16 (37)	To explore and describe the communicative modes students employ to coordinate staff in a simulated environment designed for resuscitation team training.	Norway (2011)	Descriptive/4/qualitative
S17 (38)	To investigate processes used by end-of-course Nursing students to recognize and act upon clinical deterioration clues in a simulated environment.	Australia (2010)	Descriptive/4/qualitative
S18 (39)	To investigate the learning resources of a CathSim computer simulation program used for intravenous catheterization skills training.	Sweden (2010)	Quasi-experimental/2/ quantitative
S19 (40)	To describe how a Nursing faculty began to integrate patient safety education into simulation experiences for undergraduate Nursing students.	The United States (2009)	Descriptive/4/qualitative

Source: Own elabortation.

Table 3. Potentialities and weaknesses inherent to the innovative methodologies used to teach patient safety. Belo Horizonte-MG, Brazil, 2019

Innovative methodologies	Potentialities and weaknesses (study codes)
Scenario of care practice simulated in laboratory	**Potentialities** • Students can practice skills repeatedly, until they feel safe (S15, S18-S19). • It allows students to develop skills, integrating theory and practice, and critically reflect on their individual and collective performance within a safe environment (S1, S12-S13, S11, S15). • Students become aware of gaps in their knowledge, recognized during observations and in debriefing groups. (S6). • Enables practical training of students through active, independent learning with interactive multimedia and easy-to-use simulation tools. Students may have increased confidence regarding a specific skill (S18). • Improves communication abilities among students (S14).
	Weaknesses • Different and complex clinical environments, reduced control on environmental conditions, need to guarantee patient safety versus needs to improve skills and stress can affect negatively the formative process (S1). • Using this methodology in the undergraduate Nursing curriculum is time consuming and requires significant investment in staff and resources (S8, S12). • It requires a cautious and carefully planned approach, with sufficient time for each student to be observed and to receive feedback (S3). • It is not a proper teaching approach for all students. This method is not able to bring benefits to participants or increase confidence to perform in a real practical environment (S15).
Educational vídeos	**Potentialities** • Positive contributions to train skills with large groups of students (S2, S4). • Unlimited access to online video as a complement to clinical practice teaching is associated with increased skills acquisition and student satisfaction (S11).
	Weaknesses • Its use can be associated with traditional teaching methods without replacing them in practical clinical skills training. Although the effectiveness of the multimedia-supported training model is well established, its use remains limited (S4).
Staging/Role modeling	**Potentialities** • It is a valid and easily accessible form of teaching that is not only pleasant for most students, but can provide them with the necessary connections to use critical thinking and sound clinical judgment (S5). • It is a relevant method, especially with respect to active learning. Filming the role modeling offers a unique opportunity to reflect on one's own performance (S3).
	Weaknesses • No weaknesses were identified regarding the staging/role modeling to teach safe care to undergraduate Nursing students among the studies included in the final sample.
Films	**Potentialities** • Film education has made participants more aware of the devastating consequences of errors during health care. Exposure to errors through films can raise awareness about their risks and avoidance (S8-S9).
	Weaknesses • No weaknesses were indicated among the studies included in the final sample regarding the use of films to teach patient safety to undergraduate Nursing students.

Source: Own elaboration.

Discussion

It is noteworthy that the predominance of descriptive studies among the research analyzed in the final sample of this scoping review highlights the recurring need to describe the reality of certain phenomena in the scientific environment. However, this reveals the importance of investigative production with better evidence level to make published data more reliable and generalizable for practical application.

Regarding Nursing teaching, it is notorious that not learning the basic skills of this discipline, associated with inexperience, can increase the risk of adverse events to patients. Therefore, it is evident that Nursing students may contribute to the occurrence of unwanted but preventable episodes in health services, such as death, injury, disability, or delayed treatment of patients due to mistakes made during health care (41, 42).

Said possibility can potentially cause fear, anxiety, feelings of guilt, and sadness among Nursing students, affecting negatively their wellbeing. It can also decrease motivation and success during the course, lead to alienation or removal from the profession or even result in leaving the school or profession during the first year (42). However, the search for best teaching practices can make this process more enjoyable and facilitate learning.

Thus, by offering all students an active learning opportunity, it is possible to provide experimentation of consistent and comparable experiences, as well as help to integrate theoretical and practical knowledge and skills. In addition, it is imperative that students have the opportunity to repeat training frequently to reduce the number of errors in clinical practice and ensure the safety of patient care (43).

In this scenario, the proposal seeks to provide education that involves safety in health care to undergraduate Nursing students to favor the development of specific knowledge and practices, regardless of the intended technical education. This educational process needs to be present in their clinical approaches and in the demonstration of best practices, and must be permanent during the students' development in the different scenarios that contribute to their formation (9, 10, 44).

Given the need to meet the learning demands of Nursing students to contribute to safe care in health care, there is the consolidation of innovative teaching-oriented methodologies, which, as the author of the area (45) points out, enable new, more dynamic and participative strategies that position students as active actors in the construction of their own knowledge, supported by innovative educational tools, such as simulations, films, videos, stagings, and role modeling among others.

The scenario of simulated care practice in the laboratory or simulation, which stood out among the innovative methodologies used in the studies analyzed in the present research, can be defined as an attempt to simulate a given real clinical situation. Simulation is a process of cognitive and behavioral education that recreates a real situation in an artificial environment to promote meaningful, harmless, cost-effective student learning, and greater safety and effectiveness in performing tasks never performed previously by students (45-48).

The main objective of using simulation in the patient safety teaching environment is to create real environments so that students can act and build their learning by simulating the execution of certain care or action, as often as needed, whether on mannequins or in simulated patient to improve their technical and managerial skills (46, 48, 49).

Simulation training as an innovative teaching method plays a major role in the learning of Nursing students. Thus, the formative process based on clinical competences can be effective through the possibility of training the student by using techniques and procedures related to the Nursing discipline safely and with the support of qualified teachers available to provide immediate feedback. Moreover, by undergoing the experience in various practice scenarios, students can visualize, execute and assign a (re)significance to what they were willing to learn (50).

Simulation provides an opportunity to mitigate the limitations and variations in student learning experiences that occur during clinical stages by providing access to standardized "patients" of varying complexity to provide students with opportunities to apply and integrate critical thought, knowledge, and skills within a variety of simulated clinical contexts and situations (51).

That said, the study found that training based on a simulated laboratory practice setting is can improve students' professional knowledge and skills, increasing sensitivity and attention to behavior aimed at avoiding errors in health care services and improving patient quality and safety in the care provided, which – therefore – substantially contributes to reducing the rate of avoidable adverse events in their practice (22).

Although this approach of students with the reality of nursing care through clinical simulation is fundamental, there are still certain challenges, starting with the training of teachers/educators and teaching centers in the pursuit of excellence in nursing education, whose ultimate purpose is to train nurses who meet Brazilian DCNs and who can exercise their skills fully and with quality in nursing care and assistance (48).

Regarding the use of videos and films to support the teaching of patient safety in undergraduate Nursing, these are multimedia technologies, which allow demonstrating to students a set of audiovisual techniques that facilitate greater and faster understanding and interpretation of ideas. In addition, they provide for a more sensory learning environment to ensure that information learned can be retained for longer periods (52, 53).

Although multimedia resources present numerous possibilities and potentialities linked to patient safety teaching strategies, their use has some limitations, such as the lack of feedback from students' questions and doubts and the possibility of technical problems during the course of their use (54).

Regarding the use of role modeling in teaching patient safety to nursing students, it is understood that it is a valid and effective way to safely reproduce complex clinical situations. This teaching methodology can collaborate to better prepare students and make them more confident in caring for patients in real settings (24, 26, 55).

Innovative methodologies can significantly help the theoretical and practical teaching of patient safety to nursing students, giving them the opportunity to develop more effectively the knowledge and skills on the subject, which would reduce the rates of adverse events during the years dedicated to patient care. This is because one of the motivations for the advent of incidents during health care is the insufficiency or fragility of the knowledge and skills components of the human factor (56).

In addition to developing competencies in the training of future nursing professionals, so that care is effectively safe, the process and structure available in health services should also be considered, considering that the occurrence of adverse events is a phenomenon of multifactorial and multicausal order, as well as intrinsically related to health system failures.

In this context, it is understood that teaching and learning through innovative methodologies do not depend only on how the technology is used, that is, it is useless to merely exchange technologies already used for state-of-the-art digital elements, if there is no consideration about the strategies and the dynamized contents for their use. Hence, teaching planning is a fundamental element to make the teaching and learning process more fluid and effective (56).

Therefore, it is significantly important to consider that the use of technology in isolated manner does not guarantee better learning, given the need to develop pedagogical actions that enable critical practice linked to reality, built on students' autonomy and cooperation (15).

This scoping review was conducted with specific focus in undergraduate nursing education. Therefore, it is recommended that studies that include other areas of health be performed to take as a scope a multiprofessional approach that considers professionals already active in care and/or management practice.

Conclusion

It was concluded that the innovative methodologies used for effective teaching of patient safety in undergraduate Nursing were simulation, videos, role modeling and films; all applied in the classroom teaching modality.

Moreover, it was noted that using innovative methodologies aimed at teaching safe care in undergraduate Nursing, highlighting the scenario of simulated care practice in the laboratory, predominant in this scoping review and which presented great potential for effectiveness and efficacy of the theme's teaching-learning process.

Conflicts of interest: none declared.

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