






Simulation in cardiorespiratory arrest: assessment of satisfaction with the learning of nursing students*

Simulação em parada cardiorrespiratória: avaliação da satisfação com a aprendizagem de estudantes de enfermagem

Simulación de parada cardiorrespiratoria: evaluación de la satisfacción con el aprendizaje de estudiantes de enfermería

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ABSTRACT

Objective: To evaluate the satisfaction and self-confidence of undergraduate nursing students' learning in a scenario of realistic clinical simulation with the theme of advanced cardiopulmonary arrest maneuvers. **Method:** Exploratory-descriptive study, with a quantitative approach. In order to evaluate the simulation activity developed undergraduate nursing students responded to the Student Satisfaction and Self-Confidence with Learning Scale. **Results:** 19 students participated in the study. Students' satisfaction and self-confidence with learning were identified, with an average of 4.17 ± 0.59 in the developed scenario. In the subscale of satisfaction with current learning and in the subscale of self-confidence with learning, 86.3% and 76.6% of students scored the items in a maximum way (4-5), respectively. **Conclusion:** Nursing students demonstrate satisfaction and self-confidence with learning from a realistic clinical simulation scenario on the theme of advanced cardiorespiratory arrest maneuvers.

DESCRIPTORS

Students, Nursing; Learning; Simulation Technique; Patient Simulation Heart Arrest; Nursing Education.

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INTRODUCTION

Innovative teaching methodologies have been widely implemented in the area of health for students and professionals, as they provide the necessary critical and reflective training in the face of progress in knowledge, technological advancement and increasing care complexity⁽¹⁾. In this context, realistic clinical simulation (RCS) emerges, which allows a group of people to experience a representation of a real event with the purpose of practicing, learning, assessing or understanding human systems or actions⁽²⁾. It has been a strategy explored in teaching laboratories and simulation centers around the world to provide an environment which is as close as possible to a real one⁽³⁾.

RCS, as a dynamic process that involves the creation of a hypothetical situation incorporating an authentic representation of reality, facilitates the active participation of the student/professional and integrates the complexities of practical and theoretical learning with opportunities for repetition, feedback, evaluation and reflection, without causing harm to the patient⁽⁴⁾. Such aspects, when contemplated in a properly structured simulation activity, guarantee students' satisfaction with learning⁽⁵⁾. Studies have demonstrated the effectiveness of using this method for the development of critical thinking⁽⁶⁾, skills development⁽⁷⁾, decision making⁽⁸⁾, teamwork and strengthening self-confidence⁽⁹⁾.

In the area of nursing, RCS is characterized as an effective and innovative teaching method, allowing students and professionals to learn and train, with a broadening of the relationship between theory and practice in a safe environment⁽²⁾. RCS has been used for the learning of nursing in intensive care, presenting complex health situations of patients, in which the nurse must exercise the articulation of theoretical knowledge with practice, providing assistance in an accurate manner, based on evidence, and with quick and well-informed decision making⁽¹⁰⁾. We highlight the importance of using simulated training for teaching in situations of cardiorespiratory arrest (SCA), aiming at improving and acquiring skills and, consequently, better performance in patients care and survival rates⁽¹¹⁾.

Linked to simulation activities, studies point to the need to assess satisfaction and self-confidence with students' learning⁽¹²⁻¹⁴⁾, highlighting its importance for the identification of teaching consolidation using this innovative methodology.

Thus, the objective was to assess satisfaction and self-confidence with the learning of undergraduate nursing students in a realistic clinical simulation scenario with the theme of advanced cardiorespiratory arrest maneuvers.

METHOD

DESIGN OF STUDY

This is an exploratory-descriptive study, with a quantitative approach.

POPULATION

The population consisted of undergraduate nursing students at a Federal University in the South of the country,

regularly enrolled in the Nursing Course in Adult Health II discipline, concerning the theme of nursing care in SCA. The sample for convenience was composed by students who participated in the simulation activity developed and answered the scale on the assessment of satisfaction and self-confidence with learning.

The study was carried out in a Realistic Simulation Center in a hospital complex, one of the partners of the higher education institution, which includes a hospital box, high-fidelity mannequin (Sim Man Laerdal®) and all technological resources and inputs of an Intensive Care Unit (ICU), associated with a control room and a debriefing room mirrored by the simulation room.

DATA COLLECTION

The data were obtained in the second semester of 2018, immediately after the development of the simulation activity with the students. As a tool for the development of the simulation scenario, the Linn Simulation Scenario Guide – Advanced Cardiorespiratory Arrest Maneuvers, a product of the Professional Master's Dissertation in Nursing, was used⁽¹⁰⁾. The guide allowed the structuring of the stages of the simulation scenario, namely: organization time/student briefing/actors' briefing/scenario/debriefing, scenario learning objectives, equipment/consumables, environment organization, description of the scenario, actors' briefing, sequence of actions in the scenario (checklist of actions/student actions/mannequin actions), expected student sequence, student briefing, debriefing by analysis/understanding, description/reaction and synthesis/evaluation and references (Chart 1).

After the RSC activity, students' satisfaction with learning and self-confidence was assessed using the Student Satisfaction and Learning Confidence Scale (SSLCS)⁽¹⁵⁾, aiming at the identification of the students' perceptions of the activity and the consolidation of teaching.

Developed by the National League for Nursing (NLN)⁽¹⁶⁾, translated and validated for its use in Brazil⁽¹⁵⁾, the instrument consists of 13 items with five-point Likert-type responses (satisfaction – 05 items and self-confidence in learning – 08 items), ranging from “Strongly agree” (05) to “Strongly disagree with the statement” (01). Thus, in SSLCS, the higher the item's score, the higher will be the agreement with the statement, thus exposing student's satisfaction and self-confidence with the simulation activity experienced.

The simulation activity was conducted by the researcher and contained an information session, which aimed at introducing students to the simulation activity planning. This moment occurred at the beginning of the semester, together with the presentation of the discipline's teaching plan, through the explanation of the research project to be developed. The students had already experienced learning through simulation scenarios of low complexity, in other disciplines from the undergraduate course. The introduction to the theory was developed through an expository dialogue, followed by a practical class in a nursing laboratory.

During another class, after teaching the theoretical content, students were introduced to the development

Chart 1 – Guide to the Linn Simulation Scenario – Advanced Cardiorespiratory Arrest Maneuvers – Porto Alegre, RS, Brazil, 2018.

GUIDE TO SIMULATION SCENARIO – LINN							
Scenario Name	Advanced maneuvers in cardiorespiratory arrest					No. 01	
Scenario Local	Realistic Simulation Center						
Time	Organization	Actors' Briefing	Student Briefing	Scenario	Debriefing	Total	
	30 min	10 min	5 min	25 min	30 min	100 min	
Undergraduate course(s)	Nursing			Class	Number of students	Date	Time
Professor(s)	Rita Catalina Aquino Caregnato, Emiliane Nogueira de Souza, Amanda Chlalup Linn.			Adult's Health	22	13/09/2018	
Actors							
Names		Telephone	E-mail				
Scenario Learning Objectives							
To interpret the scene in order to identify the patient in cardiorespiratory arrest (CRA). To coordinate care for CRA according to the American Heart Association (AHA) protocol. To provide qualified care to the patient in CRA.							
NECESSARY MATERIAL							
Equipment/Consumables						Unit	
Conformation of the bed:							
Hospital bed with high-fidelity mannequin (monitor and SimPad™).						01	
Arm for venipuncture + simulated blood.						01	
Defibrillator.						01	
Serum support.						01	
Infusion bomb.						01	
Oxygen and suction wall mounted with flow meters.						01	
In front of the bed:							
Glove Box (S, M, L).						01	
Protective goggles.						04	
Adult manual ventilator with mask (Ambu).						01	
Laryngoscope handle + blades (it can be of different sizes/types).						01	
Orotracheal tube.						02	
Stethoscope.							
Syringe 20 ml						10	
Simulated medications: adrenaline 1mg/ml (1 ml), calcium gluconate 10% (10 ml), sodium bicarbonate 8.4% (10 ml).						05/each	
Abocath no. 18, 20, 22.						05	
Three-way taps						05	
5 ml syringes.						10	
Macro drip set						05	
Garrote.						01	
Micropore.						01	
Hudson mask.						01	
Equipment/Consumables						Unit	
Oxygen extender.						01	
Green or black needles.						05	
Gauze packs.						10	
Bottle of alcohol gel.						03	
Spreadsheets.						02	
Defibrillation gel bottle.						01	
Small Descarpack.						01	

continue...

...continuation

SCA trolley with rigid board.	01			
Scissors.	01			
Ladder.	01			
Materials to install on the mannequin:				
Three-way taps	01			
Abocath 20.	01			
Foley 18 probe.	01			
Urokit.	01			
Identification bracelet.	01			
Organization of the Environment				
Bed with highly complex mannequin, with hybrid puncture arm, pillow and covered by sheets. Oxygen/vacuum/compressed air wall mounted. Maintain an auxiliary table at the front with the patient's medical record and SCA car at a distance. Materials arranged on a side bench.				
Scenario Description				
<p>A.A.T.M. patient, 66 years old, male, with a history of smoking, dyslipidemia, systemic arterial hypertension and acute myocardial infarction in March 2017. He sought the UFCSPA emergency service referring to pain in chest tightness, without improvement at rest. He was classified as an orange risk by the Manchester protocol, where he would wait 10 minutes to be served. While in the waiting room, he presented with sensorineural lowering and severe hypotension. He was transferred to the emergency room, requiring endotracheal intubation and puncture of peripheral venous access in the right upper limb for administration of crystalloids.</p> <p>At the moment, the patient is under residual sedative effect of intubation, has punctate pupils, in mechanical ventilation through an orotracheal tube, number 8, labial commissure 22, SatO₂ 85%, FR 15 ppm. Hemodynamically unstable, with no good response to volume. PA 69 x 46 mmHg, FC 147 bpm. He has received 2.0 L of crystalloids so far. Delayed bladder catheterization was performed, with only 30 ml of diuresis in a collection bag. You are the emergency nurse who is arriving to receive the call. The nursing technician calls you to assess the patient, as he identified changes in the monitor curves.</p>				
Actors' Briefing				
<p><u>Nursing technician 01</u> – You will be the nursing technician responsible for the patient in the case. You have recently received the call. When entering the box, you identified through the monitor alarms that the curves had changed. You decided to call the nurse on duty to assess the patient. You have just started working in the emergency room a week ago, after being transferred from the wound clinic. You are scared and insecure about taking on a patient who looks so serious.</p> <p><u>Nursing technician 02</u> – You will be the technician who will enter the middle of the scene to assist the team in attending to a cardiorespiratory arrest.</p> <p><u>Physician</u> – You will be the service doctor. Your experience is geared towards outpatient care, and you decided to be on call in the emergency room to increase your income. You do not have much experience in caring for patients in cardiac arrest. All you remember is what you have read in the books.</p>				
High Fidelity Mannequin Sequences				
Actions Checklist	Student's Actions	Nursing Technician's Actions 01	Nursing Technician's Actions 02	Physician's Actions
1 – ()	Identify ventricular fibrillation on the monitor and perform electrode checking.	Ask what is happening to the patient, and the reason the wave on the monitor is the way it is. <i>If the student does not pay attention to the rhythm, ask what ventricular fibrillation means.</i>	–	–
2 – ()	Perform a pulse or carotid or femoral check.	Ask what is happening, be nervous about the situation. <i>If the student does not proceed with a pulse check, identify the patient's absence of pulse and inform the nurse.</i>	–	–
3 – ()	Identify absence of pulse and exclaim "ARREST".	Be nervous and ask the nurse what to do.	–	–
4 – ()	Ask the nursing technician to call for help and start compressions.	Leave the room and return with the nursing technician colleague 02 and physician.	–	–
5 – ()	Perform effective compressions for two minutes, asking if someone is controlling the time.	If the nurse is not using the ladder, offer to assist in positioning for compression.	Go to the nursing stop car and suck up adrenaline.	Report that you do not remember the last SCA you have attended, request adrenaline administration with an air of doubt. Ask them what they have done to the patient.
6 – ()	Guide nursing technicians to administer medications.	Wait for guidelines for positioning in the SCA. If the nurse does not delegate, ask him/her what could be done.	Control the time of medication administration and ask the nursing technician 01 to administer the medication, in case the nurse does not do it.	Perform manual ventilation with Ambu, performing 6 breaths per minute.

environment of the simulation scenario itself. In addition, the actors who participated in the scenario had knowledge about the location and operation of the devices to be used in the activity, ensuring safety and helping students during the simulation scenario, favoring the environment. Subsequently, the briefing, scenario and debriefing were rigorously applied to the students.

DATA ANALYSIS AND TREATMENT

The data obtained were stored on Excel spreadsheets and analyzed descriptively.

ETHICAL ASPECTS

The present research was submitted and approved by the Ethics and Research Committee from a public University in the south of Brazil, with approval under the number 2,734,458/18. All ethical principles of research involving human beings were respected, in accordance with Resolution no. 466/12⁽¹⁷⁾, from the National Health Council, guaranteeing the voluntariness of participation and the anonymity of the participants, as well as the confidentiality of the data obtained.

RESULTS

The discipline of Nursing in Adult Health II had 27 students enrolled. 19 of these students participated in the RCS activity of Advanced SCA Maneuvers and responded to SSLCS. From the scale, we identified both students' satisfaction and self-confidence with learning, with an average of 4.17 ± 0.59 .

In the subscale of satisfaction with current learning, 86.3% of students evaluated the items with the maximum score (4–5), as shown in Figure 1.

In the subscale of self-confidence with learning, 76.6% of students scored the items in a maximum way (4–5) (Figure 2).

The scenario was developed according to the simulation aspects proposed in the Linn Simulation Scenario Guide⁽¹⁰⁾, meeting the criteria for the applicability of realistic simulation in nursing education.

DISCUSSION

Students express satisfaction with high-fidelity clinical simulation activities, as they identify that this proposal assists the future nurse in reinforcing critical thinking skills, technical and communication skills, obtaining confidence to develop the knowledge acquired from the experiences in simulation scenarios⁽¹⁸⁾.

Thus, it is understood that the simulation provides learning results, in which the student is able to articulate theory with practice, promoting an increase in self-confidence and satisfaction with this activity, as it generates a positive impact on the level of anxiety, in addition to increasing trust for nursing actions in patient care⁽¹⁹⁾. However, in a randomized clinical trial carried out with 54 undergraduate nursing students, it was identified that students exposed to the simulation experience had shown stress related to the lack of competence and relationship difficulties, being necessary the proper planning by professors of the simulation activities, in order to minimize stressors that can impair learning⁽²⁰⁾.

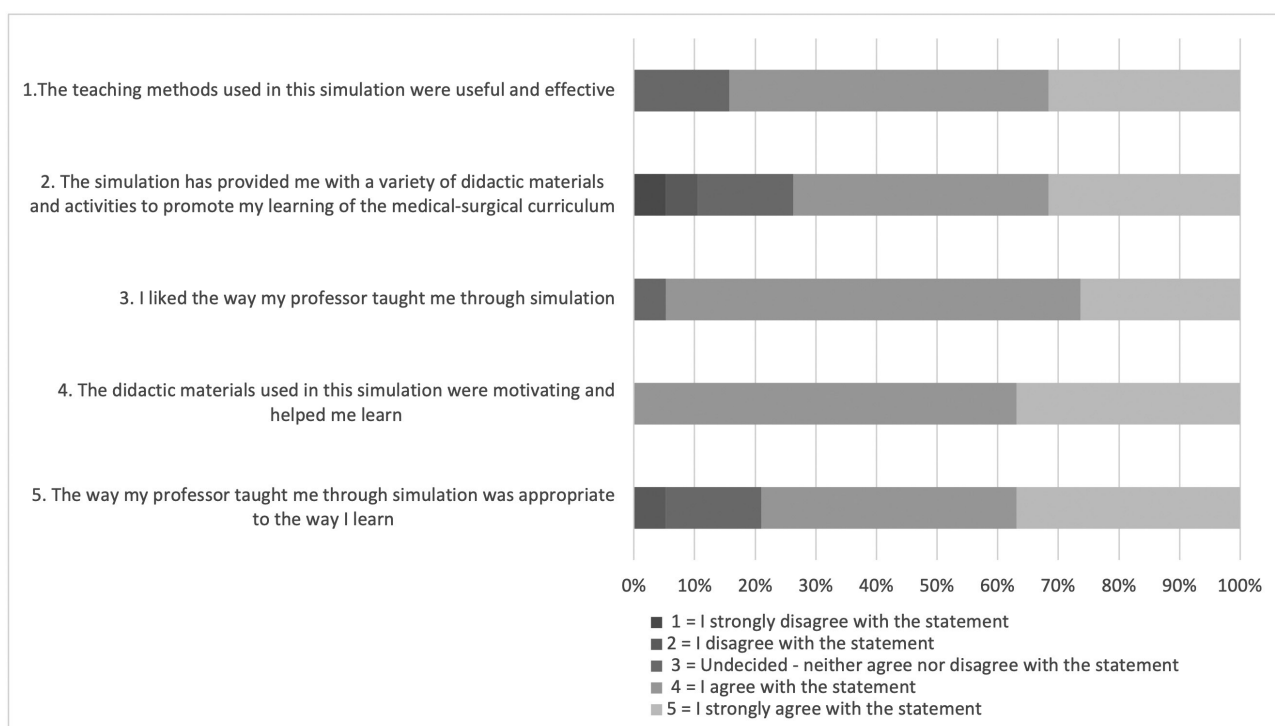


Figure 1 – Satisfaction with current learning.

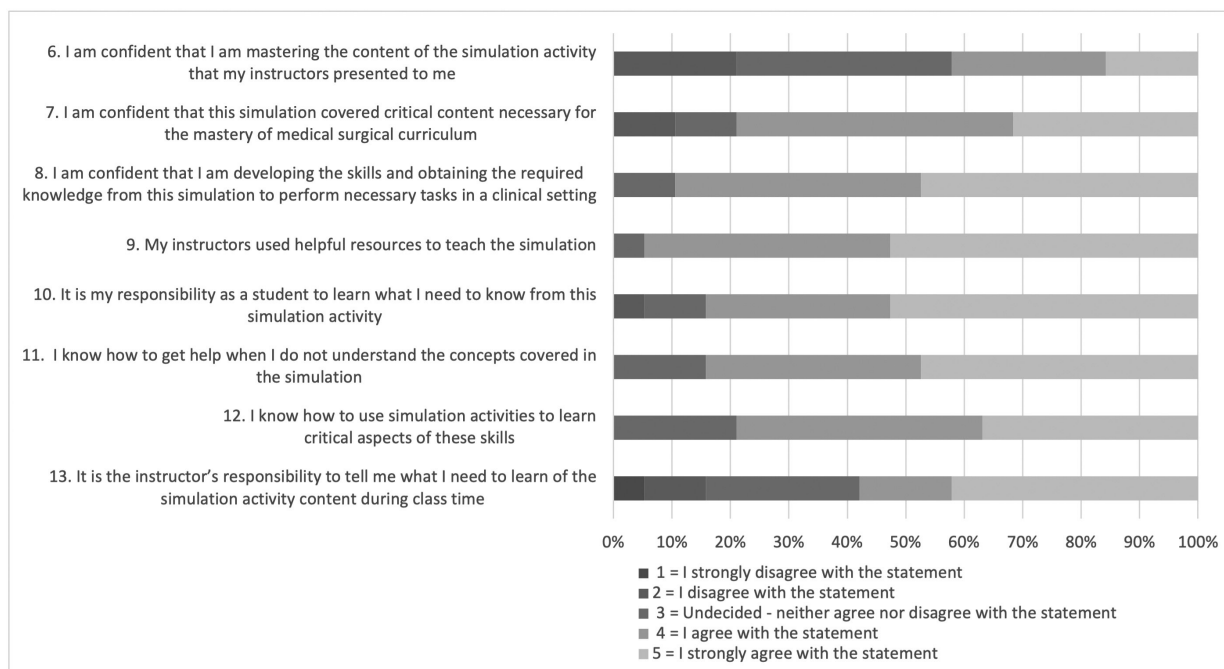


Figure 2 – Self-confidence with learning, Advanced SCA maneuvers.

The International Nursing Association for Clinical Simulation and Learning⁽²¹⁾ emphasizes the importance of standardized simulation design for the development of effective simulation experiences for learning, by identifying the need to use instruments that guide the professor in conducting the scenario, ensuring aspects of objectives and information, support, problem solving, feedback and realism. In this research, as an innovation to conduct the simulation scenario, the Linn Simulation Scenario Guide – Advanced Cardiorespiratory Arrest Maneuvers was used, which proposes the identification and description of the student's expected actions, as well as the actions of actors and mannequins, providing the necessary rigor to conduct the scenario, minimizing the student's insecurity in relation to the environment, the availability of necessary materials throughout the scene and the assistance to be provided. Thus, the skills to be developed are clearly described and provided to the student during the simulation activity, being an important aspect for achieving self-confidence and satisfaction with learning^(22–23).

Several researches have evaluated the students' satisfaction and self-confidence with the simulation activity, aiming to know the gain in learning with these proposals and, if necessary, raising subsidies so that the learning objectives are achieved through identified necessary modifications^(14,19,24–26).

In this study, students' satisfaction with learning was identified in the Advanced Cardiorespiratory Arrest Maneuvers simulation scenario. These data corroborate the satisfaction shown in simulation activities developed in other institutions.

In a survey conducted in southeastern Brazil, an average satisfaction of 4.29 ± 0.18 was identified by SSLCS in 38 undergraduate nursing students with two proposed simulation activities⁽²⁷⁾. In a survey conducted in the southern United States with 2,200 undergraduate nursing students

exposed to simulation scenarios, the average satisfaction was 4.35 ($SD \pm 0.67$)⁽²⁴⁾. Also in Brazil, SSLCS was used to assess the satisfaction of nursing professionals in a health institution regarding satisfaction with simulation activities in the theme of care for critical patients, with satisfaction identified with the average learning of 3.9 ± 0.7 ⁽²⁶⁾.

In general, the research claims that the simulation allowed students to be involved in different perspectives, making them reflect and reformulate their practice, consolidating learning and satisfaction with it. However, there was no description of the use of an instrument that guided the development of the simulation scenario of the aforementioned researches, as well as of the activities of the informative session, entry of the theory and introduction to the environment^(24,26,27).

Although the methodological option of the study did not include the qualitative approach, students' statements were identified at the time of debriefing, related to satisfaction, reinforcing the importance of the simulation activity for learning in a safe and close to the real environment, as shown through the statements: "The simulation allowed exposure to situations that would happen in real life and I probably would not know how to act"; "I felt safe with the simulation activity, as I have the possibility to make mistakes in a situation that could happen in real life" and "the controlled and identical to the real environment brought me security to provide nursing care". In addition, the students reinforced essential points about the nursing care to patients in SCA, indicating the success in reaching the learning objectives, as they expressed: "we need to recognize the pace of cardiorespiratory arrest as soon as possible"; "It is necessary to check the pulse in less than 10 seconds" and "the coordinated nursing team is necessary for the assistance to be effective and agile in this case".

Points of attention were also raised by the participants: “the multiprofessional healthcare team needs to be more integrated, which have hindered the care provided”; “There was a delay in recognizing the stop rhythm” and “chest compressions fluctuated a lot in positioning, rhythm and depth”. It is possible to identify that this teaching methodology exposes students to a common professional nurse daily situation, assisting them in a theoretical-practical relationship in a safe and close to the real environment, favoring learning through an activity that, in addition to the development of technical skills, allows reflection and, consequently, the consolidation of knowledge to effectively provide nursing care in critical situations.

With regard to self-confidence, it is known that nurses with this characteristic develop the skills of critical analysis, reflection, problem solving and decision-making⁽²⁸⁾.

Self-confidence, assessed on the SSLCS subscale, was high in the developed scenario. However, it is worth emphasizing the need to deepen the knowledge on the handling of nursing care devices, as well as the theoretical apparatus on the care of critical patients, besides the need for students' commitment to the activities that precede the simulation, such as expository lectures, also employing a methodology of dialogue and discussion of issues, skill training and active participation in activities proposed by professors and lectures as a whole.

The present study corroborates the identification of the importance of using realistic clinical simulation in nursing

education, particularly when related to care provided during cardiorespiratory arrests, based on satisfaction and self-confidence with the learning evidenced in the students.

Subsidizing students and nursing professionals, through access to the benefits of this innovative teaching methodology, guarantees the improvement of technical and non-technical skills, qualifying nursing care as a whole.

As a limitation of the study, the reduced number of students participating in the activity was identified, imposed by the characteristic of smaller classes in the undergraduate course and the annual admission of nursing students to the institution.

CONCLUSION

Undergraduate nursing students have demonstrated satisfaction and self-confidence with learning from a realistic clinical simulation scenario on the theme of advanced cardiorespiratory arrest maneuvers.

The simulation scenario, when applied in order to contemplate the essential aspects for the execution of activities as recommended in the literature, through the use of a guide for conducting and minimizing stressors to students, coupled with feedback to assess satisfaction and self-confidence of these, ensures the achievement of the established learning objectives. Thus, realistic clinical simulation as a methodology supports educational institutions to promote the qualification of nursing care.

RESUMO

Objetivo: Avaliar a satisfação e autoconfiança com a aprendizagem de estudantes de enfermagem em cenário de simulação clínica realística com a temática de manobras avançadas de parada cardiorrespiratória. **Método:** Estudo exploratório-descritivo, com abordagem quantitativa. Para avaliação da atividade de simulação desenvolvida, estudantes do curso de graduação em enfermagem responderam à Escala de Satisfação de Estudantes e Autoconfiança com a Aprendizagem. **Resultados:** Participaram 19 estudantes. Identificou-se satisfação e autoconfiança dos estudantes com a aprendizagem, com média de $4,17 \pm 0,59$ no cenário desenvolvido. Na subescala de satisfação com a aprendizagem atual e na subescala de autoconfiança com a aprendizagem, 86,3% e 76,6% dos estudantes pontuaram os itens de forma máxima (4–5), respectivamente. **Conclusão:** Estudantes de enfermagem demonstram satisfação e autoconfiança com a aprendizagem a partir de cenário de simulação clínica realística na temática de manobras avançadas de parada cardiorrespiratória.

DESCRITORES

Estudantes de Enfermagem; Aprendizagem; Simulação; Simulação de Paciente; Parada Cardíaca; Educação em Enfermagem.

RESUMEN

Objetivo: Evaluar la satisfacción y la autoconfianza de estudiantes de enfermería con el aprendizaje en un escenario de simulación clínica realista y con la temática de maniobras avanzadas de parada cardiorrespiratoria. **Método:** Se trata de un estudio exploratorio y descriptivo, de enfoque cuantitativo. Para evaluar la actividad de simulación desarrollada, estudiantes del curso de graduación de enfermería respondieron a la Escala de Satisfacción de Estudiantes y Autoconfianza con el Aprendizaje. **Resultados:** Participaron diecinueve estudiantes. Se identificó la satisfacción y la autoconfianza de los estudiantes con el aprendizaje, con una media de $4,17 \pm 0,59$ en el escenario desarrollado. En la subescala de satisfacción con el aprendizaje actual y en la subescala de autoconfianza con el aprendizaje, el 86,3% y el 76,6% de los estudiantes, respectivamente, puntuaron los ítems al máximo (4–5). **Conclusión:** Los estudiantes de enfermería demostraron satisfacción y autoconfianza con el aprendizaje en el escenario de simulación clínica realista, en la temática de maniobras avanzadas de parada cardiorrespiratoria.

DESCRIPTORES

Estudiantes de Enfermería; Aprendizaje; Simulación; Simulación de Paciente; Paro Cardíaco; Educación en Enfermería.

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