






Effect of cardiopulmonary resuscitation training on knowledge, satisfaction and self-confidence in learning of nurses: a quasi-experimental study

Efeito de uma capacitação em reanimação cardiopulmonar no conhecimento, satisfação e autoconfiança na aprendizagem de enfermeiros: estudo quase-experimental

Efecto del entrenamiento en reanimación cardiopulmonar sobre el conocimiento, la satisfacción y la autoconfianza en el aprendizaje de enfermeros: un estudio cuasi experimental

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ABSTRACT

Objective: to evaluate the effect of a training that combines a theoretical approach with clinical simulation in cardiopulmonary resuscitation on the knowledge, satisfaction and self-confidence in learning of nurses. **Methods:** quasi-experimental study conducted with nurses from a tertiary hospital, through theoretical training and clinical simulation of cardiopulmonary resuscitation. Questionnaires were applied before and after the training; the Scale of Student Satisfaction and Self-Confidence in Learning was applied after training. **Results:** thirty-one nurses participated, 90.32% were female, mean age of 33.93 years (SD = 9,02). The mean number of correct answers in the pre-test questionnaire was 8.90 (SD ± 1.95) and after the test it was 11.58 (SD ± 1.26; p < 0.001). As for satisfaction and self-confidence, the overall average was 4.51 (SD ± 0.10). **Conclusion:** the educational intervention used in training, which combines a theoretical approach and clinical simulation in cardiopulmonary resuscitation, improves nurses' knowledge of basic and advanced life support, satisfaction and self-confidence in learning.

Descriptors: Cardiopulmonary Resuscitation; Nursing; Simulation Training; Education, Nursing.

RESUMO

Objetivo: avaliar o efeito de uma capacitação que associa abordagem teórica com simulação clínica em reanimação cardiopulmonar no conhecimento, satisfação e autoconfiança na aprendizagem de enfermeiros. **Métodos:** estudo quase-experimental, realizado com enfermeiros de um hospital terciário, por meio de capacitação teórica e simulação clínica de reanimação cardiopulmonar. Antes e após a capacitação foram aplicados questionários; a Escala de Satisfação do Estudante e Autoconfiança na Aprendizagem foi aplicada após a capacitação. **Resultados:** participaram 31 enfermeiros, 90,32% eram do sexo feminino, com média de idade de 33,93 anos (DP = 9,02). A média de acertos no questionário pré-teste foi 8,90 (DP ± 1,95) e a média de acertos pós-teste foi de 11,58 (DP ± 1,26; p < 0,001). Quanto à satisfação e autoconfiança a média geral foi 4,51 (DP ± 0,10). **Conclusão:** a intervenção educativa utilizada para capacitação, que associa abordagem teórica e simulação clínica em reanimação cardiopulmonar promove melhora do conhecimento dos enfermeiros em suporte básico e avançado de vida, satisfação e autoconfiança na aprendizagem.

Descritores: Reanimação Cardiopulmonar; Enfermagem; Treinamento por Simulação; Educação em Enfermagem.

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RESUMEN

Objetivo: evaluar el efecto de un entrenamiento que combina un enfoque teórico con simulación clínica en reanimación cardiopulmonar sobre el conocimiento, la satisfacción y la autoconfianza en el aprendizaje de los enfermeros. **Métodos:** estudio cuasi experimental realizado con enfermeros de un hospital de tercer nivel, mediante entrenamiento teórico y simulación clínica de reanimación cardiopulmonar. Se aplicaron cuestionarios antes y después de la capacitación; después del entrenamiento se aplicó la Escala de Satisfacción y Autoconfianza del Estudiante en el Aprendizaje. **Resultados:** participaron 31 enfermeros, 90,32% del sexo femenino, edad media de 33,93 años ($DE = 9,02$). La media de aciertos en el cuestionario pretest fue de 8,90 ($DE \pm 1,95$) y después del test fue de 11,58 ($DE \pm 1,26$; $p < 0,001$). En cuanto a la satisfacción y autoconfianza, la media global fue de 4,51 ($DE \pm 0,10$). **Conclusión:** la intervención educativa utilizada para la formación, que combina el enfoque teórico y la simulación clínica en reanimación cardiopulmonar, mejora el conocimiento de los enfermeros sobre el soporte vital básico y avanzado, la satisfacción y la autoconfianza en el aprendizaje.

Descriptor: Reanimación Cardiopulmonar; Enfermería; Entrenamiento Simulado; Educación en Enfermería.

INTRODUCTION

Cardiopulmonary arrest (CPA) is a cardiovascular emergency with a high incidence in the population. It is estimated that 20-140 cases of out-of-hospital CPA/100,000 inhabitants occur in the world each year. In the United States, there are approximately 200,000 cases of in-hospital CPA per year. In turn, in Brazil, it is estimated that 200,000 cases of CPA occur per year; half of these cases occur in the hospital setting⁽¹⁻³⁾.

These high rates constitute a serious public health problem given the high morbidity and mortality, considering that the survival rate decreases by 10% for every minute a person remains in CPA. Regarding survival after hospital discharge, patients may have irreversible sequelae, which will interfere with their quality of life⁽⁴⁻⁶⁾. Therefore, the importance of prompt care for these patients is evident to achieve greater chances of quality survival^(2,4,6).

Cardiopulmonary arrest care demands from the multidisciplinary team a sequence of actions for Cardiopulmonary Resuscitation (CPR) in Basic Life Support (BLS) and Advanced Life Support (ALS), which are established and updated periodically by the American Heart Association (AHA)^(5,7).

Nurses are the closest professionals to patients within the hospital environment. They have leadership skills, technical capacity, knowledge and legal support to immediately start CPR in accordance to the AHA guidelines⁽⁸⁾. As the quick identification and action of the nursing team will influence the positive and successful result of the CPR, consequently, everyone involved with the care must be aligned and synchronized regarding actions to be performed, being led by the team nurse⁽⁹⁾.

The clinical simulation is one of the several methods can be used in the development and improvement of the clinical reasoning necessary for this service. It is a

teaching strategy within the scope of the active methodology of approaching circumstances in which students and professionals can be exposed to situations commonly found in professional practice, providing the correlation of theory and practice in a controlled and safe environment⁽¹⁰⁻¹²⁾. Clinical simulation is considered an effective and innovative tool that enables active participation in the learning process and promotes the development of clinical reasoning, professional training and teamwork⁽¹⁰⁻¹²⁾.

In this context, the analyzes of the evaluation of satisfaction and self-confidence with the learning of students and professionals is necessary to consolidation of active methodologies. These analyzes are often used in studies involving students^(13,14), and a multidisciplinary team⁽¹⁵⁾, and the evaluation of these methodologies in the training of nurses is important as well.

The objective of this study was to evaluate the effect of a training that combines a theoretical approach with clinical simulation in CPR on knowledge, satisfaction and self-confidence in learning of nurses.

METHODS

Pre- and post-intervention single-group quasi-experimental study developed between July and August 2021 in a tertiary philanthropic hospital located in the hinterland of the state of São Paulo. The Consolidated Standards of Reporting Trials (CONSORT) was used in the description of the study.

The hospital serves clinical and surgical patients and has the following sectors: clinical and surgical inpatient unit, general and specialized intensive care units (cardiological and COVID-19), surgical center, sterile service department, blood bank, hemodialysis, hemodynamics, chemotherapy, radiotherapy, maternity, obstetric center,

pediatrics and neonatal and pediatric intensive care units.

The study was developed with nurses who worked in different sectors and the sample was defined by convenience. The contingent of nurses at the hospital where the study was carried out totaled 117 professionals. In the data collection period, 113 were hired, of which 80 nurses who worked in clinical practice were invited to participate. Professionals on vacation, on leave or who worked exclusively in management were considered ineligible. Among those who agreed to participate in the study, none withdrew.

Initially, nurses were invited to participate in the study. A date within their working hours was scheduled for the training of those who accepted. Several times were made available and two to four nurses were scheduled concurrently in each session.

On the scheduled day, each nurse received the Informed Consent, the sociodemographic characterization form and the questionnaire to assess knowledge on CPA and CPR (pre-test evaluation). Data collection and the educational intervention were performed on the same day.

All meetings with research participants took place in a laboratory of clinical practices at the hospital that has all materials necessary for the clinical simulation.

Instruments

Sociodemographic characterization questionnaire

This instrument contains questions of identification, age, sex, time of professional training, time working at the institution and previous training on the subject.

Questionnaire for assessment of nurses' knowledge of CPA and CPR

The pre- and post-test knowledge assessment questionnaire was developed by the authors based on the 2020 AHA guidelines⁽¹⁶⁾. It contained 13 multiple-

-choice questions with content on correct identification of CPA and initiation of CPR maneuvers (Questions 7, 9 and 10), reversible causes of CPA (Questions 3a and 3b), cardiac rhythms during CPA and its management (Questions 1 and 2), medications used (Question 4), adequate compression (Questions 5, 6 and 8) and airway management (Questions 11 and 12). This instrument has not been previously validated.

Scale of Student Satisfaction and Self-Confidence in Learning⁽¹⁷⁾

This scale contains 13 questions scored on a 5-point Likert scale ranging from strongly disagree with the statement to strongly agree with the statement. Learning satisfaction is assessed in questions 1-5 and self-confidence in learning is explored in questions 6-13. This scale has been translated and validated for use in Brazil, with Cronbach's alpha of 0.84 for the general scale, 0.86 for the satisfaction construct and 0.77 for the self-confidence construct⁽¹⁷⁾.

Intervention

The researcher responsible for the training received prior training and guidance on the topic and form of exposure for each of the stages (theoretical and clinical simulation). Training lasting a total of 50 minutes, approximately 20 minutes for the theoretical part and 30 minutes for clinical simulation, was given to each group of nurses. In the theoretical part, fundamental aspects of recognizing CPA and ALS were presented. For this purpose, contents related to the recognition of CPA and maneuvers indicated for CPR in a hospital setting were addressed, in accordance with recommendations of the 2020 AHA⁽¹⁶⁾. In this stage, a dialogued oral exposition approach with support of audiovisual material was used. Next, participants performed the clinical simulation in which they needed to provide care to a patient in CPA (Figure 1). The scenario was developed by the researchers for this training.

Figure 1 - Description of the scenario for the clinical simulation used in the study

Continue...

Clinical Simulation of Cardiopulmonary Resuscitation for Nurses	
Learning Objectives: recognize CPA ^A and perform appropriate maneuvers.	
Human Resources: each group of participants will have the help of the researcher, who will play the role of facilitator, presenting the scene and then acting as the unit's physician.	
Material Resources: low fidelity manikin; emergency trolley with materials for CPAA care.	
Estimated time: 20-30 minutes.	Scenario fidelity: medium
Initial information: T.M.H., male, 65 years old, admitted to the intensive care unit after admission to the emergency room with severe muscle weakness, tachypnea, decreased level of consciousness and skin pallor with weak and arrhythmic radial pulse.	

Figure 1 - Description of the scenario for the clinical simulation used in the study

Continuation...



Clinical Simulation of Cardiopulmonary Resuscitation for Nurses		
<p>Initial parameters of the patient: ECG^B = 14. Presence of cyanosis in the extremities and absence of edema. Vital signs: Heart rate = 112 beats per minutes, Respiratory Rate = 27 breaths per minute, Blood Pressure = 67x32mmHg^C, SpO₂^D = 84% in room air, Temperature = 36.2°C^E. Patient remains in bed in dorsal decubitus, with peripheral venous access performed with a catheter over a N° 20 needle in the left upper limb, with a multiparameter monitor installed, using O₂^F eyeglass catheter at 3L/min^G. After about 5 minutes the patient evolves to scene 1.</p>		
<p>SCENE 1 – Patient becomes unconscious and the following tracing appears on the monitor (Ventricular Fibrillation)</p>		
		
Stage	Actions expected from nurses	Researchers' actions
1.	Call the patient (who will be unresponsive) palpate the carotid pulse (absent).	
2.	Communicate the team and ask one of them to report the event to the medical professional.	
3.	Recognize the CPA ^A and which change in the tracing the monitor indicates (Ventricular fibrillation – shockable).	
4.	Approach and position the emergency trolley.	
5.	Coordinate the team (appoint a professional for compressions, a professional for medication and puncture, a professional for ventilations, a professional for counting time).	
6.	Start compressions until the medical professional arrives to perform the defibrillator discharge; the person responsible for the ventilation must be positioned and perform ventilations every 30 compressions, the person responsible for the time must start counting the time, the person responsible for the medication must puncture another large caliber access. (It is expected that actions occur in a synchronized and concurrent manner).	Will play the role of a medical professional who will arrive at that time for the service.
7.	It is expected that the two responsible for the compressions alternate every 2 minutes, avoiding fatigue. They are expected to do it correctly (positioning, intensity of compressions, counting of compressions).	If nurses do not alternate the compressions or do not do it at the right time, they will be warned about it. If performed incorrectly, they will be corrected at the time.
<p>SCENE 2 - The shock is performed. The following trace appears on the monitor (Asystole)</p>		
		
Stage	Actions expected from nurses	Researchers' actions
1.	Due to the rhythm change, it is necessary to perform the flat line protocol (check cables, increase gain and change lead).	If they do not perform the protocol, they will be reminded.
2.	Compressions should resume.	If not performed, they will be informed.
3.	They must remember to administer epinephrine every 3-5 minutes	If not performed, they will be informed.
4.	They must remember the advanced airway management and to prepare equipment for OTI ^H .	Requests material for advanced airway management and performs the OTI ^H .
<p>SCENE 3 - The patient maintains an asystole rhythm and now has an advanced airway</p>		
Stage	Actions expected from nurses	Researchers' actions
1.	Compressions will need to be resumed (shock is now no longer recommended).	If they do not recognize it, they will be informed.
2.	Ventilations should now be every 6-8 seconds, concurrent with compressions.	If they do not apply simultaneous compressions, they will be reminded.
3.	Administer epinephrine.	

Figure 1 - Description of the scenario for the clinical simulation used in the study

Conclusion...

Clinical Simulation of Cardiopulmonary Resuscitation for Nurses		
SCENE 4 - The patient's pulse is restored		
Stage	Actions expected from nurses	Researchers' actions
1.	Must recognize that the patient has a pulse and suspend compressions.	If they do not suspend compressions, they will be warned.
2.	Patient must be connected to mechanical ventilator.	If it is not done, they will be instructed to do so.
3.	Post-arrest care	

Referência:
Nolan JP, Maconochie I, Soar J, Olasveengen TM, Greif R, Wyckoff MH, et al. Executive Summary: 2020 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2020; 142:S2-S27. <https://doi.org/10.1161/CIR.0000000000000890>⁽¹⁶⁾

Note: ^ACPA - Cardiorespiratory arrest; ^BECG - Electrocardiogram; ^CmmHg - millimeters mercury; ^Dbpm - beats per minute; ^ESpO₂ - oxygen saturation measured by pulse oximetry; ^F°C - graus celsius; ^Goxygen; ^HL/min - liters per minute; ^IOTI - Orotracheal intubation.

After the clinical simulation, participants answered the knowledge assessment questionnaire (post-test) and then filled out the Scale of Student Satisfaction and Self-Confidence in Learning⁽¹⁷⁾.

Each group took less than an hour to perform all proposed actions. All the necessary instructions were given to participants beforehand.

Analysis procedures

The results obtained were entered into a Microsoft Excel® spreadsheet, (Microsoft Corporation, United States) with double typing. The software Statistic Package for the Social Science (SPSS® Statistics), version 22 (IBM®, United States) was used considering a significance level (α) of 5%. The analyzed variables were the nurses' knowledge before and after training; self-confidence and satisfaction with the activity after the intervention. Initially, a descriptive analysis of each variable was performed and its distribution was assessed through the analysis of histograms. For the analysis of knowledge, the correct answers before and after the intervention were counted and the points obtained were compared through the Wilcoxon test, since the distribution of variables in the histogram was asymmetric. For the evaluation of errors and correct answers in each question, the McNemar test was used, which determines if there was a difference in the proportion of correct answers before and after the intervention. The magnitude of the effect of the intervention was evaluated using Cohen's *d* for the Wilcoxon test. The reference values for the magnitude of effect were based on the literature⁽¹⁸⁾ which describes values below 0.19 as insignificant, between 0.20 and 0.49 as a small effect, between 0.80 and 1.29 as a large effect and greater than 1.30 as very large effect.

Ethical aspects

The project was sent to the Research Ethics Committee and approved under number 4.678.154 of 2021. All precepts set forth in Resolution 466/2012 were followed. The study was not registered on a clinical trial registration platform, since it is not a health intervention to change a patient's result. It is in accordance with recommendations of the International Committee of Medical Journal Editors (ICMJE).

RESULTS

Of the 80 invited nurses, 31 agreed to participate in the study. Most (90.32%) were female, mean age of 33.93 years (Standard Derivation – SD = 9.02), minimum 22 and maximum 59 years.

Most participants (54.83%) had graduated six years earlier or more, 29.03% had graduated one to five years earlier and 16.12% had graduated less than one year earlier. With regard to working time at the institution where the study was developed, 38.70% had worked there for less than one year, 38.70% between one and five years, and 19.35% for six years or more.

In terms of updating in CPR, 9.67% of participants had performed some update less than one year earlier, 45.16% had performed an update on the subject one to five years earlier, 9.67% six years earlier or more; 3.22% stated they had attended some update activity, but were unable to accurately indicate the time elapsed since then, and 32.25% have never had any type of update on the theme.

Participants worked in the following departments: general adult Intensive Care Units (ICU) and Adult Coronary Unit (ACU) (22.58%), COVID-19 ICU (12.90%), adult ward (22.58%), emergency medical

service (EMS) (6.45%); other sectors (maternity hospitalization unit, obstetrics center, milk bank, surgical center, hyperbaric chamber, hemodynamics and clinical outpatient clinic) represented 35.48%.

The educational activity developed had a positive effect on nurses' knowledge, with an increase in the average number of correct answers in the post-test question-

naire ($p < 0.001$) compared to the pre-test. Furthermore, the magnitude of the intervention effect (Cohen's $d = 1.61$) indicated a very high impact of the educational intervention on participants' knowledge (Table 1). The probability of a randomly selected participant after the intervention having a higher score than before the intervention was 87.50%.

Table 1 - Distribution of correct answers by participants before and after training ($n = 31$), São Carlos, São Paulo, Brazil, 2021

Pre-test			Post-test			p value*	Cohen's d	Effect
Mean	Median	SD**	Mean	Median	SD**			
8.90	9.00	1.95	11.58	12.00	1.26	<0.001	1.61	Very large

Note: * Wilcoxon test; ** Standard Derivation.

When analyzing the percentage of correct answers for each question before and after the intervention, an increase in the number of correct answers was observed in the post-test; only in one question (5), which dealt with the relationship between the number of compressions and ventilations per minute, an increase in the number of correct answers was not obtained, since in the pre-test 100.0% of the nurses answered correctly. Regarding questions that had a higher percentage of wrong answers in the pre-test, the question asking about the possible rhythms found in a patient in CPA (Question 1), the question about the 5H mnemonic (Question 3-a) and the question about opening the airways (Question 11) stood out (Table 2).

Table 2 - Percentage of correct and incorrect answers by question in the pre- and post-test ($n=31$), São Carlos, São Paulo, Brazil, 2021

Items	Pre-test Correct answers n (%)	Post-test Correct answers n (%)	p-value*
Question 1	15 (48.40)	25 (80.60)	0.006
Question 2	16 (51.60)	22 (74.20)	0.039
Question 3-a	10 (32.30)	29 (93.50)	< 0.001
Question 3-b	21 (67.70)	29 (93.50)	0.021
Question 4	27 (87.10)	31(100.00)	0.125
Question 5	21 (100.00)	30 (96.80)	1.000
Question 6	25 (80.60)	30 (96.80)	0.063
Question 7	25 (80.60)	29 (93.50)	0.219
Question 8	20 (64.50)	31 (100.00)	< 0.001
Question 9	29 (93.50)	30 (96.80)	1.000
Question 10	25 (80.60)	29 (93.50)	0.219
Question 11	9 (29.00)	17 (54.80)	0.057
Question 12	22 (71.00)	26 (83.90)	0.219

Note: * McNemar's test.

High scores were obtained in the satisfaction and self-confidence in learning of nurses (Table 3). Regarding satisfaction with learning (questions 1 to 5 of the scale), the higher average values were found in questions 1 and 4, while the lower average values were in questions 3 and 5. Among questions of self-confidence in learning (6 to 13) the highest average value was obtained in question 10 and the lowest average value was in question 13.

Table 3 - Minimum, maximum and average values obtained regarding satisfaction and self-confidence ($n = 31$), São Carlos, São Paulo, Brazil, 2021

Dimension	Minimum	Maximum	Mean	SD*
Satisfaction	4.54	4.61	4.58	0.03
Self-confidence	4.19	4.70	4.47	0.20

Note: Standard Derivation.

Considering that the results obtained in all questions had an average greater than 4 (data not shown in the table), at the end of the study, nurses were evidently satisfied with the educational activity carried out and also felt confident regarding the learning acquired.

DISCUSSION

The 50-minute educational intervention associating a theoretical approach with clinical simulation for training nurses in CPR in ALS promoted an improvement in knowledge on the subject, with a very large effect size, satisfaction and self-confidence in learning, and showed highly positive results. This strategy should be meticulously planned and developed and can be used in the context of continuing health education for these professionals during work shifts. It may even be periodically repeated, taking care to incorporate updates of knowledge in the area.

Depending on the work setting of the nurse, CPR situations are not always frequent in daily routine. However, professionals must be properly prepared and updated if they need to act in this situation⁽¹⁹⁾.

The findings of the present investigation involving nurses are similar to those of a study on the effect of clinical simulation on BLS conducted with different groups of undergraduate nursing students in Spain, in which was also identified a significant difference in the overall average between pre-test questionnaires $12,61 \pm 2.30$ and post-test 15.68 ± 2.06 ($p < 0.001$)⁽²⁰⁾. In the same way, the results of a study developed with medical students in the internship phase, nursing and medical residents, and nursing staff (technicians and nurses) with a similar objective to that of the present study, demonstrated a significant increase ($p < 0.0001$) in the knowledge of participants, especially of nursing technicians⁽¹⁵⁾. This shows the effectiveness of this teaching strategy for this type of purpose.

Clinical simulation is considered an effective methodology for nurses' learning and has been widely and internationally used in learning and for qualifying the care provided by these professionals⁽¹¹⁾.

The assessment of satisfaction and self-confidence in learning in the context of clinical simulation is relevant to identify if the proposals initially employed were effective from the point of view of the population receiving the guidance or if adjustments are necessary for the achievement of objectives⁽¹⁴⁾. In this sense, the Scale of Student Satisfaction and Self-Confidence in Learning showed results very close to the maximum score of the questionnaire, indicating that nurses felt satisfied and self-confident in the educational activity performed.

Self-confidence is considered a factor that evidences the participant's proactivity; when high, as in the case of the present study, it decreases professionals' feeling of anxiety caused by situations of critical patient care, thereby favoring their feeling of security to act⁽¹⁹⁾.

The results of satisfaction of participants in the present study corroborate with other studies found in the literature that also evaluated the use of clinical simulation in nursing students' learning regarding knowledge of advanced CPR maneuvers^(14,21,22).

In a study using clinical simulation with 2,200 nursing students in the United States, the satisfaction of participants was 4.35 ($SD \pm 0.67$)⁽²²⁾. In Brazil, in a study of 38 nursing students who performed two clinical simulation activities, the satisfaction of 4.29 ($SD \pm 0.18$) was obtained⁽²¹⁾. Considering the satisfaction of the multidisciplinary team with training using clinical simulation, the literature indicates averages between

4.45 and 4.66 ⁽¹⁵⁾, similar results to those of the present study.

During the last few years, there has been a remodeling in the pedagogical strategies used in the teaching process within the field of nursing, which turned to innovative methodologies⁽²³⁾. Clinical simulation is considered an effective methodology for nurses' learning and has been widely and internationally used for learning and qualifying the care provided by these professionals⁽¹¹⁾. This methodology facilitates the transformation of theoretical learning into practice, increasing participants' confidence and the stimulation of critical thinking and decision-making in highly critical situations. Furthermore, it offers a situation of clinical experience in a controlled location that allows errors, exercising and reinforcing what was learned during the exposition of theoretical content^(11,19). These positive aspects of clinical simulation for professional training are corroborated by the high levels of satisfaction with learning^(14-15,21-22) that have also been identified in the present study.

In view of the skills developed during clinical simulation, which promote the professional's action in critical moments when it is necessary to act quickly and assertively, this methodology has been used in environments specialized in providing care to critically ill patients, such as the ICU and urgency and emergency units^(11,24). Due to the rapid updates occurring in the development of knowledge and practices in health, these professionals need frequent training with proposed and updated scientific guidelines. In this way, clinical simulation stands out as a way to optimize the training of these professionals, promoting critical thinking and professional safety in these situations.

Among the limitations of the study, is the fact that the scenario where the research was conducted has not been previously validated for this purpose. Participants were not asked whether they had previously participated in simulated activities, which could influence satisfaction. Other limitations refer to the restricted number of professionals taking part in the study, the convenience sample and its performance in only one hospital, and the lack of prior validation of the questionnaire used to assess knowledge.

Future research is recommended to validate the aforementioned instruments and to use this training protocol in other scenarios and with other populations. Considering that the speed of care can have an impact on the survival of patients, it is essential that all health institutions offer periodic training and, in this sense, the scenario applied in this investigation can be a relevant subsidy.

CONCLUSION

It is concluded that the educational intervention for training in the proposed structure, lasting 50 minutes and associating a theoretical component with a clinical simulation component in CPR in ALS in a specific scenario involving groups of 2-4 nurses during the respective work shift increases nurses' knowledge on the subject and generates high satisfaction and self-confidence in learning.

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None.

CONFLICT OF INTERESTS

None.

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AUTHORS' CONTRIBUTIONS – CRediT

ALM: conception; data curation; formal data analysis; methodology; project administration; writing – original draft and writing – proofreading and editing.

DPG: data curation; methodology and writing - proofreading and editing.

RHR: data curation; writing – original draft and writing – proofreading and editing.

RLBL: formal data analysis; methodology and writing - proofreading and editing.

DCG: conception; formal data analysis; methodology; project administration; supervision; writing – original draft and writing – proofreading and editing.

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