

SIMULATION AS A STRATEGY FOR LEARNING IN PEDIATRICS

SIMULAÇÃO COMO ESTRATÉGIA PARA O APRENDIZADO EM PEDIATRIA

EL SIMULACRO COMO ESTRATEGIA DE APRENDIZAJE EN PEDIATRÍA

Anna Karolyne Carvalho Fernandes¹
Laiane Medeiros Ribeiro²
Guilherme da Costa Brasil³
Marcia Cristina da Silva Magro⁴
Paula Regina de Souza Hermann⁴
Casandra Genoveva Rosales Martins Ponce de Leon⁵
Alecssandra de Fátima Silva Viduedo⁶
Silvana Scherz Funghetto⁷

¹ RN. Hospital do Coração of Brazil, Department of Nursing. Brasília, DF – Brazil.
² RN. PhD in Nursing, Assistant Professor. University of Brasília – UnB. Brasília, DF – Brazil.
³ RN. MS student. UnB, Graduate Department of Nursing. Brasília, DF – Brazil.
⁴ RN. PhD in Science. Assistant Professor. UnB, School of Ceilândia. Brasília, DF – Brazil.
⁵ RN. MS in Nursing. Assistant Professor. UnB, School of Ceilândia. Brasília, DF – Brazil.
⁶ RN. PhD in Health Science Nursing. Assistant Professor. UnB, School of Ceilândia. Brasília, DF – Brazil.
⁷ RN. PhD in Health Science. Assistant Professor. UnB, School of Ceilândia. Brasília, DF – Brazil.

Corresponding author: Guilherme da Costa Brasil. E-mail: guicbrasil@gmail.com
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ABSTRACT

Introduction: Simulation is important for situations requiring quick decisions or psychomotor skills, such as urgency and emergency. **Objective:** To evaluate the use of clinical simulation in pediatrics as a strategy for learning from nursing students from Faculdade de Ceilândia. **Method:** a cross-sectional study of descriptive nature with 47 students from Ceilândia's Nursing School. The instruments for data collection were questionnaires related to the Guidelines of the American Heart Association (AHA) and the influence of clinical simulation in student learning. **Results:** Students have knowledge of relevant guidelines, said the simulation was productive, it must be inserted into the schedule of the course and performed with other themes. **Conclusion:** The survey showed a sharp knowledge of undergraduate students in nursing at UNB/Ceilândia the AHA CPR Guidelines and concluded that the practice of clinical simulation was beneficial to the process of teaching and learning. **Keywords:** Simulation; Education, Nursing; Pediatrics.

RESUMO

Introdução: a simulação é importante para situações que exijam habilidades psicomotoras ou decisões rápidas, como as de urgência e emergência. **Objetivo:** avaliar o uso da simulação clínica em Pediatria como estratégia para o aprendizado de alunos do curso de Enfermagem da Faculdade de Ceilândia. **Método:** estudo transversal de natureza descritivo, com 47 alunos do curso de enfermagem da Faculdade de Ceilândia. Os instrumentos de coleta de dados foram questionários relacionados às Diretrizes da American Heart Association (AHA) e à influência da simulação clínica no aprendizado do aluno. **Resultados:** os alunos possuem conhecimento relevante das diretrizes e afirmaram que a simulação foi produtiva, que deve ser inserida no cronograma do curso e realizada com outros temas. **Conclusão:** a pesquisa evidenciou o conhecimento acentuado dos graduandos em Enfermagem da UnB/Ceilândia das Diretrizes de RCP da AHA e concluiu que a prática da simulação clínica foi benéfica para o processo de ensino e aprendizagem. **Palavras-chave:** Simulação; Educação em Enfermagem; Pediatria.

RESUMEN

Introducción: El simulacro es importante para situaciones que exigen habilidades psicomotoras o decisiones rápidas, como las de urgencia y emergencia. **Objetivo:** Evaluar el uso del simulacro clínico en pediatría como estrategia para el aprendizaje de estudiantes de la Facultad de Enfermería de Ceilândia. **Método:** estudio transversal de naturaleza descriptiva llevado a cabo con 47 alumnos del curso de enfermería de la Facultad de Ceilândia. Los instrumentos para la recolección de datos fueron cuestionarios relacionados con las directrices de la American Heart Association (AHA) y la influencia del simulacro clínico en el aprendizaje del estudiante. **Resultados:** Los estudiantes conocen las directrices y afirman que el simulacro fue productivo, que debe incluirse en el programa del curso y realizarse con otros temas. **Conclusión:** La encuesta mostró amplio conocimiento de los estudiantes de pregrado en Enfermería de la UnB / Ceilândia sobre las Directrices de RCP de la AHA y se llegó a la conclusión que la práctica del simulacro clínico fue positivo para el proceso de enseñanza y aprendizaje. **Palabras clave:** Simulación; Educación en Enfermería; Pediatría.

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INTRODUCTION

It is necessary to use active learning methodologies during the university training process, with evidence-based and problem-based teaching to have professional nurses with the capacity for innovation to solve the complex challenges of health today.⁴ Use of simulations during the teaching-learning process is becoming a notorious method of education in Nursing teaching worldwide and it is believed to increase the level of knowledge and critical thinking of students.⁵

It is known that in the practical classes, patient care is an experience that generates anxiety in Nursing students, and for some academics, the clinic is the most stressful period of the undergraduate course and the following factors are related to anxiety: inexperience, conditions of evaluation and the fear of making mistakes.⁶

Simulation-based clinical education is a useful pedagogical approach that provides nursing students with opportunities for practices such as decision-making and skills through a variety of real experiences without compromising patient well-being.⁷

It is important to emphasize that the practices with simulations must be planned in a logical sequence of increasing complexity, according to the requirements of the subjects, enabling the students to demonstrate the expected competence in each level of the Nursing course. Frequently, some questions arise about the method of education using simulators such as economic limitations, because it involves technology and a large contingent of human resources; technical limitations as difficulties in reproducing physiology and pathophysiology adequately; cultural limitations, such as the simple resistance to adherence to new teaching methodologies and mainly scientific limitations, such as the lack of proof of the effectiveness of the method, so currently the validity of the method has been widely explored and discussed scientifically.⁸

One of the ways of assessing clinical skills during the simulation is through structured objective clinical examination (OSCE), which is appropriate for assessing learning, especially in the psychomotor and emotional domains.⁹ At the OSCE, participants interact with patients standardized, and they perform tasks such as interviews, physical examination and counseling.¹⁰

Currently, patient simulators can be classified as low fidelity, static, less realistic and used for specific procedures; average fidelity, more realistic and it can offer breathing sounds, cardiac pulsation; and high fidelity, extremely realistic, with real-time responses identified through functional eyes, cardiac, pulmonary, gastrointestinal and vocal sounds, bleeding and secretions.²

From this perspective, the selection of the simulator is imbricated in the competence that desires to develop in the group of students or professionals. This decision goes through the teacher evaluation so that the desired result is effective in the student's education. Because it is an active methodology,

it is based on the problematization of situations and favors the development of self-confidence.⁴

For the feedback on student experience and performance in the simulation, debriefing is used. It closes gaps between teachers and participants from the perception of performance, in addition to being a learning method that leads to the feedback of the scenario; clarifies the student's actions and performance. The process is guided by a facilitator, who provides feedback after the simulation, allowing self-reflection focused on established goals.¹¹

Because it is a current topic, relevant and considering the particularities of the practice of nursing care in Pediatrics, it is also noted that it is a subject little explored scientifically in Brazil. This research can contribute to changes in the standard of traditional teaching, based on the introduction of new technologies, with the objective of enriching the knowledge and increasing the self-confidence of undergraduates, improving the quality of nursing care provided by such professionals.

This study aimed to evaluate the use of clinical simulation in Pediatrics as a strategy for the learning of students of the Nursing course of the School of Ceilândia.

METHOD

This is a cross-sectional study of descriptive nature. The data collection from the simulated practice was carried out in the Laboratory of Skills and Simulation of Care of the Nursing Course at the Ceilândia Campus of the University of Brasília. The population was of the study was 47 students from the 7th semester of the Nursing course who were regularly enrolled in the subject Comprehensive Care for Women and Children's Health.

For simulated practice, an advanced newborn simulator for training in infant emergencies called SimBaby™ was used. It allows the acquisition of various abilities, such as cardiopulmonary resuscitation (CPR). Before the data collection began and after the theoretical content regarding CPR according to the Pediatric Guidelines called American Heart Association (AHA), the students were explained on the dynamics of the simulation and clarified that the instruments used in the collection would not be in the course grades. The students could choose not to carry out the activity. However, everyone wanted to participate, and there were no sample losses.

The first data collection instrument contained closed questions regarding the content previously given in the classroom on CPR. Questions about the behaviors taken during a strike were asked, such as the correct sequence of basic life support, the evaluation of a CRP, frequency, and depth of compression, the chronological sequence of the survival chain, the opening of airways, ventilation and use of AED. The other instrument had closed questions about the student's opinion about the influence of clinical simulation on his learning, in which he asked about the time of the scenarios, the materials

available and the simulation recommendation for the future participants of the subject, built by the teachers.

Because it was the first study conducted by the researchers in this area, the OSCE was not used, since it was not possible to alternate the simulated scenarios among the students, due to the time provided for the simulation in the subject.

The data collection took place in July 2013 as follows: the students were divided by lot into two large groups, the first group (FG) was composed of 23 students who responded to the data collection instrument without the practice of the simulation, only with the theoretical content. However, after completing the instrument containing information about the clinical cases selected by the teachers of the subject for the simulated practice, the students of the first group participated in the simulated activity with SimBaby™, so that there was no impairment in their learning. The second group (SG) was composed of 24 students, who simulated SimBaby™ and then responded to the CPR collection instrument according to the American Heart Association (AHA) Guidelines in Pediatrics, also according to clinical cases.¹²

Due to the teaching-learning process for simulation, these two groups were subdivided into smaller groups so that they could enter the laboratory of skills and simulation of care.

For the simulation, five clinical cases were selected: cardiorespiratory arrest by aspiration of foreign body, by bucket drowning, by choking with breast milk, by fall and respiratory discomfort. These clinical cases could be repeated since more than five groups were obtained.

After the completion of each simulated activity, the debriefing was carried out by the teacher of the subject who gave the content of Pediatrics in class, with a duration of 15 minutes. Since the activities were only carried out in a single shift – in the afternoon – it was not possible to carry out a debriefing for a longer duration.

The research was approved by the Research Ethics Committee (CEP) of the School of Health (FS) with the CAAE nº 16600613.3.0000.0030.

The data was double-typed in an Excel spreadsheet to ensure analysis of its consistency. After comparing the spreadsheets and correcting the divergences, the data were exported to the Statistical Package for the Social Sciences (SPSS, version 20.0) for descriptive statistics and frequency distribution.

RESULTS

Table 1 shows information regarding the students' access to the 2010 American Heart Association guidelines for CPR on the correct sequence of basic life support and the frequency the students had access to the cardiac arrest protocol (CAP).

Table 2 shows the evaluation of the occurrence of CPR by students based on the analysis of some physiological and behavioral parameters in Pediatrics.

Table 1 - Student distribution on variables presented in the American Heart Association Guidelines independent of the allocation group – School of Ceilândia, 2014, Brasília, 2014

Variables		%
Guidelines access (AHA)	Yes	93.6
	No	6.4
Correct SBV sequence (A-B-C)	Yes	21.3
	No	78.7

Table 2 - Correct identification of cardiorespiratory arrest by students according to groups – School of Ceilândia, 2014, Brasília, 2014

Variables		FG		SG	
		Yes (%)	No (%)	Yes (%)	No (%)
CPR Evaluation	Reduced FR	0	100	8.3	91.7
	Breath changed	26.1	73.9	45.8	54.2
	Not responsive	87	13	83.3	16.7
	Reduced heart rate	4.3	95.7	29.2	70.8
	Absence of radial pulse (30s)	13	87	12.5	87.5
	Absence of carotid pulse (10s)	78.3	21.7	95.8	4.2
	Breathlessness	100	0	83.3	16.7

Regarding the minimum frequency of compressions per minute in the FG, 82.6% stated that 100 comp./min is the correct form, and in the SG was 87.5%.

Regarding the minimum depth in children of chest compressions, the FG 78.3% they described that the depth is 3 cm and in the SG 58.3%, only 21.7% of the PG wrote to be of 5 cm to the minimum depth compared to 41.7 SG.

Regarding the chain of survival of emergency cardiovascular care (ECC), the students were asked to place the attendance events chronologically: a) immediate recognition of CPR and activation of the emergency/urgency service; B) Early CPR, with an emphasis on chest compressions; C) advanced effective life support; D) rapid defibrillation; E) Integrated post-CAP care. Student-related sequences are described as follows, according to the group in Table 3.

Regarding chest compressions, 87% stated that there is no need to have a total chest wall return between compressions and 91.3% stated that it is not advisable to interrupt chest compressions for at least 10 seconds in the FG, as well as 79.2 and 95, 8% of SG, respectively.

Information on general perceptions of students about attitudes to be taken during CPR is given in Table 4.

If the automatic external defibrillator (AED) is not available to use it by the nursing team at the time of cardiorespiratory arrest (CRP), 100% of the FG and 95.8% of the SG do not believe that the head nurse is qualified to use the manual defibrillator.

Table 3 - Chronological order of the chain of survival of ECC by the students according to the groups – School of Ceilândia, 2014, Brasília, 2014

Chronological order	12345		12435		14235		21345	
	FG	SG	FG	SG	FG	SG	FG	SG
Yes %	39.1	29.2	56.5	66.7	0	4.2	4.3	0
No %	60.9	70.8	43.5	33.3	100	95.8	95.7	100

Table 4 - Attitudes to be taken during CPR according to groups – School of Ceilândia, 2014, Brasília, 2014

Variables		FG (%)	SG (%)
Inclination of the chin-lift head (VAS aperture)	Yes	100	100
	No	0	0
Compression-ventilation ratio 30: 2 with 1 lifeguard and 15: 2 with 2	Yes	47.8	79.2
	No	52.2	20.8
Advanced air ventilation, 1 ventilation every 6 to 8s asynchronous with chest compressions	Yes	21.7	16.7
	No	78.3	83.3
If AED is not available, only the head nurse is qualified to use the manual defibrillator	Yes	0	4.2
	No	100	95.8

The attitude to be taken soon after using the AED obtained 87% of the FG and 70.8% of SG stating that the rescuer should minimize interruptions in chest compressions before and after the shock; restarting CPR starting with compressions immediately after each shock. Only 8.7% of CG and 25% of GE believe that the rescuer should minimize chest compressions before and after the shock, restarting the compressions immediately after each shock.

The data on the minimum effective load or the upper limit for safe defibrillation are limited, 82.6% of FG and half of SG 50% scored as incorrect the alternative of considering initial loading of 2 J/kg and in subsequent shocks using energy levels of at least 4 J/kg. These may be considered higher levels since they do not exceed 10 J/kg at each shock. Both FG and SG, with 69.6 and 79.2%, respectively, stated that a load of 1 J/kg could not be used for the initial defibrillation energy.

When considering the placement of the AED electrodes according to the indications of the device, not being a differentiation between adult and pediatric blades in the two allocation groups, most of the students stated that there is a differentiation between the blades, being 19 of FG 82.6 % and SG 83.3%. When questioned about the “see, hear, and feel for breathing” procedure removing from the adult CPR sequence but remained in the pediatric sequence, 87% of FG and 91.7% of SG ensure that the procedure is no longer part of the pediatric CPR sequence.

Regarding the use of continuous monitoring of exhaled CO₂ (capnometry) detection during CPR to help guide treatment, especially the efficacy of chest compressions, 56.5% of FG and 41.7% of SG recognize it as positive.

Regarding the students' evaluation of the realistic simulation and their influence on the learning process, 53.2% of the students agree that the realistic simulation was productive, 61.7% that the topics covered during the simulation are important and 48.9% that the duration of the simulation was adequate. Of the students, 42.6% agreed that it was possible to put into practice the content taught by the lecturer in theoretical class, 68.1% that the simulation can be introduced in the class schedule of the subject as a way to increase their self-confidence and 70.2% would recommend the practice of simulation for other students.

DISCUSSION

The simulation allows the experimentation of a real event. On the correct sequence, 78.7% stated that the A-B-C sequence is not correct, demonstrating considerable student perceptions of the change in A-B-C's AHA Guideline (open airways - perform mouth-to-mouth or ventilate breathing - compressions) in 2005 for the C-A-B of 2010. The C-A-B sequence is currently considered, since the critical initial elements of SBV in patients in CRP are chest compressions and early defibrillation.¹² This change in the sequence of procedures reflects growing evidence of the importance of chest compressions during CPR.¹³ The immediate realization of CPR in a CAP victim or even chest compressions in the prehospital setting considerably contributed to the increase in the survival rates of the victims.¹³

Breathing and its characteristic should be checked as soon as possible as part of the evaluation of the occurrence of CAP to perform such verification before requesting emergency service or the AED. After checking for breath, the carotid pulse should be checked within 10 seconds, and CPR initiated using the AED as soon as possible.^{12,14}

Regarding the minimum frequency of compressions per minute, both FG and SG obtained homogeneity in the responses and responded according to what is explicit in the AHA Guidelines in FG with 82.6% and SG with 87.5% stating that the frequency of 100 comp./min is correct. The frequency of chest compressions performed per minute during CPR is a determinant of the return of spontaneous circulation (RSC) and the survival of the victim with good neurological function since the compressions generate blood flow, oxygen, and energy, important for maintaining vital organs in good functioning such as the heart and brain.¹² The metronome was used in

a study to assess the quality of heart compressions, increasing the quality of CPR (cardiopulmonary resuscitation). It was effective for the training and the students of both research groups - experimental (using a metronome) and control (without the device) - obtained a frequency of 100 comp./min. The researchers concluded that the depth of compression was better in the group that used the metronome and attributed this difference to the increase in students' concentration in depth of compression since the device helped them maintain their frequency by 100 comp./min.¹⁵

The Emergency Cardiovascular Survival chain (ECS) was created to facilitate the transmission of information regarding the step-by-step to be followed during the occurrence of a CAP. In this respect, the chronological order of highest prevalence chosen by students is in accordance with the recommended by the AHA Guidelines, with the predominantly chosen sequence being 12435: 1 - immediate recognition of CPR and activation of the emergency/urgency service; 2 - Early CPR, with an emphasis on chest compressions; 4 - rapid defibrillation; 3 - advanced effective life support; 5 - integrated post-CAP care; The choice for this sequence was similar in both groups, 56.5% GC, and 66.7%. The insertion of integrated post-CAP care as the fifth link in the survival chain is one of the novelties brought by the AHA in the 2010 Guidelines, aiming at reducing mortality through the early recognition and treatment of post-cardiac arrest syndrome, characterized by complex pathophysiological process of tissue damage secondary to ischemia, with additional reperfusion injury.¹⁴

As the post-CAP treatment, it should include cardiopulmonary and neurological support, therapeutic hypothermia and percutaneous coronary interventions (PCIs) should be performed.⁸ Recent studies with children have demonstrated that therapeutic hypothermia has promoted the significant improvement of neurological injury and can be performed in comatose individuals after cardiac arrest. There are still few studies on the amount observed in adults, but it has been demonstrated as an effective method for infants, children, and adolescents who are in comatose state after the CPR of an extra-hospital ventricular fibrillation (VF) CAP observed.^{14,16}

Regarding chest compressions presenting knowledge in accordance with the AHA Guidelines, 87% stated that there is no total chest wall return between compressions and 91.3% believe that it is not advisable to interrupt chest compressions for a minimum of 10 seconds in the FG, as well as 79.2 and 95.8% of the SG, respectively. The higher number of compressions is related to the high survival rates of the victims. Therefore, it should be noted that the application of adequate chest compressions requires a high frequency and depth of compression, requiring attention mainly to minimizing interruptions between compressions, since an inadequate compression

frequency or interruptions, the total number of compressions applied per minute, reducing the effectiveness of CPR and increasing the risk of post-CAP sequelae.^{14,15}

To perform advanced airway ventilation, which should be performed only by health professionals, 78.3% of PG and 83.3% of SG believe that there should be no ventilation every six to eight seconds (eight to 10 Ventilations/min), asynchronous with chest compressions, about 1 second per ventilation, with or without chest elevation. Such knowledge is by the AHA Guidelines, and such proportion is used to avoid that the victim is hyperventilated, and it must mandatorily increase the chest at each ventilation.¹⁶

The adequate and effective management of the airways in Pediatrics is an essential skill for physicians and other professionals in the emergency area, especially at the moment of intubation, since the airways of children present unique obstacles due to differences in anatomy among adult and pediatric population.¹⁷

If the automatic external defibrillator (AED) is not available for use by the nursing staff at the time of cardiorespiratory arrest (CRP), 100% of the FG and 95.8% of the SG do not believe that the head nurse is qualified to use the manual defibrillator. The manual defibrillator needs the recognition of the rhythm and the appropriate load value by whoever will handle it, consist of a medical act and its use is usually restricted to hospital environments.¹⁸ Regarding the attitude to be taken soon after using the AED, large part of the students recognizes the activity to be performed in accordance with the AHA Guidelines, 87% of the FG and 70.8% of SG stated that the rescuer should minimize interruptions in chest compressions before and after the shock; restarting CPR by starting with compressions immediately after each shock, so that the victim is kept as short as possible without any compression, since interruption between them would impair all CPR.

The students were unaware of the AHA's guidance regarding defibrillation load. The FG (82.6%) and SG (50%) marked as incorrect the alternative to consider an initial load of 2 J/kg and in subsequent shocks to use energy levels of at least 4 J/kg, if they do not exceed 10 J/kg at each stroke. However, regarding the adequate placement of the AED electrodes in the two allocation groups, a large part of the students (FG 82.6% and SG 83.3%) stated, in agreement with the AHA Guidelines, that there is a differentiation between the blades of adults and pediatrics AEDs. Also, these should be placed according to the indications of the device, demonstrating knowledge of the equipment.

The nurse professional is a member of a multi-professional team, and it is the responsibility of the other professionals in the team to be wise enough to attend a CAP case with skill, knowledge, and agility. Although the manual defibrillator shock cannot be administered, the nurse must be aware of the loads to assist the medical staff during the procedure.¹⁸

Regarding the knowledge about the “seeing, hearing and feeling for breath” procedure, 87% of the FG and 91.7% of the SG reported that the procedure is no longer part of the adult or pediatric CPR sequence. With the new SBV sequence prioritizing chest compressions, after the first series of chest compressions, the airway is opened, and the rescuer applies two ventilations. Thus, respiration is quickly analyzed as part of the verification of the occurrence of CAP, since CPR will only be performed if the victim is not responding, is not breathing or is gasping.¹²

Regarding the purpose of the detection of exhaled CO₂ (capnometry), students from both groups were divided, 56.5% FG and 41.7% SG, in agreement with the AHA, that capnometry is recommended together with the assessment to confirm the position of the tracheal tube in neonates, infants and children with perfusion heart rhythm in all settings (prehospital, surgical center, ICU) and during intra or extra-hospital transportation. However, continuous capnometry monitoring may be beneficial during CPR to help guide treatment, especially the effectiveness of chest compressions.⁸ Their use is a formal recommendation, as it begins to correlate with cardiac output during CPR, providing valuable information regarding the CPR process and the patient’s response to treatment.¹³

Health professionals often find situations that require immediate and rapid action, since they involve risk to the patient and CAP is one of them since the chance of survival after the event varies from 2 to 49% depending on the identification of the initial heart rate and the early initiation of resuscitation. Considering that nurse are usually the first team member to perceive CAP, they need to have knowledge about emergency care, as well as being able to make quick decisions, evaluate priorities, and establish immediate actions.¹⁹

Regarding the influence of performing realistic simulation in Pediatrics on the learning process, 53.2% of the students strongly agree that the realistic simulation was productive, 61.7% that the topics covered are important and 48.9% that the duration time of the simulation was adequate. In recent times, nursing education is undergoing some significant transformations worldwide. The current model is centered on the humanized and holistic approach to the patient, through clinical teaching based on programs that integrate low, medium and high fidelity simulation and assisted instruction by computers.²⁰

Evaluating the possibility of putting into practice the content taught by the teacher in a theoretical class, 42.6% of the students agreed that it was possible to put theoretical knowledge into practice. Most of the students (68.1%) strongly agreed that the simulation could be introduced in the class schedule of the subject, as a way to increase their self-confidence, as well as 70.2% recommended simulation practice for other students. A descriptive quantitative study concluded that Nursing students often confirmed that they felt anxious before the first

clinical care, which was evidenced verbally, and that the learning process of these students through clinical case simulations contributed to decreasing anxiety and Increase self-confidence and care skills.²¹

For the AHA, course participants should not be evaluated in writing only. A practical evaluation should be performed as this is essential during CPR. However, it also recommends that formal evaluation should continue to exist, as it is a method both for evaluating student development and for evaluating course effectiveness.

This study presented some limitations, such as the impossibility of deepening the statistical analyses, since the data collection was done only by the descriptive statistics, and by a validated questionnaire regarding the students’ opinion about the simulation and the evaluation of the knowledge about CPR maneuvers in specific health students for Pediatrics.

CONCLUSION

The students had prior access to the cardiorespiratory arrest protocol through theoretical education, and through this, they were able to identify the priority stipulated in the attendance of each presented case. Before each scenario, the students identified the peculiarities related to the care of a pediatric patient according to the AHA guidelines. Also, students agree with the use of simulation methodology within the learning process.

From this study, it was possible to insert the simulation activity in its schedule and other subjects of the institution.

REFERENCES

- Chiamenti C, Fonseca AD, Fernandes GFM, Vaghetti HH. Tendências tecnológicas na práxis educativa da enfermagem e sua interface com a organização do trabalho. *Ciênc Cuid Saúde*. 2012[cited 2016 Jan 08];11(4):832-7. Available from: http://periodicos.uem.br/ojs/index.php/CiencCuidSaude/article/view/11536/pdf_133
- Teixeira CRS, Kusumota L, Braga FTMM, Gaioso VP, Santos CB, Silva VLS, *et al*. O uso de simulador no ensino de avaliação clínica em Enfermagem. *Texto Contexto Enferm*. 2011[cited 2016 Jan 08];20(Spe):187-93. Available from: <http://www.redalyc.org/articulo.oa?id=71421163024>
- Kong LN, Qin B, Zhou YQ, Mou SY, Gao HM. The effectiveness of problem based learning on development of nursing students’ critical thinking: a systematic review and meta-analysis. *Int J Nurs Stud*. 2013[cited 2016 Jan 08];51(3):458-6. Available from: [http://www.journalofnursingstudies.com/article/S0020-7489\(13\)00191-0/fulltext](http://www.journalofnursingstudies.com/article/S0020-7489(13)00191-0/fulltext)
- Tanaka RY, Catalan VM, Zemiack J, Pedro ENR, Cogo ALP, Silveira DT. Objeto educacional digital: avaliação da ferramenta para prática de ensino em enfermagem. *Acta Paul Enferm*. 2010[cited 2016 Feb 23];23(5):603-7. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-21002010000500003
- Shinnick MA, Woo MA. The effect of human patient simulation on critical thinking and its predictors in prelicensure nursing students. *Nurse Educ Today*. 2013[cited 2016 Feb 24];33(9):1062-7. Available from: [http://linkinghub.elsevier.com/retrieve/pii/S0260-6917\(12\)00109-8](http://linkinghub.elsevier.com/retrieve/pii/S0260-6917(12)00109-8)

6. Del'Angelo N. Objeto digital no ensino da avaliação clínica do pré-termo: a aprendizagem de estudantes [dissertação]. Ribeirão Preto: Universidade de São Paulo; 2012. [cited 2016 June 20]. Available from: <http://www.teses.usp.br/teses/disponiveis/22/22133/tde-06062012-155212/pt-br.php>.
7. Kim SJ, Kim S, Kang K, Oh J, Lee M. Development of a simulation evaluation tool for assessing nursing students' clinical judgment in caring for children with dehydration. *Nurse Educ Today*. 2016[cited 2016 Aug 03];(37):45-52. Available from: [http://www.nurseeducationtoday.com/article/S0260-6917\(15\)00468-2/abstract](http://www.nurseeducationtoday.com/article/S0260-6917(15)00468-2/abstract)
8. Pazin FA, Scarpelini SS. Simulação: definição. *Medicina (Ribeirão Preto)*. 2007[cited 2016 June 20];2(40):162-6. Available from: <http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IscScript=iah/iah.xis&src=google&base=LILACS&lang=p&nextAction=lnk&exprSearch=500791&indexSearch=ID>
9. Parish SJ, Stein MR, Hahn SR, Goldberg U, Arnsten JH. Teaching and assessing residents' skills in managing heroin addiction with objective structured clinical exams (OSCEs). *Subst Abus*. 2013 [cited 2016 Aug 03];34(4). Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3811017/?tool=pubmed>
10. Kanada Y, Sakurai H, Sugiura Y. Difficulty levels of OSCE items related to examination and measurement skills. *J Phys Ther Sci*. 2015[cited 2016 Aug 03];27(3):715-8. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4395699/?tool=pubmed>
11. Oikawa S, Berg B, Turban J, Vicent D, Mandai Y, Birkmire-Peters D. Self-debriefing vs instructor debriefing in a pre-internship simulation curriculum: night on call. *Hawaii J Med Public Health*. 2016[cited 2016 Aug 03];75(5):127-32. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4872264/>
12. American Heart Association. American Heart Association guidelines for CPR and ECC, 2010. [cited 2016 July 20]. Available from: http://www.heart.org/HEARTORG/CPRandECC/Science/Guidelines/Reprint-2010-AHA-Guidelines-for-CPR-ECC_UCM_317174_Article.jsp
13. Falcão LFR, Ferrez D, Amaral JLG. Atualização das diretrizes de ressuscitação cardiopulmonar de interesse ao anesthesiologista. *Rev Bras Anesthesiol*. 2011[cited 2016 Apr 01];61(5):624-40. Available from: <http://www.scielo.br/pdf/rba/v61n5/v61n5a13.pdf>
14. Gonzalez MM, Timerman S, Oliveira RG, Polastri TF, Dallan LAP, Araújo S, et al. I diretriz de ressuscitação cardiopulmonar e cuidados cardiovasculares de emergência da Sociedade Brasileira de Cardiologia: resumo executivo. *Arq Bras Cardiol*. 2013[cited 2016 Jan 02];100(2):105-13. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0066-782X2013000200001
15. Fonseca AHIRM, Fonseca FIRM, Oliveira RG, Barral TN, Gonzalez MM, Timerman S. Evaluation of frequency and depth of chest compressions performed with the use of metronome. *Rev Bras Clin Med*. 2012[cited 2016 Feb 18];10(3):175-8. Available from: <http://files.bvs.br/upload/S/1679-1010/2012/v10n3/a2895.pdf>
16. Tallo FS, Junior RM, Guimarães HP, Lopes RD, Lopes AC. Update on cardiopulmonary resuscitation: a review for the internist. *Rev Bras Clin Med*. 2012[cited 2016 Feb 18];10(3):194-200. Available from: <http://files.bvs.br/upload/S/1679-1010/2012/v10n3/a2891.pdf>
17. Soto F, Murphy A, Heaton H. Critical procedures in pediatric emergency medicine. *Emerg Med Clin North Am*. 2013[cited 2016 Aug 03];31(1):335-76. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23200337>
18. Campos JF, Silva RF, David HMSL, Santos MSS. Terapias elétricas em crianças e neonatos: novidades nas diretrizes da American Heart Association. *Rev Enferm UERJ*. 2012 [cited 2016 Aug 03];20(3):396-8. Available from: <http://www.e-publicacoes.uerj.br/index.php/enfermagemuerj/article/view/2027/2891>
19. Bellan MC, Araujo IIM, Araujo S. Capacitação teórica do enfermeiro para o atendimento da parada cardiorrespiratória. *Rev Bras Enferm*. 2010[cited 2016 Aug 03];6(63):1019-27. Available from: http://www.scielo.br/scielo.php?pid=S0034-71672010000600023&script=sci_abstract&lng=pt
20. Zakari NM, Hamadi HY, Salem O. Developing an understanding of research-based nursing pedagogy among clinical instructors: a qualitative study. *Nurse Educ Today*. 2014[cited 2016 Aug 03];34(11):1352-6. Available from: [http://www.nurseeducationtoday.com/article/S0260-6917\(14\)00104-X/fulltext](http://www.nurseeducationtoday.com/article/S0260-6917(14)00104-X/fulltext)
21. Khalaila R. Simulation in nursing education: an evaluation of students' outcomes at their first clinical practice combined with simulations. *Nurse Educ Today*. 2014[cited 2016 Aug 03];34(2):252-8. Available from: <http://www.sciencedirect.com/science/article/pii/S0260691713003067>