

KNOWLEDGE OF PROFESSORS AND STUDENTS ON BASIC LIFE SUPPORT**CONHECIMENTO DOS DOCENTES E DISCENTES DE ENFERMAGEM SOBRE O SUPORTE BÁSICO DE VIDA****CONOCIMIENTOS PROFESORES Y ESTUDIANTES SOBRE APOYO BÁSICO A LA VIDA**

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How to cite this article: Medeiros AB, Freire ILS, Santos FR, Silva BCO, Batista GFM, Menezes MM. Knowledge of professor and students on basic life support. Rev Enferm Atenção Saúde [Internet]. 2021 [cited: ____]; 10(1): e202102. doi: <https://doi.org/10.18554/reas.v10i1.4163>

ABSTRACT

Objective: to identify the knowledge of nursing professors and students from a public university on basic life support. **Method:** exploratory-descriptive study, with cross-sectional design and quantitative approach, conducted by means of a questionnaire with professors and students from the technical nursing course and professors from the undergraduate nursing course. **Results:** there was a greater knowledge of the participants regarding the environment where cardiopulmonary resuscitation may be performed (88.4%), the clinical signs that identify a cardiorespiratory arrest (77.5%), the compression-ventilation ratio (71.3%), the links in the survival chain (56.6%) and the depth of thoracic compressions (55.0%). On other questions, however, there was a significant percentage of errors, such as: special situations for using the automatic external defibrillator (93.8%), signs of respiratory arrest (69.8%), shockable rhythms (65.1%) and frequency of thoracic compressions (50.4%). **Conclusion:** the study demonstrated important knowledge on basic life support among those surveyed. Nevertheless, there were errors in specific situations related to the questionnaire.

Descriptors: Cardiopulmonary Resuscitation; Cardiac Arrest; Nursing Professors; Nursing Students; Nursing Education.

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RESUMO

Objetivo: identificar o conhecimento dos docentes e discentes de enfermagem de uma universidade pública sobre suporte básico de vida. **Método:** estudo exploratório-descritivo, com delineamento transversal e abordagem quantitativa realizado por meio de questionário com docentes e discentes do curso técnico em enfermagem e docentes da graduação em enfermagem. **Resultados:** observou-se maior conhecimento dos participantes referente ao ambiente onde se pode realizar a ressuscitação cardiopulmonar (88,4%), aos sinais clínicos que identificam uma parada cardiorrespiratória (77,5%), à relação compressão-ventilação (71,3%), aos elos da cadeia de sobrevivência (56,6%) e à profundidade das compressões torácicas (55,0%). Em outras questões, porém, ocorreu percentual expressivo de erros, tais como situações especiais para utilização do desfibrilador externo automático (93,8%), sinais da parada respiratória (69,8%), ritmos chocáveis (65,1%) e frequência das compressões torácicas (50,4%). **Conclusão:** o estudo demonstrou conhecimento importante sobre suporte básico de vida entre os pesquisados. Contudo, houve erros em situações pontuais relativas ao questionário.

Descritores: Reanimação Cardiopulmonar; Parada Cardíaca; Docentes de Enfermagem; Estudantes de Enfermagem; Educação em Enfermagem.

RESUMEN

Objetivo: identificar los conocimientos de profesores y estudiantes de enfermería de una universidad pública sobre soporte vital básico. **Método:** estudio exploratorio-descriptivo, con diseño transversal y enfoque cuantitativo, realizado a través de un cuestionario con profesores y estudiantes del curso técnico en enfermería y profesores de pregrado en enfermería. **Resultados:** hubo un mayor conocimiento de los participantes sobre el entorno donde se puede realizar la reanimación cardiopulmonar (88,4%), los signos clínicos que identifican una parada cardiorrespiratoria (77,5%), la relación compresión-ventilación (71,3%), los eslabones de la cadena de supervivencia (56,6%) y la profundidad de las compresiones torácicas (55,0%). En otras cuestiones, sin embargo, hubo un porcentaje significativo de errores, tales como: situaciones especiales de uso del desfibrilador externo automático (93,8%), signos de parada respiratoria (69,8%), ritmos desfibrilables (65,1%) y frecuencia de las compresiones torácicas (50,4%). **Conclusión:** el estudio demostró importantes conocimientos sobre soporte vital básico entre los encuestados. Sin embargo, hubo errores en situaciones específicas relacionadas con el cuestionario.

Descriptorios: Reanimación Cardiopulmonar; Parada Cardiaca; Profesores de Enfermería; Estudiantes de Enfermería; Educación en Enfermería.

INTRODUCTION

Since 1960, investigations related to cardiorespiratory arrest (CRA) have been highlighted in the scientific community, with direct reflection on the scientificity and standardization of the care provided to the individual affected by this event. Techniques and maneuvers started to be

developed from systematic studies and literature reviews with the objective of promoting recovery of cardiac, respiratory and encephalic functions, phenomenon that underlies Cardiopulmonary Resuscitation (CPR).¹

CPR consists in the treatment of CRA, being developed by means of an

approach of phases and algorithms with the objective of maintaining the perfusion of noble organs, restoring it as soon as possible and minimizing the encephalic injury. Based on the possibility of the aforementioned situation, health teams must be prepared for urgent and emergency events, where the nurse must be able to perform basic life support (BLS) and advanced life support (ALS). In order to hold it in a safe way, it is important that this professional receives, during training, the knowledge and skills necessary for a proper performance in such situations.²

It is important to emphasize that BLS consists in the articulation of systematized and objective methods in search of urgent resolution, with emphasis on emergency service activation, thoracic compressions and ventilatory support. In this regard, advanced life support (ALS) brings the hospital environment as a scenario. In this process, randomized studies show that surveillance and prevention are essential factors for reducing the number of deaths.³

Therefore, the knowledge and skill of nursing professionals must be intertwined in such a way as to subsidize and ensure effective and qualified assistance, since the care of the patient who is a victim of CRA must be provided quickly and safely. To that end, it is indispensable the mastery of all processes

related to the chain of survival by these workers, whether in the intra or extra-hospital environment, aspects that must even constitute the body of knowledge of the lay population.⁴

Therefore, it is up to the teaching institutions to offer adequate training to professors on BLS, in order to enable them to act in emergency situations, as well as to know how to prepare their students for the technical and updated procedures of these situations. From these considerations, the objective is to identify the knowledge of nursing professors and students from a federal public university on basic life support.

METHOD

Exploratory-descriptive study, with cross-sectional design and quantitative approach, conducted with professors from the undergraduate and technical nursing course and students from the technical nursing course in a federal public university located in the northeast of Brazil. Data collection took place from February to April 2017, through a structured questionnaire with closed questions. The sample consisted of 40 professors and 89 students from that university, based on the following inclusion criteria: being a professor or student in active exercise in the institution. With regard to exclusion, it was adopted the filling out of less than 90% of

part II of the questionnaire, but there was no sample loss.

The data collection instrument used was a questionnaire prepared by the researchers, based on the foundations recommended by the scientific literature on the topic. The tool was validated in two stages: the first by judges selected from the Lattes Platform; and the second by professionals from the Continuing Education Center (NEP, as per its Portuguese acronym) of the Emergency Mobile Care Service (SAMU, as per its Portuguese acronym) 192/Natal and SAMU 192/RN. There were small changes in the wording, structure, content, sequence, categorization and codification of the questionnaire information, with the objective of improving its applicability and suitability for the purposes of the study.

The final version of the instrument was composed of two parts. Part I refers to data related to the sociodemographic characterization of professors and students, such as: age, gender, marital status, maximum degree (for the professor) and course period (for the student). Part II addresses the knowledge of participants on Basic Life Support (BLS) in cardiology. Accordingly, it contains nine multiple-choice questions with five answer options, plus one question with five answer options in T (true) or F (false).

Question 1: The first link of the survival chain of Extra-Hospital Cardiorespiratory Arrest (EHCRA) is: a) Immediate, high-quality cardiopulmonary resuscitation (CPR). b) Recognition and activation of emergency medical service. c) Basic and advanced emergency medical service. d) Rapid defibrillation. e) I do not know how to inform.

Question 2: Cardiopulmonary resuscitation (CPR) is a procedure: a) Exclusively in the intra-hospital environment. b) Exclusively in the extra-hospital environment. c) That happens in the intra-hospital and extra-hospital environment. d) That happens exclusively in the intra-hospital environment in the emergency and intensive care units. e) I do not know how to inform.

Question 3: Are clinical signs of a cardiorespiratory arrest (CRA): a) Absence of responsiveness, respiration present and with palpable central pulse. b) Absence of responsiveness, respiration absent or agonic and without palpable central pulse. c) Presence of responsiveness, respiration present and without palpable central pulse. d) Presence of responsiveness, respiration absent or agonic and with palpable central pulse. e) I do not know how to inform.

Question 4: Respiratory arrest must be suspected when the patient is: a) Responsive to the stimulus, with agonic or absent respiration, without palpable

peripheral pulse. b) Responsive to the stimulus, with agonic or absent respiration, with palpable peripheral pulse. c) Irresponsive to the stimulus, with agonic or absent respiration, without palpable central pulse. d) Irresponsive to the stimulus, with agonic or absent respiration, with palpable central pulse. e) I do not know how to inform.

Question 5: It is sensible for health professionals during basic life support (BLS) to apply thoracic compressions and ventilation to all adult patients with cardiorespiratory arrest (CRA) in a ratio of: a) 3 compressions and 1 ventilation. b) 5 compressions and 1 ventilation. c) 15 compressions and 2 ventilations. d) 30 compressions and 2 ventilations. e) I do not know how to inform.

Question 6: Automatic External Defibrillators (AED) are simple to operate computerized equipment capable of identifying shockable rhythms and managing shocks. In this context, the following items are considered shockable rhythms in cardiorespiratory arrest: a) Ventricular fibrillation and pulseless ventricular tachycardia. b) Pulseless electrical activity and asystole. c) Pulseless ventricular tachycardia and pulseless electrical activity. d) Asystole and ventricular fibrillation. e) I do not know how to inform.

Question 7: Regarding the special situations for the use of the Automatic External Defibrillator (AED), it is correct to state: a) If the victim has excess hair in the thorax, the hair of the whole thorax must be removed. b) If the patient has a wet thorax, the place where the paddles will be positioned must be dried. c) If the victim has medication/hormonal adhesives, they must be removed only if they are in the place where the paddles will be positioned. d) If the victim is in a puddle of water, there are no problems, even if the puddle of water also involves the rescuer who will apply the shock. e) I do not know how to inform.

Question 8: In adults, the depth of thoracic compressions is: a) About 2.5 centimeters. b) At least 5 and not more than 6 centimeters. c) More than 6 centimeters. d) Between 6 and 7 centimeters. e) I do not know how to inform.

Question 9: The recommended frequency for thoracic compressions in Cardiopulmonary Resuscitation procedures is: a) Minimum 90 and maximum 100/ compressions per minute. b) Minimum 90 and maximum 110/ compressions per minute. e) Minimum 100 and maximum 120/ compressions per minute. d) Minimum 100 and maximum 140/ compressions per minute. e) I do not know how to inform.

Question 10: In order to obtain high quality Cardiopulmonary Resuscitation for adults, put T for True and F for False: a) ()

It is indicated, on the pacemaker carrier (PM), that the paddles be applied 8cm away from the PM or that the rescuer opt for another positioning of the paddles. b) () It is recommended that the rescuer rests on the thorax of the victim during the compressions so as not to cause fatigue to the rescuer. c) () It is recommended that the compressions be interrupted for at least 15 seconds for wrist evaluation. d) () It is recommended that each ventilation be administered in 1 second, promoting the elevation of the thorax. e) () I do not know how to inform.

All the ethical and legal principles that govern research in human beings were obeyed, recommended in the Resolution of the National Health Council n° 466/12, manifested by the approval of the protocol of registration of the Ethics and Research Committee of the Federal University of Rio Grande do Norte (CEP-UFRN) n° 1.489.098/2016 and Certificate of Presentation for Ethical Appreciation (CAAE) n° 54295016.1.0000.5537.

Data were organized in a spreadsheet and presented in tables with relative and absolute frequencies. To that end, descriptive statistics and Microsoft Excel software were used.

RESULTS

When characterizing the sociodemographic profile of those

surveyed, it was observed that most students were under 20 years of age, with a minimum age of 16 and a maximum age of 44, besides an average age of 25.6 years. Most were female (86.5%), single (69.7%) and attended from the first to the fifth period of the technical nursing course, with a predominance of students in the third period (36.0%). With regard to professors, most were in the age group from 41 to 50 years (38.1%), with a minimum age of 30 years, maximum of 62 years and average age of 41.1 years. In addition, they were married (57.5%) and had a doctoral degree as their maximum training level (65.0%).

Regarding the questions in the questionnaire (Table 1), it was observed in question one, related to the first link of the survival chain in the extra-hospital environment, that most respondents pointed out the right alternative (56.6%). The second question, in turn, asked the participant about the location of CPR; and 88.4% of the participants answered rightly. It should be noted, incidentally, that all the professors answered the aforementioned question appropriately.

In restricted situations, such as those related to special situations in Basic Life Support, a significant portion of the interviewees answered wrongly. This was the case of questions four, related to the development of suspected CRA (69.8% of errors); six, related to shockable rhythms in

cardiac arrest (65.1% of errors); and seven, related to special cases for use of AED (93.8% of errors).

Conversely, in several other questions, there was a predominance or balance of right answers on the part of the interviewees. This was the case in questions three, related to clinical signs of CRA

(77.5% of hits); five, related to the compression-ventilation ratio in adult patients in CRA (71.3% of hits); eight, related to the depth of thoracic compressions (55.0% of hits); and nine, related to the frequency of thoracic compressions recommended in CPR (49.6%).

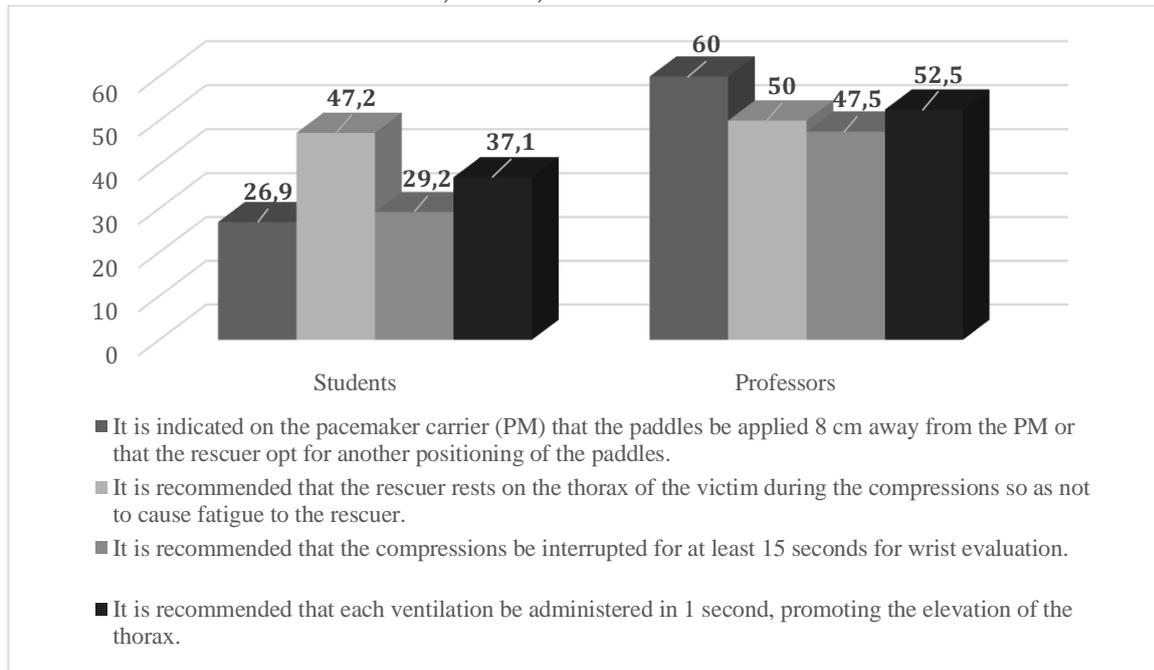
Table 1 – Knowledge of nursing professors and students on basic life support in cardiology in adults. Natal-RN, Brazil, 2017.

Questions	Answers	Professors		Students		Total	
		n	%	n	%	n	%
Question 1	Right	29	22.5	44	34.1	73	56.6
	Wrong / do not know	11	8.5	45	34.9	56	43.4
Question 2	Right	40	31.0	74	57.4	114	88.4
	Wrong / do not know	0	0.0	15	11.6	15	11.6
Question 3	Right	37	28.7	63	48.8	100	77.5
	Wrong / do not know	3	2.3	26	20.2	29	22.5
Question 4	Right	19	14.7	20	15.5	39	30.2
	Wrong / do not know	21	16.3	69	53.5	90	69.8
Question 5	Right	29	22.5	63	48.8	92	71.3
	Wrong / do not know	11	8.5	26	20.2	37	28.7
Question 6	Right	22	17.1	23	17.8	45	34.9
	Wrong / do not know	18	14.0	66	51.2	84	65.1
Question 7	Right	4	3,1	4	3,1	8	6.2
	Wrong / do not know	36	27.9	85	65.9	121	93.8
Question 8	Right	25	19.4	46	35.7	71	55.0
	Wrong / do not know	15	11.6	43	33.3	58	45.0
Question 9	Right	24	18.6	40	31.0	64	49.6
	Wrong / do not know	16	12.4	49	38.0	65	50.4

Figure 1, finally, presents the answers to question 10, which is based on the specificities of Basic Life Support. In the answer options, the researched individuals would have to put T (true) or F (false) on

the high-quality CPR for adults. It was observed, in this context, that the percentage of right answers was higher among the professors in all the items.

Figure 1 – Knowledge of nursing professors and students on high-quality cardiopulmonary resuscitation for adults. Natal-RN, Brazil, 2017.



DISCUSSION

The characteristics of nursing professors and students related to gender follow other investigations conducted in this area, which show the predominance of women.^{2,5} Regarding the degree of the professors, it is observed an expressive percentage of doctors, which shows us that the *stricto sensu* graduate nursing degree in Brazil has grown in the last years and contributed to improving the qualification of the health care nurses and professors in the area of nursing.⁶

As for the results of part II of the questionnaire, it is observed that, in the question regarding the links of the survival

chain in the extra-hospital environment, 56.6% of the participants opted for the right alternative. In fact, similar studies conducted with nursing students in Brazilian universities show important statistical difference among the knowledge levels referring to this question, with variation of hits between 29,3% and 84,4%.^{5,7}

It should be underlined that the links of the survival chain are essential elements to be followed in the care of a CRA. Regarding the topic, the most recent updates of CPR guidelines emphasize the need for distinct survival chains, in order to identify the different ways of caring for

patients suffering from CRA in the hospital or in the extra-hospital environment.⁸

In this context, the care of the patient who presents an intra-hospital CRA (IHCRA) must start with surveillance and prevention, succeeded by the recognition and activation of the emergency medical service; execution of immediate, high-quality CPR with rapid defibrillation; and installation of advanced life support plus post-CRA care. In extra-hospital CRA (EHCRA), from another angle, care must be started by recognizing and activating the emergency medical service, with prioritization to immediate and high-quality CPR; search for rapid defibrillation; and completion with advanced life support and post-CRA care.⁸

Concerning the environment where CPR is held, all the professors answered rightly, claiming that it may happen in the intra and extra-hospital environments. Nevertheless, some students (11.6%) still presented a wrong understanding on the topic. Although the latest CPR guidelines updates reinforce distinct specificities in the treatment of CRA happened in hospital and extra-hospital environments, the emergency regarding the treatment of the person affected by the event does not depend on the scenario where it happens, and one should always seek the stabilization of the victim and recovery of his/her health condition.^{8,9}

In the meantime, the need for the lay population itself to be aware of the clinical signs that identify a CRA must be reinforced, among which loss of consciousness; absence of central pulse, respiration; or gasping. After all, every citizen must take an active part in assisting the individual in imminent risk of life, except in situations where his/her own safety is in danger. Despite this, there are few capabilities related to these individuals in daily life, which is reflected in greater difficulties in apprehending and using knowledge on BLS.¹⁰

Among health professionals, not only the theory related to the theme is necessary, but also its ability to apply it quickly and effectively, which is not always perceived. In the present study, for example, 22.5% of the total of interviewees were unaware of the signs and symptoms presented by patients in cardiorespiratory arrest, a fact that was also noticed in another research conducted with undergraduate nursing students in Brazil.⁵

Regarding the compression-ventilation ration in adult patients in CRA, most of the respondents identified the right alternative (71.3%). As for the topic, the new CPR guidelines highlight that, when the treatment is performed by a single rescuer, one should start with 30 compressions for 2 ventilations, at a frequency of 100 to 120 times per minute.

However, if the rescuer is a lay person, he/she should prioritize only the compressions until the arrival of help, since, in these circumstances, the neurological benefits are similar.⁸

It is believed that the success of CPR is intrinsically related to early defibrillation, which is ideal within the first three to five minutes after CRA. In fact, every minute after the start of the sudden arrhythmic event without defibrillation decreases the chances of survival by 7 to 10%. Based on this, it is essential that nursing professionals have knowledge on the types of rhythms of a CRA and recognize the importance of applying defibrillation as soon as possible.¹¹⁻¹³

In contrast to the above, when asked about the rhythms that respond to shock as a treatment, most of the study participants (65.1%) opted for wrong alternatives. It should be underlined that CRA may appear in four rhythms: pulseless ventricular tachycardia (PVT), ventricular fibrillation (VF), pulseless electrical activity (PEA) and asystole, of which only two are considered shockable (PVT and VF). If this is not known to the team, the consequences related to the shock or its absence may be catastrophic and even imply the death of the patient.^{12,14}

About AED, it is a portable device capable of interpreting the heart rhythm, besides selecting the power level and giving

the operator the function to press only the shock button, when indicated. In clinical practice, it is the major responsible for the recovery of patients in CRA, a fact that, in the legal context, is reflected in the development of bills such as n° 735/2015, dedicated to the mandatory availability of AED in locations throughout the country with high circulation of people.^{11,15}

Of course, the aforementioned legislation is only the first step to make it feasible to use the device as a saving measure in emergency situations. Other needs include: determination of public sites with high incidence of cardiovascular events; investigation of the reasons why AED is not used at certain times when the device is available; and measurement of the improvement in the survival of patients undergoing AED use by lay rescuers.¹⁶

Regarding the special situations for the use of the tool in question, few participants (6.2%) answered rightly, data that are opposed to the research carried out with nursing academics from a Brazilian public university. In the latter institution, more than 50% of the respondents understood the right conduct to be taken in specific situations, such as the use of the defibrillator in patients in contact with water.⁵

Other occasions considered unique for the use of the equipment is the presence of pacemaker (PM) or implantable

cardioverter-defibrillator located in the region indicated for the application of the paddles. In the latter case, they must be moved at least 8cm away or positioned elsewhere, since, if they are very close to the PM or implantable cardioverter-defibrillator, they may impair the analysis of the rhythm by the external defibrillator.¹¹

As for the depth of thoracic compressions, the new CPR guidelines recommend that they be a minimum of 5 and a maximum of 6 centimeters, with permission to return the thorax at the end of each compression.¹⁰ Regarding this item, most participants (55.0%) answered rightly. Nevertheless, when asked about the frequency of thoracic compressions recommended in CPR, most responded wrongly (50.4%), a fact that is even worse in another work carried out with Brazilian nursing students.⁵

Updates of the CPR guidelines formulated by the American Heart Association in 2020 state that, in adult victims of CRA, rescuers must apply thoracic compressions at a frequency of 100 to 120/min.⁸ Regarding this topic, a study conducted in a higher education institution in the southeast of Brazil checked the knowledge of nursing students on CPR in BLS, obtaining a percentage of hits lower than in the present study regarding the frequency and depth of thoracic compressions (38.7% and 6.7%,

respectively). However, after receiving adequate training, about 89.0% of the interviewees answered these questions in an adequate way, which reinforces the need for frequent training related to BLS still during the undergraduate level.⁵

In fact, even the teaching on BLS in the school environment – aimed at children and adolescents – may be effective, depending on how it is employed. In addition to being recommended by the World Health Organization, the instruction on the topic proved to be able to solidify the knowledge related to CPR in adulthood, although a good part of the investigated individuals was not able to perform appropriate resuscitation maneuvers due to issues such as insufficient weight and height.¹⁷

CONCLUSION

In the present study, it was observed that professors and students presented greater knowledge regarding the environment where CPR is performed, the identification of clinical signs of a CRA, the compression-ventilation ratio, the links of the survival chain and the depth of thoracic compressions. Nevertheless, in more specific and in-depth questions, a significant percentage of errors happened, mainly in special situations for the use of AED, signs for the identification of a

cardiorespiratory arrest and the rhythms of a CRA that are shockable.

Thus, it is possible that questions of greater degree of difficulty, such as those number four and six, may have negatively influenced the degree of assertiveness of the respondents and resulted in the impression that there is a significant knowledge deficit related to Basic Life Support among professors and, mainly, students of the technical nursing course. It should be underlined that the elaboration of the questions and test in a pilot project could have allowed a better understanding of these topics and also in the best way to carry out their approach.

Even so, in view of all the above, it is a fact that there is a need to invest in the training of nursing professionals, especially regarding the use of AED, since the question regarding this equipment was the one with the highest percentage of errors. In the meantime, it is essential to exercise

knowledge in order to improve the care of victims who present CRA and increase the chances of survival of these patients.

It should be underlined that, although there are specific academic subjects for teaching BLS, where professors are preparing themselves to teach the aforementioned content, it is necessary to obtain this knowledge by nursing professors in all areas, since the teaching nurse, whether from technical course or undergraduate degree, is responsible for training multidisciplinary professionals. Finally, in spite of the work to respond to the objective of the study, the participation of individuals from a single educational institution was a limitation, which makes it difficult to generalize the results. Therefore, it is recommended the execution of similar investigations in other institutions, both in the national and global scenarios.

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RECEIVED: 11/27/2019

APPROVED: 01/06/2021

PUBLISHED: 03/2021