

## The knowledge of health academics with regards to cardiopulmonary resuscitation in basic life support

Conhecimento de acadêmicos da saúde sobre ressuscitação cardiopulmonar no suporte básico de vida

El conocimiento académico acerca de la salud cardiopulmonar reanimación en soporte vital básico

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### ABSTRACT

**Objective:** The study's purpose has been to assess the knowledge of academics from the health school of a private university with regards to the cardiopulmonary resuscitation care in basic life support. **Methods:** It is a descriptive study with a quantitative approach, which was carried out in a private university with 276 students from the nursing, physical education, physiotherapy and nutrition courses. The students answered a questionnaire on the subject. **Results:** In general, it was found that the interviewed students obtained a reasonable performance on the knowledge of cardiopulmonary resuscitation. Nursing students with a better positive correlation of 0.8658, close to indicator 1, showed a strong correlation, followed by physical therapy students with 0.2406. **Conclusion:** It was possible to identify that only the students from two distinct courses obtained a significant performance, considering that it is an essential knowledge in their professional lives.

**Descriptors:** Knowledge, heart arrest, cardiopulmonary resuscitation.

### INTRODUCTION

A major threat to an individual's life is a Cardiorespiratory Arrest (CRA). For the attendance to the same, the professional is required of the theoretical, technical and practical knowledge, speed and effectiveness during Cardiopulmonary Resuscitation (CPR) maneuvers. The cardiorespiratory arrest is the abrupt cessation of cardiac, respiratory and brain functions and can affect people of any age and for various reasons, in the intra- or extra-hospital settings. When identified, the CPR should be started as quickly as possible along with chest compressions.<sup>1</sup>

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These maneuvers, when done correctly, increase the chances of survival of the victim.<sup>2</sup>

After the identification of CRA, CPR maneuvers should be performed immediately, even if they are only with chest compressions in the pre-hospital, as it contributes significantly to the increase in the survival rates of cardiac arrest victims. A successful CPR can double or triple the survival rates after a CRA and depends on a sequence of procedures that can be systematized in the concept of the survival chain.<sup>3</sup>

According to the computer department of the Brazilian Health Ministry, in the period from 2004 to 2013, 8,279,489 people died by CRA in that country. Of these, 578,892 occurred on public roads and 7,700,597 in hospitals and other health facilities.<sup>4</sup>

According to the American Heart Association, the CRA survival chain consists of surveillance and prevention; recognition and activation of the emergency medical service; High-quality CPR; rapid defibrillation, and finally advanced life support and post-CRA care. It is also recommended that communities with persons at risk of CRA implant programs of access to the Automatic External Defibrillator (AED) in public places.<sup>1</sup>

Given the aforementioned, it is understood that the health professional must acquire knowledge for the care of the CRA independent of his/her specialty since this is the most serious clinical emergency and can cause in the team much stress, fatigue, anxiety, and exhaustion. Therefore, skills must be acquired that enable them to act quickly and effectively during the service.<sup>5</sup>

It is necessary then that the students of the courses of the area of the health have theoretical knowledge-practical to realize the attendance to the victim of CRA. To this end, universities and colleges have instituted disciplines related to emergency and emergency care and Prehospital Care (PHC) in their curricular matrices. These disciplines bring the students closer to concepts and behaviors for basic life support and the CPR protocol based on the guidelines of cardiology societies and organs.<sup>6</sup>

Given this context, the following question has appeared: what is the knowledge assimilated by academics from specific courses of the health school from a private university about the service of basic life support to the CRA? In order to respond to the questioning, the study's aim was to assess the knowledge of academics from the health school of a private university with regards to the cardiopulmonary resuscitation care in basic life support.

## METHODS

It is a descriptive study with a quantitative approach. A descriptive research presents a phenomenon and registers the way it occurs (those seeking to discover and classify the relationship between variables), which propose to investigate "what is it", in other words, to discover the characteristics of a phenomenon as such.<sup>7</sup>

The quantitative approach presents the data by the use of quantification, both in the collection and in the treatment of the same. Statistical techniques are used that aim at results

that avoid possible distortions of analysis and interpretation, in addition to allowing a greater margin of safety.<sup>8</sup>

The study was conducted at the Health School from a private university based in *Natal* city, *Rio Grande do Norte* (RN) State, Brazil. The population was composed of students enrolled in physical education, nursing, physiotherapy and nutrition courses, with a total of 3,393 students.

The following inclusion criteria were adopted: students enrolled in nursing, nutrition, physical education and physiotherapy courses who attended and obtained an PHC and/or emergency and urgency course in the first semester of 2016. Students enrolled in other courses; the students who attended the discipline of PHC and/or urgency and emergency in semesters prior to 2016; and students who attended the PHC discipline and/or urgency and emergency in 2016 and did not obtain approval.

These courses presented the number of 515 students enrolled in the first semester, in 2016. The sample consisted of convenience, in which 276 students participated. A questionnaire was used with open and closed questions on the theme, divided into two parts: 1. Socio-demographic profile. 2. Questions related to the use of CRA. The questionnaire was built by the researchers themselves. The questions related to CRA care were elaborated according to the guidelines of the American Heart Association (AHA) 2015. This instrument was validated by 5 nurses with experience in PHC and 2 teachers of the emergency and/or PHC disciplines for undergraduate courses in the health area.

The interested sample was approached in class at a time previously agreed with the teacher to avoid harming the progress of classes or other activities. Participants were instructed to complete the questionnaire. Data collection took place from August to September 2016.

Data were tabulated in Microsoft Excel 2016 software and analyzed in STATA SE 12 by Karl Pearson correlation. This coefficient ranges from -1 to 1 that indicates the positive or negative direction of the relationship and its value suggests the strength of the variables. If the correlation is perfect, it indicates that the score of one variable can be determined by knowing the score of the other. A zero-value correlation indicates that there is no linear relationship between the variables.<sup>9</sup> Absolute and relative frequency distribution tables were constructed, besides the calculation of standard deviation and averages.

All research took into account the precepts of the Brazilian Resolution No. 466/2012, which regulates research involving human beings. The study was submitted to the Research Ethics Committee from the *Universidade Potiguar*, and was approved under the *Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appraisal] No. 57262216.1.0000.5296 and the Legal Opinion No.1.712.744/2016. The participants were informed about the research objectives and performed the reading and signing of the Free and Informed Consent Term when they agreed to participate.

## RESULTS

### Participants' socio-demographic profile

The sample analyzed in the study was 276 undergraduates, of which 177 (64%) were female, 223 (81%) were single, 88 (32%) of the physical education course, with a average age of 22 years old, and most reported not working 172 (62%), as shown in **Table 1**.

**Table 1** - Distribution of the socio-demographic variables. *Natal* city, RN, 2016.

Gender	n	%
Female	177	64
Male	99	36
<b>Age Group</b>		
16 - 20 years old	169	61
21 - 25 years old	53	19
26 - 30 years old	32	12
More than 30 y.o.	22	8
<b>Marital Status</b>		
Single	224	81
Married	43	15
Divorced	2	1
Other	7	3
<b>Work</b>		
Yes	104	38
No	172	62
<b>Total</b>	<b>276</b>	<b>100</b>

Source: Direct research, 2016.

### The knowledge of health academics with regards to CPR in basic life support

**Table 2** presents the correlations of students interviewed in nursing, physical education, nutrition, and physiotherapy courses with questions related to CPR knowledge.

**Table 2** - Correlations obtained among the mentioned courses and questions related to CPR. *Natal* city, RN, 2016.

Pearson correlation	Nutrition	Physio-therapy	Physical Education	Nursing
Trauma kinematics	-0.0236	0.0346	-0.0188	0.0165
Detection of a CRA	-0.0893	-0.0117	0.1129	-0.0172
Conduct when identifying a CRA	-0.0214	0.0478	-0.1551	0.1615
Placement on the chest	0.0685	0.0316	-0.2121	0.139
Compression/ventilation ratio	-0.0338	-0.0159	0.0638	-0.0204
Ventilation procedure	-0.1405	0.0621	0.0836	0.0064
Compressions per minute	0.1837	-0.1324	-0.1688	0.1103
Thorax depth in CPR	0.0047	0.0377	-0.1814	0.1717
Minimal interruptions in CPR	0.0607	-0.0168	-0.116	0.0815
Moment of using the AED	-0.084	0.2036	-0.2664	0.2165
More Indices	1 time	2 times	3 times	5 times

Source: Direct research, 2016.

It was observed that when questioned about what attitude to take when encountering an unconscious victim on the street, the students of the physiotherapy course had a positive correlation with corrections of 0.0346, followed by nursing students, who obtained 0.0165. These students performed the best on the subject. The students of the other courses did not obtain a significant correlation, which shows a low knowledge about the procedure questioned to them.

Concerning the knowledge of detection of a CRA, the students of the physical education course correlated positively, with 0.1129 of correct answers and the students of the other courses failed to obtain positive correlation. With regards to what to do when detecting a CRA, the students of the nursing course presented a better correlation with 0.1615 of correct answers.

Considering the knowledge of correct positioning of the body and hands in the thorax of the CRA victim, the students who presented the best correlation were those of nursing, with 0.139 of the correct answers.

When asked how should the compression-ventilation ratio be in the adult, it was seen that the students of the physical education course correlated better, with 0.0638 of the correct answers. With regard to the time spent with ventilation and whether or not to increase the victim's chest, again the students of the physical education course correlated positively, with 0.0836 of the correct answers.

Nutrition students were the ones that best correlated with the correct answers, 0.1837, followed by those in the nursing course with 0.1103 when asked how many compressions should be done per minute in an adult CRA.

With regards to how many centimeters the chest should be deepened in the compressions, the nursing students had a positive correlation of correct, with 0.1717. Observing the duration of the interruptions in the chest compressions, again the nursing ones correlated positively, with 0.0815 of the correct answers.

The students who best correlated when questioned about the timing of the use of AED in a CRA were those of the best performing nursing courses, followed by physiotherapy, with scores of 0.2136 and 0.2065 respectively.

From the statistical inferences of the correlations of Karl Pearson, it was identified that the nursing course has a majority, when added the correlations of the courses with the answers of the questions analyzed, with a result of 0.8658, close to 1. The indicator shows a strong correlation. The research has as a result that nursing students have a pre-disposition about the subject of cardiopulmonary resuscitation in basic life support, followed by physical therapy students.

## DISCUSSION

The results obtained in this research identified a predominance of female students and single marital status in the nursing, nutrition, physical education and physiotherapy courses. This is in line with a study on the enrollment profile in health courses that identified that 89% of the students evaluated were female and 97% were single.<sup>10</sup>

The results from the students' performance on the knowledge about CPR in this research lead to the conclusion that there was cognitive learning, verified by the evaluation of the knowledge regarding the guidelines on the maneuvers of CPR and the use of AED according to the AHA.

Before the research, the students' knowledge about CPR was evaluated. The safe scene evaluation is the primary information that will assist the victim. After detecting that the scene is safe and that the victim is in CRA, the *Serviço de Atendimento Móvel de Urgência (SAMU)* [emergency mobile service] must be triggered and chest compressions should be initiated immediately.<sup>11</sup>

According to the correct AHA guidelines for the immediate conducts in the identification of CRA in PHC, the knowledge and technical skills to be performed increase the chances of life of the victim.<sup>5</sup> As for these facts, it was identified that part of the students interviewed showed, have been clarified, which is a positive aspect of the quality of victim assistance.

Recognizing a CRA is important to direct the actions to be taken, because after a few minutes the cells and organs more sensitive to the lack of oxygen, which is the brain and heart, minimize sequelae and can guarantee the survival of the affected person.<sup>12</sup> Study carried out with nursing professionals showed that the interviewees know how to identify a CRA, which differs from the present study, since only students from the physical education course had positive results.<sup>13</sup> A negative factor was observed for most students since it shows that they do not understand the identification of the classic signs and symptoms of CRA, which may make it difficult to decide the immediate conduct that should be performed.

Placement in front of the victim's chest and depth of compression during CPR maneuvers allows the rescuer to perform high-quality compressions. The compression-depth-ventilation ratio should be 30 compressions with arms extended at 90° and depth of 5 cm followed by 2 ventilations, with a maximum time of 1 minute for each ventilation. Chest elevation should also be provided.<sup>1</sup>

The information described above is in line with the results of the present study that were positive about the knowledge of the correct chest compression procedure and ventilation. The students of the nursing and physical education courses had a positive correlation with this item and responded appropriately. This can contribute to improving the quality of CPR maneuvers and minimizing any harm to the victim.

Considering the minimum of chest compressions per minute, there was a change in quantity. The 2010 guidelines were at least 100 per minute. In 2015, the updated guideline for CPR and ACE changed the compressions to 100 to 120 per minute.<sup>1</sup> Herein, only the students of the nutrition course had positive correlation when questioned about this information and still did not reach perfect correlation, which is 1, then revealing a low knowledge about this matter.

Studies indicate the increased chances of survival of non-hospital-acquired CRA victims when treated early by first responders who are familiar with the AED.<sup>14-5</sup> It was observed that the information described is in agreement with the results of the study, to nursing and physiotherapy students, who have adequate knowledge about the use of AED.

## CONCLUSIONS

It was found that the students interviewed in general obtained a reasonable performance on the knowledge of CPR, especially the students of the nursing course who had a greater number of positive correlations in the applied questionnaire. This may be the result of greater involvement and commitment to the discipline as these students will be future professionals who will need knowledge and skills for emergency and emergency clinical situations because they are part of their work context.

Although this topic is discussed in the undergraduate course, it is noticed that the content has not been enough to build a solid knowledge for the students. Many nursing students identify with urgency and emergency and intend to work in the area, and as it can be perceived, have demonstrated a better performance in relation to the students of the other courses analyzed.

It is noteworthy that some students showed resistance and refused to answer the questionnaire, which contributed to a smaller sample. This makes it difficult to generalize, as does the application in only one university. Hence, aiming to minimize these limitations, this research can serve as a reference for the development of other investigations in public and private universities of other realities.

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