



DEVELOPMENT OF A THEORETICAL GUIDE FOR NURSING CARE IN CARDIAC ARREST

ELABORAÇÃO DE GUIA TEÓRICO DE ATENDIMENTO EM PARADA CARDIORRESPIRATÓRIA PARA ENFERMEIROS

ELABORACIÓN DE GUÍA TEÓRICA DE ATENCIÓN EN PARADA CARDIORRESPIRATORIA PARA ENFERMEROS

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This study aimed to identify the knowledge on cardiorespiratory arrest among nurses in a hospital of Vale do Paraíba, São Paulo, Brazil, and develop a theoretical guide for care of this emergency. We prepared an instrument of data collection based on relevant literature and the 2010 AHA Guidelines for CPR, from August to October 2012. The sample consisted of 41 nurses who deliver care activities in various units of the hospital. The study showed that professional participants said they were able to act in cardiopulmonary resuscitation, however, there were limitations of knowledge about the theme. Given the above, we developed a theoretical guide for cardiac arrest care based on scientific literature and covering questions submitted by nurses.

Descriptors: Heart Arrest; Cardiopulmonary Resuscitation; Practice Guideline; Nurses.

Objetivou-se identificar o conhecimento de enfermeiros de hospital do Vale do Paraíba, São Paulo, Brasil, sobre a parada cardiorrespiratória e elaborar um guia teórico para o atendimento nesta emergência. Elaborou-se instrumento de coleta de dados embasado na literatura pertinente e nas Diretrizes da *American Heart Association*, no período de agosto a outubro de 2012. A amostra constituiu-se de 41 enfermeiros que desenvolvem atividades assistenciais em diversas unidades do hospital. Estes enfermeiros afirmaram estar capacitados para atuar em reanimação cardiorrespiratória, porém, foram identificadas limitações em seus conhecimentos sobre a referida temática. Diante do exposto foi criado um guia teórico para o atendimento à parada cardiorrespiratória com base na literatura científica, contemplando as dúvidas apresentadas pelos enfermeiros.

Descritores: Parada Cardíaca; Ressuscitação Cardiopulmonar; Guia de Prática Clínica; Enfermeiros.

El objetivo fue identificar el conocimiento de enfermeros de hospital del Vale do Paraíba, São Paulo, Brasil, acerca de la parada cardiorrespiratoria y desarrollar una guía teórica para la atención de esta emergencia. Se producción instrumento de recolección de datos basado en la literatura pertinente y en las directrices de la *American Heart Association*, de agosto a octubre de 2012. Muestra de 41 enfermeros que desarrollan actividades de atención en distintas unidades del hospital. Los enfermeros participantes dijeron que eran capaces de actuar en la resucitación cardiorrespiratoria, sin embargo, hubo limitaciones del conocimiento acerca el tema. Delante del expuesto, fue creada una guía teórica para la atención en parada cardiorrespiratoria basada en la literatura científica, con exposición de las dudas presentadas por los enfermeros.

Descritores: Paro Cardíaco; Resucitación Cardiopulmonar; Guía de Práctica Clínica; Enfermeros.

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INTRODUCTION

Cardiovascular diseases caused by external factors have been increasing in recent years, being responsible for public resources allocation in hospitalizations and prolonged hospital stay⁽¹⁻²⁾. Defined by the sudden cessation of efficient ventricular activity and breathing, cardiac arrest consists in four types: asystole, ventricular fibrillation, pulseless ventricular tachycardia, and pulseless electrical activity⁽³⁾.

The American Heart Association (AHA) Guidelines were developed to enable health professionals to properly perform cardiopulmonary resuscitation (CPR) and rely on science to reduce death and disability⁽⁴⁾. The Basic Life Support and Advanced Cardiac Life Support (BLS/ACLS) are essential to prevent the victim's deterioration, in which the maintenance of coronary and cerebral perfusion predominate⁽⁴⁾.

Therefore, nurses should be technically prepared to face the challenge of sudden and severe events, aware of the need for early diagnosis and effective intervention, considering that the patient's prognosis depends directly on the speed and effectiveness of actions. The application of CPR maneuvers must include the victim's chance of survival considering ethics, culture, religion and health⁽⁴⁻⁵⁾.

The victim assessment and care must be effective to reduce the sequels and increase the victim's chances of survival. Above all, immediate and proper assistance reduces mortality and contributes significantly to the cardiac and cerebral preservation of cardiac arrest victims⁽⁶⁾.

The skills of nurses in performing their role properly and the ability to perform CPR maneuvers directly affect the mortality and morbidity rates⁽⁶⁻⁷⁾. Estimates say that, every minute in cardiac arrest reduces 10% the chances of survival, showing that time is a critical factor⁽⁸⁾.

It is worth mentioning that, the literature emphasizes the need for a leader during CPR in order to

orient, coordinate and assign tasks to each participant in the assistance. Above all, we believe that the synchronized and organized care is essentially important⁽⁹⁾.

Therefore, the nurses and the nursing staff play important roles in cardiac arrest care along with the medical staff, since the victim's survival depends directly on the success of this operation and implementation of quick and appropriate actions. This situation requires a set of specific interventions from the professionals involved, facing the challenge of saving lives⁽¹⁰⁻¹¹⁾.

Nurses are in charge of providing direct care to patients in critical and life-threatening condition, requiring scientific-based knowledge and the ability to make immediate decisions, acting in the health recovery and rehabilitation⁽¹²⁾.

In this regard, we highlight the need for training on the subject, since the professionals involved are facing difficulties with this emergency, being up to the nurses to upgrade themselves and be prepared to upgrade the skills of the staff, once the success is directly associated with the immediate and effective acting⁽¹³⁾.

Thus, for nurses to have an excellent performance and develop their skills and abilities, it is essential that nursing services develop continuing training programs⁽¹⁴⁻¹⁵⁾. We also highlight that, these trainings must follow protocols or guidelines adapted to the general conditions of each service, professionals, or teams available.

Given the above, we aimed to identify the knowledge on cardiac arrest among nurses of a hospital of Vale do Paraíba, São Paulo, Brazil, and develop a theoretical guide for this emergency service.

METHOD

This study aimed to develop a theoretical guide for the nursing care in cardiac arrest. The methodology followed three stages: data collection on the knowledge

on cardiac arrest care among nurses, construction of theoretical guide, and its validation.

For data collection on nurses' knowledge, we developed an instrument based on the scientific literature^(6,9-11), especially the AHA Guidelines for CPR⁽⁴⁾. This instrument corresponded to a self-administered questionnaire with closed-ended and open-ended questions, covering the following variables: gender, age, professional experience, participation in AHA training courses, frequency of contact with cardiac arrest situations, nurse's judgment on their ability to perform basic CPR maneuvers and participation in cardiac arrest situations.

To validate the content and appearance of the instrument in order to improve its clarity, comprehensiveness and relevance of the variables to be evaluated, the filing took place with five professionals considered experts on the subject addressed. As a criterion for selecting the judges, we chose doctors or nurses, specialists in cardiology or intensive and/or emergency care, and with minimum experience of two years in the hospital. First, the experts were contacted by email and then received the instruments from the researcher. After the filing, only two instrument variables related to basic CPR maneuvers were changed.

The study took place in a nonprofit philanthropic hospital of Guaratinguetá, declared of public utility, treating patients throughout the Paraíba Valley and southern Minas Gerais, Brazil. The sample consisted of 41 nurses who delivered assistance activities, nursing supervision and coordination, distributed by the various sectors of the hospital, from August to October 2012.

We entered and tabulated data collected into a Microsoft Excel[®] spreadsheet. We used descriptive statistics (mean, median, standard deviation, frequencies and percentages) to represent the answers in tables.

The criteria used to design the theoretical guide for cardiac arrest care was based on obtained data related to the questions found in the research and based

on the scientific literature, especially on the AHA Guidelines for CPR⁽⁴⁾.

We excluded the nurses who were on vacation or off work for some reason. There was no rejection regarding the study participation. The research protocol was submitted to the Research Ethics Committee of the Universidade de Taubaté, being approved under protocol No. 315/12.

RESULTS

This study aimed to evaluate the knowledge of nurses regarding cardiac arrest and CPR maneuvers. The main purpose was to collect subsidies to design a training guide for these nurses, based on the doubts and difficulties found, as well as questions relevant to the issue in the scientific literature. This guide can become a tool for upgrading nursing professionals.

Among the 41 nurses participating in the research, there was a predominance of females and the mean age was 32 ± 5.4 years.

Most had five to 10 years of professional experience. As for the field of expertise, 46% of respondents work in medical and surgical clinic units, however there is a significant rate of nurses currently working in the ICU (32%).

Table 1 summarizes data on nurses' self-assessment about the ability to work in CPR, as well as the experience in dealing with cardiac arrest (assistance dynamic and frequency).

Table 1 - Distribution of the number of nurses according to the frequency of variables: contact, self-assessment, and participation in CPR assistance. Guaratinguetá, SP, 2012

Variables	n	%
Frequency of contact with cardiac arrest situations		
Never	2	5.0
At least once a week	29	71.0
More than once a week	10	24.0
Self-assessment on the ability to perform CPR*		
Poorly trained	12	29.0
Trained	29	71.0
Participation in cardiac arrest care		
When there is no other nursing professional available	3	7.0
Voluntarily, even when not responsible for the patient	14	34.0
Always participate with the team	24	59.0

(*) CPR – Cardiopulmonary Resuscitation.

Table 2 - Distribution of the number of nurses according to the knowledge on cardiac arrest care. Guaratinguetá, SP, 2012

Knowledge on cardiac arrest*	Yes		No	
	n	%	n	%
Cardiac arrest identification	40	98.0	1	2.0
Routes of drug administration	32	78.0	9	22.0
Analysis of VF*/Asystole	27	66.0	14	34.0
Upper airway	23	56.0	18	44.0
Types of drugs	9	22.0	32	78.0
Shockable rhythm VF/PVT*	7	17.0	44	83.0
Drug administration times	5	12.0	36	88.0
Technique for chest compressions	-	-	-	-

(*). VF – Ventricular Fibrillation; PVT – Pulseless Ventricular Tachycardia.

There was a high percentage of hits in relation to cardiac arrest identification (98.0%), routes of drug administration (78.0%), analysis of the rhythms of ventricular fibrillation, Asystole (66.0%), and artificial airways (56.0%). Nevertheless, we found that no nurse was able to report the proper technique for chest compression.

DISCUSSION

In the current scenario of continuing health education, many professionals have reported an urgent need for technical and scientific upgrade⁽¹⁶⁻¹⁹⁾. In this respect, the study showed the importance of the profile of nurses in professional practice, valuing teacher training, ethics and the human factor, in addition to technical and scientific knowledge and certain personal characteristics⁽¹⁹⁾.

Nursing teams act differently depending on the workplace, like in the emergency room or ward, since the organization marks the work environment, and this includes the acting/reacting in nursing care. Therefore, the differences between these sectors happen in both the physical space and the unit organization, and succeed in the coping of these teams in a cardiac arrest event⁽¹⁹⁾.

It is worth mentioning that the Advanced Cardiac Life Support corresponds to a theoretical and practical

immersion course that aims to meet the cardiac emergencies, including the various forms of cardiorespiratory arrest, lethal arrhythmias, initial treatment of acute myocardial infarction and its complications, and brain attack, with information and technical skills needed for cardiopulmonary resuscitation⁽⁴⁾.

As for the frequency with which nurses are faced with cardiac arrest situations, 29 (71%) reported that sometimes face these situations and only 10 (24%) reported that the contact is frequent. However, most consider themselves qualified for such care regardless of the frequency of contact or workplace. These data corroborate a study that aimed to elucidate the knowledge of nursing professionals, which showed that 40% of them could not recognize the signs of cardiac arrest, nonetheless, 93% considered themselves able to perform the CPR assistance⁽¹⁷⁾.

Of the respondents, 15% were not able to report their first action facing cardiac arrest (identification) according to the AHA guidelines⁽⁴⁾, which emphasizes early recognition of first signs and symptoms of cardiac arrest and CPR maneuvers in order to reduce mortality rates⁽⁶⁻⁷⁾.

A study stated that every community must acknowledge their weakness and work improvements regarding basic life support⁽⁷⁾. It is important to include early recognition of patients with first signs and symptoms and CPR maneuvers, because only the action at the various stages of care to these victims may reduce mortality rates^(6,8-9).

None of the nurses identified the appropriate place to perform chest compressions. This result is consistent with other studies that evaluated nursing professionals regarding the proper way of conducting chest compression and demonstrated that performing this technique was the greatest deficiency the professionals presented^(6,17). Therefore, this is a concerning result because the critical initial elements of

BLS are chest compressions, which provide vital blood flow to the heart and brain⁽⁴⁾.

Considering the performance of nurses according to the algorithm based on the 2010 Guidelines, any treatment offered to cardiac arrest victims is directly associated to the rhythm found⁽⁵⁾. It is noteworthy that when a cardiac arrest or an emergency that endangers life occurs, a fast and skillful response can make the difference between life and death and between intact survival and sequelae^(17,19).

We must evaluate the nursing staff and its coping given the variation according to the sector in which this team works, because depending on the unit the cardiac arrest process may become a new procedure, never seen before by this team^(6,17).

When analyzing the results obtained in relation to the conducts to restore the victim in the asystole rhythm, the majority answered the question incorrectly and 15% could not answer it, only a small minority answered the question correctly: "differential diagnosis: to be aware of reversible causes". This finding concurs with a study that aimed to standardize the cardiac arrest care, where the subsection "probable causes of cardiac arrest" ceased to be completed in 38 (70%) of the instruments. However, this information is not always easy to obtain, but is essentially important to allow professionals to better target interventions during CPR⁽¹⁹⁾. A study with physicians who had more than five years after graduation showed that when questioned about the asystole rhythm, only 33.3% would seek the cause of cardiac arrest⁽¹⁸⁾.

Regarding alternative routes for drug administration during CPR maneuvers, in addition to intravenous route, most answered correctly: "endotracheal and intraosseous". However, when asked about the types of drugs used during CPR, 32 (78%) could not answer and 36 (88%) did not know the time intervals pre-established for the use of these drugs. This finding corroborates a study that also presented a low percentage of correct answers regarding the drugs used and routes of administration, demonstrating that nursing professionals were not up-to-date with the new AHA guidelines⁽⁶⁾.

Above all, nurses must remain informed and up-to-date to feel secure, which provides job satisfaction and quality care. It is noteworthy the importance of preparing professionals based on the development of competence (knowledge, skills and attitudes) to provide appropriate assistance during CPR. The investment in training for the professionals who provide direct care to cardiac arrest patients and the development of protocols to guide the assistance to be performed can provide lower risk and lead to increased safety during the treatment⁽²⁰⁾.

Cardiac arrest is an emergency that highly affects mortality rates; thus, nurses play a key role in the assistance along with the medical team, considering the survival directly dependent on the success of this action as a participant of the multidisciplinary team.

Therefore, we proposed a guidance for nursing professionals, which can be a tool for professional upgrade, and thus enable a more effective assistance (Charts 1a and 1b).

Chart 1a - Theoretical guide for nursing assistance in cardiac arrest. Guaratinguetá, SP, Brazil, 2012

Step	Action	Recommendation
1st - Identification	Assess the level of consciousness.	Call the victim and touch them firmly.
At this point, there was confirmation of cardiac arrest?		
2nd - Help	Call for help.	Multidisciplinary team: physician, Nursing and Physiotherapy staff; Get the emergency cart and the Automated External Defibrillator.
3rd - Check pulse	Check carotid pulse.	Pulseless: quickly begin 30 chest compressions.
4th - Start CPR	Start chest compressions in the center of the chest, compression frequency of 100/min, and depth of at least 2 inches (5 cm) in adults with complete recoil of the chest after each compression, with minimum interruption of chest compressions.	Position the victim on supine position on hard surface; 90-degree angle (own body weight); Immediately start chest compressions and do not delay breathing.
5th - Open airway and provide two rescue breathings	One rescuer should begin chest compressions while a second rescuer opens the airway and provides bag-mask ventilation as soon as the first rescuer completes a series of 30 chest compressions.	Open the airway: head tilt-chin lift maneuver (if suspected trauma, they should open the airway using a jaw thrust).
Observations	When the victim has an advanced airway in place, chest compressions can be continuous and without pauses for ventilation. Confirm that the endotracheal tube is in place correctly: listen to the epigastric region and left and right hemithorax.	1 breath every 6 to 8 seconds; Observe visible chest rise; Avoid excessive ventilation; Switch chest compressors approximately every 2 minutes.
After five cycles of compression and ventilation (approximately two minutes), one must re-check the heart rate or spontaneous breathing		

Chart 1b - Theoretical guide for nursing assistance in cardiac arrest. Guaratinguetá, SP, Brazil, 2012

Step	Action	Recommendation	
6th - Assess the cardiac rhythm ↓ If PVT* or VF* → Or ↓ Asystole or PEA* →	Heart rhythm monitoring	Importance of immediate heart monitoring: the time from Ventricular Fibrillation to shock delivery should be less than 3 minutes and one should apply CPR* while the defibrillator is ready	
	Use defibrillator	Shock after 1 minute	Defibrillation: 360J for monophasic devices and 200J for biphasic devices
	Perform chest compressions/bag-mask ventilation (30:2)		Apply CPR
7th - Drug therapy	Prepare to obtain artificial airway (orotracheal intubation)	Special attention: potential cause of the event (differential diagnosis); Probable causes: hypoxia, hypovolemia, metabolic/respiratory acidosis, hypothermia, hyperkalemia, cardiac tamponade, toxins, coronary thrombosis, pulmonary embolism, exogenous intoxication.	
	Vascular Caliber Access, if not possible one can use:	The consensus is that for gaining access, the resuscitation maneuvers should not be interrupted and the first defibrillation attempts should not be delayed; Endotracheal route: The doses are increased from two to two and a half times; Intraosseous route: Puncture point 1-3 cm below the tibial tuberosity, pointing to the foot with a 60-degree angle; Through this route, one can administer all medications used in cardiac arrest in the same dosages of intravenous routes.	
	Drug administration;	Cardiac stimulant and vasopressor	Epinephrine dose: 1 mg every 3-5 minutes
	Medication + 20 ml bolus of distilled water or 0.9% saline followed by member elevation.	Antidiuretic and vasoconstrictor hormone	1 dose of vasopressin: 40 U and it can replace the first dose of epinephrine. Note: single dose
	Antiarrhythmic for VF or PVT	Amiodarone Dose: 300mg Bolus, second dose of 150 mg. In the presence of refractory VF – Lidocaine Dose: 1 to 1.5 mg/kg IV bolus, may be repeated every 5-10 minutes for a total of up to 3mg/kg.	
Return of spontaneous circulation	When the heart rhythm returns, maintain artificial ventilation. A comprehensive, structured, integrated and multidisciplinary post-CPR care system must be implemented. Treatment should include neurological and cardiopulmonary support.		

(*) CPR – Cardiopulmonary Resuscitation; PVT – Pulseless Ventricular Tachycardia; VF – Ventricular Fibrillation; PEA – Pulseless Electrical Activity.

CONCLUSIONS

The limitations of the theoretical knowledge of most participants related to the time interval to assess the cardiac rhythm during CPR, the conducts to restore the victim in the asystole rhythm, the time intervals pre-established for the use of drugs and especially to the unawareness of the proper location for performing chest compressions.

The results demonstrate the importance of continuing education on cardiac arrest and CPR, for which the presented guide will serve as theoretical support for the standardization and improvement of the team performance in study.

COLLABORATIONS

Silva AB and Machado RC contributed to the design, field data collection, analysis, interpretation of data, drafting and final approval of the version to be published.

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