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BASIC LIFE SUPPORT IN ADULTS: NURSES' KNOWLEDGE ON THE GUIDELINES 2010-2015

SUORTE BÁSICO À VIDA EM ADULTOS: CONHECIMENTO DOS ENFERMEIROS SOBRE AS DIRETRIZES 2010-2015

SOPORTE BÁSICO DE VIDA EN ADULTOS: CONOCIMIENTO DE LOS ENFERMEROS ACERCA DE LAS DIRECTRICES 2010-2015

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ABSTRACT

Objective: to identify nurses' knowledge on the cardiopulmonary resuscitation guidelines 2010-2015 for basic life support in adults. **Method:** this is a descriptive quantitative study carried out with 70 nurses at a school hospital in Curitiba, Parana, Brazil, in August and September 2011, after approval by the Ethics Committee of Sociedade Evangelica Beneficente, under the Protocol 4,297/11. Data were collected through structured interview and statistically addressed through analysis of absolute and relative frequency and chi-square test. **Results:** 30% of nurses knew the survival chain sequence in cardiopulmonary resuscitation and 57% knew the correct execution order; 51% didn't know the rate and depth of cardiac massage; 73% knew the compression/ventilation ratio. **Conclusion:** there's a need for implementing the continued education process on the theme as a joint responsibility between nurses and the institution. **Descriptors:** Emergency Nursing; Cardiac Arrest; Cardiopulmonary Resuscitation.

RESUMO

Objetivo: identificar o conhecimento dos enfermeiros sobre as diretrizes de ressuscitação cardiopulmonar 2010-2015 para suporte básico à vida em adultos. **Método:** trata-se de estudo quantitativo descritivo realizado com 70 enfermeiros em um hospital-escola de Curitiba-PR, em agosto e setembro de 2011, após a aprovação do Comitê de Ética da Sociedade Evangélica Beneficente, sob o Protocolo n. 4.297/11. Os dados foram coletados por meio de entrevista estruturada e abordados estatisticamente por meio de análise de frequência absoluta e relativa e de teste qui-quadrado. **Resultados:** 30% dos enfermeiros conheciam a sequência da cadeia da sobrevivência em reanimação cardiopulmonar e 57% conheciam a ordem correta de sua execução; 51% não conheciam a frequência e profundidade da massagem cardíaca; 73% conheciam a relação compressão/ventilação. **Conclusão:** é necessário implementar o processo de educação permanente sobre a temática como responsabilidade conjunta entre os enfermeiros e a instituição. **Descritores:** Enfermagem em Emergência; Parada Cardiorrespiratória; Reanimação Cardiopulmonar.

RESUMEN

Objetivo: identificar el conocimiento de enfermeros acerca de las directrices de resucitación cardiopulmonar 2010-2015 para soporte básico de vida en adultos. **Método:** esto es un estudio descriptivo cuantitativo realizado con 70 enfermeros en un hospital-escuela en Curitiba, Paraná, Brasil, en agosto y septiembre de 2011, después de la aprobación del Comité de Ética de la Sociedade Evangélica Beneficente, bajo el Protocolo 4.297/11. Los datos fueron recogidos por medio de entrevista estructurada y abordados estadísticamente por medio de análisis de frecuencia absoluta y relativa y de prueba de chi-cuadrado. **Resultados:** el 30% de los enfermeros conocían la secuencia de la cadena de supervivencia en reanimación cardiopulmonar y el 57% conocían el orden correcto de su ejecución; el 51% no conocían la frecuencia y la profundidad del masaje cardíaco; el 73% conocían la relación compresión/ventilación. **Conclusión:** es necesario implementar el proceso de educación permanente acerca de la temática como responsabilidad conjunta entre los enfermeros y la institución. **Descriptores:** Enfermería de Emergencia; Paro Cardíaco; Resucitación Cardiopulmonar.

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INTRODUCTION

Cardiopulmonary arrest (CPA) is the most severe emergency condition which can affect a human being. It's defined as a cessation of effective respiratory and circulatory activities. The intervention to reverse the condition has as its crucial principles the application of a set of procedures to resume circulation and oxygenation.

For successfully caring for a person in this situation, there's a need for early recognition of the CPA signs, rapid activation of the emergency care system, and prompt implementation of basic and advanced life support.¹

In this context, it's essential that the nursing team is attentive to the CPR diagnosis, in order to establish immediate therapeutic measures designed to keep vital organs functioning, and the nurse plays an important role in this event.

To this end, one highlights the importance of technical and scientific competence of the professionals involved, as there's a need for applying care protocols in order to standardize the actions to be followed as a means to facilitate the therapeutic approach.²

Aiming to build guiding protocols for such care, the American Heart Association (AHA), every five years, releases new cardiopulmonary resuscitation (CPR) guidelines, which are based on a rigorous international process of evidence evaluation. It involves hundreds of scientists and experts in resuscitation from all around the world who evaluate, discuss, and debate a large number of peer reviewed publications.³

Thus, in October 2010, the latest guidelines for this practice were released, which will remain in force until 2015. They intend to focus on the science of practitioners performing resuscitation, in order to decrease death and disability caused by cardiovascular diseases.³

In the authors' professional career one empirically realized that the nurse shows to be a crucial professional with regard to the success of care for CPR, not only by performing procedures, but playing the role of leader of her/his team and, also, connecting themselves to other professionals.

Besides, the new cardiopulmonary resuscitation guidelines 2010-2015 present a chapter highlighting training, implementation, and teams. This is a new section addressing the growing body of evidence guiding the best practices in teaching and learning for

resuscitation training, the implementation of the survival chain, and the best practices related to teams and care systems.³

Such considerations pushed reflections on the nurse's importance in the multiprofessional team working with CPR, and also with regard to her/his role as the nursing team's educator, having updated protocols as a basis.

However, as it's a wide scope subject, one delimited the focus of concerns with regard to the basic life support (BLS) for adults, something which led to the following question as a guiding wire for this study: "What is the knowledge of nurses from a school hospital on the cardiopulmonary resuscitation guidelines 2010-2015 for basic life support in adults?"

To clarify this question, one drew up as an aim identifying the nurses' knowledge on the cardiopulmonary resuscitation guidelines 2010-2015 for basic life support in adults.

METHOD

This is a quantitative study carried out in a large philanthropic school hospital in Curitiba, Parana, Brazil. The population of nurses in the institution is 128 individuals (according to data from the Human Resources Department), and the sampling was probabilistic, with simple random selection, consisting of 70 individuals, with a confidence level (1- α) of 95%, standard deviation of 0.5, and sampling error of 8%.⁴

The data collection technique was the structured interview, using an instrument which consists an initial part for characterizing the subject, followed by 8 closed questions on the theme guiding the research. For content validation, the instrument was submitted to 5 nurses playing the role of judges, 2 specialists in Intensive Care, 2 in Emergency, and 1 in Critical Patient Care.

One carried out a pilot study with five nurses not included in the sample, aiming to evaluate the collection instrument with regard to the absence of criteria on range, objectivity, and relevance to the theme.

The interviews took place in August and September 2011, after approval by the Ethics Committee of Sociedade Evangelica Beneficente, under the Protocol 4,297/11, with signing of a free and informed consent term by the subjects. The ethical precepts of research were ruled by the Resolution 196/96 from the National Health Council.⁵

In possession of the collected data, one conducted the statistical approach through

the analysis of absolute and relative frequency and the chi-square test, using the software *Microsoft Excel*.

DATA PRESENTATION

Data are divided into two sections: characterization of subjects and knowledge on basic life support in adults.

♦ Characterization of subjects

Among respondents, females (80%) and ages between 25 to 30 years prevailed. Regarding their length of professional practice, 23% had more than 5 years of experience as a nurse, followed by up to 1 year (21%) and between 1 and 2 years (20%).

The institution has many sectors, of the most varied specialties. However, in this research, the General ICU had higher participation (10%), followed by Medical Clinic, Emergency Room, Neonatal ICU, and Health Insurances, all of them with 7%. Those who had lower participation were Orthopaedics and Hemodynamics, both with 1%. The interview was randomly conducted, thus, the non-participation of some sectors doesn't represent a refusal by their nurses.

Out of the interviewed professionals, 56% attended some graduate course in Nursing and 44% didn't. Out of the graduate nurses, 28% attended a specialization course in Urgency and Emergency, 10% in Labor Nursing, 8% in Nursing Audit, and 8% in Critical Patient Care, among others.

♦ Knowledge on basic life support in adults

When asked about the correct order of the survival chain for an adult CPR victim, only 30% of nurses knew the exact answer. It's noteworthy that 23% answered that CPR should be started before asking for the help of a specialized service, something which has been regarded as wrong for long by the AHA protocols.

The second question of the instrument addressed the execution order of cardiopulmonary resuscitation maneuvers in adults. It was correctly answered by 57% of respondents. However, 20% still regard the "see/listen/feel" procedure as the initial one, something which is wrong according to the 2010 guidelines.

Regarding the rate and depth of cardiac massage, 49% answered in an adequate manner. However, 30% answered in accordance with that recommended by the former guidelines (2005-2010) and the remaining 21% chose alternatives which don't fit in any of the guidelines already published by AHA. Thus, 51% of nurses didn't know the

rate and depth of thoracic compressions.

When asked about the compression/ventilation ratio during CPR on an adult victim with no definitive airway, 73% chose the correct alternative. In turn, with regard to the use of automated external defibrillator (AED), the total number of correct answers was only 34%.

The sixth question of the instrument consisted of statements which should be classified as true or false by respondents. Most nurses answered correctly, indicating all statements as true. However, one highlights that 37% didn't recognize the need for minimizing interruptions in thoracic compressions - limiting interruptions to less than 10 seconds. The same percentage regarded as false that, without a barrier device, ventilation isn't needed in BLS and one must only perform thoracic compressions, contradicting the current guidelines.

After answering to the questions with a technical nature on BLS in adults, the subjects were asked whether they knew about the five-year update of the CPR protocol and the dissemination of new guidelines by AHA; 80% said yes, whereas 81% of the sample said to know that the year when the last guidelines were released was 2010.

However, crossing the answers on knowledge of the protocol update in 2010 with the first question - which addressed the survival chain - one found out that, although 81% of respondents claimed to know the year of last update, out of them, only 37.3% chose the correct alternative, including the chain links recommended for 2010-2015.

By performing the same crossing with the question including the correct execution order of CPR maneuvers, out of the 81% who said to know the 2010 update, 62.3% answered correctly.

In turn, through the crossing of this same data (knowing the new guidelines year) with the question on the compression/ventilation ratio, only 56.6% out of the 81% who reported knowing the 2010-2015 guidelines got the answer. It's noteworthy that 26.4% answered in accordance with the former guidelines, even though they claimed to know the 2010-2015 update.

DISCUSSION

In conferences held every five years, the International Liaison Committee on Resuscitation (ILCOR), along with the Resuscitation Committee of AHA, since 2000, releases international guidelines for CPR, in

order to standardize care.⁶ Up to now, the AHA guidelines for CPR released in October 2010 have force, and they will keep being the reference until 2015.^{2,3}

Although 81% of the sample has indicated to know that there were changes in the CPR guidelines in 2010, there was a large error percentage in the technical aspects mentioned by respondents. Only 30% of them knew the correct order of the survival chain.

The nurse's role is crucial in CPR cases, especially when it comes to making decisions. It's known that, usually, the nurse firstly evaluates the patient and starts the CPR maneuvers, since the immediate recognition will reflect on the victim's prognosis. Thus, the professional should be qualified to deal with this situation.⁷

First, for discussing BLS, one emphasizes the survival chain and its correct sequence of procedures during the care for a CPR, named links. Most nurses participating in the study were unaware of the survival chain of the 2010-2015 CPR guidelines, something which, somehow, makes it clear that updating isn't included in the respondents' knowledge, although they know that there were changes introduced by AHA in 2010. However, knowledge is one of the most powerful tools for providing the profession with visibility, for this, it must be based on scientific methods, so that the quest for autonomy isn't ruled only by common sense practices.

Unlike the former guidelines, wherein the survival chain had 4 links⁸, the new 2010-2015 guidelines have 5. The first consists in the recognition of CPR and the immediate call for the urgency/emergency service; the second link is that in which one must apply the CPR techniques with an emphasis on thoracic compressions; the third is early defibrillation, followed by the fourth, which refers to the effective advanced life support (ALS). The fifth and new link, named integrated post-CPR caring procedures, consists of the training, implementation, and team sectors, emphasizing the need for training and the methods to increase the willingness of people who are there to perform a CPR, whether lay people or health professionals. Another aspect advocated by this link is simplifying the training for rescuers, pointing out the most needed aspect for success in a CPR, which is performing thoracic compressions as early as possible.³

Regarding the correct order of execution of procedures in a CPR, 57% of respondents knew that the act of "seeing/listening/feeling" was removed from the CPR protocol, but 20% still

would take the initiative of starting maneuvers by this procedure before starting thoracic compressions. Given this scenario, one highlights that, for the success of CPR maneuvers, it's essential that all professionals involved in the process know them and, due to the fact that the guidelines are reviewed every five years, there's a need for seeking a continued update with regard to this theme.

The new protocol recommends that one immediately performs thoracic compressions (letter C), following a C-A-B-D³ sequence, thus, that the cardiac massage in adults is applied before ventilation, something different from what was indicated by the former 2005-2010 protocol, whose order was A-B-C-D.⁹ This is justified by the fact that, starting CPR with 30 compressions instead of 2 ventilations, one decreases the delay in applying the first compression.³

Most of the study subjects (57%) identified the order of procedures with regard to the rate and depth of maneuvers, showing that they have some knowledge on the subject. As before rate was related to the term "about", now one applies rate along with the term "at least" - 100 beats per minute and 2 inches depth (about 5 cm). Furthermore, 79% knew that it's crucial to have complete chest recoil after each compression, because, this way, the maneuver effectiveness becomes more reliable. However, 37% didn't recognize the need for minimizing interruptions in thoracic compressions.

The step C of CPR consists in checking the carotid pulse within up to 10 seconds and, in the absence of it, thoracic compressions are started with a minimum rate of 100 beats per minute. That is, the thorax must be fastly and strongly compressed and the chest return between a compression and another has to be complete in order to perform an effective maneuver. Studies show that delays and interruptions in thoracic compressions decrease the victim's survival. The correct application of cardiac massage requires an emphasis not only on the appropriate rate of compressions, but also on minimizing interruptions between a maneuver and another in CPR.³

The compression rate has been changed for at least 100 beats per minute, instead of about 100 beats per minute, and the compression depth has also undergone significant changes in its performance. What was formerly about 1.5 to 2.0 inches, after the new protocol, became at least 2.0 inches, i.e. at least 5 centimeters.³

In step A, one must perform an opening of airways, recalling the care procedures and restrictions in cervical trauma cases. Moving to phase B, after opening the airways, the health professional should quickly check for breathing or not and whether it's in an abnormal way (only gasping in agony). The procedure "seeing, listening, and feeling", if there's breath, as mentioned, has been removed from the algorithm.³

However, 20% of subjects still mentioned this procedure among those needed for CPR, but 60% found that ventilation is dispensable in BLS in the absence of a barrier device, in accordance with the new protocol.

Step D corresponds to early defibrillation, also an important point addressed in the new protocol. The use of AED in the 2010-2015 guidelines hasn't underwent major changes with regard to the 2005-2010 guidelines, but the emphasis on early defibrillation combined to high-quality CPR is the key to improve survival from sudden CPR, along with training to enhance, organize, plan, create partnerships towards a continued quality improving process.³

However, only 34% of subjects had some knowledge on this step of BLS in adults, and 23% would perform the procedure on the opposite way to that established by the 2010-2015 AHA protocol, in electrical therapies, and other 14% would apply it incorrectly.

For understanding the use of defibrillators, whether automated or not, a CPR with ventricular fibrillation is didactically divided into three phases: electric phase, circulatory or hemodynamic phase, and metabolic phase. In the electric phase - which occurs between 0 and 4 minutes after heartbeat cessation -, one realizes a rough ventricular defibrillation; it's the most effective phase, with a good response to shock. After this period, defibrillation stops being beneficial, and there's a need for a thoracic compression time so that the myocardium better respond to shock. That's because thoracic compression improves myocardial electrical condition so that it can benefit from defibrillation. In the circulatory or hemodynamic phase, between 4 and 10 minutes after CPR, there's energy loss by the myocardium and, this way, a lower response to shock. The third and final phase, known as metabolic phase, is that occurring 10 minutes after CPR, and the victim's recovery is put into question. One believes that the most severe complication in this phase is post-CPR hypothermia.⁹

Since the 2005 guidelines, it's recommended that, in witnessed CPR cases or

those with a response time less than 4 minutes, one must apply a shock with AED (as soon as the device is available) and, then, start CPR. In turn, when CPR is installed for more than 4 minutes, one should perform 5 cycles or 2 minutes of CPR (30:2) and, then, use AED. The number of shocks was reduced from 3 to only 1, in order to shorten the time the victim remained without thoracic compressions.⁹

Furthermore, it's known that after receiving a shock, every heart presents a certain degree of ventricular dysfunction, something which allows one to indicate that the greater the number of shocks, the greater the dysfunction and difficulty for resuming appropriate rate. Thus, since 2005, the protocol registers only one shock event with AED, with immediate CPR resumption, regardless of rate, starting from thoracic compressions.^{3,9}

Regarding the compression/ventilation ratio, until an advanced airway is placed, in case of 1 or 2 rescuers, one keeps advocating for the 30 compressions and 2 ventilations cycle, if there's a barrier device. In the absence of it, one goes on only with the letter C (compressions only). In case of a definitive airway, the health professional should perform a ventilation every 6 to 8 seconds (8 to 10 ventilations per minute), in accordance with thoracic compressions, about 1 second for ventilation, and one should always observe the visible elevation of thorax.³

Regarding this specificity, 73% of nurses chose the correct alternative, since there was no change in this 30:2 compression/ventilation cycle, when compared to the former protocols. However, besides, 9% of nurses are in total disagreement both with the current 2010-2015 protocol and the former 2005-2010 protocol, taking into account correct alternatives with 15 massages and 2 ventilations cycles. A portion of this unawareness leads CPR and the nurse's role, in the face of this intervention, to become compromised and avoid following what the guidelines establish.

One has to stress the fact a successful reversal of a CPR also depends on factors such as: the victim's clinical conditions prior to CPR, causes which determined it and standardization of the CPR maneuvers applied. With this, training should be a paramount requirement to minimize errors and conflicts, achieve the shortest time between CRP and the performance of maneuvers, among others.

It's worth mentioning that the findings of a study¹⁰ suggest that the greater the time after graduation, the lesser the theoretical knowledge on the compression/ventilation ratio and the electrical charge used for defibrillation, something which justifies the professional's need for updating in the face of periodic changes according to the evolution of researches.

Although most of the study participants have mentioned to know about the publication of the new 2010 guidelines, they showed a poor performance with regard to knowledge on their changes, demonstrating the need for continued education on this theme.

However, professional updating must be understood as something desired both by the nurse her/himself and the health organization where she/he works, i.e. it's attributed to the private and institutional sphere.

The National Policy of Continued Education, proposed by the Ministry of Health, presents itself as a strategy which contributes to change the training processes of pedagogical and health practices for organizing services and it emphasizes that the educational process is both a responsibility of the institutional and the individual spheres.¹¹

According to statements of this policy, continued education is learning at work, with the inclusion of learning and teaching in the organizations daily life and in work itself. It's carried out through the problems faced in reality and it takes into account the individual's previous knowledge and experience.¹¹

Through this concept, one states that the nurse's updating on CPR having the new guidelines as a basis isn't only an individual responsibility, but also a responsibility of the employing institution, since its performance tends to positively reflect not only on the patient's prognosis, but on the work process, contributing to organizational development.

One also thinks that a training program should be regularly applied, quarterly or half-yearly, as there's a sharp decline in knowledge over time.¹²

Thus, institutions must provide regular trainings which address theory and practice. Concomitantly, practitioners should seek study strategies for improving and maintaining their own performance over time.¹

So, the proposal of a training program for nurses to care for CPR is crucial to allow an approach between her/his labor reality and the knowledge on the subject that has been

produced, thus contributing to a standardization of care for this disease at the institution.¹²

Furthermore, it's important that the nurse, playing her/his role of nursing team's supervisor, identifies its problems and needs, in order to properly train it to develop its competences.¹³

FINAL REMARKS

The starting point of this study was identifying whether nurses were updated with regard to the new 2010-2015 guidelines for CPR for adults in BLS.

The nurses' knowledge and updating with regard to the recommendations of the new AHA guidelines are essential and of paramount importance to optimize care for CPR. There's a great expectation that, with the new link in the survival chain - the section of trainings, implementation, and team -, there would be a reduction in the gap between doing and not doing due to lack of knowledge and, this way, there may be an improvement on the survival of victims in CPR.

CPR is a complex and systematic process involving many factors and the nursing professional is included in this set. It can contribute in a participatory and shared manner, or even delegating tasks to achieve a better patient's prognosis. Therefore, to perform her/his role of leader and tutor/educator of her/his team, the nurse should be updated with regard to changes in the CPR protocol.

This study concludes that the subjects' theoretical knowledge on the BLS procedures in adults undergoing CPR, according to the new 2010-2015 CPR guidelines, is insufficient on the part of the professionals interviewed. It's noteworthy that the participants' experiences and expertise didn't affect the results. It was also concluded that their understanding about the theme doesn't depend on the sector or experience in nursing. Few have some knowledge on the use of AED and the importance of well-performed compressions at the beginning of a CPR.

Literature data is reinforced, indicating that there's a need for implementing educational measures to intervene in vulnerable points investigated in this survey and that there should be a commitment both on the part of the institution and the nurses for constructing continued education, fundamentally aiming at the quality of care and minimization of errors due to unawareness or lack of skill.

Even with the limitations of this study, it's expected that its findings can support the nurses' interests towards the pursuit of knowledge on the subject concerned, as well as play the role of a springboard for the institutional encouragement of this professional category's training.

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