

Education Strategies through Simulation for Training in Cardiopulmonary Resuscitation Treatment

OPINION

Abstract

Theoretical and reflective study based on scientific literature and critical analysis of authors related to teaching strategies through simulation for training in cardiopulmonary resuscitation (CPR). Current teaching methodologies CPR involve realistic simulation strategies and simulations in virtual environments, but the first method provides the best results, allowing proactivity of individuals in their teaching-learning process and bringing them the experience of a life threatening situation. It is noteworthy that health professionals need to be able to assist a victim in cardiac arrest, but even existing effective teaching methodologies to enable them in this subject, is not fully applicable in the Brazilian context of health education.

Keywords

Cardiac arrest; Health education; Simulation.

Introduction

Cardiopulmonary Resuscitation was featured in Brazil in 1960 with Dr. John Cook Lane, a pioneer in the teaching of basic life support maneuvers. It also emphasizes the beginning of training in Advanced Cardiac Life Support (ACLS) in Brazil and its viability for people in different age groups. In this scenario, some authors were forerunners in publications of the thematic and research about treatments to cardiopulmonary resuscitation CPR favoring the dissemination of knowledge in the area and increasing studies focused on this issue [1].

Despite the history about the efforts in training in CPR, this still ranks as a concern in the Brazilian scenario, there are deficiencies in the implementation of training courses on the subject for health professionals. Arise questions regarding the best teaching strategies, considering the limited educational resources and knowledge retention.

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Thus, this article aims to reflect on the main existing teaching methods in the training of treatment of CPR.

Importance of training in cpr

Acute coronary disease (ACD) figure in the global public arena as responsible for high morbidity and mortality. In the United States of America (USA), annually are about 330,000 deaths from the DACs outside the hospital and emergency [2] departments. In Brazil, in 2012, diseases of the circulatory system amounted to approximately 26.4% of population [3], causing numerous unfavorable outcomes for the patient.

Most deaths resulting from acute myocardial infarction (AMI) occur mainly in the early hours, with 40% -65% of cases in the first hour, and about 80% in the first 24 hours. The most frequent form of cardiopulmonary arrest (CPA) associated with the AMI is the ventricular fibrillation [4]. Thus, to minimize the deleterious consequences of CPA, it is necessary the implementation of early CPR maneuvers and of high quality and must be performed by qualified multidisciplinary team and owner of material resources and equipment needed to watch this emergency.

CPA is characterized as one of the most critical events, stressful and decisive for health professionals, defined as the sudden cessation of systemic circulation/breathing in people expected to restore these functions and that do not carry a disease in terminal or intractable phase [5]. The progressive increase in this emergency both in extra-hospital and in-hospital environments reinforces the need for training of health professionals, being patient survival directly related to quality of care. The survival rate related to CPA ranges from 2 to 49% due to the initial cardiac rhythm and early onset of CPR [6].

Bearing in mind the seriousness of the CPA and its progressive increase in non-critical environments, training and continuing education on the subject should be conducted with the health teams in all

areas of care, involving higher and technical professionals so they are able to act effectively during this emergency [7].

Currently, existing training programs in CPA/CPR are intended for medical professionals, nurses and paramedics, who work in urgency and emergency situations [6]. However, given the unpredictability of this event, it is necessary leveling of knowledge among health professionals, all being able to act effectively during CPA.

CPR standardized behaviors favor the use of one language between health professionals and better performance in the execution of maneuvers, minimizing the impact on the victim's survival quality [8]. In this logic, training programs in treatment to CPA, increase retention of knowledge dealing with theoretical and practical teaching of the stages that make up the treatment of CPA [7-8]. There are reports in the literature regarding the better performances in the treatment of CPA of health professionals after the training period, which reinforces the importance of continuing education for the team performance [9].

Training models of Basic Life Support (BLS) and Advanced Life Support (ALS) are the most important enablers of the multidisciplinary team, being effective as strategies for improvements in care for victims of CPA [8].

The inclusion of training in CPR in the Brazilian reality has been undertaken with the establishment of training centers in different locations, linked to universities, medical associations or private institutions [7-8], and, simulation units and simulated patient use are interesting sources for training and currently available for professional training in urgency and emergency [10].

Health education technologies indicate changes in the teaching-learning process, specifically when it comes to CPR, where learning is no longer "with and in human life" and becomes in one risk-free simulated environment, the person victim of a CPA [11].

Education strategies related to training on treatment of cardiopulmonary resuscitation

The training strategies as CPR maneuvers involve the acquisition of theoretical knowledge, practical skills and professional attitudes, worked concomitantly with practice of participants, in order to facilitate their performances [8].

Realistic simulation methodology is presented as a methodological teaching resource that allows to the individual to enter into a context that simulates reality, developing a critical view and clinical reasoning directed to the immediate solution of the problem. In addition, this method allows the individual to position itself as the main actor of its learning process through questioning and contextualization of the scenarios that will be found in professional practice [12].

The simulation experience promotes critical thinking of professionals, comprising five factors: goals, loyalty, problem solving, support and feedback [11]. The objectives indicate the guidelines for the learning process. Fidelity is the approach parameter to reality, whose environment has specific characteristics of the scenario: clinic, hospital room, infirmary, clinic or home. The roles of the research participants are defined previously to the simulation, and a clinic case of the "patient" should be a challenge with possible solution [13]. Feedback should happen immediately after the simulation, observing the principles of appropriateness, frequency and interaction [10-13].

The methodological strategies for simulated education may be several: the use of high-fidelity mannequins; static dolls for training specific skills related to procedures in general; simulated patients that can be represented by a person previously trained and inserted in a scenario that enables reproduce the environment where the event occurs, among others [12]. High-fidelity mannequins due to its high cost could not be implemented, but the low-fidelity mannequins seem suitable for all levels of training courses in CPR [14].

In educational institutions it is common to find simulation stations for professional practice, aiming to build along with the students skills to identify health needs and development of care plans. In this mode, besides the opportunity to diversify learning scenarios, there is also the possibility of participating repeat the simulation again and again, which makes advantageous strategy in relation to conventional teaching aids [15].

Moreover, within the protected environment of the simulation, the student has the opportunity to learn by doing, making mistakes and learning from them. By reflecting on the mistake, it builds their learning through the identification of gaps in their knowledge and cognitive basis of their skills [15].

Another type of education is the computer-assisted simulation in which simulates an event in a virtual scenario and participants require an active interaction to apply the knowledge acquired in solving a problem or situation, with feedback on the answers. Thus, the participant has the opportunity to think and decide on a particular event and observe the consequences of their actions in a virtual scenario with the development of real skills. Besides allowing to the participant focus its attention on the problem, allowing a controlled manipulation of situation on caring the patient in PCR [11].

Although quite valid, the virtual simulation mode presents some limitations, because once the participant is not exposed to an environment close to reality of the situation that is reproduced, there may be limitations with respect to a best action facing PCR. Therefore, the use of computer simulation may require a trained instructor to remedy some kind of difficulty that the participant may have.

The use of these methods of teaching strategies requires a careful planning; they involve costs ranging from the purchase of materials such as mannequins, up to structuring environments, training of professors and instructors as a whole. In this context, the applicability of some teaching methods are not common to the routine in health training, in which most of the time planning is taking into account

the available resources, thus limiting the quality of teaching strategies directed to care in CPR.

Conclusions

The guidelines recommend that health professionals are able to perform effectively the cardiopulmonary resuscitation including the use of DEA. Then it is necessary a further theoretical and practical knowledge about the CPR maneuvers.

Caring a victim of PCR involves the work of a multidisciplinary team that must hold scientific knowledge and technical skills in CPR maneuvers, besides being updated on the subject.

Realistic simulation methodology for the training of health professionals on CPR/CPA is constituted as an important technology in the implementation of actions on health education, enabling the construction of knowledge and development of skills, since the individual is proactive agent in developing their skills and exercises their autonomy in decision-making. However, due to its cost, it is not fully applicable in the Brazilian context of health education.

References

1. Guimarães HP, Lane JC, FlatoUAP, Timerman A, Lopes RD. A história da ressuscitação cardiopulmonar no Brasil. *Rev Bras Clin Med.* 2009; 7:238-44.
2. Iwami T, Kawamura T, Hiraide A, Berg RA, Hayashi Y, Nishiuchi T, et al. Effectiveness of bystander-initiated cardiac-only resuscitation for patients with out-of-hospital cardiac arrest. *Circulation.* 2007; 116(25): 290-7.
3. Brasil. Ministério da Saúde. Departamento de Informática do Sistema Único de Saúde (DATASUS) [Internet]. Motalidade, Brasil. Disponível em: <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sim/cnv/obt10uf.def>. Acessado em 15 de outubro de 2015.
4. Piegas LS, Timerman A, Feitosa GS, Nicolau JC, Mattos LAP, Andrade MD, et al. V Diretriz da Sociedade Brasileira de Cardiologia sobre Tratamento do Infarto Agudo do Miocárdio com Supradesnível do Segmento ST. *Arq. Bras. Cardiol.* 2015; 105 (2), S1: 1-121.
5. Schneider A, Bottiger BW, Popp E. Cerebral resuscitation after cardiocirculatory arrest. *AnesthAnalg.* 2009; 108(3):971-9.
6. Miotto HC, Camargos FRS, Ribeiro CV, Goulart EMA, Moreira MCV. Efeito na ressuscitação cardiopulmonar utilizando treinamento teórico versus treinamento teórico-prático. *Arq Bras Cardiol.* 2010; 95(3):328-31.
7. Ferreira DF, Timerman A, Stapheton E, Timerman S, Ramires JAF. Aplicação prática do ensino em emergências médicas. *Rev SocCardiol Estado São Paulo.* 2011; 11(2): 505-11.
8. Radeschi G, Urso F, Campagna S, et al. Factors affecting attitudes and barriers to a medical emergency team among nurses and medical doctors: a multi-centre survey. *Resuscitation* 2015; 88: 92-8.
9. Alves FG, Maia LFS. A importância do treinamento em PCR e RCP para os profissionais de enfermagem em unidade de terapia intensiva. *Revista Recien.* 2011; 1(2):11-6
10. Sahu S, Lata I. Simulation in resuscitation teaching and training, an evidence based practice review. *J Emerg Trauma Shock.* 2010; 3(4): 378–84.
11. Sasso GTMD, Souza ML. A simulação assistida por computador: a convergência no processo de educar-cuidar da enfermagem. *Texto Contexto Enferm.* 2006 ; 15(2):231-9.
12. Ferreira C, Carvalho JM, Carvalho FLQ. Impacto da metodologia de simulação realística, enquanto tecnologia aplicada a educação nos cursos de saúde. In: *Anais do I Seminário de Tecnologias Aplicadas em Educação e Saúde*; 2014 out 30-31; Salvador. Brasil. Bahia: Universidade Estadual da Bahia; p. 1-9. Disponível em: www.revistas.uneb.br/index.php/staes/article/view/1617/1099.
13. Jin J, Bridges SM. Educational Technologies in Problem-Based Learning in Health Sciences Education: A Systematic Review. *J Med Internet Res.* 2014; 16(12):e251.
14. Greif R, Lockey AS, Conaghan P, Lippert A, De Vries W, Monsieurs KG. European Resuscitation Council Guidelines for Resuscitation 2015. Education and implementation of resuscitation. *Resuscitation* 95. 2015; 288-301.
15. Varga CRR, Almeida VC, Germano CMR, Melo DG, Chachá SGF, Souto BGA, et al. Relato de experiência: o uso de simulações no processo de ensino-aprendizagem em medicina. *Rev Bras Educ Med.* 2009; 33 (2) : 291-7.

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