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Use of the Objective Structured Clinical Examination for the assessment of the nursing team during a cardiopulmonary arrest

Utilización del Examen Clínico Estructurado Objetivo para la evaluación del equipo de enfermería durante una parada cardiopulmonar

Utilização do Exame Clínico Objetivo Estruturado para avaliação da equipe de enfermagem durante uma parada cardiorrespiratória

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Abstract

The aim was to evaluate the technical-scientific skills and competences of the nursing team during a cardiopulmonary arrest using the Objective Structured Clinical Examination. Descriptive quantitative study, carried out in a municipal hospital in Rio de Janeiro with 20 nursing professionals - 11 from internal medicine and nine from cardiology. For data collection, a pre-test with closed questions and the Objective Structured Clinical Examination, previously elaborated, were used. The pre-test evaluations showed significant results by the nursing teams from the internal medicine and cardiology sectors, with a p-value < 0.05. The results demonstrated the precariousness of nursing knowledge and skills in the face of cardiac arrest. However, there needs to be the encouragement and interest of the teams to keep up to date in the area. In addition to the need for continuing and permanent education to provide a quality service, with active methodologies that provide its protagonism.

Descriptors: Health Evaluation; Education, Nursing; Heart Arrest; Cardiopulmonary Resuscitation; Inservice Training.

Resumén

El objetivo fue evaluar las habilidades y competencias técnico-científicas del equipo de enfermería durante una parada cardiopulmonar mediante el uso del Examen Clínico Estructurado Objetivo. Estudio descriptivo cuantitativo, realizado en un hospital municipal de Río de Janeiro con 20 profesionales de enfermería, 11 de medicina interna y nueve de cardiología. Para la recolección de datos se utilizó un pre-test con preguntas cerradas y el Examen Clínico Objetivo Estructurado, previamente elaborado. Las evaluaciones previas a la prueba arrojaron resultados significativos por parte de los equipos de enfermería de los sectores de medicina interna y cardiología, con un valor de p <0,05. Los resultados demostraron la precariedad de los conocimientos y habilidades de enfermería frente al paro cardíaco. Sin embargo, es necesario que exista el ánimo y el interés de los equipos para mantenerse al día en el área. Además de la necesidad de una educación continua y permanente, con el fin de brindar un servicio de calidad, con metodologías activas que brinden su protagonismo.

Descriptores: Evaluación em Salud; Educación en Enfermería; Paro Cardíaco; Resucitación Cardiopulmonar; Capacitación en Servicio.

Resumo

Objetivou-se avaliar as habilidades e competências técnico-científicas da equipe de enfermagem durante uma parada cardiorrespiratória por meio da utilização do Exame Clínico Objetivo Estruturado. Estudo quantitativo descritivo, realizado em um hospital municipal do Rio de Janeiro junto à 20 profissionais de enfermagem - 11 da clínica médica e nove da cardiologia. Para a coleta de dados, utilizou-se um pré-teste com questões fechadas e o Exame Clínico Objetivo Estruturado, previamente elaborado. As avaliações do pré-teste apresentaram resultados significativos pelas equipes de enfermagem dos setores de clínica médica e cardiologia, com p-valor < 0,05. Os resultados demonstraram a precariedade de conhecimento e habilidades da enfermagem frente a uma parada cardiorrespiratória. Contudo, é necessário que haja o incentivo e interesse das equipes de se manterem atualizadas na área. Além da necessidade de atuação da educação continuada e permanente, a fim de possibilitar um serviço de qualidade, com metodologias ativas que propiciem o seu protagonismo.

Descritores: Avaliação em Saúde; Educação em Enfermagem; Parada Cardíaca; Reanimação Cardiopulmonar; Capacitação em Serviço.

Introduction

Cardiorespiratory arrest (CPA) is a cardiovascular emergency with high rates of morbidity and mortality characterized by the absence of signs of systemic circulation and respiratory movements due to an abrupt interruption of the mechanical activity of the heart[1]. The cessation of these functions causes a suspension of oxygen supply to the cells and tissues of the body, in addition to blocking the distribution of essential nutrients to maintain life, and if this clinical condition is not quickly reversed, CRP can lead to cell and brain damage. irreversible, or even lead the victim to death[2].

The Brazilian Society of Cardiology estimates that around 200 thousand cases of CPA occur in Brazil per year and that on average 50% correspond to the in-hospital environment[3]. In the United States, according to the American Heart Association (AHA) the values are close to those in Brazil, with an estimate that, on average, 209,000 cases of CPA in adults are treated annually in the intra-hospital environment[4].

The reversal of a CPA depends on some factors such as the early recognition of its possible triggering conditions, obtaining a quick and accurate diagnosis and the correct performance of cardiopulmonary resuscitation (CPR), in addition to the post-cardiac arrest care that is essential for the patient's survival[5,6]. In the out-of-hospital environment, the most frequent cardiac arrest rhythm is ventricular tachycardia and ventricular fibrillation. The survival rate is high when defibrillation is promptly performed. On the other hand, in the in-hospital environment, the main rhythm of CRP is pulseless electrical activity or asystole, with a worse prognosis[1].

The rapid response to a PCR through an immediate warning system and the harmonious interaction of the various departments and services of the institution and a multidisciplinary team are essential for its reversal. The in-hospital survival chain of a CRA includes surveillance and prevention, recognition and activation of emergency medical service, prompt and high-quality CPR, rapid defibrillation, advanced life support and post-CPA care. During CPR it is important to emphasize the frequency and depth of chest compressions; the installation of an advanced airway device; the use of a defibrillator when the stopping rhythm is shocking; installing a peripheral or intraosseous venous access and the use of recommended medications[7].

In-hospital CPA patient care can be initiated by any member of the healthcare team, even in the absence of the physician. The professional who comes across a patient who is not responding and shows signs of CPA should ask for help in the vicinity while breathing and pulse continues to confirm the diagnosis and be able to start chest compressions while the other team members organize to help with the assistance. On these occasions, the entire health team is expected to have knowledge and skill in CPR, trained in accordance with the protocol established by the AHA[7].

Among health professionals, the nurse is the one who has the greatest contact with the patient by providing assistance 24 hours a day in units of the hospital environment. Therefore, it is necessary that the nursing team obtain technical and scientific skills, as well as in-service updates and training, as they are usually the first to detect CPA in the inpatient sectors. Faced with this scenario, the nurse must develop agility, speed of reasoning and emotional control so that CPR can be performed successfully[2].

Several studies in the literature address the daily challenges faced by the nursing staff during CPA care. The lack of harmony among nursing professionals, lack of material and equipment failure, and lack of adaptation to the CPA cart were highlighted as factors that compromise the quality of CPR[2]. In addition to these, the deficit in knowledge regarding the maneuvers in force in the CPR protocol is a factor that remains present in the reality of the nursing team in hospital care[8].

Negative results have been observed regarding the lack of resources, knowledge and practical skills of nurses and nursing technicians during CPA. In the intra-hospital environment, it is possible to identify the lack of in-service assessments and training, as well as the lack of training of health professionals[3,8,9].

As a result of this precariousness of scientific knowledge among nursing teams, the care of victims of CPA is often harmful or ineffective during its reversal. Therefore, investments in permanent education programs are necessary to fill the lack of training of health professionals, and thus, reduce the deficit in theoretical-practical knowledge of these professionals to raise the standard of care provided to the patient[9].

The professional training process can be carried out by different types of methods present today, and among them there is the Objective Structured Clinical Examination (OSCE) which over the last few years has been highlighted in different educational institutions. The OSCE is a tool to assess mastery of clinical skills, knowledge gaps, communication skills, professionalism, time management, critical thinking and interpersonal relationships that was developed in 1975, by Ronald Harden, in the United Kingdom[10,11]. In addition to evaluating failures, and thereby helping to determine the points of greatest need for intervention in terms of theoretical-practical content, and thus provide a better targeting of training teams in continuing education, capturing and solving the deficiencies of all professionals directly involved in the hospital care[10-14].

In Brazil, this teaching-learning method is being used in higher education courses in health areas, but data in the literature on the use of the OSCE with professionals active in the hospital network are incipient[12,13]. The present study aimed to evaluate the technical-scientific skills and competences of the nursing staff during a cardiopulmonary arrest using the OSCE.

Methodology

This is a descriptive study with a quantitative approach. The study was carried out at a large Municipal Hospital located in the city of Rio de Janeiro, a reference for 24-hour emergency care.

Study participants were nurses and nursing technicians from the Internal Medicine and Cardiology

wards. In these sectors, nursing professionals are distributed into three day and night shifts, each with 12 hours of work.

The inclusion criteria for the participants were employees who had worked in the sectors for at least six months, agreed to participate in the research and signed the Informed Consent Term (FICF) and teams belonging to the day shift, since data collection was performed during the period of in-service training of the researchers. The exclusion criteria were nursing professionals who were on night shift and/or on leave, vacation or relocated.

Data collection began with a pre-test with closed questions, applied to each participant (step 1). Subsequently, step 2 was carried out with the application of a checklist guided by the OSCE. This method is a simulation referring to a clinical reality where the participant must perform a task according to the situation presented by an external examiner. The participant's performance evaluation was carried out through a checklist, where the examiner assigns points to each action expected to be performed properly. After the assessment, the participant received feedback on their mistakes and successes, so that the method not only provided an effective assessment environment, but also promoted a theoretical-practical training scenario[10,11,14].

A simulated scenario was created to represent a PCR. A static mannequin was used to represent the patient and volunteers played the role of other team members. It was expected that the participant would provide care to the patient in CPA in accordance with the legal competences of their profession. They were instructed on the simulation and were evaluated separately. When signing the consent form, each participant was asked not to transfer the information experienced to other colleagues. An examiner was responsible for evaluating the performance of each participant for ten minutes. The researchers played the role of examiner and performed the assessment according to the checklist previously elaborated.

The pre-test had 18 questions, which were assigned ratings to assess the skills and competences of the participating professionals, according to the number of correct answers. The participant evaluation process was carried out during the OSCE (simulation), by two evaluators. While one of the evaluators controlled the time of 10 minutes for each, the other observed and scored the correct answers. So that there was no bias in the survey results, the participants had no communication with those who underwent the assessment. They were asked to leave their cell phones in their bags, stored in their lockers and at the end of the evaluation, each participant was directed to a different room from the other participants who had not yet been evaluated.

During the period of data collection, none of the researchers was working in the sectors where the research was carried out, as they passed their first year of residency. The simulation was carried out in a room of the cardiology ward, between the months of July and September 2020. The shift varied between morning and afternoon, according to the availability of room reservation and release of the department heads.

To apply the pre-test, a validated instrument was used to assess training in cardiopulmonary resuscitation[15] and the checklist used to apply the OSCE was prepared in accordance with the 2015 AHA guidelines[7]. The database was organized and tabulated in Microsoft Excel® software 2021 version 1.0.1 and later, imported into the Statistic R version 4.0.2 software to perform data processing and analysis.

A univariate analysis was performed in order to describe the profile of the health professionals who participated in the study. Then, a bivariate analysis of non-parametric statistical methods for paired samples was used. Thus, the choice for the Wilcoxon[16] test proved to be relevant since the scales were applied in the same study population, respecting the order of execution that started with the pre-test and, subsequently, the same health professionals were forwarded, individually, to be submitted to the OSCE.

Through the Wilcoxon test, it was possible to verify significant differences in the scores of nursing professionals when comparing equivalent competences in the theoretical and practical way, assuming a significance level of 0.05 for p-value. The maximum score attributed to the instruments called pre-test and OSCE was 10.0 points for each. In addition, the instruments were divided by competences called organization, ventilation, compressions, reassessment, medication and defibrillation that determined the variables compared in this study. However, among the competences mentioned above, only organization, ventilation and compressions obtained satisfactory values to be submitted to the hypothesis test, others such as medication and defibrillation were addressed only in the form of a pre-test, with no possibility of comparison.

The project was submitted to the Ethics and Research Committees of the proposing and co-participating institution, being approved by both, with the respective opinion numbers No. 3.986.476 of the Federal University of the State of Rio de Janeiro and No. 4.076.820 of the Municipal Health Department of Rio de Janeiro.

Results

The population consisted of 20 professionals from the nursing team, with 11 (55.0%) being distributed in clinical medicine and 9 (45.0%) in cardiology. According to the professional category, among the 20 participants, 15 (75.0%) were nursing technicians and 5 (25.0%) were nurses, belonging to the three day shifts at the hospital. The average time of work in the field of nursing professionals was 15 years.

Most of the pretest and OSCE results were below the average of 5 points since the pre-established value for each instrument totaled 10 points. When comparing the values of the grades by professional category (Table 1), it was found that the differences between nursing technicians and nurses were minimal.

Table 1. Pre-test scores and general OSCE and by competences of Nursing Technicians (n=15) and Nurses (n=5). Rio de Janeiro, RJ, Brazil, 2020

Category	Variables	Main (SD[1])	Min – Max	p-value[2]
Nursing technician	Pre-test grade OSCE Grade	4,7 (1,57) 5,6 (1,57)	2,2 - 6,7 2,5 - 7,5	0,107
	OSCE time (sec.)	110,1 (52,6)	38 - 241	-
	Pre-test organization OSCE Organization	6,5 (1,84) 6,4 (2,17)	2,5 - 10,0 1,7 - 8,3	0,905
	Pre-test ventilation OSCE ventilation	4,7 (2,10) 2,7 (4,57)	0 - 6,7 0 - 10,0	-
	Pre-test compressions OSCE compressions	5,3 (2,47) 5,8 (1,55)	2,5 - 10,0 2,5 - 8,8	0,503
	Pre-test reassessment OSCE reassessment	2,0 (4,14) 2,7 (4,57)	0 - 10,0 0 - 10,0	-
	Pre-test medication OSCE medication	1,7 (2,44) 4,0 (2,82)	0 - 5,0 0 - 8,0	-
Nurse	Pre-test grade OSCE Grade	5,2 (1,083) 6,2 (1,82)	3,9 - 6,7 3,8 - 8,1	0,312
	OSCE time (sec.)	144,4 (38,7)	102 - 202	-
	Pre-test organization OSCE Organization	6,5 (2,23) 5,7 (3,24)	5 - 10,0 0 - 8,3	0,812
	Pre-test ventilation OSCE ventilation	4,7 (1,82) 4,0 (5,47)	3,3- 6,7 0 - 10,0	-
	Pre-test compressions OSCE compressions	4,5 (2,09) 6,8 (1,11)	2,5 - 7,5 5,0 - 7,5	0,089*
	Pre-test reassessment OSCE reassessment	4,0 (5,47) 8,0 (4,47)	0 - 10,0 0 - 10,0	-
	Pre-test medication	4,0 (2,23)	0 - 5,0	-
	Pre-test defibrillation	5,6 (2,60)	4,0 - 10,0	-

Note: SD[1]: Standard Deviation; [2]Wilcoxon Test; *Significant at the level of 10%.

The "organization" competency showed better results in both groups. When evaluating the practical skills represented by the OSCE, for the nursing technicians, the organization remained in the spotlight, while for the nurses, it was identified that the compressions and the re-evaluation were the points with the best performance. Furthermore, we obtained a p-value of 0.089 in the competence of compressions, with significance at a 10% level. It was also found that nurses had a longer OSCE execution time (144 seconds) compared to nursing technicians (110 seconds).

Then, the nursing professionals were grouped by sectors to analyze the scores by competences of the pre-test and OSCE (Table 2). The values found showed better means in the scores in the general OSCE assessment (6.1) and in the organization, ventilation, and medication skills for both assessments, by professionals from the medical clinic. Regarding the average OSCE execution time, cardiology nursing professionals were shorter, taking just over 111 seconds.

Table 2. Pre-test scores and general OSCE and by competences of clinical medicine (n=11) and cardiology (n=9). Rio de Janeiro, RJ, Brazil, 2020

Sectors	Variables	Main (SD[1])	Min – Max	p-value[2]
MC	Pre-test grade	4,7 (1,59)	2,2 - 6,7	0,101
	OSCE Grade	6,1 (1,58)	2,5 - 7,5	
	OSCE time (sec)	124,6 (52,401)	38,0 - 241,0	-
	Pre-test organization	6,8 (1,61)	5,0 - 10,0	1,000
	OSCE organization	6,5 (2,16)	1,7 - 8,3	
	Pre-test ventilation	4,8 (2,29)	0,0 - 6,7	-
	OSCE ventilation	4,5 (5,22)	0,0 - 10,0	
	Pre-test compressions	5,2 (2,84)	2,5 - 10,0	0,329
	OSCE compressions	6,0 (1,34)	3,8 - 7,5	
	Pre-test reassessment	2,7 (4,67)	0,0 - 10,0	-
	OSCE reassessment	5,5 (5,22)	0,0 - 10,0	
	Pre-test medication	1,8 (2,52)	0,0 - 5,0	-
	Pre-test defibrillation	3,8 (2,27)	0,0 - 8,0	-
Cardio	Pre-test grade	4,9 (1,34)	3,3 - 6,7	0,570
	OSCE Grade	5,4 (1,65)	2,5 - 8,1	
	OSCE time (sec)	111,4 (51,05)	47,0 - 202,0	-
	Pre-test organization	6,1 (2,20)	2,5 - 10,0	1,000
	OSCE organization	5,9 (2,77)	0,0 - 8,3	
	Pre-test ventilation	4,4 (1,66)	3,3 - 6,7	-
	OSCE ventilation	1,1 (3,33)	0,0 - 10,0	
	Pre-test compressions	5,0 (1,76)	2,5 - 7,5	0,228
	OSCE compressions	6,0 (1,74)	2,5 - 8,8	
	Pre-test reassessment	2,2 (4,41)	0,0 - 10,0	-
	OSCE reassessment	2,2 (4,41)	0,0 - 10,0	
	Pre-test medication	2,8 (2,63)	0,0 - 5,0	-
	Pre-test defibrillation	5,1 (3,33)	0,0 - 10,0	-

Note: SD[1]: Standard Deviation; [2]Wilcoxon Test.

Regarding the pre-test and OSCE scores by nursing professionals, this evidence was significantly different (p-value = 0.049), as well as for ventilation competence (p-value = 0.008) (Table 3).

Table 3. Pre-test scores and overall OSCE and by skills of nursing professionals (n=20). Rio de Janeiro, RJ, Brazil, 2020

Variables	Main (SD[1])	Min - Max	p-value[2]
Pre-test grade	4,8 (1,45)	2,2 - 6,7	0,049
OSCE Grade	5,8 (1,60)	2,5 - 8,1	
OSCE time (sec)	118,7 (50,8)	38,0 - 241,0	-
Pre-test organization	6,5 (1,88)	2,5 - 10,0	1,000
OSCE Organization	6,2 (2,41)	0,0 - 8,3	
Pre-test ventilation	4,7 (1,99)	0,0 - 6,7	0,008
OSCE ventilation	3,0 (4,70)	0,0 - 10,0	
Pre-test compressions	5,1 (2,36)	2,5 - 10,0	0,129
OSCE compressions	6,0 (1,49)	2,5 - 8,8	
Pre-test reassessment	2,5 (4,44)	0,0 - 10,0	-
OSCE Revaluation	4,0 (5,02)	0,0 - 10,0	
Pre-test medication	2,2 (2,55)	0,0 - 5,0	-
Pre-test defibrillation	4,4 (2,79)	0.0 - 10,0	-

Note: SD[1]: Standard Deviation; [2]Wilcoxon Test.

Discussion

The results of this research demonstrate the precariousness of knowledge and skills of nursing professionals facing a cardiorespiratory arrest, as pointed out in the health literature for decades and more frequently since the implementation of the new AHA-2015 guidelines, a theme mentioned by other authors who observed similar data in their analysis[17-19].

In this study, the knowledge about CPA of nursing professionals in the medical clinic sectors was superior to the knowledge of nursing professionals in the field of cardiology. This is a surprising occurrence, since in the cardiology sector, the fundamental concepts of care are focused on cardiovascular care and possible complications that comprise a CPA situation, which can be explained by the fact that all CPR protocols are recommended by the AHA.

In this research, the working conditions, training, and experience of these professionals were not deepened. However, studies carried out with nursing professionals demonstrate that there is a deficiency in this area of knowledge, as problems that encompass both the teaching-learning process and working conditions[17, 20-22].

By isolating the theoretical-practical tools, the professionals had better scores, even if still low, in the field of "OSCE" simulation against a PCR. The results may suggest a learning experience acquired through the experience and work routine in the hospital environment, as well as corroborating other findings in the literature[23]. Routine can help in apprehending learning, as the repetition of in situ simulations can favor the development of competence in this area of knowledge, so there is nothing better than a routine for apprehending practical knowledge[24].

Furthermore, theory and practice are often made up of distinct knowledge. The knowledge acquired in the academy may be far from what is done in daily life, that is, in the world of work, which is directly related to training problems that fragment knowledge in a reductionist way, based on positivism[25].

The results revealed that those with the best averages are the ones who need more time to complete their simulation, as observed in clinical medicine. However, time is paramount in this type of care, as studies show that survival is reduced by 10% for every minute lost in which the patient remains in the condition of a CPA[26]. Effectiveness in caring for victims of CPA depends on early recognition of the situation and prompt maneuvers by a competent multidisciplinary team. On the other hand, the delay in carrying out these maneuvers can lead to irreversible injuries and lead to the individual's death[3,27,28].

The data intensify the lack of knowledge and skill centered on CPR, with averages that highlight the need for training and investment in professionals representing the public health service in the city of Rio de Janeiro. Similar results were found in different studies on CPA, in different hospital sectors, including mobile pre-hospital services, in different locations in Brazil. Therefore, there is a need to rethink the pedagogical practices aimed at the teaching-learning process in nursing courses. As well as developing more continuing education courses in service on this topic[12,22,29-31].

However, when discriminating the ventilation competence (Table 3), despite its values still being much lower than the standard mean, it became possible to infer that the theoretical concept was superimposed on technical skills, with a more expressive difference (p-value = 0.008). In this case, theory prevailed at the expense of technical skill, perhaps because the participants in this study may still be guided by more obsolete references, since the time of experience in the field of nursing had an average of 15 years. Some individuals still currently believe that ventilation is the only form of conduct in Basic Life Support (BLS)[22].

The competency called organization prevailed as the competency with the greatest affinity in this study. It is

believed that nursing, as it is mainly a managerial profession, heads of sectors and teams, obtain managerial skills from a nurse since their initial training process[32]. In addition, it was noted that the use of the checklist proved to be useful not only to assess nurses and nursing technicians, but also helped to analyze knowledge that can provide safety and quality in patient care, as well as others. studies demonstrate the effectiveness of this instrument in the application of the health field, aimed at knowledge of nursing care[33].

Conclusion

Nursing professionals are essential in assisting patients with CPA, in urgent and emergency care, being responsible for early identification of signs, as well as in the process of resuscitation of patients. Through the analysis of the results obtained in the research, there is a lack of knowledge in relation to the theoretical-practical management of a CPR.

Thus, it is important that there is solid training in this area, with an emphasis on the action of continuing and permanent education to provide a quality service, with active methodologies that encourage its protagonism. In addition, the team's interest in taking responsibility and constantly being updated in the health area should be encouraged, as well as investment in training courses and professional updating. These measures can be relevant strategies to encourage and achieve prepared, organized and quality customer care with the improvement of technical-scientific knowledge.

Therefore, it is believed that, based on the results found, this study can be considered significant to aggregate and guide future research in the search for strategies that help and encourage the improvement of critical thinking and skills assimilated to nursing professionals for patient care in PCR.

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