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Effectiveness of cardiopulmonary resuscitation training in the teaching of family members of cardiac patients*

Efetividade de treinamento sobre ressuscitação cardiopulmonar na aprendizagem de familiares de pacientes cardiopatas

Efectividad del entrenamiento sobre resucitación cardiopulmonar en el aprendizaje de familiares de pacientes cardíacos

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ABSTRACT

Objective: To evaluate the effectiveness of a cardiopulmonary resuscitation training in the skill acquisition of family members of heart disease patients. **Method:** A quasi-experimental study, conducted in a hospital in São Paulo, Brazil. The study participants were one or more relatives of patients with heart disease that were hospitalized at the institution. In the first phase, the participant's skills and theoretical knowledge on cardiopulmonary resuscitation were evaluated before and immediately after the training. The second phase took place one month after the training, in which the same evaluations were applied. The McNemar's and Stuart-Maxwell tests were adopted (5% significance level). **Results:** The theoretical knowledge of family members before and after training increased and a great retention of this knowledge after 30 days of training was observed. Immediately after training, the family members showed significant improvement of skills in the 15 analyzed actions and, after one month of training, they maintained most of the acquired practices on cardiopulmonary resuscitation, except for chest compressions frequency and the time between turning on the defibrillator and delivering the shock. **Conclusion:** Cardiopulmonary resuscitation training was effective in the acquisition of theoretical and practical knowledge of the family members.

DESCRIPTORS

Family; Out-of-Hospital Cardiac Arrest; Cardiopulmonary Resuscitation; Nurses; Simulation Training; Effectiveness.

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INTRODUCTION

One of the main causes of death in cardiac patients is cardiac arrest (CA), a condition in which, due to the cessation of cardiac and respiratory functions, body cells and tissues no longer receive oxygen and nutrients necessary to maintain life[1]. Yearly, out-of-hospital CA affects approximately 76.5 people per 100,000 inhabitants in the United States[2] and, in Brazil, the disparities between care training and records of this sudden event are significant and often conflicting[3].

Out-of-hospital CA is an emergency that requires immediate recognition and care with early onset of cardiopulmonary resuscitation (CPR), enabling a greater chance of survival and the reduction of sequelae in victims[3,4]. Despite out-of-hospital cardiac arrest occurring mostly at home and in the presence of a family member, studies show that many victims do not receive the immediate initial care that could be performed by a layperson[2,4,5].

Interviews with laypeople showed that the main reasons for not performing CPR when witnessing cardiorespiratory arrest is due to lack of knowledge on how to recognize a person in CA, lack of ability to perform resuscitation maneuvers, as well as fear of harming the victim[6]. A Brazilian study that evaluated the theoretical knowledge of laypeople on assisting a person in CA found that approximately 61% of the participants did not feel prepared to perform cardiopulmonary resuscitation[7].

It is known that sudden cardiac death is more frequent in people with some type of heart disease, especially the ischemic diseases[1]. This evidence, associated with the unpreparedness of laypeople to perform CPR[6,7], reinforces the importance of training this population, including relatives of cardiac patients, to act early when witnessing a CA.

Considering that little is known in the literature about the ability of family members of cardiac patients to act in the face of CA in an out-of-hospital environment and the impact of CPR training on theoretical-practical learning, it is important to carry out this research, aiming to evaluate the effectiveness of CPR training in the acquisition of knowledge of relatives of cardiac patients.

METHOD

Design of Study

A quasi-experimental study, with quantitative approach.

Local

The study was conducted in the medical clinic unit of a university hospital in São Paulo, Brazil.

Selection Criteria

Family members of cardiac patients who met the following inclusion criteria participated in the study: individuals aged 18 years or older; that have at least one member of the family diagnosed with cardiopathy that were hospitalized in the institution medical clinic, with a scheduled hospital discharge during the period of data collection; reside with the patient; and have physical conditions to perform practical CPR training. Relatives who were illiterate or who had previously taken a course on the subject were excluded from the study. The selection of participants was made through the analysis of the daily census of patients hospitalized in the unit, those with some type of cardiopathy were identified and an invitation was made to at least one family member of each cardiopathic patient.

Sample Definition

For the sample calculation, it was assumed that the minimum detectable effect size would be $d = 0.5$ (with a one-point difference and two-point standard deviation), requiring a sample of 50 participants for the study. Accounting for the loss of approximately 10% of the participants during the study follow-up, the final sample of 60 relatives of patients with heart disease was considered for the study.

Data Collection

Three instruments were used to collect data for the study, which occurred from March to August 2018, in two phases. In the first phase, information regarding the participants' characteristics was collected, such as gender, age, and degree of kinship (Instrument 1); the theoretical knowledge and skills of family members regarding CPR were evaluated before and immediately after a theoretical-practical training offered by nurses.

The instrument for evaluating the theoretical knowledge of family members (Instrument 2) was elaborated by the researchers based on the CPR guidelines of the American Heart Association (AHA)[1] and it addressed aspects of CA identification, quality of chest compressions, and use of the automatic external defibrillator (AED). In this instrument, composed of 10 multiple choice questions with four alternatives each, popularly known terms (e.g., cardiac massage instead of chest compression) were used to facilitate the interpretation by the participants. For each question, the alternative "I don't know" was inserted to prevent the examinees from randomly choosing a correct answer, thus misrepresenting they real knowledge about the question.

To assess the skills of family members on attending to a person in CA, a simulation was applied before and after training. In this simulated activity, the family member would read a clinical situation ("you are walking in the park and find a person lying on the ground") and follow the orientation ("you must assist this person"). The nurse, one of the researchers of the study, observed the treatment performed by the family member and, based on an instrument with 15 items (Instrument 3), elaborated based on the recommendations of the AHA[1], identified whether the following actions were performed: assessment of the scene for safety, recognition of the victim's unconsciousness, request for help, verification of the victim's breathing, correct execution of chest compressions, and use of the AED. At each stage, the participants' actions were classified as correct, wrong, or remediated (if they performed the required action but in the incorrect sequence). For this simulated activity, participants were offered a medium fidelity CPR simulator (Little Anne® Laerdal brand) and an automatic external defibrillator (Laerdal AED Trainer 2®).

The intervention of the study was the theoretical-practical training offered by a nurse, in a session of approximately 30

minutes, which aimed at training the family members on the approach of the aforementioned stages. The theoretical explanation about CPR was made with the help of a flyer created by the researchers that contained the steps for CA care based on the AHA guidelines[1]. Subsequently, the family members participated in the practical training of skills in attending to a person in CA, using the aforementioned equipment.

The second phase of the study took place one month after training, the same evaluations were applied to assess the retainment and assimilation of the participants' acquired CPR skills and theoretical knowledge. At the end of phases 1 and 2, the nurse performed a summary of the activities developed with the family members, clarified any doubts, and corrected the mistakes observed during the practical evaluation with new training of skills whenever necessary. All training and meetings were held individually in the medical clinic unit of the institution, in a room set up exclusively for research, ensuring the comfort and privacy of the participants.

Data Analysis and Treatment

The collected data were stored in a Microsoft Excel 2017 spreadsheet and data analysis was performed using the statistical package R version 3.5.3. The McNemar's test with Holm correction was used to evaluate the theoretical knowledge of the family members before, immediately after, and 30 days after the training. The Stuart-Maxwell test with Holm correction was applied to evaluate the practical skills assimilated by the participants (before, immediately after, and one month after training). All the analyses had a 5% significance level.

Ethical Aspects

The research was approved by the Research Ethics Committee of the institution (CAAE no. 79424117.9.0000.5392) and all participants signed an informed consent form.

RESULTS

The first phase of the study consisted of 60 relatives of cardiac patients. Due to the loss of 10 members during the follow-up, the second phase had a total of 50 participants. Table 1 shows the participants' demographic characteristics. Regarding the degree of kinship, there was a prevalence of offspring, 41.67%, and grandchildren, 21.67%.

Regarding the results of the first phase of the research, Table 2 shows that, out of the 10 theoretical questions evaluated pre-training, there was no 100% hit in any of them. After training, there was an increase in the percentage of correct answers in all theoretical questions evaluated and 100% of the participants correctly answered the way of identifying the victim's breathing (Question 3), the site of chest compressions (Question 5), and the use of the AED (Question 10). Table 2 also shows that there was a statistically significant difference ($p < 0.050$) between the number of correct answers before and immediately after training in relation to the 10 theoretical questions answered by the participants.

Table 3 shows that, during the first phase, the percentage of correct answers by the participants, before the training, in the simulation was low (less than 30.0%) for most of the 15 practical actions evaluated. Regarding the use of the AED (Actions 10 to 15), no relatives knew how to manipulate the

Table 1 – Demographic characteristics of study participants (n = 60) – São Paulo, SP, Brazil, 2018.

Demographic characteristic	n (%)	Mean (SD)
Male	17 (28.33)	
Female	43 (71.67)	
Age		36.22 (11.49)

SD: standard deviation.

Table 2 – Comparison of participants' (n = 60) performance during the theoretical evaluation on cardiopulmonary resuscitation before and after training – São Paulo, SP, Brazil, 2018.

Questions – theoretical evaluation	Pre-training		Post-training		p*
	Right answers		Right answers		
	n	%	n	%	
1. What do you do to make sure a person is unconscious?	38	63.30	57	95.00	<0.001
2. After verifying that the person is not responding, what do you do?	50	83.30	59	98.30	0.032
3. How do you identify if the person is breathing?	51	85.00	60	100.00	0.008
4. To perform chest compressions (cardiac massage), in what position should the person in cardiac arrest be?	48	80.00	59	98.30	0.005
5. In the case of a person in cardiac arrest, in which place would you do chest compressions (cardiac massage)?	49	81.70	60	100.00	0.005
6. How often would you do chest compressions (cardiac massage) in the person in cardiac arrest?	5	8.33	59	98.30	<0.001
7. What minimum depth would you perform chest compressions (cardiac massage) on the person in cardiac arrest?	4	6.67	53	88.30	<0.001
8. To ensure high quality care for a person in cardiac arrest, I must…	11	18.30	44	73.30	<0.001
9. What number would you call for help?	44	73.30	59	98.30	0.001
10. If an automatic external defibrillator (AED) is available, what would you do?	15	25.00	60	100.00	<0.001

*McNemar's test with Holm correction.

Table 3 – Comparison of participants' (n = 60) performance in the simulated practical evaluation of cardiopulmonary resuscitation before and after training – São Paulo, SP, Brazil, 2018.

Actions – practical evaluation	Right		Remedied		Wrong		p*
	Pre	Post	Pre	Post	Pre	Post	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
1. Assessed scene safety	2 (3.33)	55 (91.70)	–	–	58 (96.67)	5 (8.30)	<0.001
2. Assessed responsiveness (by tapping and calling the victim aloud)	17 (28.33)	56 (93.30)	2 (3.33)	2 (3.33)	41 (68.34)	2 (3.37)	<0.001
3. Called for help (192)	19 (31.66)	17 (28.30)	1 (1.67)	20 (33.30)	40 (66.67)	23 (38.40)	<0.001
4. Checked breathing (chest or abdomen movement) – 5 to 10 seconds	10 (16.67)	45 (75.00)	–	3 (5.00)	50 (83.33)	12 (20.00)	<0.001
5. Correctly positioned hands during chest compressions	18 (30.00)	60 (100.00)	–	–	42 (70,00)	–	<0.001
6. Performed a minimum amount of 100 and a maximum of 120 chest compressions per minute	4 (6.67)	58 (96.70)	–	–	56 (93.33)	2 (3.30)	<0.001
7. Maintained minimum depth of 5 cm and maximum of 6 cm at each chest compression	5 (8.33)	55 (91.70)	–	–	55 (91.67)	5 (8.30)	<0.001
8. Allowed chest to return to its original position at each chest compression	6 (10.00)	60 (100.00)	–	–	54 (90.00)	–	<0.001
9. Did not interrupt chest compressions	2 (3.33)	60 (100.00)	–	–	58 (96.67)	–	<0.001
10. Turned on the AED	–	53 (88.30)	–	7 (11.70)	60 (100.00)	–	<0.001
11. Connected the electrodes in the correct position	–	59 (98.30)	–	–	60 (100.00)	1 (1.70)	<0.001
12. He followed instructions from the AED and asked aloud for everyone to clear away during the analysis and shock	–	60 (100.00)	–	–	60 (100.00)	–	<0.001
13. Delivered the shock to the victim	–	60 (100.00)	–	–	60 (100.00)	–	<0.001
14. Started CPR immediately after the shock	–	60 (100.00)	–	–	60 (100.00)	–	<0.001
15. Time between turning on the AED and delivering the shock – up to 45 seconds	–	53 (88.30)	–	–	60 (100.00)	7 (11.70)	<0.001

*Stuart-Maxwell test with Holm correction.

device. After training, the improvement of the participants' ability occurred in 14 of the 15 actions evaluated, with emphasis (above 85% of correctness) to the assessment of scene safety (Action 1) and responsiveness of the victim (Action 2), chest compressions (Actions 5 to 9), and use of AED (Actions 10 to 15). Regarding the request for help, there was a drop in the percentage of correct answers in the after-training stage (from 31.66% to 28.30%). However, 20 relatives (33.30%) performed this task in the incorrect sequence (remediated action) at this stage. Table 3 also shows that there was a significant difference ($p < 0.001$) between the before and after training in the practical performance of the participants in relation to the practical actions evaluated during the simulation.

In the second phase of the study, that is, considering the post-training periods and 30 days after training, a reduction in the percentage of correct answers of the participants was identified in seven out of the 10 theoretical questions evaluated. However, in the comparative analysis, this reduction was statistically significant ($p = 0.003$) only for Question 6, which addressed the frequency of chest compressions. As for the others, the participants' performance was similar in both evaluated periods, showing that the theoretical knowledge, after 30 days of training, was retained by family members (Table 4).

30 days after training, the participants increased the frequencies of correct answers, during the simulated practical activity, in tasks related to scene safety (Action 1), request for help (Action 3), and breathing check (Action 4). The absence of interruption of chest compressions (Action 9) continued to be performed by the entire sample (Table 5).

In relation to the other tasks evaluated, there was a reduction of 2% to 22% in the number of correct answers of the participants, with emphasis on greater decreases in those related to the frequency of chest compressions (Action 6), time of turning on the AED (Action 10), correct installation of the electrodes (Action 11), and time of up to 45 seconds between turning on the AED and administering the shock (action 15) (Table 5). Table 5 shows that there was a significant difference, according to the comparative analysis, of the participants' practical performance between the periods post-training and 30 days after training, with an increase in wright answers regarding the action of requesting help ($p = 0.008$) and a decrease for the activities regarding the frequency of chest compression ($p = 0.002$) and the time to turn on the AED and deliver the shock ($p = 0.039$). In most of the evaluated actions, however, there was no loss of practical knowledge, evidencing that the training provided the assimilation of skills on the stages of CPR after 30 days of the offered training.

DISCUSSION

For this study, CPR training was offered to family members of cardiac patients, most of them were female, offspring or grandchild, and with a mean age of approximately 36 years, these characteristics corroborate investigations that trained family members of patients with heart problems on attending to a CA victim[8,9].

Table 4 – Comparison of participants' (n=50) in the theoretical post-assessment on cardiopulmonary resuscitation and assessment 30 days after training – São Paulo, SP, Brazil, 2018.

Questions – theoretical evaluation	Post-training Right answers		After 30 days of training Right answers		p*
	n	%	n	%	
1. What do you do to make sure a person is unconscious?	49	98.00	47	94.00	0.617
2. After verifying that the person is not responding, what do you do?	49	98.00	47	94.00	0.617
3. How do you identify if the person is breathing?	50	100.00	50	100.00	1.000
4. To perform chest compressions (cardiac massage), in what position should the person in cardiac arrest be?	49	98.00	46	92.00	0.248
5. In the case of a person on cardiac arrest, in which place would you do chest compressions (cardiac massage)?	50	100.00	45	90.00	0.074
6. How often would you do the cardiac massage in the person in cardiac arrest?	49	98.00	38	76.00	0.003
7. What minimum depth would you perform chest compressions (cardiac massage) on the person with cardiac arrest?	44	88.00	44	88.00	1.000
8. Allowed chest to return to its original position at each chest compression	36	72.00	31	62.00	0.332
9. What number would you call for help?	50	100.00	45	90.00	0.074
10. If an automatic external defibrillator (AED) is available, what would you do?	50	100.00	50	100.00	1.000

*McNemar's test with Holm correction.

Table 5 – Comparison of participants' performance (n=50) in the simulated practical assessment of cardiopulmonary resuscitation post-training and 30 days after training – São Paulo, SP, Brazil, 2018.

Actions – practical evaluation	Right		Remedied		Wrong		p*
	Post	30 days after	Post	30 days after	Post	30 days after	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
1. Evaluated site security	47 (94.00)	50 (100.00)	–	–	3 (6.00)	–	0.083
2. Evaluated responsiveness (by tapping and calling the victim aloud)	47 (94.00)	46 (92.00)	1 (2.00)	2 (4.00)	2 (4.00)	2 (4.00)	0.564
3. Called for help (192)	13 (26.00)	24 (48.00)	18 (36.00)	16 (32.00)	19 (38.00)	10 (20.00)	0.008
4. Checked breathing (chest or abdomen movement) – 5 to 10 seconds	38 (76.00)	39 (78.00)	2 (4.00)	1 (2.00)	10 (20.00)	10 (20.00)	0.317
5. Correctly positioned hands during chest compressions	50 (100.00)	47 (94.00)	–	–	–	3 (6.00)	0.083
6. Performed a minimum amount of 100 and a maximum of 120 chest compressions per minute	48 (96.00)	37 (74.00)	–	–	2 (4.00)	13 (26.00)	0.002
7. Maintained minimum depth of 5 cm and maximum of 6 cm at each chest compression	45 (90.00)	42 (84.00)	–	–	5 (10.00)	8 (16.00)	0.257
8. Allowed chest to return to its original position at each chest compression	50 (100.00)	48 (96.00)	–	–	–	2 (4.00)	0.157
9. Did not interrupt chest compressions	50 (100.00)	50 (100.00)	–	–	–	–	1.000
10. Turned on the AED	44 (88.00)	37 (74.00)	6 (12.00)	13 (26.00)	–	–	0.108
11. Connected the electrodes in the correct position	49 (98.00)	44 (88.00)	–	1 (2.00)	1 (2.00)	5 (10.00)	0.082
12. He followed instructions from the AED and asked aloud for everyone to clear away during the analysis and shock	50 (100.00)	49 (98.00)	–	1 (2.00)	–	–	0.317
13. Delivered the shock to the victim	50 (100.00)	49 (98.00)	–	1 (2.00)	–	–	0.317
14. Started CPR immediately after the shock	50 (100.00)	49 (98.00)	–	1 (2.00)	–	–	0.317
15. Time between turning on the AED and delivering the shock – up to 45 seconds	44 (88.00)	35 (70.00)	–	–	6.0 (12.00)	15 (30.00)	0.039

*Stuart-Maxwell test with Holm correction.

The results of the theoretical evaluation applied before the training showed that the participants of the study knew little about the steps of cardiopulmonary resuscitation or how to act if they found a person in CA. These findings were also identified in other investigations, in which the participants had deficient theoretical knowledge about the steps of CPR[10] and, sometimes, even incorrect knowledge[11]. These data are worrisome considering the possibility of these family members witnessing cardiac arrest, since heart diseases continue to be the main cause of this serious event[12].

Some factors, such as emotional stress, concerns with legal repercussions, risk of infectious transmission, and especially

the lack of skill and knowledge contribute negatively to the layperson attending to a victim in CA[9,13]. A Korean study showed that only 40% of the interviewees would try, without prior knowledge, to perform CPR on a family member[9]. Undeniably, training on cardiopulmonary resuscitation is important, since it enables laypeople to provide adequate initial care when they witness the cardiac arrest of a family member or stranger.

This study demonstrated that the proposed training was effective in acquiring and retaining the theoretical knowledge of the participants, according to the results found in the two evaluated moments: immediately after training and one month after training. The impact of training on the acquisition of theoretical knowledge of CPR was also evidenced in a study that interviewed 300 subjects in public spaces, in Jordan. The researchers identified that people who had received CPR training had greater knowledge about the signs of CA and the actions to be taken than those who had never had contact with the theme[14]. Therefore, the results of the theoretical evaluation of our investigation showed that the relatives of heart disease patients were able to obtain—in a short course (about 30 minutes)— the knowledge and assimilation necessary to recognize and to assist a person in CA.

When the participants had to simulate attending to a victim in CA, the percentage of correct answers of the actions performed was low; and regarding the handling of AED, no participant knew how to manipulate the device. The family members, despite having some previous theoretical knowledge about the stages and actions of care, did not know how to apply them. Notably, early defibrillation performed by a trained layperson has provided an increase in the survival of hundreds of CA victims outside the hospital environment[3]; however, the percentage of cardiac arrest victims who were defibrillated before the arrival of the pre-hospital team is still very low, less than 5%, since few people are aware of the closets location of AED or how to use the device[10,15]. These data are worrisome and were confirmed in this research: the participants did not even open the bag of the EAD, a self-explanatory device, when the researcher offered the device during the simulated activity performed before training.

Other studies suggest that, despite living with a patient at high risk of CA, most family members do not know how to initiate resuscitation maneuvers, nor are they encouraged to perform this type of training. Additionally, these family members present inadequate physical conditioning to perform such practical training and they lack knowledge about existing training programs[8,16]. Thus, the importance of CPR training for lay people and the need for wide dissemination of training programs to this population are indisputable.

Our results also showed that the relatives of heart disease patients presented, immediately after training, significant improvement of practical skills in all actions analyzed during the simulation. Thus, 30 days after training, the participants were able to retain most of the steps of the acquired CPR skills—except for actions related to the frequency of chest compressions and the time between turning on the AED and delivering the shock. Similarly, university students also presented a decrease in performance related to the frequency of chest compressions over time[17]. As for taking longer than 45 seconds between turning on the ASD and delivering the shock in the evaluation 30 days after the training, we believe that this result is related to the lack of practical skill of the participants in the management of the device associated with the stressful moment. Despite the decrease in the quality of the participants' performance, the training can be considered effective—based on the previous knowledge of the family members—in the retention of theoretical knowledge and in the assimilation of the skills on CPR of the study participants.

Note that, the teaching strategy employed in the research—a theoretical explanation presented in a flyer, followed by simulated practical activity—may have positively influenced the results found. Studies show that a combined teaching strategy, such as video and practice, including rapid cycles of deliberate practice, favors performance, acquisition, and assimilation of an individuals' abilities in performing CPR[18,19]. Additionally, the performance of periodic, short-term training, with a small number of participants, is more effective than the punctual training of large groups (known as mass training) in the acquisition of knowledge on cardiopulmonary resuscitation for laypeople[19].

Finally, the training of relatives of cardiac patients performed by a nurse made it possible to understand that a layperson is able to retain theoretical and practical knowledge on CPR and how to act when finding a person in CA, ceasing to be mere bystanders and increasing the victims' chances of survival. Therefore, the results of this study highlight the importance of the nurses' actions in the training of these family members.

This study has some limitations. The follow-up time of the participants (30 days) to evaluate the acquired knowledge and skills about CPR was short. Considering that CA is not part of the daily life of laypeople, higher follow-up periods may identify the best time to reapply the course to maintain the theoretical and practical knowledge of family members. Moreover, the effect of training on the survival of people who underwent CA and were attended by trained family members was not evaluated. Despite these limitations, the outcomes serve as subsidies to guide nursing practice in the training of family members of cardiac patients at the time of hospital discharge orientation, for example, considering that this study proved that family members are interested and able to retain the skills taught on CPR.

CONCLUSION

The training on CPR, performed by nurses, was effective in acquiring and retaining theoretical knowledge and practical skills related to CA care by family members of cardiac patients. Therefore, laypeople trained by nurses can save the lives of those who have this type of cardiac collapse, underscoring the importance of nursing in this context.

RESUMO

Objetivo: Avaliar a efetividade de um treinamento sobre ressuscitação cardiopulmonar na aprendizagem de familiares de pacientes cardiopatas. **Método:** Estudo quase experimental, realizado em hospital de São Paulo, Brasil. Participaram da pesquisa um ou mais familiares de pacientes cardiopatas internados na instituição. Na primeira fase foram avaliados o conhecimento teórico e as habilidades dos participantes sobre a ressuscitação cardiopulmonar antes e imediatamente após o treinamento. A segunda fase aconteceu um mês após o treinamento, com a aplicação das mesmas avaliações. Os testes McNemar e Stuart-Maxwell foram adotados (nível de significância de 5%). **Resultados:** Houve aumento do conhecimento teórico dos familiares antes e após o treinamento e elevada retenção desse conhecimento após 30 dias da capacitação. Os familiares apresentaram, após o treinamento, melhora significativa das habilidades nas 15 ações analisadas e, após um mês da capacitação, mantiveram a maioria das práticas assimiladas sobre ressuscitação cardiopulmonar, com exceção da frequência das compressões torácicas e do tempo entre ligar o desfibrilador e aplicar o choque. **Conclusão:** O treinamento sobre ressuscitação cardiopulmonar foi efetivo na aprendizagem teórica e prática dos familiares.

DESCRITORES

Família; Parada Cardíaca Extra-Hospitalar; Reanimação Cardiopulmonar; Enfermeiras e Enfermeiros; Treinamento por Simulação; Efetividade.

RESUMEN

Objetivo: Evaluar la efectividad del entrenamiento sobre resucitación cardiopulmonar en el aprendizaje de familiares de pacientes cardíacos. **Método:** Estudio cuasiexperimental, realizado en un hospital de São Paulo, Brasil. Participaron de la investigación uno o más familiares de pacientes cardíacos, hospitalizados en la institución. La primera fase evaluó los conocimientos teóricos y habilidades de los participantes sobre resucitación cardiopulmonar antes e inmediatamente después del entrenamiento. La segunda fase se realizó un mes después del entrenamiento, con la aplicación de las mismas evaluaciones. Se adoptaron las pruebas de McNemar y Stuart-Maxwell (nivel de significación del 5%). **Resultados:** Los familiares incrementaron sus conocimientos teóricos antes y después del entrenamiento, los cuales persistieron después de 30 días de la capacitación. Después del entrenamiento, los familiares mejoraron significativamente las habilidades en las 15 acciones analizadas y, después de un mes de capacitación, mantuvieron la mayoría de las prácticas asimiladas sobre reanimación cardiopulmonar, excepto la frecuencia de las compresiones torácicas y el tiempo entre encender el desfibrilador y aplicar la descarga. **Conclusión:** El entrenamiento de resucitación cardiopulmonar fue efectivo en el aprendizaje teórico y práctico de los familiares.

DESCRIPTORES

Familia; Paro Cardíaco Extrahospitalario; Reanimación Cardiopulmonar; Enfermeras y Enfermeros; Entrenamiento Simulado; Efectividad.

REFERENCES

1. Merchant RM, Topjian AA, Panchal AR, Cheng A, Aziz K, Berg KM, et al. Part 1: executive summary: 2020 american heart association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation. 2020;142 Suppl 2:S337-57. DOI: http://dx.doi.org/10.1161/CIR.0000000000000918

2. Virani SS, Alonso S, Aparicio HJ, Benjamin EJ, Bittencourt MS, Callaway CW, et al. Heart disease and stroke statistics-2021 update: a report from the american heart association. Circulation. 2021;143(8):e254-e743. DOI: http://dx.doi.org/10.1161/CIR.0000000000000950

3. Bernoche C, Timerman S, Polastri TF, Giannetti NS, Siqueira AWS, Piscopo A, et al. Atualização da diretriz de ressuscitação cardiopulmonar e cuidados cardiovasculares de emergência da sociedade brasileira de cardiologia - 2019. Arq Bras Cardiol. 2019;113(3):449-663. DOI: https://doi.org/10.5935/abc.20190203

4. Viereck S, Moller TP, Ersboll AK, Baekgaard JS, Claesson A, Hollenberg J, et al. Recognising out-of-hospital cardiac arrest during emergency calls increases bystander cardiopulmonary resuscitation and survival. Resuscitation. 2017;115:141-7. DOI: http://dx.doi.org/10.1016/j.resuscitation.2017.04.006

5. Suematsu Y, Zhang B, Kuwano T, Sako H, Ogawa M, Yonemoto N, et al. Citizen bystander–patient relationship and 1-month outcomes after out-of-hospital cardiac arrest of cardiac origin from the All-Japan Utstein Registry: a prospective, nationwide, population-based, observational study. BMJ Open. 2019;9(7):e024715. DOI: http://dx.doi.org/10.1136/bmjopen-2018-024715

6. Vu DH, Hoang BH, Do NS, Do GP, Dao XD, Nguyen HH, et al. Why bystanders did not perform cardiopulmonary resuscitation on out-of-hospital cardiac arrest patients: a multi-center study in hanoi (Vietnam). Prehosp Disaster Med. 2022;37(1):101-5. DOI: http://dx.doi.org/10.1017/S1049023X21001369

7. Carvalho LR, Ferreira RBS, Rios MA, Fonseca EOS, Guimarães CF. Factors associated with lay people's knowledge about basic life support. Enfermería Actual en Costa Rica. 2020;(38):163-78. DOI: http://dx.doi.org/10.15517/revenf.v0i38.39087

8. Cariou G, Pelaccia T. Are they trained? Prevalence, motivations and barriers to CPR training among cohabitants of patients with a coronary disease. Intern Emerg Med. 2017;12(6):845-52. DOI: http://dx.doi.org/10.1007/s11739-016-1493-8

9. Han KS, Lee JS, Kim SJ, Lee SW. Targeted cardiopulmonary resuscitation training focused on the family members of high-risk patients at a regional medical center: a comparison between family members of high-risk and no-risk patients. Ulus Travma Acil Cerrahi Derg. 2018;24(3):224-33. DOI: http://dx.doi.org/10.5505/tjtes.2017.01493

10. Andréll C, Christensson C, Rehn L, Friberg H, Dankiewicz J. Knowledge and attitudes to cardiopulmonary resuscitation (CPR)– a cross-sectional population survey in Sweden. Resusc Plus. 2021;5:100071. DOI: https://doi.org/10.1016/j.resplu.2020.100071

11. Ro YS, Shin SD, Song KJ, Hong SO, Kim YT, Cho SI. Bystander cardiopulmonary resuscitation training experience and self-efficacy of age and gender group: a nationwide community survey. Am J Emerg Med. 2016;34(8):1331-7. DOI: http://dx.doi.org/10.1016/j.ajem.2015.12.001

12. Myat A, Song KJ, Rea T. Out-of-hospital cardiac arrest: current concepts. Lancet. 2018; 391(10124):970-9. DOI: http://dx.doi.org/10.1016/S0140-6736(18)30472-0

13. Case R, Cartledge S, Siedenburg J, Smith K, Straney L, Barger B, et al. Identifying barriers to the provision of bystander cardiopulmonary resuscitation (CPR) in high-risk regions: A qualitative review of emergency calls. Resuscitation. 2018;129:43-7. DOI: http://dx.doi.org/10.1016/j.resuscitation.2018.06.001

14. Jarrah S, Judeh M, AbuRuz ME. Evaluation of public awareness, knowledge and attitudes towards basic life support: a cross-sectional study. BMC Emerg Med. 2018;18(1):1-7. DOI: http://dx.doi.org/10.1186/s12873-018-0190-5

15. Ringh M, Rosenqvist M, Hollenberg J, Jonsson M, Fredman D, Nordberg P, et al. Mobile-phone dispatch of laypersons for cpr in out-of-hospital cardiac arrest. N Engl J Med. 2015;372(24):2316-25. DOI: http://dx.doi.org/10.1056/NEJMoa1406038

16. Thorén AB, Axelsson AB, Herlitz J. Possibilities for, and obstacles to, CPR training among cardiac care patients and their co-habitants. Resuscitation. 2005;65(3):337-43. DOI: http://dx.doi.org/10.1016/j.resuscitation.2004.12.015

17. Hsieh MJ, Chiang WC, Jan CF, Lin HY, Yang CW, Ma MH. The effect of different retraining intervals on the skill performance of cardiopulmonary resuscitation in laypeople: a three-armed randomized control study. Resuscitation. 2018;128:151-7. DOI: http://dx.doi.org/10.1016/j.resuscitation.2018.05.010

18. Bylow H, Karlsson T, Lepp M, Claesson A, Lindqvist J, Svensson L, et al. Learning outcome after different combinations of seven learning activities in basic life support on laypersons in workplaces: a cluster randomised, controlled trial. Med Sci Educ. 2021;31(1):161-73. DOI: http://dx.doi.org/10.1007/s40670-020-01160-3

19. Cheng A, Magid DJ, Auerbach M, Bhanji F, Bigham BL, Blewer Al, et al. Part 6: resuscitation education science: 2020 american heart association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation. 2020;142(16 Suppl 2):S551-79. DOI: http://dx.doi.org/10.1161/CIR.0000000000000903

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