

Effectiveness of Cardiopulmonary Resuscitation Training Among Family Members of Patients with Acute Myocardial Infarction

Eficacia de la enseñanza en reanimación cardio-cerebro-pulmonar para familiares de pacientes con infarto agudo de miocardio

Eficiencia do ensino de reanimação cardio-cerebro-pulmão para familiares de pacientes com infarto agudo do miocárdio

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Abstract

Introduction: In most cases, cardiac arrest occurs at home, and care is provided by family members. In recent years, survival following this event has increased due to public education and the use of automated external defibrillators (AEDs). Therefore, educating family members of patients who have experienced an acute myocardial infarction in basic resuscitation maneuvers is highly useful to facilitate the rapid recognition of warning signs of cardiac arrest and the prompt initiation of resuscitation maneuvers. **Objective:** To evaluate the effectiveness of cardiopulmonary resuscitation training in enabling family members of patients with acute myocardial infarction (AMI) to acquire resuscitation skills. **Methodology:** A quasi-experimental pretest-posttest study without a control group was conducted with 90 family members of patients with acute myocardial infarction who were physically able to receive training in cardiopulmonary resuscitation (CPR). The study was carried out in the clinical simulation laboratory. The intervention consisted of theoretical and practical training. A pretest and posttest were administered, and skills were assessed. **Results:** Following the training, most of the knowledge was acquired, as reflected by the higher number of correct responses on the posttest. There was a statistically significant difference in the number of correct responses before and after the theoretical training provided to the patients' family members. All participants correctly performed all assessed practical skills. There was a statistically significant difference in skills performance before and after the practical training delivered by nurses. **Conclusions:** Cardiopulmonary resuscitation (CPR) training led by nurses was effective for family members of patients with acute myocardial infarction, as they acquired the skills needed to provide timely assistance if they witness a cardiac arrest.

Keywords: Myocardial Infarction; Education; Cardiopulmonary Resuscitation; Teaching

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Resumen

Introducción: En la mayoría de los casos el paro cardíaco ocurre en el hogar y quienes dan atención son los familiares. En los últimos años, la supervivencia después de este evento ha aumentado, gracias a la enseñanza a la población y al uso del Desfibrilador Automático Externo. Por tanto, es de gran utilidad educar en maniobras de reanimación básica a familiares de pacientes que sufrieron infarto agudo de miocardio para favorecer el reconocimiento rápido de los signos de alerta de una parada cardíaca e iniciar las maniobras. **Objetivo:** Evaluar la eficacia de un entrenamiento en reanimación cardio-cerebro-pulmonar para adquirir habilidades en los familiares de pacientes con infarto agudo de miocardio (IAM). **Metodología:** Estudio cuasiexperimental pre y post sin grupo control. Se desarrolló con 90 familiares de pacientes con infarto agudo de miocardio, físicamente capacitados para recibir entrenamiento en reanimación cardio-cerebro-pulmonar (RCCP). Se desarrolló en el laboratorio de simulación clínica, la intervención consistió en formación teórica y práctica. Se aplicó pretest post test y medición de habilidades. **Resultados:** Con el entrenamiento la mayoría de los conocimientos fueron incorporados, lo cual se ve reflejado en el acierto con respuestas correctas en el post test. Hubo diferencia estadísticamente significativa entre el número de respuestas correctas antes y después de la formación teórica impartida a los familiares de pacientes. Todos los participantes lograron realizar el total de las habilidades prácticas de manera correcta. Hubo diferencia estadísticamente significativa en el desempeño de habilidades antes y después de la formación práctica impartida por los profesionales de enfermería. **Conclusión:** El entrenamiento en RCCP dirigido por los profesionales de enfermería, resultó efectivo para los familiares de pacientes con IAM puesto que, adquirieron las habilidades para una atención oportuna en el caso que presencien una parada cardíaca.

Palabras clave: Infarto del Miocardio; Educación; Reanimación Cardiopulmonar; Enseñanza

Resumo

Introdução: Na maioria dos casos, a parada cardíaca ocorre em casa e quem presta os primeiros socorros são os familiares. Nos últimos anos, a sobrevivência após esse evento aumentou, graças à educação da população e ao uso do Desfibrilador Automático Externo. Portanto, é muito útil ensinar manobras básicas de reanimação aos familiares de pacientes que sofreram infarto agudo do miocárdio, para facilitar o reconhecimento rápido dos sinais de alerta de uma parada cardíaca e iniciar as manobras. **Objetivo:** Avaliar a eficácia do treinamento em ressuscitação cardiorrespiratória e cerebral para aquisição de habilidades em familiares de pacientes com infarto agudo do miocárdio. **Metodologia:** Estudo pré e pós quase experimental sem grupo controle. Foi desenvolvido com 90 familiares de pacientes com infarto agudo do miocárdio, fisicamente capazes de receber treinamento em RCP. Foi desenvolvido no laboratório de simulação clínica, a intervenção consistiu em treinamento teórico e prático. Foram aplicados pré-teste, pós-teste e mensuração de habilidades. **Resultados:** Com o treinamento, a maior parte do conhecimento foi incorporado, o que se reflete no acerto com acertos no pós-teste. Houve diferença estatisticamente significativa entre o número de acertos antes e após o treinamento teórico ministrado aos familiares dos pacientes. Todos os participantes serão capazes de executar todas as habilidades práticas corretamente. Houve diferença estatisticamente significativa no desempenho das competências antes e após o treinamento prático ministrado pelos profissionais de enfermagem. **Conclusões:** O treinamento em RCP orientado pelos profissionais de enfermagem foi eficaz para os familiares de pacientes com IAM, uma vez que adquiriram habilidades para o atendimento oportuno caso presenciassem uma parada cardíaca.

Descritores: Infarto do Miocárdio; Educação; Reanimação Cardiopulmonar; Ensino

Introduction

The relevance of training in cardiopulmonary resuscitation (CPR) for saving lives refers to a set of standardized techniques performed in an organized manner that aim to achieve successful recovery of the victim. Therefore, training individuals who do not belong to the healthcare field, known as lay rescuers, is important so that they can act promptly by providing basic assistance in the community or at home, thereby increasing survival¹. It has been observed that, in most cases, emergencies occur at home or in locations distant from healthcare facilities, and assistance is provided by relatives, workers, bystanders, among others. In most cases, these individuals do not have training and lack the knowledge required to perform optimal resuscitation of victims².

According to the literature review, 82% of out-of-hospital cardiac arrest (OHCA) cases occur at home or at the workplace, and 18% occur in public places, with relatives or bystanders assisting the affected person³. Therefore, survival after OHCA in North America is less than 8%. However, in other areas of the United States

where training in cardiopulmonary resuscitation (CPR) for lay rescuers is provided, survival rates increased from 49% to 74%. Hence, there is interest in teaching resuscitation maneuvers to family members in order to improve the prognosis of victims who experience this event outside healthcare institutions².

The European Resuscitation Council (ERC)⁴ and the American Heart Association (AHA), among others⁵, have developed guidelines that emphasize training in techniques, skills, and knowledge in basic cardiopulmonary resuscitation for members of the community who can initially respond to these events, referred to as first responders. Therefore, training in CPR improves the response to such events². Likewise, the use of simulation may be beneficial for reinforcing what has been learned.

In recent years, survival after cardiac arrest (CA) has increased due to public education and the use of automated external defibrillators (AEDs) in different locations where cardiac arrest occurs⁶. Thus, this event in the out-of-hospital setting is considered an emergency that requires prompt recognition to initiate CPR early and thereby increase survival rates. Some studies show that cardiac arrest most often occurs at home in the presence of a family member, who, in most cases, is unable to provide immediate assistance because of a lack of knowledge or experience in performing resuscitation maneuvers. In addition, they fear causing harm; in these situations, 92% of individuals do not survive due to the lack of timely assistance^{7,8}.

Therefore, educating family members of patients who have experienced an AMI in basic resuscitation maneuvers is highly useful, since individuals with this condition are at greater risk of experiencing CA⁹. Such training is beneficial for promoting the rapid recognition of warning signs of CA and for initiating resuscitation maneuvers quickly, appropriately, and safely. In addition, it guides optimal decision-making, helping to maintain blood circulation and reduce brain injury⁴. Thus, a family member must provide initial assistance to their loved one while awaiting care from healthcare professionals.

Likewise, it is important to highlight the role of nursing in educational interventions for family members of individuals who have experienced an AMI, in this case, through teaching basic resuscitation maneuvers. This approach produces a positive impact by improving participants' level of knowledge and skills through short-term training², which favors more appropriate assistance from family members and a better prognosis.

In Colombia, studies have been conducted on training in basic cardiopulmonary resuscitation focused on individuals with low or no prior knowledge, which have shown that trained participants can acquire skills and abilities that are reflected in increased survival rates. However, to date, no studies have been identified in the Orinoquía region, which highlights the need for research in this region. Accordingly, this study aimed to evaluate the effectiveness of cardiopulmonary resuscitation training in enabling family members of patients with acute myocardial infarction to acquire resuscitation skills.

Methodology

Study design

This was a quasi-experimental pretest-posttest study without a control group.

Population and sample

Family members of patients were selected based on the admission records of individuals hospitalized with AMI in two healthcare institutions in Villavicencio. Records indicated that, in the previous year, an average of 100 patients with AMI were admitted and hospitalized in the intensive care unit (ICU). Therefore, a sample of 80 family members of patients with AMI was calculated for a 95% confidence level and a 5% margin of error. Non-probability convenience sampling was used.

The inclusion criteria considered were family members of patients diagnosed with AMI, aged 18 years or older, whose relatives had been hospitalized during the data collection period, who lived with the patient, and who

were physically able to receive training in CPR. The exclusion criteria include family members who were unable to read or write or who had previously received training in CPR. Using the data from the admission records of the healthcare institutions, family members were contacted by telephone to invite them to participate in the study. A meeting was convened with those interested in participating, during which the purpose of the study and the methodology were explained.

Intervention

The training was conducted in the clinical simulation lab of the Faculty of Health Sciences at the Universidad de los Llanos, where high-fidelity simulators are available. The study intervention consisted of theoretical and practical training delivered by three nurses trained in CPR over five months (March to July 2024).

Data collection instrument

A structured form was used to obtain the sociodemographic characteristics of the participants and to assess the theoretical knowledge of family members of patients with AMI before receiving the training.

In addition, the researchers used a skills checklist developed based on the guidelines of the American Heart Association (AHA) to evaluate family members' performance. The following aspects were considered to demonstrate what the family member should do when encountering a person in cardiac arrest: assessment and activation; first cycle of CPR (quality of chest compressions and rescue breaths); second cycle of CPR (quality of chest compressions and rescue breaths, resumption of chest compressions in less than 10 seconds); and use of the AED.

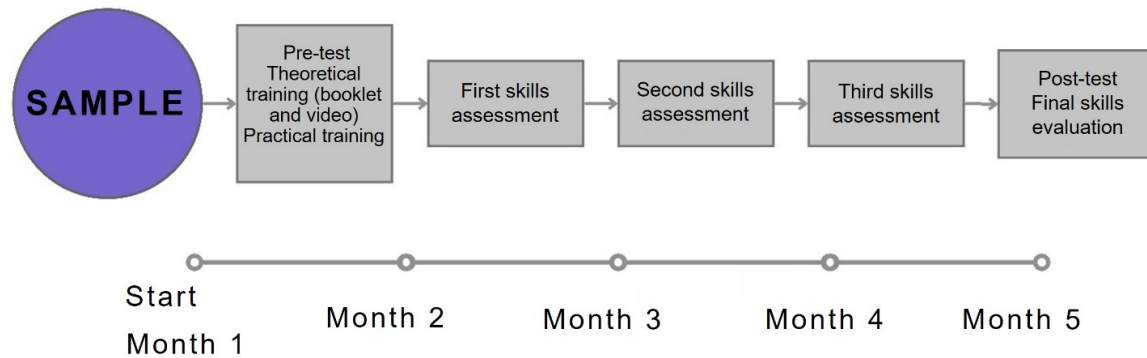
The intervention included theoretical and practical training provided by three nurses. The theoretical session lasted one hour and was conducted in groups of 20 participants over four days until all family caregivers were included ($n = 80$). The session began with a knowledge test in which participants answered questions on warning signs of cardiac arrest, recognition of cardiac arrest, the chain of survival, the cycle of chest compressions and rescue breaths, and the use of the AED (see [Appendix 1](#)). Subsequently, the AHA video "Es por la vida" was shown, followed by the distribution of an educational booklet that was simultaneously displayed on a television screen and explained schematically in simple language. The booklet addressed the anatomy of the heart, warning signs of myocardial infarction, how to recognize cardiac arrest, the OHCA chain of survival, and how to perform CPR in adults. At the end of the booklet presentation, questions from participants were addressed. Afterwards, participants watched the AHA Hands-Only CPR instructional video. The theoretical session concluded with a clinical scenario discussed in small groups and facilitated by the researchers.

For the practical component in the simulation lab, four training sessions were designed, each lasting four hours, with three groups of seven participants per session until the target sample size was reached ($n = 80$). During these sessions, participants practiced chest compressions, rescue breaths, and the use of the AED.

Follow-up and assessment

To assess theoretical knowledge of CPR, a posttest using the same questions as the baseline test was administered. Nurses provided practical skills training and used a skills checklist (see [Appendix 2](#)) to evaluate learning. Commonly used terms were employed to facilitate participants' understanding.

In total, three skills assessments were conducted using simulation scenarios in which family members read the following scenario: You encounter a person in cardiac arrest. You approach the scene and ensure that it is safe. Demonstrate what you would do. The participant then acted according to what had been learned: ensuring scene safety; if the victim did not respond, calling for help and activating the emergency response system; checking for breathing and a pulse; initiating high-quality CPR; and using the AED as soon as it became available. Final assessment was achieved once participants correctly completed all the steps. If at least one item was left blank, participants were required to undergo remediation, and the form indicated the skills requiring further practice (see [Appendix 2](#)). [Figure 1](#) shows how the intervention and follow-up were conducted. For each simulated activity, participants were provided with a Laerdal medium-fidelity CPR simulator and a Laerdal AED trainer.



Follow-up and assessment

Figure 1. CPR intervention

The collected data were stored in Excel. Statistical analyses were performed using the R statistical package, version 4.5.0, to determine the effectiveness of the educational intervention. McNemar's test¹⁰ was applied, a statistical test used to assess the significance of changes in paired binary responses before and after an intervention in a repeated-measures design.

Ethical considerations were framed in accordance with Resolution 008430 of 1993¹¹ of the Colombian Ministry of Health for health research. This project was classified as minimal-risk research, as it involved only evaluative intervention with volunteers. The principle of beneficence is reflected in the benefits for family members of patients, who acquire knowledge and skills to respond to CA, as well as for victims of such events and the community through the strengthening of first aid culture. Participants voluntarily signed an informed consent form to take part in the study. The study was approved by the Bioethics Committee of the Universidad de los Llanos, as recorded in the minutes dated November 2, 2023.

Results

The sample consisted of 90 family members of patients with AMI. Of these, 29% were men and 71% were women, with a mean age of 18–29 years. No participants were lost to follow-up. The sociodemographic characteristics are presented in [Table 1](#).

Table 1. Sociodemographic characteristics of the study participants

Variable	n (90)	%
Sex		
Female	64	71.11
Male	26	28.88
Age		
18–29 years	33	36.66
30–39 years	15	16.60
40 years and older	42	46.66
Marital status		
Married	20	22.22
Single	1	1.11
Cohabiting	22	24.44
Widowed	39	43.33
Separated	8	8.88

The age distribution was concentrated at the extremes: the group aged 40 years and older represented the largest proportion (46.66%), followed by young adults aged 18–29 years (36.66%), whereas the intermediate group aged 30–39 years was the least represented (16.66%). Regarding marital status, notably, widowed participants accounted for 43.33% of the sample, followed by those cohabiting (24.44%) and married (22.22%), with a minimal proportion of single individuals (1.11%). This sociodemographic profile suggests a predominantly female population of mature to older adult age, with a high prevalence of widowhood. These characteristics may reflect greater exposure to cardiovascular events within the family and community environment, thereby supporting the relevance of the CPR training.

Regarding knowledge assessment, differences were observed before and after the educational session provided by nurses, as shown in **Figure 2**.



Figure 2. Assessment of CPR knowledge

The y-axis shows the percentage of participants who answered each question correctly (%). The blue line represents pre-training results, and the orange line represents post-training results. P values above each point were calculated using McNemar's test for paired samples. The sample included 90 participants. A p-value < 0.05 indicates statistically significant differences between pre- and post-training measurements.

The x-axis shows five key dimensions of knowledge related to cardiopulmonary resuscitation and the use of the AED: (1) recognition of warning signs of cardiac arrest, (2) identification of cardiac arrest, (3) knowledge of the OHCA chain of survival, (4) knowledge of the procedure to follow when alone with a family member in cardiac arrest, and (5) familiarity with the concept and operation of the AED. These dimensions cover early recognition of the emergency, conceptual knowledge of the response protocol (chain of survival), practical skills for responding to the emergency, and familiarity with the use of life-support technology, providing a comprehensive assessment of the competencies required to respond effectively to an acute cardiovascular event in the out-of-hospital setting.

The results show a notable improvement in participants' knowledge after the theoretical training, with significant increases in correct responses for nearly all questions, particularly in the identification of cardiac arrest warning signs, the chain of survival, and knowledge of the AED. The difference between responses before and after training is clear, reflecting a direct impact of the training program, as evidenced by the question on the identification

of cardiac arrest, where only 14% responded correctly before training, whereas 71% did so afterward. In addition, knowledge about the AED, which was previously 23%, increased to 100% after the theoretical training, highlighting the effectiveness of the training in teaching the use of this crucial device in emergencies. Extremely low p-values across all questions ($p < 0.001$) confirm that the differences observed between the pre- and post-training assessments are statistically significant, indicating that the changes are not due to chance but rather the result of the training program.

Figure 3 presents the results of the practical training conducted to respond to a person in cardiac arrest using the available simulators and using the skills checklist. Three successive assessments and a final assessment were conducted. In the first assessment, participants obtained good scores performing the following skills: delivering two rescue breaths using a barrier device, checking the pulse, and stepping aside to allow the AED to analyze the rhythm. The actions with the lowest performance were delivering 30 compressions within no less than 15 seconds and no more than 18 seconds, allowing full chest recoil after each compression, delivering each rescue breath with a duration of one second, and resuming chest compressions in less than 10 seconds. Therefore, additional training was provided, and subsequent assessments were conducted until all participants successfully performed all skills. There was a statistically significant difference in skills performance before and after the practical training delivered by the nurses.

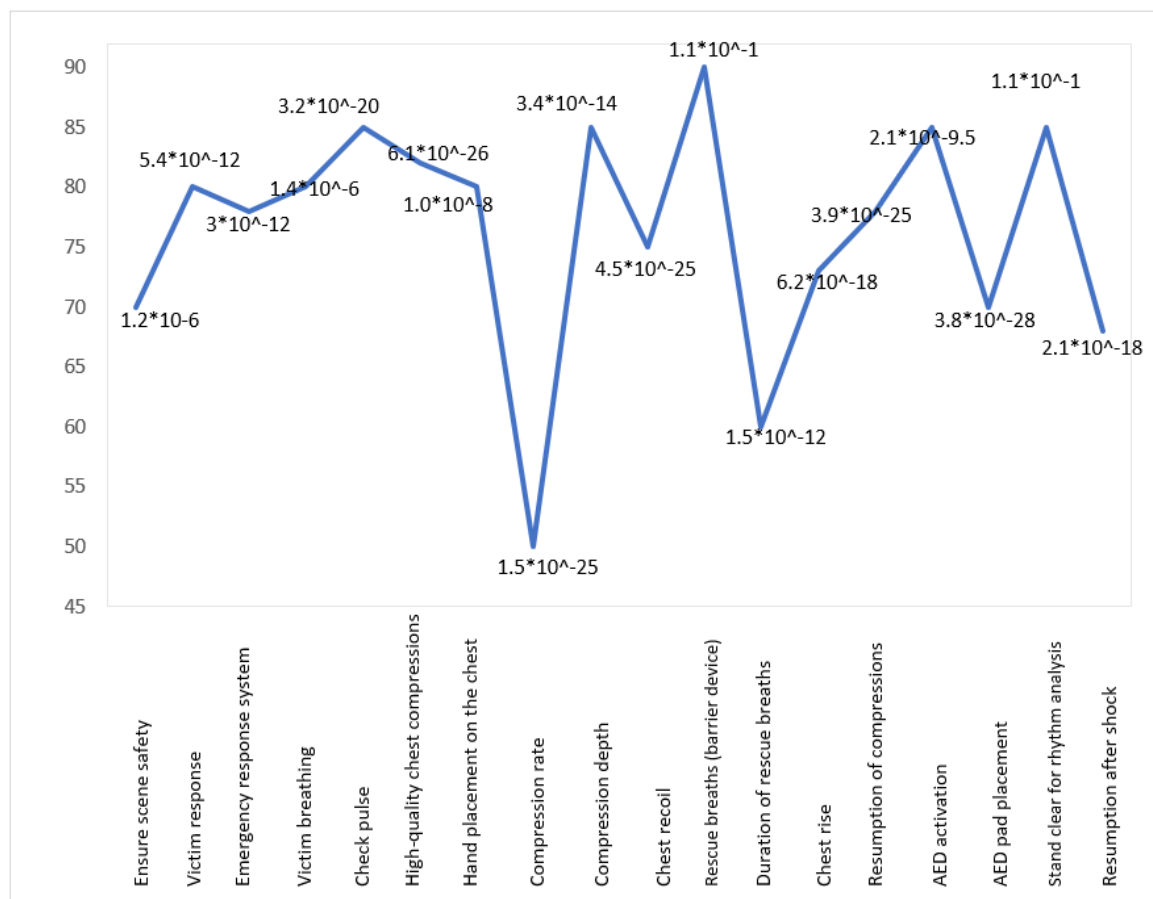


Figure 3. Assessment of CPR Skills

The y-axis shows the percentage of participants who demonstrated proficiency in each dimension (%). The x-axis shows the different dimensions assessed related to the response to OHCA and the use of the AED. P values above each point were calculated using a chi-square goodness-of-fit test comparing the observed distribution with a uniform expected distribution. The sample included 90 participants. A p-value < 0.05 indicates that the observed proportion of knowledge in that dimension differs significantly from that expected by chance.

Figure 3 shows the improvement in participants' performance across the assessed skills related to cardiopulmonary resuscitation (CPR), evaluated at different time points. Comparison of "YES" and "NO" responses at each step clearly showed that practical training improved participants' competencies in most of the skills assessed, suggesting that the training program had a positive impact on the performance of family members of patients with AMI. This is particularly evident in critical steps such as "performing high-quality chest compressions," where performance improved from 10% to 80%, indicating a notable acquisition of skills following the training process delivered by nurses. However, some areas still require greater attention.

Some steps, such as "performing 30 chest compressions in no less than 15 seconds" and "allowing complete chest recoil after each compression," showed a less pronounced improvement across the assessments. These findings may indicate that participants still experienced difficulties with certain technical aspects of CPR, suggesting that these components should be reinforced in future training sessions. In addition, low p-values ($p < 0.001$) in several of the measurements indicate that the differences observed across the assessments are statistically significant, supporting the conclusion that the training had a real and measurable effect on participants' skills.

Discussion

The initial results of the theoretical assessment revealed limited knowledge related to heart anatomy, warning signs of myocardial infarction, how to recognize cardiac arrest, the OHCA chain of survival, and how to perform CPR in adults. These findings are consistent with the study by Escobedo Romero⁶, in which participants served as lay rescuers for a day and showed a lack of clarity in key concepts, which hindered their ability to assimilate the material taught. However, in the present study, considerable improvement was observed after training was provided to family members of patients with AMI.

The study conducted by Sáenz Montoya¹² showed that 62.7% of participants identified signs to recognize a cardiac arrest, which differs markedly from our study, in which only 39% of family members were able to do so before the intervention. In another study, 84.5% of participants considered cardiac arrest to be the "sudden loss of breathing and heartbeat." Likewise, most family members recognized the absence of pulse and breathing in cardiac arrest¹³. Additionally, in the study by Escobedo-Romero⁶, all participants expressed the importance of receiving training in cardiopulmonary resuscitation. This finding is consistent with Lera Abadía et al.¹⁴, who highlight the need to train lay rescuers to increase survival rates, demonstrating that an intervention of at least 30 minutes can achieve substantial results. They also emphasize that teaching the sequence of the links in the chain of survival is essential. This aspect was considered in the present study and was learned by all participants.

The researchers recognized that in CPR, it is important to know the compression-to-ventilation ratio. This aspect was also identified in the studies by Madero Zambrano et al.¹³ and Ballesteros Peña¹⁵. The latter emphasizes the importance of assessing compression depth and complete chest recoil during chest compressions, as well as considering the caregivers' physical build, as this may influence the quality of chest compressions, rescue breaths, and chest expansion during CPR.

At the beginning of the training, family members of patients were not familiar with the AED, nor were they familiar with how to use it. Similar findings were reported in the studies by Madero-Zambrano et al.¹³, Luna-Lamas¹⁶, and Elhussain et al.¹⁷. It is important to note that early defibrillation increases the survival rates of victims experiencing OHCA¹⁸. However, currently, few individuals receive this intervention before the arrival of the healthcare team, most often due to a lack of knowledge about how to use this medical device¹⁹⁻²¹.

This study yielded results similar to those reported by Citolino et al.⁷, as family members of patients with AMI acquired knowledge of CPR and improved their skills in all tasks performed during the simulation and after the training.

Finally, the p-values in the results of the present study showed statistical significance attributable to the intervention. In contrast, the study by Álvarez Loja et al.²² did not establish this relationship but instead reported statistically significant associations with the sociodemographic variables of sex ($p = 0.002$), educational level ($p = 0.002$), and kinship ($p = 0.037$), among others, and no statistically significant association with marital status ($p = 0.229$). These variables were not analyzed in the present study.

For future research, it is recommended to continue these interventions with family members of patients with AMI to reduce complications through timely assistance provided at home. Short-term follow-up of participants is also recommended to evaluate knowledge and skills retention and to assess the impact of the intervention. Future studies should also include a control group.

Conclusions

Cardiopulmonary resuscitation (CPR) training delivered by nurses was effective for family members of patients with AMI, as they acquired the skills needed to provide timely assistance in the event of witnessing a cardiac arrest.

It is important that training for lay rescuers include both a theoretical and a practical component to prepare caregivers adequately to respond to cardiac emergencies. Training should focus on learning how to recognize a CA, provide rescue breath correctly, and deliver high-quality chest compressions to improve victims' survival. In this way, the goal of saving lives and improving patient outcomes can be achieved.

The main implication of this study for nursing is its educational role, as it demonstrates the effectiveness of cardiopulmonary resuscitation (CPR) training delivered by nurses. This finding underscores the need for nurses to assume a proactive role in training family members and caregivers of patients with heart disease to improve health outcomes.

Author contributions

EBA: Responsible for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

MLVS: Substantial contributions to the conception or design of the work, or to the acquisition, analysis, or interpretation of data for the work. Final approval of the final version of the manuscript to be published.

APPP: Drafting the work or critically revising it for important intellectual content.

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Ethical Considerations

The study was approved by the Bioethics Committee of Universidad de los Llanos, as documented in the minutes dated November 2, 2023.

Conflict of Interest

The authors declare no conflict of interest.

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No artificial intelligence, language models, machine learning, or similar technologies were used in the preparation of this article.

References

1. Bozzo S, Arancibia C, Pérez L, Contreras D, Silva I. Reanimación cardiopulmonar en el adulto. Entrenamiento y educación en reanimación cardiopulmonar. *Rev Invest Educ Enferm*. 2021; 25. doi: <https://doi.org/10.34720/a241-6j31>
2. Álvarez B, Mesa I, Ramírez A, Mendoza R. Gestión de enfermería en reanimación cardiopulmonar solo con las manos. *Arch Venez Farmacol Ter*. 2021; 40(3): 231-239. doi: <https://doi.org/10.5281/zenodo.5037063>
3. Blanco D, Gómez J, Sáenz X. Incremento del conocimiento en soporte vital básico facilitado por un recurso educativo digital. *Enfermería universitaria*. 2020; 17(1): 42-53. doi: <https://doi.org/10.22201/eneo.23958421e.2020.1.737>
4. European Resuscitation Council (ERC). Guidelines for Resuscitation. Niel, Bélgica; 2021. [Internet] [Consultado 10 de octubre de 2024] Disponible en: <https://cprguidelines.eu/guidelines-2021>
5. American Heart Association (AHA). Aspectos destacados de las Guías de la American Heart Association del 2020 para RCP y ACE. Dallas, Texas, Estados Unidos: 2020. [Internet] [Consultado 10 de octubre de 2024] Disponible en: https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/highlights/hghlghts_2020eccguidelines_spanish.pdf
6. Escobedo R. Reanimador por un día. Estudio cualitativo sobre las experiencias de reanimadores legos con formación. *Ene*. 2019; 13(2): 1325. Disponible en: https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1988-348X2019000200005
7. Citolino C, Nogueira L, Gomes V, Polastri T, Timerman S. Effectiveness of cardiopulmonary resuscitation training in the teaching of family members of cardiac patients. *Rev Esc Enferm USP*. 2022; 56(spe): e20210459. doi: <https://doi.org/10.1590/1980-220X-REEUSP-2021-0459en>
8. Montero E, Yafar C, Pérez M. Enseñanza de maniobras de reanimación cardiopulmonar a familiares y cuidadores de niños con mayor riesgo. *Ludovica pediátr*. 2019; 22(4): 12-18. Disponible en: <https://host170.sedici.unlp.edu.ar/server/api/core/bitstreams/62020157-5350-4103-8f98-3e8083551249/content>
9. Dattoli C, Jackson C, Gallardo A, Gopar R, Araiza D, Arias A. Acute myocardial infarction: Review on risk factors, etiologies, angiographic characteristics and outcomes in young patients *Arch Cardiol Mex*. 2021; 91(4): 485-492. doi: <https://doi.org/10.24875/ACM.20000386>
10. Hernández R, Mendoza C. Metodología de la Investigación Las Rutas Cuantitativa, Cualitativa y Mixta. México, Mc Graw Hill Education; 2018; 10(18): 6096-5,714p. doi: <https://doi.org/10.22201/fesc.20072236e.2019.10.18.6>
11. Ministerio de Salud de Colombia. Resolución 008430 de 1993. "Por la cual se establecen las normas científicas, técnicas y administrativas para la investigación en salud". Bogotá D.C, Colombia: Diario Oficial; 1993 [Internet] [Consultado 25 de octubre de 2024] Disponible en <https://www.minsalud.gov.co/sites/rid/lists/bibliotecadigital/ride/de/dij/resolucion-8430-de-1993.pdf>
12. Sáenz X, Blanco D, Gómez J. Paro cardíaco extrahospitalario: conocimientos en una comunidad universitaria. *Rev Colomb Enferm*. 2021; 20(2): 1-15. doi: <https://doi.org/10.18270/rce.v20i2.3401>
13. Madero K, Rivera Y, Sumoza J. Conocimiento en RCCP básica adulto en personas lego. *J Ind Neo-Technol*. 2020. https://www.jint.usach.cl/sites/jint/files/articulo_v7n1jint004-20.pdf
14. Lera G, Valdovinos R, Jordan de Urríes M, Ezquerro S, Gutiérrez M, Reblet S. La importancia del reanimador lego en una parada extrahospitalaria. *Rev sanitaria de investigación*. 2023. Disponible en: <https://revistasanitaria-deinvestigacion.com/la-importancia-del-reanimador-lego-en-una-parada-extrahospitalaria/>

15. Ballesteros S, Vallejo G, Fernández I, Etayo A, Berasaluze L, Domínguez J. Características de los reanimadores asociados a la correcta compresión torácica durante la reanimación cardiopulmonar. *Enferm Intensiva*. 2022; 33(3): 126-131. doi: <https://doi.org/10.1016/j.enfi.2021.05.002>
16. Luna M, Velázquez K. Importancia de formar reanimadores legos: atención inicial del paciente con paro cardio-respiratorio. *Rev Educ Investig Emer*. 2022; 4(2): 133-138. doi: <https://doi.org/10.24875/reie.21000132>
17. Elhussain M, Ahmed F, Mustafa N, Mohammed D, Mahgoub I, Alnaeim N, et al. The Role of Automated External Defibrillator Use in the Out-of-Hospital Cardiac Arrest Survival Rate and Outcome: A Systematic Review. *Cureus*. 2023 Oct 26; 15(10): e47721. doi: <https://doi.org/10.7759/cureus.47721>
18. Bernoche C, Timerman S, Polastri T, Giannetti N, Siqueira A, 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>
19. 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>
20. 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>
21. Vu D, Hoang B, Do N, Do G, Dao X, Nguyen H, 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>
22. Álvarez B, Moyano E, Merchán M, Jaya L. Nivel de conocimiento en reanimación cardiopulmonar en familiares de pacientes con cardiopatías. *Rev Cient Cuid Salud*. 2024; 8(14): 20–27. doi: <https://doi.org/10.29076/issn.2602-8360vol8iss14.2024pp20-27p>

Appendix I. Knowledge Test on Basic Life Support

UNIVERSIDAD DE LOS LLANOS FACULTY OF HEALTH SCIENCES EFFECTIVENESS OF CARDIOPULMONARY RESUSCITATION TRAINING IN FAMILY MEMBERS OF PATIENTS WITH AMI TEST

Dear participant, below you will find multiple-choice questions with a single correct answer. Based on your knowledge, please mark the option you consider correct.

Participant's Name _____ Date _____ No. _____

1. One of the warning signs of cardiac arrest is:

- A. Headache
- B. Cough
- C. Chest pain
- D. Fever

2. You identify that a person is in cardiac arrest when the person:

- A. is asleep
- B. is very agitated
- C. has a weak pulse
- D. is not breathing

3. Are you familiar with the out-of-hospital cardiac arrest chain of survival?

Yes ____

No ____

4. When you are alone, and your family member is in cardiac arrest, you perform:

- A. 30 compressions and two rescue breaths
- B. 15 compressions and two rescue breaths
- C. 50 compressions and five rescue breaths
- D. 20 compressions and 20 rescue breaths

5. Do you know what an automated external defibrillator (AED) is?

Yes ____ No ____

Appendix 2. Basic Life Support Skills Checklist

**UNIVERSIDAD DE LOS LLANOS
FACULTY OF HEALTH SCIENCES
EFFECTIVENESS OF CARDIOPULMONARY RESUSCITATION TRAINING IN FAMILY MEMBERS
OF PATIENTS WITH AMI
SKILLS CHECKLIST**

Participant's Name _____ Date _____ No. _____

You find a person in cardiac arrest. You approach the scene and ensure that it is safe. Demonstrate what you would do.

Assessment and Activation

Checks if the victim responds _____ Calls for help loudly/Activates the emergency response system/Sends someone to retrieve the AED _____ Checks if the victim is breathing _____
Checks the pulse _____

Once the participant calls for help loudly, the instructor says, "Here is the barrier device. I will go and retrieve the AED."

First Cycle of CPR (30:2)

Adult compressions

_____ Performs high-quality chest compressions
Places hands on the lower half of the sternum
Performs 30 compressions in no less than 15 seconds and no more than 18 seconds
Compresses at least 5 cm (2 inches)
Allows complete chest recoil after each compression

Adult Rescue Breaths

_____ Performs two rescue breaths using a barrier device
Each rescue breath lasts one second
Visible chest rise with each rescue breath
Resumes compressions in less than 10 seconds

Second Cycle of CPR (repeat the steps of the first cycle)

Check the box if the step is correctly performed.

_____ Compressions _____ Rescue breaths _____ Resumes compressions in less than 10 seconds

The second rescuer says, "Here is the AED. I will continue the compressions; you use the AED."

AED (follow AED prompts)

_____ Turns on the AED _____ Correctly attaches the defibrillation pads _____ Stands clear for rhythm analysis _____
Stands clear to deliver a shock safely _____ Delivers a shock safely

Resume Compressions

_____ Ensures that compressions resume immediately after delivering a shock

The participant instructs the instructor to resume compressions, or the participant resumes compressions.

STOP THE TEST

Instructor Notes

Place ✓ in the box next to each step performed correctly by the participant.

If the participant does not perform all steps satisfactorily (if at least one box remains blank), the participant must undergo remediation. Indicate which skills require remediation. _____

Test Results

Mark PASS or NR (Needs Remediation)

PASS ____ NR ____

Instructor Name _____ Date _____