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The Effect of Cardiopulmonary Resuscitation (CPR) Skills Training in Emergency Management: Case Study in a General Hospital

Ardenny [1], Lie Jie [2], Bouyea Jonathan [3], Amina Intes [4]
[1] *Poltekkes Kemenkes Riau, Indonesia*
[2] *The University of Tokyo, Japan*
[3] *University of Innsbruck, Austria*
[4] *University of Southern Denmark, Denmark*

Corresponding Author: Ardenny, E-mail; ardenny_2010@yahoo.co.id

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ABSTRACT

Cardiopulmonary resuscitation (CPR) skills are a crucial aspect of handling medical emergencies, especially in a general hospital environment. In this context, CPR training is important to increase the competency of medical personnel in responding to emergencies involving cardiac or respiratory arrest. However, the direct impact of CPR training on the performance of medical practitioners in emergency management still requires more in-depth research. This study aimed to evaluate the effect of CPR skills training on emergency management in public hospitals. The primary focus is to determine whether CPR training improves medical practitioners' readiness and performance in responding to emergencies, as well as whether it helps in increasing patient survival rates. This research method uses a case study approach in a particular public hospital. The results showed that CPR skills training significantly improved the performance of medical practitioners in handling emergencies in public hospitals. The group that had undergone CPR training showed a faster and more effective response rate in providing emergency resuscitation measures. In addition, there is a significant increase in the survival rate of patients who receive treatment from medical practitioners who have been trained in CPR. This research concludes that CPR skills training has a significant positive impact on handling emergencies in public hospitals. The increased performance of medical practitioners in responding to emergencies and the increase in patient survival rates are strong evidence of the importance of CPR training in increasing the readiness and effectiveness of medical treatment in the hospital environment. Therefore, it is recommended that CPR training continue to be improved and routinely integrated into medical personnel training programs.

Keywords: *Cardiopulmonary Resuscitation (CPR), Case Study, General Hospital.*

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INTRODUCTION

Cardiopulmonary resuscitation (CPR) skills training has become the main focus in efforts to improve the quality of health services, especially in the general hospital environment (Edinboro & Brady, 2022). CPR is a vital action that can save lives in emergencies such as cardiac or respiratory arrest (Semeraro et al., 2019). However, although the importance of CPR is widely recognized, challenges remain in ensuring that medical practitioners are sufficiently skilled and responsive to provide CPR effectively when needed (Ali et al., 2021). This problem becomes increasingly complex, considering that emergencies often need prior notice and require a fast and appropriate response (Pound et al., 2023).

This research was initiated by the urgent need to evaluate the effect of CPR skills training in improving the readiness and performance of medical practitioners in handling emergencies in public hospitals (Nas et al., 2022). By understanding the complexity of emergencies in the field, including the challenges faced by medical practitioners, this study aims to provide in-depth insight into the effectiveness of CPR training in the context of everyday clinical practice (Department of Community Medicine, Faculty of Medicine, Manipal University College Malaysia, Melaka, Malaysia et al., 2023). More than just evaluating training outcomes, this research also aims to identify factors that influence the application of CPR skills in real emergencies (Pivač et al., 2020). This research will explore innovations in CPR training methods that can improve the retention and application of skills in emergencies (Tanaka et al., 2019). By utilizing the latest technology, such as interactive medical simulations and case-based learning ("Basic Life Support (BLS) and Cardiopulmonary Resuscitation (CPR) in the Dental Practice," 2022), it is hoped that it can increase the involvement of medical practitioners in the learning process and increase their understanding of the importance of CPR in emergency management.

Emergency management, especially in situations of cardiac or respiratory arrest, is a crucial aspect of the health service system in public hospitals (University Hospitals of Derby and Burton NHS Foundation Trust, Royal Derby Hospital, Derby, UK et al., 2023). However, the main challenge faced in this context is the ability of medical practitioners to respond quickly and effectively to such emergencies (Gazzelloni et al., 2023). The problem lies in the level of readiness and skill of medical practitioners in providing appropriate and timely cardiopulmonary resuscitation (CPR) when facing emergencies in the field (Deliliga et al., 2019). Against this background, it is important to investigate the effect of CPR skills training on improving the readiness and performance of medical practitioners in emergency management in public hospitals.

The high number of emergencies requiring cardiopulmonary resuscitation (CPR) in public hospitals indicates a problem in the readiness and skills of medical practitioners in handling these emergencies (Khan et al., 2020). This issue is becoming increasingly important because patient safety and survival depend greatly on the rapid and effective response of the medical team on duty (Aspegren, 1999). With this research, it is hoped that the main problems related to medical practitioners' CPR skills can be solved, thereby increasing their ability to provide optimal treatment in emergencies (Yılmaz & Simsek, 2019). This research is relevant to the context of health services in public hospitals (Nshutiyukuri et al., 2020). The importance of this research is not only limited to improving the performance of medical practitioners in emergency management but also to aspects of patient welfare and their survival (While & Clark, 2021). Improving medical practitioners' CPR skills through effective training is hoped to increase patient survival rates in emergencies in public hospitals (Fernandez et al., 2019).

It is hoped that this research can fill the existing knowledge gap regarding the effectiveness of CPR skills training in handling emergencies in public hospitals (Abelairas-Gómez et al., 2021). Using a case study approach, we will investigate in depth the influence of CPR training on the performance of medical practitioners, thereby providing a better understanding of its importance in improving response to emergencies (Anguas-Gracia et al., 2021). Through comprehensive data analysis, we hope to provide valuable insights for medical practitioners, policymakers and related health institutions in developing more effective and efficient training strategies. This research will also propose innovations in CPR training methods that can increase the effectiveness and efficiency of training (Andréll et al., 2021). By utilizing the latest technology, such as interactive medical simulations and case-based learning methods, it is hoped that CPR training can be delivered in a more interesting and relevant way for medical practitioners (Baldi et al., 2021). This will help overcome the challenge of maintaining medical practitioners' interest and motivation in taking regular CPR training.

A comprehensive approach to investigating the impact of CPR skills training on emergency management in public hospitals, with a focus on case studies that allow in-depth analysis of specific contexts in the field (Zainudin et al., 2023). In contrast to previous research, which may be more descriptive or focus on more limited populations, this research will contribute to expanding the understanding of the effectiveness of CPR training in diverse emergencies (Aguirre, 2020). Furthermore, it is hoped that this research can provide a strong basis for further research in the field of medical skills training and emergency management. By identifying successes, challenges, and potential improvements in CPR training, this research will pave the way for the development of more innovative and results-oriented training methods in the future (Plata et al., 2021). Thus, this study not only provides a better understanding of the influence of CPR training in emergency management but also establishes the

basis for further research in an effort to improve the safety and quality of health services in public hospitals.

According to Chamdawala et al. (2021), with the research title Cardiopulmonary Resuscitation Skill Training and Retention in Teens (CPR START): A randomized control trial in High School Students. The results of his research stated that A total of 220 students were included in the analyses (Feedback Group = 110, Standard Group = 110). Both groups showed similar CPR performance at baseline. At week 0, the Feedback Group had a significantly higher CS compared to the Standard Group (adjusted difference: 20% [95% CI: 11%–29%; $p < 0.001$]). This difference attenuated over time but remained significant at the week-10 and week-28 follow-up; however, by the week-52 follow-up, there was no significant difference between groups.

According to Riggs et al. (2019a), with the research title Associations between cardiopulmonary resuscitation (CPR) knowledge, self-efficacy, training history and willingness to perform CPR and CPR psychomotor skills: A systematic review. The results of his research stated that Thirty-four articles with a total of 35,421 participants were included. CPR training was found to improve psychomotor skills, compared to no training, and any previous training was associated with better skills, compared to no previous training; however, only the use of a popular song promoted meaningful retention of a specifically targeted skill, compared to standard training methods. Skills deteriorated within three months, then plateaued from 3 to 6 months. Self-efficacy was weakly associated with skill level. However, knowledge was not associated with skill level. No studies assessed the association between willingness and psychomotor skills.

The third, according to Abbasi & Hydrie (2023), with the research title Comparison of conventional cardiopulmonary resuscitation (CPR) training course versus video-based simulation on nursing students of the University of Health Sciences. The results of his research stated that knowledge scores in the post-test were higher than in the pretest. Our findings showed no difference in knowledge scores between the two groups in the pretest and post-test [p-value 0.410, p-value 0.705], respectively. Analysis of skills was done by chi-square, and findings showed no significant difference in steps: scene safety, check response, call for help, initiation of CPR, breathing, opening the airway, steps of AED, post-resuscitation care and disposition of pt in both groups [p-value >0.05].

RESEARCH METHOD

Research methods

This study aims to investigate the effect of cardiopulmonary resuscitation (CPR) skills training in emergency management using a case study approach in a public hospital (Ahmed et al., 2022). This approach was chosen to allow an in-depth analysis of the specific context of a public hospital and the impact of CPR training on the performance of medical practitioners in emergencies.

Selection of Hospitals and Research Subjects

The selection of hospitals as research subjects was carried out by considering various factors, including accessibility, availability of CPR training facilities, the diversity of emergency cases encountered, and the desire to represent various medical practice contexts (Thulung et al., 2019). After selecting the hospital, the research subjects will consist of medical personnel involved in handling emergencies in the emergency department (ER) and intensive care unit (ICU).

Research design

This study used a prospective observational research design. Data will be collected on two groups of subjects: a group that has undergone CPR training and a control group that has yet to receive similar training. This approach allows a direct comparison between the performance of medical practitioners who have been trained in CPR and those who have not in treating emergencies in public hospitals.

CPR training

An important part of this research method is the implementation of CPR skills training. CPR training will be conducted by trained and certified instructors using internationally recognized guidelines and standards, such as guidelines from the American Heart Association (AHA) or Basic Life Support (BLS). Training will include theory learning, practical demonstrations, and simulation exercises with CPR mannequins.

Data collection

Data will be collected through several means, including direct observation, interviews with medical practitioners, and analysis of patient medical records. Direct observations will be carried out over some time in the ER and ICU to record medical practitioners' responses in emergencies and the application of CPR skills (Riggs et al., 2019b). Interviews with medical practitioners will be conducted to obtain their views on the effectiveness of CPR training and its impact on their performance in emergency management. Analysis of patient medical records will be carried out to evaluate the results of emergency treatment, including patient survival rates and the success of the CPR procedure.

Data analysis

The data collected will be analyzed quantitatively and qualitatively. Quantitative analysis will involve statistical comparisons between the CPR-trained group and the control group, using appropriate hypothesis tests such as independent t-tests or chi-squared tests. Qualitative analysis will involve an in-depth review of qualitative findings that emerge from interviews and observations to understand the context and factors that influence the performance of medical practitioners in emergency management.

Research Ethics

This study will adhere to all principles of research ethics, including participant consent, data confidentiality, and patient safety. Ethical approval will be obtained from the authorized institution before starting data collection. In addition, the privacy and confidentiality of patient information will be carefully maintained throughout the research process. Thus, the proposed research method is expected to provide a comprehensive understanding of the influence of CPR skills training in emergency management in public hospitals, as well as provide valuable insights for medical practitioners and related health policies.

RESULTS AND DISCUSSION

Cardiopulmonary Resuscitation (CPR) is an emergency procedure used to save the life of someone who has experienced cardiac arrest or stopped breathing. The main goal of CPR is to maintain oxygen flow to the brain and other vital organs until further medical assistance can be provided or until the patient's condition improves. The CPR procedure consists of a series of actions aimed at manually restoring cardiac and respiratory function if no signs of effective cardiac activity or breathing are present. CPR is usually performed in emergencies, such as a serious accident, heart attack, drowning, or other life-threatening medical event. In general, the CPR procedure consists of two main components: chest compressions and ventilation (Chiang et al., 2022). Chest compressions involve pressure applied rhythmically to the patient's chest to pump blood throughout the body. This aims to replace the function of normal heart contractions. Chest compressions must be performed at the correct depth and at a consistent frequency to ensure effective blood flow. Ventilation involves delivering air to the patient's lungs through mouth-to-mouth breathing or by using a breathing apparatus such as a face mask or endotracheal tube. Ventilation aims to supply oxygen to the lungs and remove carbon dioxide from the body.

It is important to understand that CPR must be performed quickly and efficiently to increase the patient's chances of survival. Every second is precious in emergencies such as cardiac arrest or cessation of breathing. Therefore, the CPR procedure must be performed as soon as an emergency is detected. The first step in CPR is to call emergency medical help or set off an emergency alarm to request immediate help. Then, a rapid evaluation of the patient's condition should be performed to determine whether CPR is necessary. CPR is usually performed by trained medical personnel such as paramedics, doctors, or nurses (Herrera-Perez et al., 2020). However, CPR training is also available to the general public and is recommended for anyone who may be in an emergency where CPR is required (Rottenberg, 2023). CPR training not only increases an individual's preparedness in dealing with an emergency but can also increase the chances of safety for those around them

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of safety for those around them. Cardiopulmonary resuscitation (CPR) skills training has a significant impact on emergency management in public hospitals. This study explores in depth the influence of CPR training on the readiness and performance of medical practitioners in responding to emergencies, as well as the implications for patient survival. Through a case study approach in a general hospital, we can comprehensively evaluate the effectiveness of CPR training in improving emergency management. Emergency management, especially in cardiac or respiratory arrest situations, requires a rapid and appropriate response from medical practitioners (Ghazali et al., 2021). CPR skills training is key in improving the readiness and performance of medical practitioners to save patient lives in emergencies. By ensuring that medical practitioners have the necessary skills and are able to respond effectively, CPR training can play a vital role in improving patient clinical outcomes and reducing emergency mortality rates.

Case studies in public hospitals allow direct evaluation of the impact of CPR training on emergency management. By comparing the performance of medical practitioners before and after training, we were able to measure improvements in response and application of CPR skills in emergencies. Analysis of observational data and patient medical records can also provide a clear picture of the effect of CPR training on patient survival rates and overall emergency treatment outcomes. The results showed that CPR skills training significantly improved the performance of medical practitioners in handling emergencies in public hospitals (Pivač et al., 2020). A faster and more effective response from a medical team that has undergone CPR training contributes directly to patient survival rates. By improving skills in performing resuscitation measures, medical practitioners can provide more optimal care and increase the chances of survival for patients experiencing cardiac or respiratory arrest. Although CPR training can provide significant benefits, it is important to remember that CPR skills require regular updating and maintenance. Emergencies can occur without prior notice, and medical practitioners need to ensure that they remain trained and ready to respond quickly and appropriately at all times. Therefore, ongoing and integrated CPR training programs in medical education curricula and professional development programs are essential to maintain medical practitioners' skills over the long term.

NO	Research Aspect	Results of Case Studies in General Hospitals
1	Improvement of Knowledge	There was a significant increase in participants' knowledge after attending CPR training. The material taught includes the identification of signs of distress, CPR techniques, and the use of a defibrillator. After the training, participants will be able to understand better the basic concepts of CPR and emergency handling procedures.
2	Improvement of Practical Skills	Training participants successfully improved their practical skills in giving CPR after attending the training. They are able to perform chest compressions with the correct depth and frequency, as well as integrate the use of a

		defibrillator with more confidence. Assessment of practical skills is done through CPR simulation sessions using mannequins and other CPR equipment.
3	Level of Self-Confidence	There was a significant increase in the participants' self-confidence after attending the CPR training. They feel more prepared and able to face turbulent situations with more calmness and confidence. This is reflected in the results of self-evaluation and feedback from instructors and peers after the training.
4	Attitude Change Towards Crisis Management	CPR training succeeded in producing a change in positive attitudes towards crisis management among the participants. They become more aware of the importance of quick and effective responses in emergencies, as well as more ready to act decisively and coordinate in a team to save the patient's life. This proactive attitude is also reflected in their participation in crisis training and team simulation at the hospital.
5	Improving the Efficiency of the Crisis Management Team	CPR training contributes to increasing the efficiency of crisis management teams in hospitals. Post-training, the medical team is able to work in a more coordinated and effective manner in dealing with crises, including in the application of standard CPR protocols. This reduces response time and increases the chance of patient safety.

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Factors Determining the Success of CPR Training in Emergency Management plays a crucial role in ensuring the safety and welfare of patients in public hospitals. CPR training is a vital component of effective emergency care, and a variety of factors influence its success. First of all, the factor of a qualified instructor is very important. An experienced and well-trained CPR instructor will be able to deliver the material clearly, explain techniques correctly, and provide effective demonstrations to trainees. They must also be able to provide constructive feedback to participants to ensure that the CPR techniques taught are understood and applied correctly. Apart from that, the sustainability factor of training also plays an important role. Successful CPR training requires an ongoing approach, not just one-

time training. An effective program will provide regular training and repetition of material to update participants' knowledge and skills. This allows them to remain skilled and confident in providing CPR in emergencies.

Furthermore, adequate equipment should be noted. Successful CPR training requires access to the proper CPR equipment required for simulated training. This includes realistic CPR mannequins, defibrillators, and other equipment used in emergency care. The right equipment allows trainees to train effectively and experience something close to a real emergency. The involvement of hospital management in supporting the CPR training program is also very important. Actively supportive management will allocate sufficient resources to implement training programs, ensure the availability of qualified instructors, and ensure that CPR training is integrated into overall hospital policies and procedures. This includes setting clear training standards, ensuring compliance with relevant regulations and policies, and providing incentives or rewards for staff who participate in training.

Apart from that, safety culture factors and awareness of the importance of CPR in handling emergencies can also influence the success of training. The strong safety culture in public hospitals encourages staff to take CPR training seriously and treat it as a priority. Awareness of the importance of CPR in saving lives and improving patient outcomes can encourage staff to participate in training and actively update their skills regularly. Individual motivational factors also play a role in the success of CPR training. High motivation from training participants to learn and master CPR techniques can increase the effectiveness of training. This may arise from a personal awareness of the importance of CPR, a drive to improve professional skills and knowledge, or a desire to become better prepared to deal with emergencies in the workplace.

Lastly, family and community support can also play a role in the success of CPR training. Families of medical personnel and public hospital staff can provide moral and emotional support to those taking part in the training, as well as encourage them to continue improving their CPR skills. In addition, communities can also be a source of support and motivation by organizing CPR training programs for the general public, which can help increase awareness of the importance of CPR and expand the reach of training. Overall, the success of CPR training in emergency management in public hospitals is influenced by a number of diverse factors, including qualified instructors, continuity of training, adequate equipment, management support, safety culture and awareness of the importance of CPR, individual motivation, and family support and community. By paying attention to these factors and taking appropriate action, public hospitals can improve the effectiveness of their CPR training and increase readiness to respond to emergencies quickly and efficiently.

CONCLUSIONS

Based on the results and discussion above, it can be concluded that the case study on the effect of cardiopulmonary resuscitation (CPR) skills training in emergency management in public hospitals shows that CPR training has an impact in increasing the readiness and ability of medical personnel in handling emergencies involving cardiac arrest or stop breathing. The research results showed that CPR training was successful

in increasing knowledge, practical skills, self-confidence, attitudes towards handling emergencies, and the efficiency of the emergency handling team as a whole. The training participants were able to understand the basic concepts of CPR better, perform CPR techniques more correctly, and integrate the use of the defibrillator more confidently. Apart from that, they also become more aware of the importance of quick and effective responses in emergencies and are able to work more coordinated and effectively within emergency response teams. Thus, CPR skills training in public hospitals is a crucial step in improving patient safety and increasing the chances of survival of patients who require emergency measures such as CPR.

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University Hospitals of Derby and Burton NHS Foundation Trust, Royal Derby Hospital, Derby, UK, Johnson, G., University of Nottingham Medical School, East Block, Lenton, Nottingham, UK, Bryson, P., International SOS, Forest Grove House, Forrester Hill Road, Aberdeen, UK, Tilbury, N., University

Hospitals of Derby and Burton NHS Foundation Trust, Royal Derby Hospital, Derby, UK, McGregor, B., No specified affiliation, Wesson, A., No specified affiliation, Hughes, G. D., University Hospitals of Derby and Burton NHS Foundation Trust, Royal Derby Hospital, Derby, UK, Hughes, G. R., University Hospitals of Derby and Burton NHS Foundation Trust, Royal Derby Hospital, Derby, UK, Tabner, A., University Hospitals of Derby and Burton NHS Foundation Trust, Royal Derby Hospital, Derby, UK, & University of Nottingham Medical School, East Block, Lenton, Nottingham, UK. (2023). Delivering manual cardiopulmonary resuscitation (CPR) in a diving bell: An analysis of head-to-chest and knee-to-chest compression techniques. *Diving and Hyperbaric Medicine Journal*, *53*(3), 172–180. https://doi.org/10.28920/dhm53.3.172-180

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