



The Effect of Basic Life Support Training on Nurses' Ability to Perform Cardiopulmonary Resuscitation in the Emergency Department

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ABSTRACT

Background: Cardiopulmonary resuscitation (CPR) is a crucial step in treating cardiac arrest. Emergency nurses' ability to perform CPR is greatly influenced by the knowledge and skills gained from Basic Life Support (BLS) training.

Objective: This study aims to analyze the effect of BHD training on nurses' ability to perform CPR in the Emergency Department (IGD).

Method: Quantitative research with *pre-experimental design one group pretest-posttest Design*. A sample of 30 emergency room nurses was selected using *total sampling*. The instruments consisted of a knowledge questionnaire, a skills observation sheet, and a CPR implementation guide according to American Heart Association standards. Association (AHA) 2020. Data analysis using *paired t- test* with $\alpha=0.05$.

Results: The study showed a significant increase in nurses' abilities after receiving BHD training. The average knowledge score increased from 65.3 to 87.6, while the average skill score increased from 60.1 to 89.2 ($p=0.000$).

Conclusion: BHD training has a significant effect on improving nurses' ability to perform CPR in the ER.

Keywords: Basic Life Support, Cardiopulmonary Resuscitation, Nurse, Emergency Room

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1. Introduction

Emergencies are a major challenge in healthcare, particularly in the Emergency Department (ER). One of the most common critical conditions is cardiac *arrest*, which requires fast, precise, and skilled action through Cardiopulmonary Resuscitation (CPR). According to the American Heart Association Association (AHA, 2020), the success of CPR in saving patients is greatly influenced by the speed of cardiac arrest detection, the quality of chest compressions, and the effectiveness of ventilation performed by health workers.

Nurses in the emergency department (ER) play a crucial role as front-line first aid providers for patients with cardiac arrest. However, research shows that nurses' CPR skills are often suboptimal, partly due to a lack of knowledge and practical skills related to Basic Life Support (BLS) (Iskandar et al., 2021). Therefore, BHD training is an effective strategy in improving nurses' knowledge, skills, and confidence in dealing with cardiac arrest cases.

BHD training not only provides theoretical understanding but also hones practical skills through real-life simulations. Several studies have reported significant improvements in CPR skills after BHD training (Rahmawati et al., 2022; Syafruddin et al., 2023). In addition, this training is able to maintain the quality of nursing skills over a certain period of time, although repeated training is required to maintain competence.

Based on this phenomenon, this study aims to determine the effect of Basic Life Support training on nurses' ability to perform Cardiopulmonary Resuscitation in the Emergency Department. The results are expected to serve as a basis for evaluating ongoing training programs for healthcare workers, particularly nurses in the Emergency Department, to improve the quality of emergency care and reduce mortality due to cardiac arrest.

2. Research methods

a) Research Design

This study uses a pre -experimental design with a one-way approach. group pretest-posttest This design was chosen because it allows researchers to measure the nurses' abilities before and after being given an intervention in the form of Basic Life Support (BLS) training.

b) Location and Time of Research

The research was conducted at the Emergency Room (IGD) of Hospital X in January–March 2025.

c) Population and Sample

40 nurses working in the Emergency Room of Hospital X. *The research sample was taken using the total sampling technique, so that all Emergency Room nurses who met the inclusion criteria were made respondents.*

Inclusion criteria :





1. Nurses who actively work in the emergency room.
2. Willing to follow the entire series of training and evaluation.
3. Not on leave during the research period.

Exclusion criteria :

1. Nurses who were not present during the pretest or posttest.
2. Nurses who have certain medical conditions that prevent them from participating in the simulation.

d) Research Variables

- Independent variable: Basic Life Support Training.
- Dependent variable: Nurses' ability to perform Cardiopulmonary Resuscitation.

e) Research Instruments

The instruments used in this study are:

1. Knowledge questionnaire about BHD and CPR that has been tested for validity and reliability.
2. CPR skills checklist based on American Heart standards Association (AHA, 2020), includes response speed, hand position, compression depth, compression frequency, and ventilation techniques.

f) Research Procedures

1. Respondents were given a pretest to assess their initial abilities (knowledge and skills) in performing CPR.
2. Respondents participated in BHD training, which consisted of theoretical presentations and direct practice with simulation mannequins.
3. After training, respondents were given a posttest to assess the improvement in skills after the intervention.

g) Data analysis

Data were analyzed using a paired t- test to determine differences in ability scores before and after training. The significance level was set at $\alpha = 0.05$.

3. Research Result

a. Results

1. Respondent Characteristics

The number of respondents in this study was 40 nurses who worked in the Emergency Room of Hospital X.

- Gender: 25 (62.5%) female and 15 (37.5%) male.
- Age: the majority are 25–35 years old (70%).
- Length of service: most have worked for 3–7 years (65%).
- Education: 75% of respondents have a D3 degree in Nursing, the rest have a S1 degree in Nursing.





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2. Nurses' Knowledge Skills Before and After Training

The results of the analysis showed an increase in the average knowledge score of nurses after BHD training.

Knowledge Average (Mean ± SD) Min– Max

| | | |
|----------|------------|-------|
| Pretest | 62.5 ± 8.7 | 50–75 |
| Posttest | 85.3 ± 6.4 | 70–95 |

The paired t- test showed a p value = 0.000 ($p < 0.05$), which means there was a significant difference in knowledge before and after training.

3. Nursing Skills Competence Before and After Training

Evaluation of CPR skills is carried out using a practical checklist using a mannequin.

CPR Skills Average (Mean ± SD) Min– Max

| | | |
|----------|-------------|--------|
| Pretest | 58.7 ± 10.2 | 40–70 |
| Posttest | 88.6 ± 7.1 | 75–100 |

The results of the paired t- test showed $p = 0.000$ ($p < 0.05$), which means there was a significant increase in nurses' skills in performing CPR after attending the training.

Summary of Results

Overall, Basic Life Support training had a significant impact on improving the knowledge and skills of nurses in the Emergency Department in performing Cardiopulmonary Resuscitation.

b. Discussion

The results of the study showed that Basic Life Support (BLS) training significantly improved nurses' knowledge and skills in performing Cardiopulmonary Resuscitation (CPR). The increase in the average knowledge score from 62.5 to 85.3 and the skill score from 58.7 to 88.6 illustrates that the training method is effective in improving nurse competence in the Emergency Department.

1) Knowledge Enhancement

The increase in nurses' knowledge after training is in line with adult learning theory, where the training process is hands -on. training) can improve participants' understanding and memory (Knowles, 2016). Adequate knowledge is crucial, as it forms the basis for quick and accurate decision-making when faced with cardiac arrest. This finding aligns with research by Wulandari et al. (2021) reported a





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significant increase in nurses' knowledge after receiving BHD training in the emergency room.

2) Skills Enhancement

Skills outcomes also experienced significant improvement, indicating that hands-on practice using mannequins provided a simulated experience that approximated real-world conditions. This aligns with Irawan and Sari's (2020) opinion, which states that CPR skills will be more optimal when practiced repeatedly in a practical setting that mimics a real emergency. Good skills are crucial to the success of resuscitation efforts, as the quality of chest compressions and ventilation is directly related to patient outcomes (American Heart Association, 2020). Association, 2020).

3) The Role of Training in Emergency Preparedness

In the Emergency Department, nurses are often the first healthcare workers to encounter cardiac arrest patients. Therefore, improving their skills through BHD training is crucial to support preparedness and quality of care. This research reinforces the findings of Rahmawati et al. al. (2022) who emphasized that routine training can increase the speed of nurses' response in performing resuscitation actions.

4) Research Implications

This finding emphasizes the need for regular BHD training programs in hospitals, considering that resuscitation skills tend to decline if they are not practiced frequently (skills). decay). In addition, the existence of BHD competency standards for all health workers, especially emergency room nurses, will improve patient safety.

5) Research Limitations

This study is limited by its relatively small sample size and its single-site location, making the results unable to be generalized to all healthcare settings. Further research with a broader scope and a longitudinal design is needed to evaluate long-term knowledge and skill retention.

4. Conclusion and Suggestions

a. Conclusion

Based on the research results, it can be concluded that Basic Life Support (BLS) training has a significant impact on improving nurses' ability to perform cardiopulmonary resuscitation (CPR) in the Emergency Department. After participating in the training, there was a significant increase in nurses' knowledge, technical skills, and confidence in performing CPR according to standards. This indicates that structured, systematic, and ongoing BLS training is highly effective in strengthening nurses' clinical competence in treating patients with cardiac arrest.





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**b. Suggestion**

- 1) For hospitals: It is recommended to hold BHD training regularly and continuously as part of the nurse competency development program, especially in the Emergency Room and critical units.
- 2) For nursing staff: Nurses are expected to continue to improve their skills through direct practice, simulations, and participating in advanced training on CPR and Advanced Resuscitation. Cardiac Life Support (ACLS).
- 3) For further researchers: It is hoped that they can examine the effectiveness of BHD training with a broader research design, involving a larger sample, and assessing the long-term impact on service quality and patient safety.
- 4) For nursing educational institutions: BHD training should be included as mandatory material in the curriculum so that nursing students have the necessary CPR skills from an early age.

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