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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

EVALUATION OF RESUSCITATION CARDIOPULMONARY
TRAINING FOR THE NEW NURSE

A Thesis Submitted in Partial Fulfillment
of the Requirements of the Degree of
Master of Science

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College of Natural and Health Sciences
School of Nursing
Advanced Nurse Generalist

December, 2019

This Thesis by: Nguyen Thi Yen Nhan

Entitled: *Evaluation of Cardiopulmonary Resuscitation Training for the New Nurse*

Has been approved as meeting the requirement for the Degree of Master of Science in College of Natural and Health Sciences in the School of Nursing, Advanced Nurse Generalist program

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ABSTRACT

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This study aimed to define effective cardiopulmonary resuscitation training for new nurses. Nurses who respond to emergency situations are required to have the sensitivity and professional skills to respond effectively. Thus, improving resuscitation knowledge and technique for nurses is critical in order to enhance the quality and safety of patient care. This study used a pretest and posttest research design with convenience sampling; the sample consisted of 30 nurses who worked at the study hospital. As a result, new nurses' knowledge improved from 7% to 73% after training. The psychomotor development of skills after the cardiopulmonary resuscitation training improved to 57% from 43%. It is recommended that knowledge and practice skills be maintained by training to ensure ongoing competency.

Keywords: CPR, cardiopulmonary resuscitation, nurse, training, education.

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CHAPTER I

INTRODUCTION

Background and Significance of the Problem

Cardiovascular disease (CVD) is the leading cause of death worldwide; 17.9 million people died from CVDs in 2016. Of these deaths, 85% were related to cardiac arrest and stroke (World Health Organization [WHO], 2019). In the United States, cardiac arrest is a leading cause of death. It is estimated more than 356,000 out-of-hospital cardiac arrests occur with 90% of them fatal (Sudden Cardiac Arrest Foundation, 2018). To describe in-hospital resuscitation of cardiac arrest in the United States, a multisite observational prospective study was conducted between January 1, 2000 through June 20, 2002 in which 14,720 adult patients experienced cardiac arrest (Peberdy et al., 2003). Overall survival rate from in-hospital cardiac arrest to hospital discharge was 17%. Improving awareness and timely response of medical staff could reduce deaths from cardiac arrest (Peberdy et al., 2003).

In Vietnam, a study at Thong Nhat hospital in 2010 showed that almost 97.6% of out-of-hospital cardiac arrest cases resulted in mortality and only 2.4% patients survive (Cong, Dung, Hoang, & Dao, 2010). Similar research conducted by Huy and Hon (2014) at Truong Vuong hospital showed out-of-hospital cardiac arrests had a survival rate of 5%.

American Heart Association (AHA, 2015) guidelines for cardiopulmonary resuscitation (CPR) are identified as the world's most trustworthy resuscitation guidelines. Cardiopulmonary resuscitation is a lifesaving medical procedure given to someone who is in cardiac arrest. It helps pump blood around the person's body when the heart stops. Cardiopulmonary resuscitation provides blood flow to the heart and brain to maintain life.; it keeps the blood flow active, even partially, to extend the opportunity for a successful resuscitation once trained medical staff arrive on site. Therefore, this efficiency highlights the need for trained rescuers to deliver the highest quality CPR possible.

To improve the quality of CPR, the inclusion of automated external defibrillator (AED) skill practice during CPR training was added by the AHA (2019). Automated external defibrillator availability can now be found in a variety of public settings. In the United States, AED is available in airports, museums, federal buildings, and even in schools. The purpose of availability is to reduce the time to deliver AED for a patient and optimize a patient's chance of survival. In 2000, U.S. Congress passed legislation regarding placement of AEDs in federal buildings to improve survival rates of individuals who experienced cardiac arrest in these buildings (Public Health Improvement Act, 2000).

The nurse is an important factor in patient outcomes. Numerous studies have established the need for all healthcare professionals to be trained for resuscitation care. Moreover, nursing staff play an important role in the emergency cardiac resuscitation chain. The nurse is usually among the first people to respond in an emergency at a hospital and the survival rate of patients could depend on the resuscitation skills of the

nurse. Thus, improving nurses' resuscitation knowledge and skills retention is essential to ensure nurses have the competencies to provide high quality care at the right time (Oermann, Kardong-Edgren, & Odom-Maryon, 2012).

Currently, the hospital environment places an emphasis on a culture that prioritizes safety and high-quality care. One way to ensure the safety of patients is to provide opportunities for nurses to practice responding to cardiac distress in simulated situations. Using simulations in learning and teaching methods help the nurses have an opportunity to experience healthcare situations and develop needed care competencies. Human patient simulation is a relatively new teaching strategy that allows learners to develop, refine, and apply knowledge and skills in a realistic clinical situation as they participate in interactive learning experiences designed to meet their educational needs. Learners participate in simulated patient care scenarios within a specific clinical environment, gaining experience, learning and refining skills, and developing competencies; all this is accomplished without fear of harm to a live patient. The use of simulation as a teaching strategy could contribute to patient safety and optimize outcomes of care. Simulation provides learners with opportunities to experience scenarios and intervene in clinical situations within a safe, supervised setting without posing a risk to a patient. Simulated practice helps maximize learning and limits the frequency and impact of medical errors for nurses. Simulation-based education has strong education effects in the psychomotor domain (Kim, Park, & Shin, 2016). Thus, using simulation models for cardiopulmonary resuscitation training in accordance with AHA guidelines is an effective method to improve the quality and survival rate of patients with cardiac arrest.

Problem Statement

New nurses must be trained in CPR. Training nurses to perform resuscitation procedures is essential because nurses frequently encounter patients in cardiac arrest; therefore, nurses need to have integrated knowledge and skills to respond in emergency situations to immediately optimize patient survival rates (Oermann et al., 2012). To assess pre-arrest physiologic changes in patients, Rich (1999) conducted a retrospective study that examined medical records of 100 patients who had experienced an in-hospital cardiopulmonary arrest. Results showed assessment variances present in patients were recognized by nurses prior to the cardiac arrest. Thus, continuing education about cardiac arrest for nurses needs to include competencies to assess a patient's pre-arrest status (Rich, 1999).

Unfortunately, many healthcare providers are not providing high-quality resuscitation skills in high-risk clinical situations. This is especially true for new nurses who have completed the usual nursing education and practical hospital training in nursing school but lack experience to identify a patient with cardiopulmonary arrest in the hospital setting. Even though new nurses have a foundation of nursing knowledge and skills, evidence has shown new nurses experience stress and challenges with beginning nursing practice. Stresses reported by new graduates included not feeling confident and competent as well as making mistakes due to workload and responsibilities. New graduates reported anxiety about caring for patients and encountering new clinical experiences (Oermann & Garvin, 2002). Providing a safe environment for new nurses to learn about new procedures and techniques is essential to enhance not only the confidence of the new nurse but to enhance the quality of care and patient safety.

Cardiopulmonary resuscitation is a lifesaving intervention for cardiac arrest. However, survival depends in part to the quality of CPR delivered. High-quality CPR provides 10-30% normal blood flow to the heart and 30%-40% of normal blood flow to the brain. The inefficiency of CPR identifies the need for delivery of the highest quality CPR possible. The recovery of the patient depends on the quality of cardiopulmonary resuscitation. The need to provide excellent CPR knowledge and skills to nurses is essential to ensure optimal implementation of CPR to patients who experience cardiac arrest (Meaney et al., 2013).

In addition, the quality of cardiopulmonary resuscitation also includes using AEDs. Automated external defibrillator use in the early stages of cardiopulmonary resuscitation is emphasized in the chain of survival of AHA guidelines (AHA, 2015). Automated external defibrillator have been widely accepted to use in public, even on the very young, because they are less complicated for unskilled users. When an AED is turned on, the user follows the voice prompts and visual cues. Nevertheless, in Vietnam, AED use is still unpopular in the community and among medical practitioners as well.

Limited research exists about CPR for new nurses in Vietnam. There is little concern regarding nurse's knowledge and skill around CPR. However, CPR can save lives. Nurses are on the front line to not only identify signs and symptoms of pre-cardiac arrest but to initiate CPR. New nurses must have the knowledge and skills to perform high quality CPR.

Gap Statement

Every five years, AHA guidelines for CPR and emergency cardiovascular care (ECC) are updated. The latest version shows a new development in resuscitation science

(AHA, 2015). Firstly, they emphasized the use of chest compressions, suggesting the untrained lay rescuer should use compression-only (hands-only) CPR until advanced providers with additional training come to assist. This was suggested instead of the need to do a ratio of 30 compressions to two breaths (Hazinski et al., 2010). Secondly, the chest compression rate changed to 100 to 120/min in AHA 2015 from 100/min in AHA (2010). Thirdly, rescuers should perform chest compression to a depth limit of 5-6 cm while AHA (2010) recommended compressions at least 5 cm. Fourthly, there was the subject of chest recoil. In the 2015 guidelines, the AHA suggested the rescuer avoid pressing on the chest after compression, which would allow full chest wall recoil for the victim in cardiac arrest. Fifthly, the newest recommendation by the AHA (2015) was the use of social media to summon rescuers. Because of these key changes in the 2015 updated guidelines for CPR, training with new criteria is critical for improving nurse knowledge and competencies.

Previous research on CPR coaching and maintaining skills has been conducted with physicians, nurses, and emergency medical services personnel. However, there is limited research on CPR for new nurses. In health care, the emphasis is on giving accurate and safe care to patients. Simulations and the use of simulators allow for the practice of this important skill in a less threatening environment (Kim et al., 2016).

Purpose of Research

The aim of this study was to explore the knowledge and practical skills of CPR of new nurses. Cardiopulmonary resuscitation knowledge was compared before and after a structured, standardized CPR course. After completing the course, nurses were evaluated

to determine whether they acquired satisfactory CPR resuscitation knowledge and skills.

The research results were used to inform CPR training for new nurses.

Research Questions

The following research questions guided this study:

- Q1 What is the difference in knowledge about CPR before and after teaching are measured by pre-test and post-test?
- Q2 What is level of CPR competency after CPR teaching and demonstration as measured by CPR checklist?

Theoretical Framework

The model of nursing practice developed was by Patricia Benner (1984) who emphasized development from novice to expert practice. The five levels of expertise include novice, advanced beginner, competent, proficient, and expert. Benner asserted that undergraduate nursing students need faculty to place a greater emphasis on clinical experiences and not just lecture. Benner's model depends on the acquisition of expertise through clinical experiences but does not specifically define how an individual might gain these experiences or how more rapid progression to higher levels of practice could be facilitated. In this study, the new nurse is the main subject of emphasis so the competence of new nurses can be enhanced by training and practice, which could reduce the distance from novice and experienced nurse through practice.

Assumptions

The following assumptions were made concerning this research. The knowledge evaluation tool used would elicit reliable feedback. After the researcher provided a guide and explanation, the content for the participants was clear. The participants fully understood the questions they were asked and provided honest statements about their

knowledge in the pretest and posttest. Finally, the participants performed CPR on simulation mannequins following the AHA (n.d.) checklist.

Significance of the Research

The results from this intervention study would be useful as a baseline for experts and researchers interested in similar studies. In addition, it provided knowledge and practice to healthcare practitioners to correctly respond in cardiovascular emergencies. The study might provide support for the practice of nurses to perform certain procedures in resuscitation, especially in the use of AED and defibrillation.

Definition of Variables and Relevant Terms

Automated external defibrillators. Used to help those experiencing sudden cardiac arrest. They are sophisticated, yet easy-to-use, medical devices that can analyze the heart's rhythm and, if necessary, deliver an electrical shock, or defibrillation, to help the heart reestablish an effective rhythm (American Red Cross, 2019a).

Basic life support or BLS. The action of the first-responder is to prevent damage to the brain and improve a patient's chances of survival until advanced care becomes available. It includes knowledge and skills in cardiopulmonary resuscitation (CPR), using automated external defibrillators (AED) and relieving airway obstructions in patients of every age (American Red Cross, 2019b).

New nurse. A nurse who has graduated from a nursing program and has less than two years of experience in the nursing field.

CHAPTER II

LITERATURE REVIEW

The literature review is a synthesis of many studies related to a topic. The purpose of the literature review was to assess the evidence and summarize results from different studies. In addition, the literature review provides a general report on concepts and theories related to the topic and offers methods to minimize potential gaps and reduce controversy. Thus, conducting a literature review is to improve the evidence and credibility for the topic.

Search Strategy and Keywords

The research was based on PubMed, CINAHL, EBSCO, Cochrane from 2009 to 2019 that focused on the primary setting in cardiopulmonary resuscitation. The following keywords were used to locate research: CPR, cardiopulmonary resuscitation, nurse, training, competency. The first scan showed 218 studies were retrieved using “CPR or Cardiopulmonary” AND “nurse” AND “training” and 99 studies retrieved were as “new nurse” AND “competence.” Forty relevant articles were reviewed for this research.

High Quality Cardiopulmonary Resuscitation

Cardiopulmonary resuscitation has been practiced for over 50 years. It is a set of specifically designed procedures that include chest compressions and artificial ventilation to maintain blood flow to the brain and other organs when someone is not breathing or heartbeat has stopped. This means tissue death is delayed, extending the opportunity for

successful resuscitation before healthcare professionals arrive with a more advanced intervention (Meaney et al., 2013).

The chain of survival consists of five important links: early recognition in the emergency, quick activation of the emergency system, rapid administration of CPR, quick access to advanced life support, and transport to the post-resuscitation care (AHA, 2015). In addition to performing CPR early, high-quality CPR is an important component to increasing the survival rate after a patient suffers a cardiac arrest. High-quality CPR includes minimized interruption in chest compressions, accuracy in the rate and depth of chest compressions, recoil of the chest after compression, and the avoidance of excessive ventilation. In fact, it is not often that a patient gets high-quality CPR, especially if the responder is uncertain or hesitant to treat life-threatening emergencies. This ambiguity also accounts for the lack of knowledge to deal with emergency situations. Since nurses are most frequently first responders in hospital cardiac arrest, it is imperative they have the knowledge and skills to initiate CPR to enhance patient outcomes. To evaluate the knowledge of the nurse about basic life support (BLS), a questionnaire was distributed to nurses in a small hospital (Xanthos et al., 2012). Research results showed a low level of knowledge of nurses regarding BLS. Further, a refresher BLS course or previous experience with BLS had no impact on the knowledge score of these nurses (Xanthos et al., 2012). The results of this research provided evidence of the importance of ongoing education and practice of CPR for nurses to enhance quality of care and patient outcomes.

The AHA (2015) is one of the most trusted organizations that issues information on resuscitation science such as CPR. The AHA provides CPR training courses and

teaching that is referenced around the world. This study provides current, correct knowledge for nurses to guide performance based on the 2015 AHA guidelines for CPR.

To maintain competency, skills need to be used or practiced. Cardiopulmonary resuscitation skills deteriorate rapidly. This rapid loss of competency plus long periods of time for retraining of CPR is of concern particularly since nurses are frequently first responders to a cardiac arrest and need to be prepared to initiate lifesaving measures. Brief practice sessions are effective in maintaining or improving CPR skills and competencies in nursing students. Moving the focus from one time to ongoing regular refresh sessions to maintain and strengthen CPR skills is essential to ensure nurses are prepared to care for patients in cardiac arrest (Oermann et al., 2012).

Nurse Education

In the hospital, nurses are often the first healthcare professionals to identify a patient with a life-threatening emergency in the hospital setting and therefore should possess adequate competency to provide effective resuscitation. Their training should include safe AED and manual defibrillation procedures that permit them to provide effective care and quality BLS care to treat life-threatening emergencies. Early recognition and intervention in cardiac arrests saves lives. For every minute that passes in which a patient does not receive CPR and defibrillation, the patient's chance of survival from cardiac arrest decreases by 7–10% (Munezero, Atuhaire, Groves, & Cumber, 2018). However, knowledge and skill of CPR are not synonymous. A study suggested CPR knowledge and skill remain for a period of six months to perform resuscitation successfully (Rajeswaran, Cox, Moeng, & Tsim, 2018). Hospital personnel from three hospitals participated in a cross-sectional study about CPR; 89% of

the participants reported some training in CPR but only 11% had updated their skills within the time frame recommended by national standards. Yet, self-reported confidence in CPR was reduced after two only years since last CPR training (Hopstock, 2008). The evidence clearly demonstrated CPR competence of nurses declined with the time and too few nurses updated their CPR knowledge and competencies. Consequently, compulsory CPR training for the nurse is necessary.

Competent Nurses and Patient Outcomes

Early and effective CPR is essential for optimal patient outcomes. Kaihula, Sawe, Runyon, and Murray (2018) conducted a cross sectional descriptive study to determine the current level of knowledge and ability to perform CPR among hospital health care providers. The level of knowledge and skills by all participants was poor even though most providers had reported previous experience with CPR. These authors recommended all health care providers be trained regularly and evaluated for retention of CPR knowledge and skill to ensure readiness for quality and safe resuscitation care. Likewise, with standardized training, good quality equipment, and familiarity with CPR skills through simulated training, the nurses could effectively perform in their assigned roles (Ouseph, Mohidin, Tabsh, & Al-Hebshi, 2015). The quality of CPR performed by rescuers depends on professional learners maintaining and applying the knowledge acquisition and psychomotor skills to perfectly perform resuscitation (Soar et al., 2010). These findings emphasized education frequency for nurses is key for improving patient outcomes.

Undoubtedly time is of the essence when a person is unconscious, not breathing, or having difficulty breathing. A life preserved depends on rapid decisions of bystanders

who either choose to do something as opposed to nothing. A nurse's decision to implement CPR when the patient is in an emergent condition depends on his/her knowledge of CPR practice and confidence. Ultimately, it is the responsibility of the nurse to learn, practice, and regularly update his/her training to ensure competency for these lifesaving interventions.

Effectiveness of Simulation-Based Nursing Education

Simulation-based nursing education is an effective pedagogical approach to learning in a safe environment. Students participate in various real-life situations to gain practical experience in clinical decision-making skills. Simulation-based educational interventions in nursing could be meaningful training for novice as well as experienced nurses through realistic clinical scenarios that help them develop effective skills, practice in rare emergency situations, and provide a variety of genuine life-threatening situations (Kim et al., 2016)

Overall, strong evidence has shown the effectiveness of CPR training as well as the relationship between competent nurses and patient outcomes. The literature review provided support for this research. The purpose of this research was to identify baseline CPR knowledge and skills through BLS training for new nurses in four departments at the University Medical Center.

CHAPTER III

METHODOLOGY

This chapter explains the research method used in this thesis. It addresses every component involved in the research: study population, research setting, inclusion and exclusion criteria of the sample, and a description of the techniques used for the interviews. The reliability, validity, and selected mode of analysis are also addressed in this chapter. The chapter concludes with ethical considerations for the study.

Design

A non-randomized, one-group pretest-posttest design was used to conduct this study. Such an approach was appropriate for the purpose of assessing nurses' CPR knowledge and skills prior to and after the structured education and skill practice. The following research questions guided this study:

- Q1 What is the difference in knowledge about CPR before and after teaching are measured by pre-test and post-test?" and "
- Q2 What is the level of CPR competency after CPR teaching and demonstration as measured by CPR checklist?

Recruitment of Participants

Inclusion Criteria

Participants who joined the study had to have had fewer than two years of experience. It was also necessary for them to feel interested in participating in the study. Finally, they were required to attend the full training course.

Exclusion Criteria

Participants who were part of the nursing administration team and or had cardiopulmonary medical problems were excluded from the participant pool.

Sample

The sample size needed for this research project was calculated using the following formula:

$$P = \frac{p_1(1-p_2)}{p_2(1-p_1)}$$

$$P_{Discordant} = p_1(1-p_2) + p_2(1-p_1)$$

$$n_{pair} \geq \frac{\left(Z_{1-\alpha/2}(p+1) + Z_{1-\beta} \sqrt{(p+1)^2 - (p-1)^2 p_{Discordant}} \right)^2}{(p-1)^2 p_{Discordant}}$$

(1) The calculation formula estimates the sample size based on the proportion comparing two shortcomings.

$$\alpha=0.05$$

$$\beta=0.2$$

$$p_1=0.45$$

$$p_2=0.75$$

$$\text{The result : } n_{pair} \geq 44$$

The sample size was calculated as 44 based on predicting results for the pretest and posttest at 45% and 75%, respectively. Data collection took place over a two-week period. Thus, a convenience sample of 44 new nurses who worked in UMC was included in the study.

Study Setting

This study was conducted at the Medical University Center (UMC), which is located in Ho Chi Minh city. Ho Chi Minh is a large economic center of Vietnam; it has 25 years of experience with model schools-hospitals and UMC is the top hospital in Vietnam with international standards. Annually, there are 55,000 inpatients and 30,000 surgeries so the hospital must constantly strive to improve the quality of care to gain the trust of patients. This is no small challenge. In 2017, UMC had 43 “code blue” heart attacks reported; therefore, to meet emergency situations, medical staff must have excellent knowledge and must be trained adequately. Currently, more than 3,300 employees work at UMC; nursing accounts for 70%. They were selected from many sources throughout the country (University Medical Center Ho Chi Minh City, 2019). In addition, their knowledge and skills are not equal. Providing a process according to international guidelines is necessary to ensure consistent quality and safe care for all patients. Due to the above reasons, this study was conducted in UMC Ho Chi Minh city.

Instruments

Sociodemographic Data Form

An initial survey document was used to collect demographic data such as age, gender, height, weight, education level, department the nurses work in, graduated from school, work experience, experience in real CPR, trained CPR, location of training in CPR, and number of nurses trained in AED (see Appendix A).

Knowledge Assessment Questionnaire

A structured questionnaire containing 25 items was based on a 2015 update of AHA guidelines (see Appendix B). Scoring was based on 1 for a right answer and 0 for a

wrong answer. The maximum possible score was 25 and the minimum was 0 for level of knowledge (Inadequate < 84% and adequate \geq 84%; Hazinski, 2011).

Practice Assessment Form

This form was based on an adult CPR and AED skills testing checklist (AHA, n.d.). It is scored as right performance = 1; wrong performance = 0 with a maximum possible score of 20 and the minimum of 0. The scale of performance: Inadequate < 84%, Adequate \geq 84%). The content validity of the form was established by three experts from the University of Medicine and Pharmacy and University Medical Center (see Appendix C).

Educational Program

The education program is outlined in the steps provided in Table 1. Planning for the course is clearly described in each implementation step, the content of the course, time duration, and who was responsible for each element of the education program.

Table 1

Planning for the Cardiopulmonary Resuscitation Course

Step to Implement	Content	Duration (minutes)	Responsibility
Pretest	25 questions in the questionnaire	20	Participant
Lecture	<ul style="list-style-type: none"> • High quality CPR • Chain of survival • CPR for adult • CPR for child • CPR for infant • CPR with one provider • CPR with two providers • How to use AED 	15	Tran Thanh Long, RN Nguyen Thi Yen Nhan, RN
Skill Practice	<ul style="list-style-type: none"> • Watch CPR video • Step to Assess and active emergency system • Adult compression • Breathing • How to use AED • Repeat the cycle 	15	Nguyen Thi Yen Nhan, RN
Scenario	CPR scenario	15	Participant
Posttest	25 questions in the questionnaire	20	Participant
Test practice skill	Based on CPR checklist	15	Participant

Data Collection Procedures

In the first step, the researcher went to every department to approach and introduce the purpose and methods of the research to the nurses. Then, participants were assigned the number in the list by research assistants after consenting to participate in the study (see Appendix D). The number was used for the participant's name. In the next step, every participant in this study was given a demographics form and pretest questionnaire. After completion, they joined the CPR course. The participants were

divided into several groups of seven to eight participants each depending on the nurses' available times.

After the course, every participant in this study completed a posttest questionnaire. Then the participant performed CPR on simulation mannequins and was checked according to the CPR checklist in the final step. After the data collection process was complete, it was checked to make sure all the required data were collected fully and accurately. Completed questionnaires were then returned to a sealed mailbox for analysis.

Pilot Study

A pilot study comprised of five nurses from UMC was conducted as a trial for the main study. The pilot study was conducted to ensure the clarity of CPR questionnaires and to evaluate the feasibility and reliability of the study. Data from this pilot study were not included in the analysis of the sample.

Analysis of Data

The data were analyzed in two stages. The first stage was an analysis and computation of the descriptive statistics. The second stage was an analysis of the pretest and posttest scores of the questionnaires and testing checklists. The Statistical Package for the Social Sciences (SPSS) version 22 was used for analysis after collecting data. A p -value $< .05\%$ was used for all tests of statistical significance.

Ethical Considerations

Prior to the completion of this study, the researcher received permission in writing from the study hospital (see Appendix E) and approval from University of Northern Colorado's Institutional Review Board (see Appendix F). All participants received a full

explanation of the study and after deciding to participate, signed, and submitted the consent form to the researcher prior to participation in the study. All participants were identified with a unique study number. This study number was placed on their questionnaires and skill testing checklists to maintain anonymity. Only the researcher and the research advisor had access to the master list of participants' names and corresponding study numbers. All data collected for this study and the master list of participants were kept in a locked drawer in a locked office to which only the researcher had access. All records linking the nurse's names and numbers were destroyed after analysis was completed.

Limitations

This research is one of the first studies to evaluate training for new nurses in Vietnam so there were limitations such as a lack of reference sources. A limitation in this study was the small sample size. Due to the sample size, it would not be possible to generalize the results of this study to all new nurses. Because of the reasons above, further research is needed to use this study as a background and valid reference.

Conclusion

In this research, the intention was to discover the effect of CPR training for new nurses by intervention methods including a pretest and posttest design. The study also determined the difference between pre and post training. This research provides support for new nurse training in CPR in order to achieve better quality healthcare.

CHAPTER IV

DATA ANALYSIS AND RESULTS

The findings of this study are presented in separate sections. The first section is a brief description of the demographic data of the sample. The second section addresses the results of pretest and posttest knowledge. The third section explores the level CPR skills of nurse after an education session for cardiopulmonary resuscitation.

Description of the Sample

The demographic data are summarized in Table 2. The sample included 30 nurses who worked at the study hospital. The nurses ranged in age from 22 to 27 years and were 60 % Female ($n = 18$) and 40% Male ($n = 12$). Their average BMI was 20.93. Most of the nurses ($n = 25$, 83%) were educated at the bachelor level, graduating from University of Medicine and Pharmacy. Although 19 (63.3%) of the nurses had less than six months of nursing experience, six (20%) had 7 to 12 months and the remaining five had 13 to 24 months of nursing experience. Worthy of note was 13 (43.3%) had actual CPR experience and 21 (70%) had previous CPR education. Additionally, 28 (93.3%) did not have AED education (see Figure 1).

Table 2

Demographic Characteristics of Study Participants

Characteristic	<i>N</i>	<i>n</i>	%	<i>M</i>	Median	<i>SD</i>	Minimum	Maximum
Age	30			23.93	24.00	1.36	22.0	27.0
BMI	30			20.93	20.44	2.21	17.4	25.3
Gender	30							
Female		18	60.0					
Male		12	38.7					
Education Level	30							
Intermediate		5	16.7					
College		0	0					
Bachelor		25	83.3					
Master		0	0					
Graduated From:	30							
UMP		22	73.3					
Other		8	26.7					
Department	30							
Anesthesiology		13	43.3					
Emergency		9	30.0					
Internal cardio		4	13.3					
ICU		4	13.3					
Experience in Nursing	30							
0 – 6 months		19	63.3					
7 – 12 months		6	20.0					
13 – 24 months		5	16.7					
Real CPR Exp	30							
No		17	56.7					
Yes		13	43.3					
CPR Education	30							
No		9	30.0					
Yes		21	70.0					
If CPR Educ – where?	21							
School		3	14.29					
Hospital		18	85.71					
AED trained								
No		28	93.3					
Yes		2	6.7					

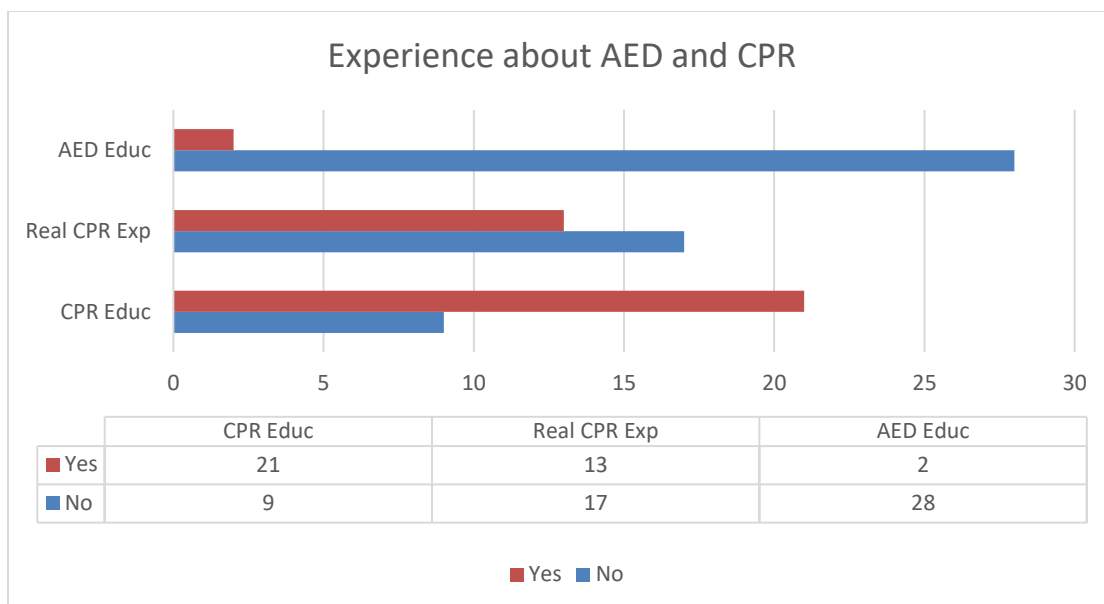


Figure 1. New nurse experience with automated external defibrillator and cardiopulmonary resuscitation.

Knowledge of Cardiopulmonary Resuscitation

Nurses' knowledge of CPR was evaluated prior to and after a planned education program (see Appendix G). The results of the pretest and posttest assessment are reported in Table 4 (see Appendix B for questionnaire with pretest/posttest assessment questions).

Knowledge of Basic Life Support/ Cardiopulmonary Resuscitation

The BLS/CPR section of the survey tool contained 25 multiple choice questions. The pretest and posttest correct and incorrect responses for each study subject are located in Table 3. There appeared to be an improvement (a positive difference) between the scoring of the correct answer of the 25 questions in this section from the results of the pretest and posttest.

Table 4 shows the result of research carried out with a p value $< .05$. A paired samples t -test was conducted to assess if there was an increase in nurses' knowledge after the education program as reflected by the number of correct responses from the pretest to posttest. In summary, the educational intervention significantly increased nurses' knowledge about BLS/CPR. The nurses gained an average of 4.2 points on the knowledge test. The gain was statistically significant at $p < .001$ by the paired t -test (two tailed).

Table 5 and Figure 2 depict information about the results of practice skills of new nurses after CPR training. For the CPR skills testing portion (items 1-14), participants had the lowest performance related to frequency of compressions: 57% performed according to guidelines and depth of compressions with only 63% performing correctly. The skills testing (items 15-20) related to AED skills. Overall, participants performed well on these skills with the exception of resuming CPR compressions after shock delivery. Furthermore, most of the nurses had never been trained about AED but they could perform the AED skill (steps 15 to 19) correctly after training (97.4%).

Table 6 and Figure 3 depict information about the skill results in comparison with the AHA (2015) standard. Only 7% of new nurses had adequate knowledge on the pretest. Surprisingly, this index changed dramatically to 73% on the posttest. The results after CPR training showed 43% of nurses had adequate knowledge to practice CPR.

Table 3

Results of Pretest and Posttest Knowledge and Skill in Practice After Training

Subject Number	Pretest		Posttest		Practice Skill	
	Correct	% Correct	Correct	% Correct	Correct	% Correct
1	17	68	20	80	16	80
2	15	60	23	92	17	85
3	18	72	23	92	15	75
4	18	72	24	96	11	55
6	17	68	21	94	17	85
7	17	68	22	88	15	75
8	18	72	22	88	18	90
9	16	64	22	88	13	65
10	14	56	20	80	16	80
11	16	64	21	84	16	80
12	16	64	21	84	17	85
13	23	92	23	92	16	80
14	16	64	22	88	15	75
15	18	72	20	80	17	85
16	18	72	21	84	17	85
17	17	68	19	76	18	90
18	17	68	21	84	16	80
19	16	64	23	92	18	90
20	17	68	20	80	17	95
21	19	76	20	80	16	80
22	18	72	24	96	16	80
23	16	64	23	92	14	70
24	17	68	21	84	19	95
25	21	84	23	92	16	80
26	14	56	22	88	16	80
27	20	80	21	84	15	75
28	15	60	16	64	14	70
29	16	64	22	88	18	90
30	16	64	21	84	17	85

Note: For exact questions, please see study instrument (see Appendix B).

Table 4

Comparison of Pretest and Posttest Results

		Paired Differences					
		<i>M</i>	<i>SD</i>	Standard Error Mean	95% Confidence Interval of the Difference		Sig. (2- tailed)
					Lower	Upper	
Pair 1	Score 2 – Score 1	4.2	2.2345	0.408	3.3656	5.0344	0.000

Table 5

Result of Practice Skills of New Nurses After Cardiopulmonary Resuscitation Training

Step	Correct	% Correct
1. Checks responsiveness	20	67
2. Shouts for help	17	57
3. Checks breathing	20	67
4. Checks pulse	22	73
5. Hand placement on lower haft of sternum	24	80
6. 30 compressions in no less 15 and no more than 18 second	17	57
7. Compresses at least 2 inches (5cm)	19	63
8. Complete recoil after each compression	26	87
9. Each breath chest given occur 1 second	24	80
10. Visible chest rise with each breath	23	77
11. Resumes compressions in less than 10 second	26	87
12. Compressions	26	87
13. Breaths	27	90
14. Resumes compressions in less than 10 seconds	27	90
15. Powers on AED	29	97
16. Correctly attaches pads	29	97
17. Clears for analysis Clears for analysis	28	93
18. Clears to safely deliver a shock	30	100
19. Safely deliver a shock	30	100
20. Ensures compressions are resumed immediately after shock deliver	19	63

N = 30

Note: For exact questions, please see study instrument in Appendix B.

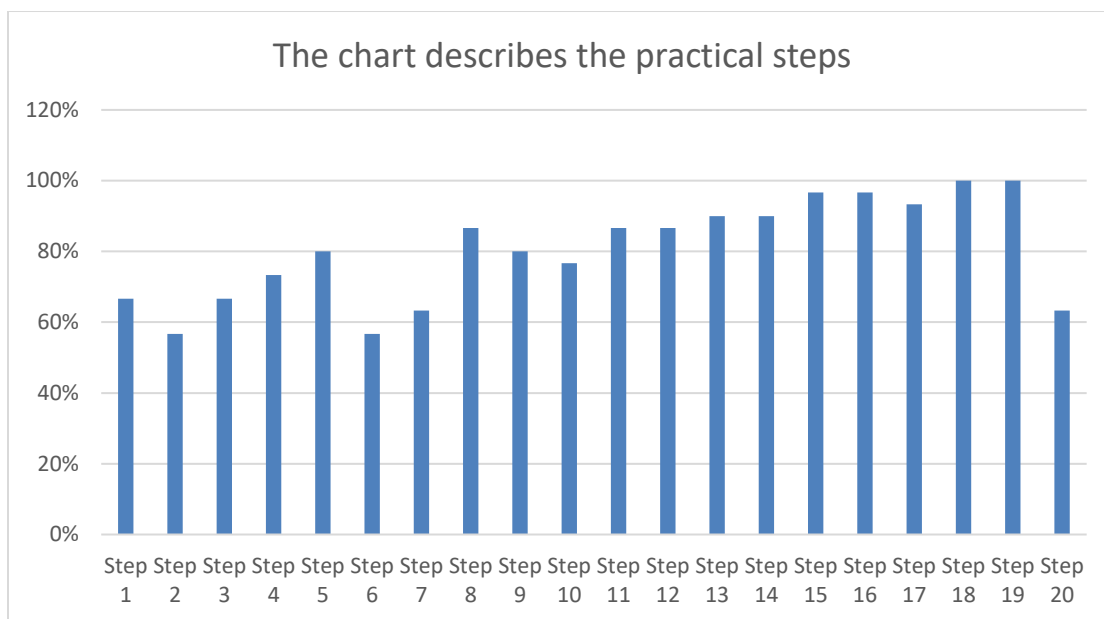


Figure 2. Practical steps after training.

Table 6

Comparison of Results with 2015 American Heart Association Guidelines

Result	Inadequate		Adequate	
	<i>n</i>	%	<i>n</i>	%
Pretest	28	93%	2	7%
Posttest	8	27%	22	73%
Skill after training	17	57%	13	43%

N = 30

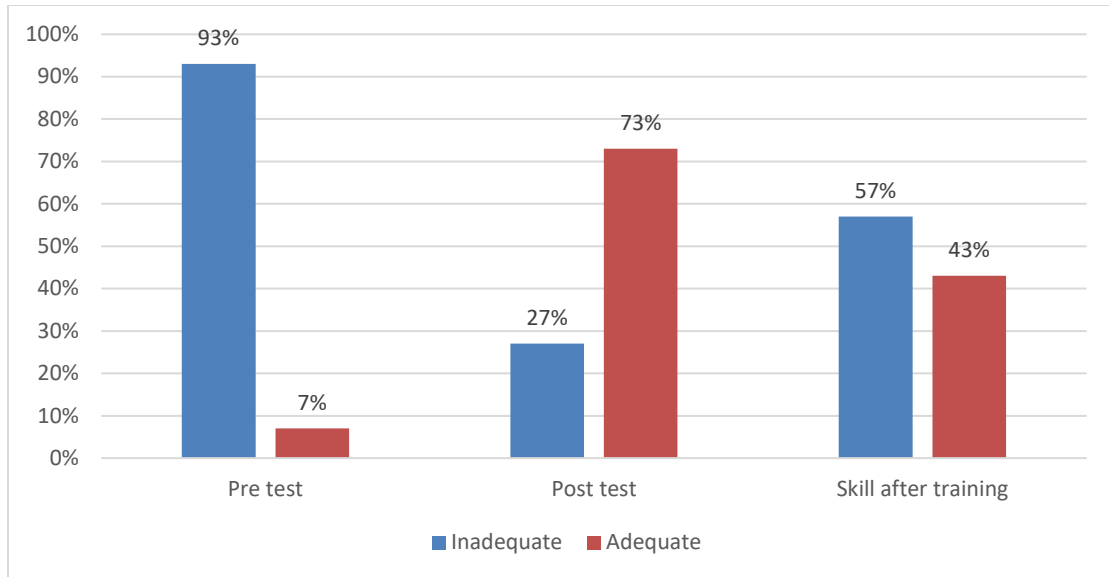


Figure 3. Research results based on American Heart Association standard.

CHAPTER V

DISCUSSION

The purpose of this study was to determine the current level of BLS/CPR knowledge and skills of new nurses who worked in hospital settings. The study investigated if an educational program specifically designed to inform the new nursing staff about the ways in which the principles of BLS/CPR could improve the level of BLS/CPR knowledge and skill for new nurses. The difference in the study was the calculation was based on the 2015 AHA standard (Adequate $\geq 84\%$) instead of the average score (Adequate $\geq 50\%$), which explained why the results achieved after the training session indicated only 43% of new nurses were Adequate in the practical skills and 73% of new nurses were Adequate in posttest knowledge.

Major Findings

The first finding related to the knowledge of new nurses. They improved their knowledge by completing the CPR training. The second finding related to the changes some new nurses implemented to perform AED correctly after the course. Therefore, this significant finding might assist with further education of new nurses.

Strengths and Limitations of the Study

The questionnaire was translated by researcher and was validated by CPR experts in Vietnam. Therefore, the content of the questionnaire was valid and reliable. This exploratory study was conducted at one hospital with new nurses who volunteered to participate in this study. The survey was in the language of the study participants

(Vietnamese). Although the reliability and validity of the study data collection instrument was previously assessed in many countries, the information attained from this study could guide and direct future training of new nurses at the Medical University Center (UMC). However, as the BLS/CPR education program for new nurses continues to grow, further validity and reliability should be formally re-assessed.

Generalizability

Generalizability of the findings of this study could be limited by several factors. A major limitation was this exploratory study was limited to one setting with a subject population of new nurses only. Therefore, conclusions were based on this limited sample size and should be generalized with caution. Another limitation was it was not possible or desirable to randomly select subjects at more than one setting. Therefore, the study sample could not be considered representative of all new nurses at general hospitals. Thus, the findings would be limited to similar population groups.

Implications for Practice

According to the AHA's (2015) recommendation, nurses in healthcare settings should be certified in BLS and nurses who work in acute care environments should have knowledge of advanced cardiovascular life support. This knowledge needs to be re-evaluated every two years (Field et al., 2010). Data collected from this study supported the need to discuss the next education program and an on-site assessment of the education program on patient care outcome. Also, this research suggests this education program should be mandatory for all nurses.

Recommendations for Research

There is a strong need to regularly update and provide additional education for new nurses regarding BLS/CPR. Further studies should assess the impact of this education on patient outcomes. Also, similar studies should be conducted in other hospitals and, according to the results, a plan for education of nursing personnel in BLS should be implemented. In addition to the assessment of knowledge and skills, further studies could be done to measure whether confidence correlated to better acquisition of necessary skills in BLS. In the survey demographics, AED knowledge rate was low as only 6.7% of new nurses were trained in AED. Another suggestion would be investing in the installation of AEDs in the hospital and making AED education available for bystanders as well.

Conclusion

This study provided rich data about new nurses' BLS/CPR knowledge. Major findings of this exploratory foundational study included (a) baseline knowledge about BLS/CPR of new nurses and the need for a specific BLS/CPR education program and (b) new nurses' knowledge and practice skills about BLS/CPR could be significantly increased by a planned educational (BLS/CPR) offering.

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APPENDIX A
SOCIODEMOGRAPHIC DATA FORM

1. Age : _____
2. Gender: Male Female
3. Height : ___ cm
4. Weight: ___kg
5. Education level : Intermediate Colleges
 Bachelor Master
6. Graduated from school: _____
7. Where do they work in University Medical Center: _____
8. How many is month experience:
 0-6 months 7-12 months 13-24 months
9. Real CPR experience:
 Yes No
10. CPR educated:
 Yes No
11. If Yes, where?: _____
12. AED educated:
 Yes No

APPENDIX B

**KNOWLEDGE ASSESSMENT QUESTIONNAIRE
IN ENGLISH AND VIETNAMESE**

1. Which of the following is a characteristic of high-quality CPR in adults?

- A. Minimizing recoil
- B. Compressing at a depth of about 1 inch
- C. Compressing at a depth of at least 2 inches
- D. Checking for a pulse every minute

2. According to the 2015 AHA guidelines for CPR and ECC, the BLS sequence of steps is now

- A. B-C-A (Breathing, Chest compressions, Airway)
- B. C-B-A (Chest compressions, Breathing, Airway)
- C. A-B-C (Airway, Breathing, Chest compressions)

3. According to the 2015 AHA Guideline for CPR and ECC, the recommend rate for performing chest compressions for victims of all ages is

- A. At least 40 compressions per minute
- B. At least 60 compressions per minute
- C. At least 80 compressions per minute
- D. At least 100 compressions per minute

Scenario :

You are a healthcare provider in a large hospital and you respond to call that there is a “very sick” person in the waiting room down the hall from you. You arrive in the waiting room just as an older man slumps over in his seat.

4. For which of the following would it be appropriate to move an adult victim who might need CPR?

- A. When help is more than 15 minute away from the scene

- B. To locate the AED when one is not available
- C. When the adult victim is in a dangerous environment
- D. As soon as the adult is found to be in arrest

5. Several colleagues are nearby. After determining that the scene is safe, you assess the victim for responsiveness and breathing. There is no response when you gently tap and speak to the victim. You note that he is not breathing. The next thing you need to do is

- A. Begin chest compressions
- B. Check for carotid pulse.
- C. Open his airway using the head tilt-chin lift technique
- D. Send someone to activate the emergency response system and get the AED.

6. Which of the following victim needs CPR?

- A. A victim with a pulse who is having trouble breathing
- B. A victim with chest pain and indigestion
- C. A victim who is unresponsive with no breathing (or no normal breathing) and no pulse
- D. A victim who is unresponsive but is breathing adequately

7. After you send someone to activate the emergency response and get an AED, you and 2 other colleagues lower the victim gently to the floor. You would then

- A. Begin chest compressions
- B. Check for a pulse.
- C. Open his airway and assess for adequate breathing
- D. Provide 2 breaths (1 second each) using a face mask with a 1-way valve

8. The recommend depth of chest compressions for an adult victim is at least

- A. 1 inch (2.5 cm)
- B. 2 inches (5 cm)
- C. 3 inches (7 cm)

AED FOR ADULT AND CHILDREN 8 YEARS OF AGE AND OLDER

9. You and several colleagues are with an adult male victim who collapsed while while entering the hospital. He is unresponsive, is not breathing, and has no pulse. You and a colleague perform 2-rescuer CPR until another colleague arrives with AED. She kneels at the victim's side, places the AED next to the victim, and opens the case. What should she do next?

- A. Place the AED pads on the chest
- B. Clear the patient
- C. Turn on the AED
- D. Press the analyze button

10. The AED analyzes the victim's cardiac rhythm and reports " No shock advised".

The victim is still unresponsive and not breathing. Next, You should

- A. Clear the victim and push the analyze button again
- B. Check for pulse ; If none , start 2-rescuer CPR
- C. Resume CPR, beginning with chest compressions

11. After 2 minutes of CPR, the AED prompts you to analyze again. The next step is to

- A. Confirm that no one is touching the victim, allow the AED to analyze, and deliver and shock if to prompted by the AED

- B. Continue with CPR until advanced providers arrive
- C. Open the airway and assess for breathing

12. This time, the AED advises you to shock the victim. After you clear the victim and deliver the shock, you should

- A. Wait for the AED to reanalyze the rhythm
- B. Immediately restart CPR, beginning with chest compressions
- C. Provide 2 breath to the victim
- D. Immediately check the carotid pulse for no more than 10 second

BLS/CPR FOR CHILDREN FROM 1 YEAR OF AGE TO PUBERTY

Scenario :

You are a healthcare provider responding to a call for help. You enter the hospital wing and see a 6-year-old boy lying motionless on the hallway floor. Another healthcare provider is already with the boy and explains to you that the boy has a heart condition and just collapsed. After confirming that the child is unresponsive and not breathing, he goes to activate the emergency response system and get AED, leaving you to attend to the victim.

13. You should now

- A. Provide rescue breaths at a ratio of 30:2
- B. Take no more than 10 seconds to check for a pulse
- C. Begin chest compressions

14. The child has no pulse. You should now

- A. Begin cycle of chest compression and breaths at a ratio of 30:2
- B. Begin cycle of chest compression and breaths at a ratio of 15:2

15. The proper compression rate for victim of all ages is at least

- A. 30 compression per minute
- B. 50 compression per minute
- C. 100 compression per minute
- D. 200 compression per minute

16. The recommend depth of compression for a child is

- A. At least one third the depth of the chest , or approximately 2 inches
- B. One quarter the depth of the chest, or approximately 1.5 inches
- C. At least two thirds the depth of the chest, or approximate 4 inches.
- D. At least three fourths the depth of the chest, or approximate 4.5 inches.

17. The proper location to perform a pulse check for a child is

- A. At the carotid artery of the neck or the femoral artery of the leg.
- B. At the brachial artery of the arm

18. Your colleague arrives with the AED, and a third rescuer arrives with a bag and mask. The colleague managing the AED opens the device and begins taking out the pads. The third rescuer use the bag and the mask, and you and your colleague begin 2-rescuer child CPR with the correct compressions-to-breaths ratio of

- A. 30:2
- B. 15:2**
- C. 20:2
- D. 5:1

19. Your colleague finds that there are only standard adult pads in the AED case.

He should

- A. Go get another AED to see if there are child pads available
- B. Cut the pads down to the right size
- C. Use the standard adult pads
- D. Fold the pads in half before use

20. In 2-rescuer CPR for an adult or child 8 years of age or older, the first rescuer begins chest compressions while the second rescuer

- A. Count compression aloud
- B. Checks for a pulse during compressions
- C. Does nothing until the first rescuer relief
- D. Maintains an open airway and gives breaths

Scenario :

You are passing by the radiology department waiting room when you hear a call for help.

You enter, check for scene safety, and find an infant lying on a radiology table. A colleague in the room says the infant suddenly become limp.

21. You and your colleague perform the next steps of BLS for an infant in the correct order by

- A. Checking for a brachial pulse, opening the airway, checking for breathing, and giving a breaths.
- B. Checking for both responsiveness and breathing, and then sending the colleague to activate the emergency response system and get the AED while you check for a brachial pulse and start CPR if there is no pulse.
- C. Opening the airway, checking for a brachial pulse, checking for breathing, and starting CPR

22. Where should a rescuer attempt to locate the brachial pulse in an infant?

- A. On the outside of the lower arm, near the wrist
- B. Inside the upper arm, between the elbow and shoulder
- C. On the medial side of the upper leg, near the groin
- D. On the side of neck, near the trachea

23. There is no pulse, and your colleague has not returned with the AED. You begin chest compressions. As a lone rescuer, you start chest compressions by using the 2-finger technique, providing ?

- A. 5 compressions, across the nipple line, at a rate of 100 compressions per minute, with a compressions-to-breaths ratio of 5:2
- B. 30 compressions, just below the nipple line, at a rate of at least 100 compressions per minute, with compressions-to-breaths ratio of 30:2
- C. 15 compression, just below the nipple line, at a rate of at least 100 compressions per minute, with compressions-to-breaths ratio of 15:2

24. More colleagues arrive at the scene, bringing the AED. You and a colleague are now ready to begin 2-rescuer CPR while the pads are being placed. Which of the following is the preferred chest compression technique for 2-rescuer CPR in an infant?

- A. 2 fingers
- B. 2 thumb-encircling hands
- C. 1 hand
- D. Either 1 or 2 hands

25. To perform the 2 thumb-encircling hands technique, you wrap your fingers and around the infant's chest, and place your thumbs

- A. Just above the navel and well below the xiphoid.
- B. On the lower half of the breastbone .
- C. 2 or 3 finger widths below the nipple line
- D. Just above the nipple line

Answer table :

1	2	3	4	5	6	7	8	9	10	11	12	13
C	B	D	D	D	C	B	B	B	C	A	B	B
14	15	16	17	18	19	20	21	22	23	24	25	
A	C	A	A	B	C	D	B	B	B	B	B	

BẢNG CÂU HỎI

I. Câu hỏi nhân trắc học:

13. Tuổi: _____
14. Giới tính: Nữ Nam
15. Chiều cao: _____ cm
16. Cân nặng: _____ kg
17. Học vấn: Trung cấp Cao đẳng Đại học Thạc sĩ
18. Tốt nghiệp tại trường : _____
19. Khoa đang làm việc: _____
20. Kinh nghiệm làm việc của điều dưỡng:
- 0-6 tháng 7-12 tháng 13-24 tháng
21. Kinh nghiệm CPR thực tế:
- Có Không
22. Đã được tập huấn trước đây:
- Có Không
23. Nếu “Có”, đã tập huấn tại đâu: _____

II. Câu hỏi kiến thức:

Giải thích các thuật ngữ viết tắt:

AHA : American Heart Association - Hội tim mạch Hoa Kỳ.

CPR: Cardiopulmonary Resuscitation - Hồi sinh tim phổi.

BLS: Basic Life Support - Hồi sinh tim phổi cơ bản.

AED: Automated External Defibrillator - Máy khử rung bên ngoài tự động.

1. Trong những yếu tố sau, yếu tố nào được xem là đặc điểm của CPR chất lượng cao ở người lớn?

- A. Hạn chế sự phục hồi của lồng ngực.
- B. Ấn tim sâu 5cm
- C. Ấn tim ở độ sâu ít nhất 5 cm và không vượt quá 6cm
- D. Kiểm tra mạch mỗi phút

2. Theo hướng dẫn của AHA 2015 cho hồi sức tim phổi và chăm sóc tim mạch khẩn cấp, trình tự các bước là :

- A. B-C-A (Thông khí - Ép tim - Khai thông đường thở)
- B. C-A-B (Ép tim - Khai thông đường thở - Thông khí)
- C. A-B-C (Khai thông đường thở - Thông khí - Ép tim)

3. Theo hướng dẫn của AHA 2015 cho hồi sức tim phổi và chăm sóc tim mạch khẩn cấp, tốc độ khuyến cáo cho việc thực hiện ép tim cho nạn nhân tất cả độ tuổi là :

- A. Ít nhất 40 lần/phút
- B. Ít nhất 60 lần/phút
- C. Ít nhất 80 lần/phút
- D. Ít nhất 100-120 lần/phút

Tình huống giả định:

Bạn là một nhân viên y tế trong một bệnh viện lớn. Bạn nhận được báo là có một bệnh nhân rất nặng đang ở dưới sảnh chờ. Bạn tới phòng chờ thì thấy một người đàn ông lớn tuổi gục ngã trên ghế.

4. Điều nào sau đây là phù hợp khi di chuyển một nạn nhân trưởng thành có khả năng cần đến CPR?

- A. Khi người trợ giúp ở cách xa hiện trường hơn 15 phút
- B. Xác định vị trí của AED khi không có sẵn
- C. Khi nạn nhân ở trong môi trường nguy hiểm
- D. Ngay khi phát hiện nạn nhân bị ngưng tim

5. Có nhiều đồng nghiệp của bạn ở xung quanh. Sau khi xác định rằng hiện trường an toàn, bạn tiếp cận nạn nhân và đánh giá đáp ứng của họ. Sau khi nhận thấy nạn nhân không có đáp ứng với lay gọi bạn cần:

- A. Bắt đầu ép tim
- B. Kiểm tra mạch
- C. Khai thông đường thở sử dụng kỹ thuật ngửa cổ, nâng hàm
- D. Nhờ một ai đó kích hoạt hệ thống cấp cứu và lấy máy AED

6. Nạn nhân nào sau đây cần được CPR?

- A. Nạn nhân bị rối loạn nhịp thở.
- B. Nạn nhân đau ở ngực và chán ăn.
- C. Nạn nhân không đáp ứng, không thở hoặc thở không bình thường và không có mạch.
- D. Nạn nhân không đáp ứng nhưng vẫn thở bình thường.

7. Sau khi bạn nhờ ai đó kích hoạt hệ thống cấp cứu và lấy máy AED, bạn và 2 người đồng nghiệp đặt nạn nhân xuống đất nhẹ nhàng. Bạn sẽ làm gì sau đó:

- A. Bắt đầu ép tim
- B. Kiểm tra mạch và nhịp thở đồng thời
- C. Khai thông đường thở, bóp bóng.
- D. Cung cấp 2 nhịp thở (mỗi lần 1 giây) bằng cách sử dụng mặt nạ với van 1 chiều

8. Theo khuyến cáo, độ sâu của ép tim cho người lớn là ít nhất :

- A. 2.5cm
- B. 5 cm và không quá 6cm
- C. 7cm

AED CHO NGƯỜI LỚN VÀ CHO TRẺ TỪ 8 TUỔI TRỞ LÊN

9. Bạn và các người đồng nghiệp đang cấp cứu một nạn nhân nam. Khi vào viện, anh ấy không đáp ứng, không thở, và không có mạch. Bạn và 1 đồng nghiệp khác thực hiện CPR với 2 cấp cứu viên cho đến khi một đồng nghiệp khác mang máy AED tới. Cô ấy quỳ xuống bên cạnh nạn nhân, đặt máy AED kế bên người nạn nhân. Cô ấy nên làm gì tiếp theo .

- A. Dán miếng AED kế bên.
- B. Làm sạch người bệnh.
- C. Mở máy AED.
- D. Nhấn nút phân tích.

10. Máy AED phân tích nhịp của nạn nhân và báo là: “ Đề nghị không sốc”. Nạn nhân vẫn không phản ứng và không thở. Tiếp theo bạn nên :

- A. Không chạm vào bệnh nhân, ấn nút phân tích lại lần nữa.
- B. Kiểm tra mạch, nếu không bắt được, bắt đầu CPR với 2 cấp cứu viên.
- C. Tiếp tục CPR, bắt đầu với ép tim.

11 . Sau 2 phút CPR, máy AED báo hiệu cần phân tích lại lần nữa. Bước kế tiếp là :

- A. Xác nhận rằng không một ai chạm vào bệnh nhân, cho phép máy AED phân tích và sốc điện nếu máy AED báo bệnh nhân cần sốc điện.
- B. Tiếp tục CPR cho đến khi đội ngũ cấp cứu tới.
- C. Khai thông đường thở và đánh giá nhịp thở.

12 . Lúc này, máy AED yêu cầu bạn sốc cho nạn nhân. Sau khi tránh xa nạn nhân và cung cấp sốc, bạn nên:

- A. Chờ cho AED phân tích lại nhịp tim.
- B. Lập tức CPR lại cho nạn nhân, bắt đầu với ép tim.
- C. Cung cấp 2 nhịp thở cho nạn nhân.
- D. Lập tức kiểm tra mạch trong vòng 10 giây.

BLS/CPR CHO TRẺ TỪ 1 TUỔI TỚI TRẺ DẬY THÌ

Tình huống giả định:

Bạn là nhân viên y tế và được gọi đến hỗ trợ cấp cứu. Bạn bệnh viện và thấy bé trai 6 tuổi đang nằm bất động trên hành lang. Một người trợ giúp khác đang ở đó với cậu bé và giải thích với bạn rằng đứa bé có bệnh tim và vừa ngã quy. Sau khi xác nhận rằng đứa bé không phản ứng, không thở, anh ấy đi kích hoạt hệ thống cấp cứu và lấy máy AED, để bạn lại với bệnh nhân.

13 . Bạn nên:

- A. Hỗ trợ hô hấp cho trẻ.
- B. Kiểm tra mạch không quá 10 giây.
- C. Bắt đầu ép tim.

14. Đứa trẻ không có mạch. Bạn nên làm gì tiếp theo :

- A. Bắt đầu với chu kỳ ép tim và thông khí với tần số 30:2
- B. Bắt đầu với chu kỳ ép tim và thông khí với tần số 15:2

15 . Tốc độ ép tim thích hợp cho nạn nhân tất cả lứa tuổi là:

- A. Ít nhất 30 lần/phút.
- B. Ít nhất 50 lần/phút.
- C. 100-120 lần/phút.
- D. Ít nhất 200 lần/phút.

16 . Khuyến cáo độ sâu ấn tim cho trẻ em là :

- A. Độ sâu ít nhất 1/3 bề dày lồng ngực hoặc tương đương với 5 - 6 cm
- B. Độ sâu ít nhất 1/4 bề dày lồng ngực hoặc tương đương với 3.8 cm
- C. Độ sâu ít nhất 2/3 bề dày lồng ngực hoặc tương đương với 10 cm
- D. Độ sâu ít nhất 3/4 bề dày lồng ngực hoặc tương đương với 11,5 cm

17 . Vị trí thích hợp để kiểm tra mạch cho trẻ là

- A. Tại động mạch cổ hoặc động mạch bẹn.

B. Tại động mạch cánh tay.

18 . Đồng nghiệp của bạn đến với máy AED và người thứ 3 đến với bóng mask.

Người đồng nghiệp đang quản lý máy AED mở thiết bị và bắt đầu lấy miếng dán ra.

Người thứ 3 sử dụng bóng mask, bạn và đồng nghiệp khác của bạn tiến hành CPR với 2 cấp cứu viên cho trẻ em với tỷ lệ giữa ép tim và thông khí chính xác là :

A. 30:2

B. 15:2

C. 20:2

D. 5:1

19 . Đồng nghiệp của bạn phát hiện ra là chỉ có miếng dán dành cho người lớn trong hộp AED. Anh ấy nên :

A. Lấy bộ AED khác để tìm miếng dán cho trẻ em.

B. Cắt miếng dán cho đúng kích thước.

C. Sử dụng miếng dán người lớn.

D. Gấp miếng dán thành 1/2 trước khi sử dụng.

20. Trong CPR với 2 cấp cứu viên cho người lớn hoặc trẻ em trên 8 tuổi, người cứu hộ thứ nhất bắt đầu ấn ngực trong khi người thứ 2 :

A. Đếm to số lần ấn ngực.

B. Kiểm tra mạch trong suốt quá trình ấn ngực.

C. Không làm gì cho đến khi thay phiên người cứu hộ thứ nhất

D. Khai thông đường thở và bóp bóng.

Tình huống giả định:

Bạn nghe gọi giúp đỡ khi đang ngang qua phòng chờ của khoa X- quang. Bạn bước vào, kiểm tra mức độ an toàn của hiện trường, và thấy một đứa trẻ đang nằm trên bàn chụp X-Quang. Đồng nghiệp của bạn nói rằng đứa trẻ bất tỉnh đột ngột.

21 . Bạn và đồng nghiệp của bạn thực hiện bước tiếp theo của hồi sinh tim phổi cơ bản cho đứa bé với thứ tự chính xác như sau :

A. Kiểm tra mạch cảnh, khai thông đường thở, kiểm tra nhịp thở, và giúp thở.

B. Kiểm tra phản ứng của bệnh nhân, sau đó nhờ người đồng nghiệp kích hoạt hệ thống cấp cứu và lấy máy AED, trong khi đó bạn kiểm tra mạch cảnh và hô hấp. Bắt đầu CPR nếu không có mạch.

C. Khai thông đường thở, Kiểm tra mạch cảnh, kiểm tra hô hấp, và bắt đầu CPR.

22 . Người cứu hộ nên bắt mạch cho trẻ dưới 1 tuổi ở đâu:

A. Bên ngoài của phần dưới cánh tay, gần cổ tay.

B. Bên trong cánh tay, giữa khuỷu tay và vai.

C. Ở phía trung điểm của chân trên, gần háng.

D. Trên cổ gần khí quản.

23 .Bệnh nhân vẫn không có mạch, người đồng nghiệp của bạn vẫn chưa quay lại với máy AED. Bạn bắt đầu quy trình ép tim một cấp cứu viên, bạn cần làm gì khi bắt đầu ép tim với kỹ thuật 2 ngón tay.

A. 5 lần ép tim , vị trí trên đường liên núm vú, với tốc độ 100 lần/phút, với tỷ lệ ép - thông khí là 5: 2

B. 30 lần ép tim, vị trí ngay dưới đường liên núm vú, với tốc độ ít nhất 100 - 120 lần/phút, với tỷ lệ ép tim-thông khí là 30: 2

C. 15 lần ép tim, vị trí ngay dưới đường liên núm vú, với tốc độ ít nhất 100 lần/phút, với tỷ lệ ép tim-thông khí là 15: 2

24. Thêm nhiều đồng nghiệp đến hiện trường, mang theo máy AED. Bạn và đồng nghiệp bây giờ đã sẵn sàng thực hiện CPR với 2 cấp cứu viên. Kỹ thuật nào sau đây được khuyến cáo trong thủ thuật ép tim với 2 cấp cứu viên cho trẻ em?

A. 2 ngón tay

B. 2 ngón cái và bàn tay bao quanh lồng ngực.

C. 1 tay

D. 1 hoặc 2 tay

25. Để thực hiện kỹ thuật 2 ngón tay cái và bàn tay bao quanh lồng ngực, và vị trí đặt ngón tay cái của bạn :

A. Chỉ trên rốn và ngay dưới xương ức

B. 1/2 dưới xương ức

C. 2 hoặc 3 khoát ngón tay dưới đường núm vú

D. Chỉ phía trên đường núm vú

APPENDIX C**ADULT CARDIOPULMONARY RESUSCITATION AND
AUTOMATED EXTERNAL DEFIBRILLATOR
SKILL TESTING CHECKLIST IN
ENGLISH AND VIETNAMESE**

Step	Content	Yes <input checked="" type="checkbox"/>/No <input type="checkbox"/>
1. Assessment and activation	Checks responsiveness	<input type="checkbox"/>
	Shouts for help	<input type="checkbox"/>
	Checks breathing	<input type="checkbox"/>
	Checks pulse	<input type="checkbox"/>
2. Adult compression-Performance high quality compression	Hand placement on lower haft of sternum	<input type="checkbox"/>
	30 compressions in no less 15 and no more than 18 second	<input type="checkbox"/>
	Compresses at least 2 inches (5cm)	<input type="checkbox"/>
	Complete recoil after each compression	<input type="checkbox"/>
3. Adult breaths Give 2 breaths with a barrier device	Each breath chest given occur 1 second	<input type="checkbox"/>
	Resumes compressions in less than 10 second	<input type="checkbox"/>
4. Cycle 2 of CPR	Compressions	<input type="checkbox"/>
	Breaths	<input type="checkbox"/>
	Resumes compressions in less than 10 seconds	<input type="checkbox"/>
5. AED (follows prompts of AED)	Powers on AED	<input type="checkbox"/>
	Correctly attaches pads	<input type="checkbox"/>
	Clears for analysis	<input type="checkbox"/>
	Clears to safely deliver a shock	<input type="checkbox"/>
	Safely deliver a shock	<input type="checkbox"/>
6. Resumes compressions	Ensures compressions are resumed immediately after shock deliver	<input type="checkbox"/>

BẢNG KIỂM KỸ NĂNG HỒI SINH TIM PHỔI VÀ SỬ DỤNG MÁY AED CHO NGƯỜI LỚN

Bước thực hiện	Nội dung	Có <input checked="" type="checkbox"/>/Không <input type="checkbox"/>
1. Tiếp cận và hành động	Kiểm tra phản ứng của nạn nhân	<input type="checkbox"/>
	Kích hoạt hệ thống cấp cứu	<input type="checkbox"/>
	Kiểm tra nhịp thở	<input type="checkbox"/>
	Kiểm tra mạch	<input type="checkbox"/>
2. Ấn ngực cho người lớn - Thực hiện ấn ngực chất lượng cao	Đặt tay ở vị trí 1/2 dưới xương ức	<input type="checkbox"/>
	Ấn ngực 30 lần, không nhanh hơn 18 giây và cũng không chậm hơn 15 giây	<input type="checkbox"/>
	Độ sâu ít nhất 5cm và không quá 6 cm	<input type="checkbox"/>
	Ngực nảy hoàn toàn sau mỗi lần ấn ngực	<input type="checkbox"/>
3. Giúp thở ở người lớn - thực hiện 2 lần giúp thở với thiết bị hỗ trợ.	Mỗi lần giúp thở hơn 1 giây	<input type="checkbox"/>
	Ngực có thể nâng lên sau mỗi lần giúp thở	<input type="checkbox"/>
	Tiếp tục ép tim thời gian gián đoạn không quá 10 giây	<input type="checkbox"/>
4. Chu kỳ 2 của CPR	Ép tim	<input type="checkbox"/>
	Bóp bóng	<input type="checkbox"/>
	Tiếp tục ép tim thời gian gián đoạn không quá 10 giây	<input type="checkbox"/>
5. AED (theo hướng dẫn của máy AED)	Bật máy AED	<input type="checkbox"/>
	Chọn miếng dán phù hợp	<input type="checkbox"/>
	Tránh xa nạn nhân để máy phân tích nhịp	<input type="checkbox"/>
	Tránh xa nạn nhân và sốc điện một cách an toàn	<input type="checkbox"/>
	Sốc điện	<input type="checkbox"/>
6. Tiếp tục ấn tim	Thực hiện ấn tim ngay lập tức sau khi thực hiện khử rung	<input type="checkbox"/>

APPENDIX D

**CONSENT FORM FOR HUMAN PARTICIPANTS
IN RESEARCH: ENGLISH AND
VIETNAMESE VERSIONS**



Institutional Review Board

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH

Project Title: Evaluation of cardiopulmonary resuscitation training for new nurse

Student Researcher: Nguyen Thi Yen Nhan

Research Advisor: Faye Hummel, RN, PhD, CTN-A, ANEF, School of Nursing

Purpose :

- Comparing the knowledge average score of nursing before and after the course
- Comparing satisfactory nursing rate resuscitation skills Cardiopulmonary respiration of nursing when completing the course.

All responses will be kept confidential and anonymous. All questionnaires will be scanned into a password protected computer and then “shredded” (permanently destroyed). All study data and information will then be kept on a thumb drive in a locked drawer in a locked cabinet. There are no anticipated risks by participation in this survey. Participation is voluntary. The course is described as the following . It will be taken about 100 minutes. It consists of 5 parts:

1. A pre-test is done before the training. It takes 20 minutes.
2. The lecture. It takes 15 minutes.
3. Practice with CPR scenario. It takes 30 minutes.
4. A Post-test is done after the training. It takes 20 minutes.
5. Test practice skills. It takes 15 minutes.
- 6.

You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled.

Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

Please give this informed consent and the completed questionnaire to the researcher (the one who gave you the form).

Committee Contact information:

Student Researcher: Nguyen Thi Yen Nhan , Master’s -student

Email: nguy3160@bears.unco.edu or yennhan3010@gmail.com

Phone: (84) 0983556350

Research Advisor: Faye Hummel, RN, PhD, CTN-A, ANEF, School of Nursing
Email: Faye.Hummel@unco.edu
Phone: (303)638-0601

Participant

Questionnaire Number Assigned _____

Print Name _____

Sign Name _____



Institutional Review Board

GIẤY ĐỒNG Ý THỰC HIỆN

Tên đề tài: Đánh giá chương trình tập huấn hồi sức tim phổi cho điều dưỡng mới.

Người thực hiện nghiên cứu: Nguyễn Thị Yến Nhân

Người hướng dẫn : Tiến sĩ Faye Hummel

Mục đích:

- So sánh kiến thức hồi sức tim phổi của điều dưỡng mới trước và sau khi tập huấn

- So sánh tỷ lệ điều dưỡng hoàn thiện kỹ năng hồi sức tim phổi sau chương trình tập huấn

Tất cả các câu trả lời sẽ được giữ bí mật và ẩn danh. Tất cả các câu hỏi sẽ được quét vào máy tính và được bảo vệ bằng mật khẩu sau đó bị cắt vụn (hủy vĩnh viễn). Tất cả dữ liệu và thông tin nghiên cứu sẽ được lưu giữ trên ổ đĩa được cất vào ngăn kéo trong tủ có khóa. Không có rủi ro nào dự đoán cho việc tham gia khảo sát này. Nếu bạn hoàn thành khảo sát, được xem như là bạn đồng ý tham gia.

Việc tham gia là tự nguyện. Khóa học được mô tả như sau. Nó sẽ được thực hiện khoảng 100 phút. Nó bao gồm 5 phần:

1. Một bài kiểm tra trước được thực hiện trước khi đào tạo. Phải mất 20 phút.
2. Bài giảng. Phải mất 15 phút.
3. Thực hành với kịch bản hồi sinh tim phổi. Phải mất 30 phút.
4. Một bài kiểm tra sau tập huấn. Phải mất 20 phút.
5. Kiểm tra kỹ năng thực hành. Phải mất 15 phút.

Bạn có thể quyết định không tham gia nghiên cứu này và nếu bạn bắt đầu tham gia, bạn vẫn có thể dừng và rời đi vào bất cứ thời điểm nào. Sự quyết định của bạn luôn được tôn trọng và không ảnh hưởng đến quyền lợi mà bạn đang có.

Vui lòng đọc và có thể hỏi bất kỳ câu hỏi nào, ký tên dưới đây nếu bạn tham gia vào nghiên cứu này. Một bản sao của giấy này sẽ được gửi bạn giữ tham khảo cho tương lai. Nếu bạn có bất kỳ mối quan tâm cho việc chọn lựa hay điều trị như một người tham gia nghiên cứu, vui lòng liên hệ Cơ Quan Nghiên Cứu, Kepner Hall, Trường Đại Học Northern Colorado Greeley, CO 80639; 970-351-1910.

Vui lòng cho thông tin đồng ý này và hoàn thành bảng câu hỏi nghiên cứu (người đưa bạn mẫu thông tin này)

Thông tin liên lạc của hội đồng:

Sinh viên nghiên cứu: Nguyễn Thị Yến Nhân, sinh viên lớp Thạc sĩ

Email: nguy3160@bears.unco.edu or yennhan3010@gmail.com

Điện thoại: (84) 0983556350

Cố vấn nghiên cứu: Tiến sĩ Faye Hummel

Email: Faye.Hummel@unco.edu

Điện thoại: (303) 638-0601

Người tham gia

Số câu hỏi chỉ định _____

Ghi tên _____

Ký tên _____

APPENDIX E

**PERMISSION FROM UNIVERSITY MEDICAL
CENTER TO CONDUCT STUDY**



UNIVERSITY MEDICAL CENTER®

Ho Chi Minh City, 05 June, 2019

LETTER OF APPROVAL

Dear RN. Nguyen Thi Yen Nhan,

This letter is to response to your request for approval to collect data for research entitled "Evaluation of Cardiopulmonary Resuscitation Training for New Nurse" at the University Medical Center, Ho Chi Minh City, Vietnam (UMC). We are pleased to inform you that the application has been approved and data collection could be started at UMC in according to the following details:

- Study subject: New nurse with less than 2 years experience
- Sample size: 44
- Department: Anesthesiology Department, Emergency Department, Critical Care Department, Cardiology Department
- Duration: 05/Jun/2019 – 22/Jun/2019
- Authorized personnel: RN. Nguyen Thi Yen Nhan

The researchers are required to comply with all conditions and regulations in data collection at University Medical Center, Ho Chi Minh City, Vietnam.

Sincerely yours,



BUI NGOC MINH TAM, MD.

Vice Manager, Training and Scientific Research Department
University Medical Center, Ho Chi Minh City

APPENDIX F
INSTITUTIONAL REVIEW BOARD APPROVAL



Institutional Review Board

DATE: July 2, 2019

TO: Nguyen Thi Yen Nhan, BSN
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1452385-2] evaluation of cardiopulmonary resuscitation training for new nurse
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE: July 2, 2019
EXPIRATION DATE: July 2, 2023

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.