

Effect of Educational Program for CardioPulmonary Resuscitation Using SimMan Versus Traditional Manikin on 2nd year nursing Students' Performance

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Abstract: The **aim** of this study is to evaluate the effect of educational program for cardiopulmonary resuscitation (CPR) using SimMan versus traditional manikin on 2nd year nursing student's performance at Medical Surgical Nursing Department laboratory- Faculty of Nursing -Benha University. **Research hypothesis:** The mean score of 2nd year nursing students' performance level regarding CPR in the study group will be higher than the score of students in the control group. **A quasi-experimental research design** was utilized. **Setting:** This study was conducted in Medical Surgical Nursing Department laboratory- Faculty of Nursing -Benha University. **Subject:** 340 of second year nursing students were recruited in this study and divided into equal groups, the control group using the traditional manikin and a study group using SimMan. **The study tools** for data collection; **First tool:** Nursing students' self-administered questionnaire sheet. **Second tool:** Nursing students' practice observational checklist for CPR & AED. **The results:** mean scores of students' knowledge and practice regarding advanced CPR in study group was higher than control group ($P < 0.001$). There was positive correlation between students' total knowledge and practice scores in both groups. **Conclusion:** there was a highly statistically significant improvement in nursing students' performance level regarding advanced CPR using SimMan versus traditional manikin. **The study recommended** Additional researches need to be conducted on the use of SimMan for improving nursing education, critical thinking, clinical competency and evaluate its effect on the students' performance regarding CPR on the actual patients (in the real situations) with cardiac arrest in emergency departments .

Key Words: Cardiopulmonary resuscitation, Nursing education, Performance, SimMan.

Introduction

Nursing education has long utilized simulation in some form to teach principles and skills of nursing care. Simulation in nursing education in the form of static manikins, role playing, CPR manikins, and other techniques has also been utilized as a teaching modality for quite some time. Nursing education needs to play its key role in training innovative, committed and responsible students so that, the students can effectively take different roles and critical nursing duties in different situations ^[1] .

The developments in medical technology and the increasing number of severe cases, advanced intensive expertise and nursing intervention techniques are required in the clinical field. Therefore, nurses are required to have more sophisticated work capacities. Through theoretical and practical educational programs, nursing education organizations focus on nurturing professional nurses' abilities to provide high-quality services. Simulation in nursing education has been recommended and introduced ^[2].

Simulation is defined as a technique used to “replace or amplify real experiences with guided experiences that evoke or replace substantial aspects of the real world in a fully interactive manner. Medical simulators range from simple replications of body parts for task based learning of some examination skills, to more sophisticated HFHPS driven by complex pathophysiological computer models which are developed to replicate clinical environments^[3] .

SimMan is manikin utilized in resuscitation training have realistic features such as the ability to replicate chest expansion and breathing sounds, provide exhaled carbon dioxide, generate a pulse and blood pressure, and speak or make sounds. SimMan measures the quality of CPR providing real-time feedback regarding compression rate, depth, release, and hands-off time. In addition, SimMan can respond appropriately to treatment; it automatically registers the amount, speed, and type of drug and activates the appropriate physiological responses^[4].

The CPR is an essential skill for all health care professionals, especially nurses. It can be a lifesaver when applied by a competent and skilled person during resuscitation. The CPR procedure is a coordinated integration of chest compression-induced circulation, rescue airway and breathing management whereby priorities are determined by evidence from literature and practice and required professional and good training nurses^[4].

Aim of the study

The aim of the study is to evaluate the effect of educational program for cardiopulmonary resuscitation (CPR) using SimMan versus traditional manikin on 2nd year nursing students' performance through the following:

- 1- Assessment of 2nd year nursing students' performance level (knowledge and practice) in both groups (study & control) regarding CPR pre educational program implementation using SimMan versus traditional manikin.
- 2- Designing and implementing educational program regarding CPR for 2nd year nursing students using SimMan versus traditional manikin.

- 3- Evaluating the effect of educational program regarding CPR using SimMan versus the traditional manikin on 2nd year nursing students' performance (knowledge and practice).

Research hypothesis

The mean score of 2nd year nursing students' performance level (knowledge and practice) regarding CPR in the study group will be higher than the score of students in the control group post program implementation.

Research Design:

A quasi-experimental research design was utilized to conduct the aim of this study.

Setting:

This study was conducted at Medical Surgical Nursing Department laboratory- Faculty of Nursing -Benha University.

Subjects:

All available 2nd year nursing students (340 students) in academic year (2014–2015) were recruited in this study applying two the clinical teaching methods. Using the traditional manikin for the half of students (170) as a control group, while using SimMan for another half of students (170) as a study group.

Tools of data collection:

The study tools which had been used for data collection was divided into:

Tool (1): Nursing students' Self administered questionnaire sheet:

It was constructed by the researcher after reviewing relevant literature. It was written for assessing 2nd year nursing students' knowledge regarding CPR in both groups (study & control), it included:

Part (1): Demographic characteristics of 2nd year nursing students in both groups such as: name, age, gender, group, educational level, learning experiences and number of training program.

Part (2): (A) students' knowledge regarding CPR:

It was included meaning of cardiac arrest, signs and symptoms of cardiac arrest, first aid for cardiac arrest, principles, indication, main components for CPR according to priority, the ways to open the air way, the steps to give the victim breaths, the way to check the breathing, depth of chest compression, the rate of compressions, the site at which starts chest compressions, contraindication and complications of CPR. It contained (21) questions which designed by the researcher and adopted from previous research references after reviewing related literature.

(B): Students' knowledge regarding Automatic External Defibrillator (AED):

It was included meaning of AED, characteristics of AED, indications, what should be indicated if shock present, contraindications, complication of defibrillation and post defibrillation nursing care. It contained (9) questions.

Knowledge scoring system:

All knowledge variables were weighted according to the items included in the model answer of each question. The data collected from the knowledge test was computed and the test received a grade out of 21 questions for CPR and 9 questions for AED, the scores were allocated as follows: right (1) and wrong (0).

The score of knowledge test expressed as percent from a maximum of 30 points as follow:

≥ 70 % (22 points) considered satisfactory level of knowledge.

< 70 % (22 points) considered unsatisfactory level of knowledge.