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Education

CLINICAL EXPERIENCE DOES NOT CORRELATE WITH THE PERCEIVED NEED FOR CARDIOPULMONARY RESUSCITATION TRAINING

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□ **Abstract—Background: The efficiency of cardiopulmonary resuscitation (CPR) training is dependent upon different influencing factors, such as the presented concepts, the participants' willingness to learn, and the interval between training sessions. However, the optimal interval for refreshing CPR training is less clear. Objective: We evaluated the perceived need of simulator-based CPR training for nurses and correlated it with their clinical experience. Methods: The 60 invited nurses were trained in simulator-based CPR. Knowledge about adult advanced life support was evaluated using a questionnaire after training, and participants rated their desired individual frequency of simulator-based training as well as the value of the presented training using a six-point Likert scale. The same questions were asked again after 1 year. Results: All participants agreed about the usefulness of this type of simulator-based training. The average number of correct answers about typical facts in adult advanced life support showed an almost bell-shaped distribution, with the highest point at 6–15 years of clinical experience and the lowest points at ≤ 5 and ≥ 21 years. The desired training-frequency need was inversely correlated with clinical experience. Conclusions: There is a high interest in CPR training among nursing staff. Self-assessment about the training-frequency need was inversely correlated with clinical experience. However, the average number of correct answers on resuscitation questions decreased with clinical experience. Therefore, the training effectiveness seems to be extremely dependent on clinical experience, and therefore, training experienced senior nurses might be more challenging than training novice nurses.** © **2013 Elsevier Inc.**

□ **Keywords—training demand; clinical experience; simulator; training; cardiopulmonary resuscitation**

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INTRODUCTION

Different training methods are used for cardiopulmonary resuscitation (CPR) training, and each of these methods has its own pros and cons. In general, training is composed of lectures, interactive discussions, and hands-on practice of resuscitation skills (1). Simulator-based training is a well-accepted tool to provide an overall realistic training scenario, to increase self-confidence, and to improve non-technical and technical skills, especially by oral- or video-assisted debriefing (2–8). Although the optimal interval for refreshing the training is less well defined, there is a consensus that repeated refresher training at intervals of < 6 months seems to be necessary for most individuals who do not perform resuscitation on a regular basis (1,9).

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Table 1. Questions Dealing with Adult Resuscitation?

Questions	Weight
How many thorax compressions per minute are needed?	3
How deep (in cm) should the torso be compressed?	3
What is the ratio of compressions to ventilations?	3
How many Joules should be delivered in a single monophasic defibrillatory shock?	2
What should immediately follow a single defibrillatory shock?	1
How much i.v. adrenaline (in mg) should be administered every 3-5 min?	2
After how many shocks should amiodarone be given?	1
How much i.v. amiodarone (in mg) should be given?	2
How much i.v. atropine (in mg) should be administered?	1
During adult CPR, what tidal volumes would be adequate?	2

Simulations can be used to observe and quantify technical and non-technical performance. For example, anesthesiologists exposed to simulated cases of intraoperative accidents are rated on their technical performance according to given protocols (10). Therefore, this tool adds a new dimension to current assessment systems and might be used as an additional tool for investigating the performance of standard operating procedures (11,12). Additionally, this tool offers the possibility to separate the performance improvement between novice and experienced medical professionals.

The aim of this study was to evaluate the perceived need of simulator-based CPR training for nurses and to identify any possible correlation between training need and clinical experience.

MATERIALS AND METHODS

Sixty nurses from the cardiothoracic surgery intensive care unit of our university hospital were invited to participate in simulator-based training on two separate occasions. Informed consent was obtained from all participants. The investigation performed by questionnaire was blinded, and the answers could not be traced back to individual participants. The training was free of charge and arranged during regular working hours. There was no additional training between the assessments.

All participants were familiarized with the technicalities of the mannequins and the monitors in the simulation center at the beginning of training. Our simulation center is located in our Department of Anesthesiology and is equipped with a variety of simulators, for example, SimMan® (Laerdal, Stavanger, Norway); and skill trainers, for example, critical lifesaving or airway (12). The training was composed of a lecture followed by simulator-based training with two scenarios: a 65-year-old patient weighing 85 kg that had three-vessel coronary disease presenting post-operatively with a pulseless ventricular tachycardia after an uneventful coronary artery bypass grafting; and a 57-year-old patient weighing 80 kg that had aortic valve stenosis presenting post-operatively with asystole after an aortic valve replacement. Each simulated scenario lasted 20 min and was followed by a 10-min debriefing session in which basic and advanced CPR skills were addressed.

Table 2. Demographic Data of Intensive Care Nurses Attending the Training

	Questionnaire	%
Gender: male/female	18/42	30/70
Full-time job: yes/no	34/26	57/43
With board certification	35	58
Age (years)	31 (21–50)	-
Clinical experience (years)	10 (0.5–30)	-

Data are represented as the median (interquartile range) or n for "gender" and "full-time job."

The two scenarios were designed by a small group of experts (two anesthesiologists, two cardiothoracic surgeons, and two nurses) with an interest in CPR training using the conventional Delphi method for the validation process (13). A list was made of typical emergencies in the cardiothoracic intensive care unit that required CPR, and was based on observed practices and current literature.

Demographic data of the participants were assessed. The questionnaire was composed of three sections dealing with general questions regarding the presented training, special questions about the nurses' subjective need for the frequency of simulator-based training in CPR, and a test about CPR. The participants answered the general questions using a six-point Likert scale in which 1 = absolutely correct, 2 = correct, 3 = almost correct, 4 = almost not correct, 5 = not correct, and 6 = absolutely not correct. The questions dealing with adult resuscitation were asked to rate the training effectiveness in an open questionnaire (Table 1). These questions on CPR were developed in the same fashion as the scenarios. The expert group rated the weight of the questions for knowledge assessment as follows: 3 points for basic, 2 points for standard, and 1 point for advanced knowledge, with a maximum of 20 points (Table 2). After 1 year, the same questions were asked again before the nurses attended the second training session. The questionnaires were collected and analyzed retrospectively. Clinical experience was portrayed in 5-year increments starting with ≤ 5 years in reference to the minimum time to become a certified intensive care unit nurse.