The effect of formal training of cardiopulmonary resuscitation (CPR) skills on medical students perceived self-sufficiency

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ABSTRACT

Background: Experience of cardiopulmonary resuscitation (CPR) in real clinical setting is not easily possible for all medical students.

Purpose: To assess medical student perceived self-sufficiency on three procedural skill on internship courses after they had taken a training course in clerkship period.

Methods: Forty three medical students who had attended a workshop on CPR, tracheal intubations and venopuncture answered the questionnaires on their perceived self-sufficiency in performing these procedures after serving a few months as interns.

Results: The mean score for perceived self-sufficiency (PSS) was 75.84 (±18.63).Thre were a high correlation between the score given for the applicability of training in real life situation and the stress reduction scores on first time performing the procedure.

Conclusion: The high degree of correlation between PSS scores and applicability scores, may warrant the consideration of new methods in procedural skills.

Keywords: SKILL TRAINING, CPR TRAINING, PERCEIVED SELF-SUFFICIENCY

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Introduction

Experience of cardiopulmonary resuscitation (CPR) in real clinical setting is not easily possible for all medical students as the number of cases required for CPR training during formal educational hours is not sufficient.

More over, patients with critical conditions that require highly sophisticated interventions such as CPR are not ethically appropriate for training activities. If the patients or his/her surrogate's consent for being the subject of training is not taken before hand, legal pursue will be possible. It is not likely that the surrogate of a "patient with critical condition give an informed consent for the patient to be worked on by medical students. On the other hand all physicians are expected to handle emergency conditions skilfully. This makes the training of procedures usually needed in management of emergency situations of outmost important.

Many medical universities presume that their students are well trained in terms of core practical skills but a study by Remen et al (1) indicated that the graduates practical skill did not meet the levels of competence which are expected from practitioners.

Another study by Esmaili et al on 200 interns of Tabriz university of medical sciences and health services showed that the educational opportunities for clinical skills and consequently the students' clinical skills were well below standards(2). Only 45.5% of students did report adequate skill on venopuncture; the situation was even worse for intubation with only 9% reporting adequate skill for performing the procedure. The problem of inadequate clinical skill training and low skill competency of medical graduates is widespread throughout the world (3,4). The good news is that many studies showed that training programs were effective in improving the clinical performance of medical students. (5,6,7).

One important component of clinical skills which is vital for any practitioner is basic and advanced life support skills (BLS&ALS). In a review of 16 medical schools in Canada, It was shown that cardiopulmonary resuscitation (CPR) courses are not fully completed (8). In a survey on CPR training in United Kingdom, only 15% reported completing a formal course on CPR. The student on this survey had a low perceived self-adequacy concerning management of an emergency situation requiring CPR. (9)

Most societies of emergency medicine have recommended that courses on emergency medicine be delivered before students entered clinical training phase. This helps students to better participate in management of patient requiring CPR(10). In a survey of 89 medical schools in U.S, 57(64%) offered students a course on emergency medicine in first 2 years of medical school. The mean duration of course was 2 weeks.

Material & methods

Forty three medical students who had attended a workshop on CPR, tracheal intubations and venopuncture answered the questionnaires on their perceived self-sufficiency in performing these procedures after serving a few months as interns. For each skill a self administered questionnaire was developed. The intubation was assessed with 20 items, Basic life support with 10 items and venopuncture with 10 items. Likert scale was used to assess students' agreement on each questionnaire. Perceived self-sufficiency index was a proportion of the standardized overall score of 100. The reliability of the three questionnaires were examined with a Chronbach's alpha of 0.9731 for intubation, a Chronbach's alpha o of 0.9404 for skills essential for life support procedures and a Chronbach's alpha of 0.9240 for venopuncture. The T test was used for examining the significance of correlation coefficient. The analysis was done with SPSS.

Results

For skills required in intubation procedure the questionnaire defined 20 items (table 1). The mean

TABLE1. Mean of standardized score for tracheal intubation training effect on perceived self-sufficiency

Skill	Mean of Standardized score
Preparation of tracheal tools	76.74 ± 14.83
Use of tracheal tube cuff	72.09 ± 22.63
How to use laryngoscope	77.32 ± 19.52
Control of laryngoscope	73.25 ± 21.4
Selection of appropriate laryngoscope, based on patient's condition	70.93 ± 20.36
Inserting laryngoscope into pharynx	75 ± 19.66
Correct inflating of tracheal tube cuff	79.06 ± 23.73
Correct positioning of patients head	84.30 ± 16.38
Guiding the tube into trachea	77.9 ± 21.96
Fixing the tube	74.41 ± 22.81
Nasal intubation	70.34 ± 30.00
Detection of the tube position in the trachea	76.16 ± 27.79
Detection of the tube position in the oesophagus	76.16 ± 28.32
Detection the tube position In the bronchia	75.58 ± 26.99
Ventilation with tracheal tube & ambu bag	83.13 ± 21.63

score for perceived self-sufficiency (PSS) was 75.84 (±18.63). The lowest and highest score were 31.25 and 100, respectively. The lowest mean score among the components of the procedure was 70.93 ± 20.36 for the "choice of laryngoscope based on patient position" and 70.34 ± 30 for intranasal intubation. The highest score among these components was 84.30 ± 16.38 for head positioning and 83.13 ± 21.63 for the use of ambo bag and tracheal tube to establish ventilation.

The students, gave a score of 80.81 ± 21.01 and 81.39 ± 18.97 to the effect of training on stress reduction of first-time performing the procedure in real-life situation and first time patient contact, respectively. The over all PSS score and stress reduction of first-time performing the procedure in

real-life situation had a significant correlation (r = 0.388).

For basic life-support skills with 10 specific components (table 2), the mean score of PSS was 81.04 ± 13.59. The components associated with lowest mean PSS score were head tilt to open airways (77.90 ± 19.06) and mouth to mouth breathing (78.48 ± 16.88).

TABLE 2. Mean of standardized score for basic life support training effect on perceived self-sufficiency

Skill	Mean of Standardized score
Head tilt maneuver	77.90 ± 19.06
Jaw thrust maneuver	80.23 ± 14.99
Mouth to mouth breathing	78.48 ± 16.88
Use of Ambu bag & ventilation with mask	84.30 ± 14.45
Chest compression in children and adults	82.55 ± 13.94
One-person and two-person chest compression and breathing	82.55 ± 16.84

Those associated with highest mean PSS score were ambo bag assisted ventilation with face mask (84.3 ± 14.45) and cardiac massage (86.04 ± 13.69). The students gave a mean score of 81.39 ± 18.17 to the applicability of training to real-life situations and 84.3 ± 16.38 to its effectiveness in reducing the stress for the first – time performing the procedure in real – life situation. There was a significant correlation (r = 0.55) between PSS score and the applicability score.

For skills involved in venopuncture the mean PSS score was 79.70 ± 15.77. Of the 10 components identified in the questionnaire (table 3) the highest mean score was for infusion pumps handling 62.79 ± 26.93 and adjusting the infusion rate of infusion sets (68.02 ± 28.51). The components associated with highest scores were antiseptic treatment of venous puncture site (88.37 ± 13.74) and intravenous injection technique (85.48 ± 18.28). The students gave a mean score of 90.23 ± 20.81 to the applicability of training to

real-life situation and 85.46 ± 16.57 to its effectiveness in

TABLE 3. Mean of standardized score for venopuncture training effect on perceived self-sufficiency

Skill	Mean of Standardized score
Detection of appropriate veins for injection	82.55 ± 18.52
How to prepare the vein	83.13 ± 17.86
How to disinfect the site of injection	88.37 ± 13.74
How to prepare IV	84.88 ± 17.37
How to inject through intravenous route	85.46 ± 18.28
Regulating fluid drops	68.02 ± 28.51
Withdrawing IV catheter	76.16 ± 23.75
How to use infusion pumps	62.79 ± 26.93

reducing the stress for the first-time performing the procedure in real-life situation. There was a significant correlation between PSS score and the applicability score (r = 0.712). The PSS score and the effectiveness of training in stress reduction in first-time performing the procedure in real-life situation had significant correlation (r = 0.621).

Discussion

Our findings showed that training medical students for procedural skill are associated with acceptable PSS. Given the high rates of accidents occurring in our country contributing to a large proportion of morbidity and mortality, medical graduates' confidence and competence in managing these conditions is of critical importance. The high degree of correlation between PSS scores and applicability scores, may warrant the consideration of new methods in procedural skills which seems to be left out of medical education focus in our country since it is to a large degree neglected in comparison to the emphasize given to theoretical knowledge.

Further study on the effect of skill lab training on medical graduates' clinical skill seems warranted since establishment of skill labs has been one of

the challenges of medical schools in Iran in recent years. We would like to emphasize that, well planned training in skill labs at best can serve as a complement for bedside training not as an alternative option.

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