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TRAINING AND EDUCATIONAL PAPER

# Assessment of CPR-D skills of nurses in Göteborg, Sweden and Espoo, Finland: Teaching leadership makes a difference<sup>☆</sup>

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## KEYWORDS

Cardiopulmonary resuscitation (CPR); Education; Scoring system; Automated external defibrillator (AED); Defibrillation CPR-D; OSCE; Nurse

## Summary

*Introduction:* Construction of an effective in-hospital resuscitation programme is challenging. To document and analyse resuscitation skills assessment must provide reliable data. Benchmarking with a hospital having documented excellent results of in-hospital resuscitation is beneficial. The purpose of this study was to assess the resuscitation skills to facilitate construction of an educational programme.

*Materials and methods:* Nurses working in a university hospital Jorvi, Espoo ( $n = 110$ ), Finland and Sahlgrenska University Hospital, Göteborg ( $n = 40$ ), Sweden were compared. The nurses were trained in the same way in both hospitals except for the defining and teaching of leadership applied in Sahlgrenska. Jorvi nurses are not trained to be, nor do they act as, leaders in a resuscitation situation. Their cardiopulmonary resuscitation (CPR) skills using an automated external defibrillator (AED) were assessed using Objective Structured Clinical Examination (OSCE) which was build up as a case of cardiac arrest with ventricular fibrillation (VF) as the initial rhythm. The subjects were tested in pairs, each pair alone. Group-working skills were registered.

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**Results:** All Sahlgrenska nurses, but only 49% of Jorvi nurses, were able to defibrillate. Seventy percent of the nurses working in the Sahlgrenska hospital (mean score 35/49) and 27% of the nurses in Jorvi (mean score 26/49) would have passed the OSCE test. Statistically significant differences were found in activating the alarm ( $P < 0.001$ ), activating the AED without delay ( $P < 0.01$ ), setting the lower defibrillation electrode correctly ( $P < 0.001$ ) and using the correct resuscitation technique ( $P < 0.05$ ). The group-working skills of Sahlgrenska nurses were also significantly better than those of Jorvi nurses.

**Conclusions:** Assessment of CPR-D skills gave valuable information for further education in both hospitals. Defining and teaching leadership seems to improve resuscitation performance.

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## Introduction

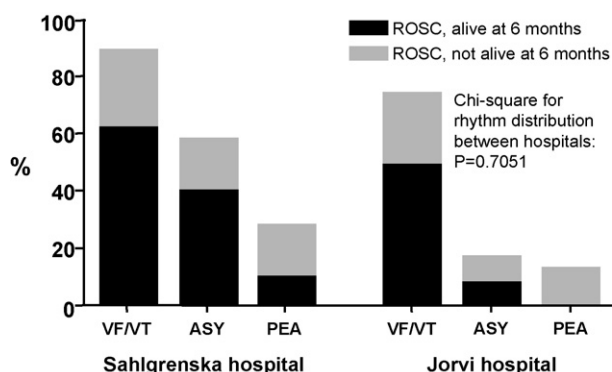
According to the international resuscitation guidelines published in 2000<sup>1,2</sup> every member of health care personnel should be able to perform basic life support including defibrillation with an automated external defibrillator (AED). However, according to previous studies, nurses, in spite of training, do not use a defibrillator on general wards or in the emergency room in resuscitation situations.<sup>3</sup>

In previous analyses made in Finnish hospitals the majority of physicians and nurses felt that training in CPR was insufficient at various levels of care.<sup>4,5</sup> Construction of an effective in-hospital resuscitation programme is challenging. Systematic institutional efforts were needed to increase survival from in-hospital cardiac arrests. Sahlgrenska hospital in Goteborg Sweden has recorded and analysed their in-hospital resuscitations systematically.<sup>6-10</sup> Since 1996, one AED has been distributed for every six wards and all the nurses have been re-trained in the use of the AED at least once a year. They also have good possibilities to practice cardiopulmonary resuscitation and defibrillation (CPR-D) skills.<sup>8,10</sup> In Jorvi Hospital, Espoo Finland, training has consisted of voluntary BLS courses and regular training has been given only to members of the resuscitation team and to nurses working in the intensive care unit. Jorvi Hospital has recorded in-hospital resuscitations systematically since 1998. Systematic CPR-D education and evaluation of the whole staff began in 2004. Defibrillators (50% manual) were placed in every other ward. In Sahlgrenska hospital nurses are trained routinely to lead resuscitation, but not in Jorvi hospital. Jorvi nurses are not taught to be, nor do they act as, leaders in a resuscitation situation. In Sahlgrenska hospital, the nurse who uses the defibrillator is assigned the leadership of the resuscitation situation.

In 2004, 41 patients suffered a cardiac arrest in Sahlgrenska hospital with ventricular fibrillation (VF) as the initial rhythm. Return of sponta-

neous circulation (ROSC) was achieved in 37 (90%) patients. Twenty-six (63%) patients were alive at 6 months. In Jorvi hospital in year 2004, eight patients were found in VF and ROSC was achieved in 6 (75%) patients. Four (50%) patients were alive after 6 months. There was no statistically significant difference between the distribution of different rhythms or survival rate between the hospitals (ROSC: VF  $P < 1.00$ , asystole (ASY)  $P < 0.09$ , pulseless electrical activity (PEA)  $P < 0.19$ ; alive at 6 months: VF  $P < 0.51$ , ASY  $P < 1.00$ , PEA  $P < 1.00$ ) (Figure 1).

Tools and a clear standard are needed to document quality of CPR-D skills.<sup>11</sup> Comparing students with their peers is not acceptable for clinical competency licensing tests.<sup>12</sup> A reliable testing method with a standard pass level would help trainers to compare the results and check the retention of skills between individuals and groups. Qualified studies with well defined populations, standardised study settings and explicit, comparable outcomes are needed to assess the quality of CPR-D performance. In a systematic search for studies designed



**Figure 1** Survival of resuscitated patients in the participating hospitals as a percentage from the total amount of resuscitation attempts from different initial rhythms (ROSC; return of spontaneous circulation, VF; ventricular fibrillation, ASY; asystole, PEA; pulseless electrical activity).

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