

A Study of House Officers in a Teaching Hospital on Knowledge, Perception of Skills and Confidence Level in Performing CPR

Ismail Mohd Saiboon, Noraliza Mohd Ariffin, Teodoro Javier Herbosa, Ahmad Khaldun Ismail, Nariman Singmamae, Shamsuriani Md Jamal, Azhana Hassan, Ho Siew Eng

Department of Emergency Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur

ABSTRAK

Resusitasi kardiopulmonari (CPR) adalah penting dan pegawai perubatan siswazah (PPS) patut mahir menjalankannya. Para PPS yang baru sahaja selesai pengajian mereka ditugaskan ke wad perubatan akut dan wad pembedahan akut. Sekiranya pesakit di wad mengalami kematian mengejut akibat serangan jantung, merekalah yang akan mula merawat pesakit tersebut. Oleh itu seseorang PPS harus yakin dengan kemahirannya untuk menjalankan CPR sekiranya perlu. Kami telah menjalankan kajian berkaitan pengetahuan menjalankan CPR ke atas 26 PPS baru di Hospital Universiti Kebangsaan Malaysia (HUKM). Perkara-perkara yang dianalisis termasuk: tanggapan para PPS itu sendiri berkaitan kemahiran, pengetahuan dan tahap keyakinan mereka dalam menjalankan CPR. Kami menilai pengetahuan menggunakan satu set soalan berkaitan resusitasi kardiopulmonari. Hasil kajian mendapati bahawa 16/26 (61.5%) daripada PPS, menilai diri mereka sebagai mempunyai tahap pengetahuan yang tidak mencukupi manakala 46.2% tidak mempunyai keyakinan dalam menjalankan CPR. Kebanyakan mereka mendapat markah rendah dalam keputusan ujian penulisan, di mana min adalah 5.7 ± 1.8 . Tujuh daripada 26 (27.0%) PPS meletakkan tangan mereka pada posisi yang salah ketika menjalankan CPR. Hanya 4 dan 9 daripada 26 PPS meletakkan pad sternum dan pad kardiak pada posisi yang betul. Kami membuat kesimpulan bahawa pengetahuan, tanggapan kemahiran dan tahap keyakinan PPS dalam menjalankan CPR perlu diperbaiki dan perlu penilaian yang lebih mendalam. Institusi Pengajian Perubatan perlu meneliti kembali kurikulumnya supaya dapat menyediakan PPS agar lebih bersedia menghadapi situasi kecemasan.

Kata kunci: resusitasi kardiopulmonari, bantuan asas kehidupan, pegawai perubatan siswazah, kematian mengejut akibat serangan jantung, latihan resusitasi kardiopulmonari.

ABSTRACT

Cardio-pulmonary Resuscitation (CPR) is important and should be mastered by House Officers (HO). House officers who have just completed their studies are assigned to acute

Address for correspondence and reprint requests: Dr Ismail Mohd Saiboon. Department of Emergency Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, Cheras, 56000 Kuala Lumpur. Tel: 03-91702020 Fax: 603- 91738154 E-mail: ismail@mail.hukm.ukm.my

medical and surgical wards. If a patient in the ward has a cardiac arrest (CA), these doctors are usually the first to attend. Therefore an HO must be confident with CPR skills. They must be competent in performing CPR. The authors assessed 26 new HOs from Universiti Kebangsaan Malaysia Hospital (HUKM) with respect to their self-perception about CPR skills, confidence level in performing CPR and knowledge in performing CPR. Knowledge was assessed by a questionnaire. We found that 16 of 26 (61.5%) assessed themselves to have inadequate knowledge and 46.2% had no confidence in performing CPR. The mean score of the written test was 5.7 ± 1.8 . Seven out of 26 (27.0%) HOs had incorrect hand placement position for CPR. Only 4 and 9 out of 26 HOs had their sternal paddle and cardiac apex paddle positions correctly placed respectively. In conclusion, knowledge, perception of skills and confidence levels of HOs on CPR are inadequate and need further assessment and improvement. Medical schools need to review their CPR curriculum in order to prepare HOs adequately to work in emergency situations.

Key Words: cardiopulmonary resuscitation, basic life support, house officers, cardiac arrest, CPR training

INTRODUCTION

Cardiopulmonary resuscitation (CPR) is an essential skill for everyone especially those working in the medical field. It is composed of the recognition of signs and symptoms of impending or cardiac arrest (CA), heart attack, stroke and choking; chest compressions; and defibrillation with an automated external defibrillator (AED) (American Heart Association 2005). Regardless of the specialty of the physician, the skills and knowledge in performing these procedures are essential. Cardiac arrest is the leading cause of death in the US and also worldwide (Zheng et al. 1998). Annual incidence of CA is 0.55 per 1000 population (Vaillancort & Stiel 2004). In Malaysia, the Information and Documentation System Unit of Ministry of Health Malaysia reported cardiovascular disease as among the top principle causes of death in the country.

In the 2005 Consensus Conference by leading experts for the study on resuscitation, CPR was re-emphasized as the main initial intervention during any CA (Hazinski et al. 2005). Cardiopulmonary resuscitation should be done promptly and swiftly. It has been modified, making it easier to learn and apply. The complexities

in the sequence, different ratios of chest compression to ventilation and the different age group ratios of the previous years have been removed. Now, there is only one compression to ventilation ratio that needs to be remembered by care providers, that is 30:2 (Hazinski et al. 2005). This simplicity was recommended so that more people will come forward and assist patients needing CPR.

In the hospital, any of the ward patients may collapse. The first doctor who may be called to attend is the house-officer (HO). Senior medical officers (MO) or specialists usually come later. Therefore, the HO needs to immediately assess and recognize the situation and start CPR if needed. Hence, the knowledge and skill of the performer are essential and of utmost importance.

CPR training is usually included in the medical curriculum in most medical schools. However, there are still some schools that fail to teach CPR to their students (Phillips & Nolan 2001). In one survey in the UK, 4 out of 27 respondents failed to show that they provided CPR training in their curriculum (Phillips & Nolan 2001). In Universiti Kebangsaan Malaysia (UKM), CPR is taught during the fourth year of the medical curriculum. Even

though CPR is taught in medical school, the retention of the skills is a different issue. A meta-analysis demonstrated that professional skills can decay rapidly without practice or use (Arthur et al. 1998). This is worrisome. If it is true, then HOs are inadequately trained to perform competent CPR on patients. Therefore, immediate remedial measures need to be implemented. This study aimed to analyze knowledge, perception of skills and confidence level of performing CPR among HOs in our institution.

METHODOLOGY

Study Design

This was a cross sectional study done on a sample of HOs working in Hospital Universiti Kebangsaan Malaysia (HUKM). Most were starting their medical career with 1-2 months work experience. They came from various clinical departments depending on their posting. The authors conducted this study during the second day of the orientation programme, planned out by the hospital human resource department. Each HO was given a serial number. A self-administered three-part questionnaire was used to assess knowledge, perception of skills and confidence level of performing CPR among HOs. Thereafter, the completed questionnaires were collected and analysed.

Data Collection and Analysis

The questionnaire consisted of three parts. The first part dealt with demographic data of the HOs. The second part assessed their self-perception about their own CPR skills, confidence level in performing CPR and knowledge in performing CPR. The third and last part dealt with questions assessing their actual knowledge on the important aspects of CPR which included patient assessment, getting help, ABC's of CPR and use of AED. The total score was 11 points. A group of paramedics, medical

officers and specialists working in the Emergency Department (ED) were asked to complete the questionnaire. By calculating their mean score, we set the standard that the score expected of a doctor competent in performing CPR was 9.

After completing these questionnaires the HOs were given a short one and a half hours hands-on CPR course, which comprised of CPR, use of AED, basic airway management and relief of Foreign Body Airway Obstruction (FBAO).

Data was collected and tabulated in the SPSS 12.0 software where statistical analysis was done.

RESULTS

There were 30 listed participants for the CPR orientation course, however only 27 of them attended. Out of the 27, one did not complete the questionnaires fully; therefore only 26 respondents were available for analysis.

Twenty-two HOs were from a local university and four were from overseas universities. Their ages ranged between 24 to 37 years, with 22 (84.6%) of them, in the group of 24 to 26 years. Six were male while the rest were females with a male to female ratio of 1:3.3. Their rotational postings included 12 in general surgery, 7 in internal medicine and 7 in obstetrics and gynaecology.

Out of 26 subjects, 21 (80.8%) had done CPR training before while 5 (19.2%) had not. All except one had done their CPR training less than 2 years previously. From Table 1 we also can see that there were no differences in the percentage of those who had done CPR training and those who had not, among the groups that graduated from local public universities, local private universities and overseas universities.

Their self-perception of knowledge in CPR was rated on a scale of 1 to 5 (1 was poor and 5 was excellent). Their mean score was 2.2 (SD \pm 0.7 / SE 0.1) [Figure 1]. In terms of their perception on the confidence level in performing CPR, the

Table 1: Distribution of HOs who had CPR training in local and overseas medical schools

	Did CPR training	No CPR training	Total
Local (Public) University	12(80.0%)	3(20.0%)	15
Local (Private) University	6(85.7%)	1(14.3%)	7
Overseas University	3(75.0%)	1(25.0%)	4
Subtotal	21(80.8%)	5(19.2%)	26

Self-perception of CPR knowledge among HOs

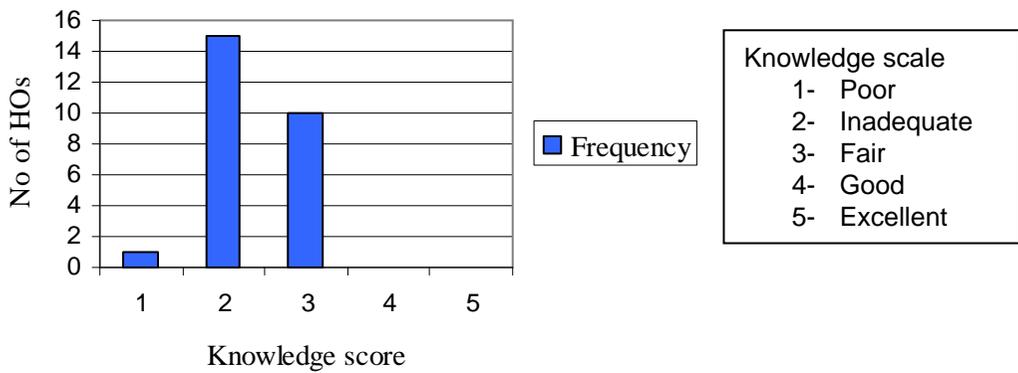


Figure 1: Self-perception of CPR knowledge among HOs

Perception of confidence level to perform CPR among HOs

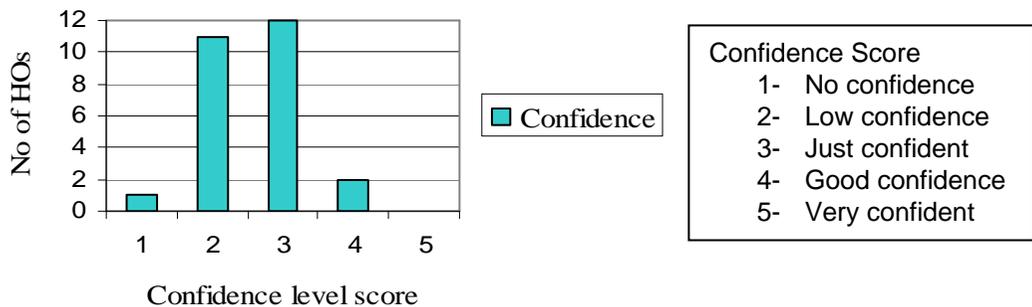


Figure 2: Perception of confidence level to perform CPR among HOs

mean score was 2.4 (SD±0.9) (Figure 2).

With regards to assessment on their actual CPR knowledge, the authors found that all subjects scored below 9/11. The highest recorded score was 8.7 and the lowest was 1.5 with a mean of 5.7/11 (SD±1.8). On the aspect of "correct hand placement during chest compression", 19 out of 26 (73.1%) were able to mark the correct spot for hand placement i.e. in the midline between the nipples on the lower half of the sternum.

Automated external defibrillator paddle attachment was another aspect that was assessed. Four out of 26 HOs (15.4%) were able to properly place the sternal pad while 9 out of 26 HOs (34.6%) were able to locate the correct placement for the apex pad.

DISCUSSION

The data represent a sample of HOs being posted every year in the Ministry of Health hospitals and University hospitals. According to the registration book for new HOs reporting in, HUKM annually receives 25 to 30 HOs. They are assigned to three major departments, namely Internal Medicine, General Surgery and Obstetrics & Gynaecology. They undergo training under supervision for a minimum of four months in each department before they are rotated to another department.

The basis for conducting the study was to analyze the knowledge, perception of skills and confidence level of performing CPR among HOs. Since HOs will be the first line of medical encounter with sick patients in the wards, it is important for them to be clinically proficient and knowledgeable in managing basic resuscitation. Resuscitation has been recorded even to the times of the Old Testament (Cooper & Cooper 2006).

It is the solid basis of the medical care doctors provide. Since then, the technique of basic resuscitation or CPR has been modified and refined (Cooper & Cooper 2006).

In terms of the actual place of graduation, this study population represents a somewhat similar situation to the rest of the country, where the majority of HOs come from local public universities. The next group is composed of those who come from local private universities and a third smaller group from overseas universities. In our study, we noticed that there are similarities among the HOs who had done basic life support (BLS) prior to their completion of their studies whether they are local graduates or from abroad. However, the number was too small for any significant statistical comparison.

In our study, we noted that knowledge on basic resuscitation skills or CPR, which is supposed to be a basic requirement for an HO, is lacking and insufficient for clinical work. The majority of the subjects perceived their knowledge and confidence level as inadequate with the mean score of 2.2 (SD±0.7 / SE 0.1) and 2.4 (SD±0.9) out of five respectively. They could be modest about their capabilities, however, even with the written test of knowledge it clearly shows that they did poorly. These two results correlate significantly as none of the subjects passed the written test. This is sad, since CPR skills were taught as a topic during undergraduate studies in UKM. In some countries, it is mandatory that before an HO enters the hospital, they must complete CPR training first (General Medical Council 1997). In fact, learning CPR has been made simple and less confusing since the year 2000, when the International Liaison Committee on Resuscitation (ILCOR) published *Resuscitation Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiac Care* (American Heart Association 2000). This guideline has made tremendous impact in terms of simplicity, similarity and necessity of BLS to be provided by all countries. Most countries have now adopted the 2005 ILCOR CPR guidelines.

These findings show that CPR skills are not emphasized enough during medical student times. Another probability is that

the medical student themselves do not bother to learn CPR because medicine is so broad and has become more technology-based. Thus, most of the students seem to feel that CPR is too basic compared to all the other information they have to know.

These results are alarming. Where do we proceed from here? What do we need to do? If this trend persists, it is high time that we review our medical curriculum. The curriculum may need some adjustment on the subject of CPR. The Emergency medicine posting should be a requirement for medical students. The delivery method of this topic (CPR) also needs to be reviewed so that it attains more retention of skills and practical knowledge rather than theoretical information only.

The study found that 24 out of 26 of the subjects did their CPR course 2 years earlier. As what was suggested by many institutions like the American Heart Association (AHA), European Resuscitative Council (ERC), Australian Resuscitative Council etc. the validity of a CPR certificate is about 2 years (Cummins et al. 1997). In this case, the majority of the subjects still had a valid CPR certificate. However, since most did badly, we suggest that the timing of the refresher course needs to be reviewed. The retention of the skills learned deteriorates quite rapidly if the skills are not practiced (Wollard et al. 2004 & Makker et al. 1995).

The authors feel that to complete only one CPR course during the whole five or six years term of medical study may be inadequate. We would suggest that a CPR course be conducted more than once. If possible the final course should be done just before they leave the medical school. Although most medical schools are claiming the issue of not enough manpower to run the course, the refresher course need not be the same as the initial course. A shorter course with more emphasis being put on the simulation technique and scenario-based learning can achieve similar results (Wayne et al. 2006).

This study has its own limitations. The sample size is small to be reflective of the whole HO population in the country. The authors feel that a similar study should be repeated on a larger study population to document the actual representation of HOs and to validate the actual extent of this identified problem. From this study, we have identified an important issue and insight of the medical education curriculum on CPR training.

CONCLUSION

From this study, the authors conclude that the HO's knowledge, perception of skills and confidence levels in performing CPR is insufficient and needs improvement. We recommend that the faculty should review the medical curriculum on CPR teaching and training needs. Strong emphasis needs to be placed on CPR training analyzing properly the method of delivery, timing and frequencies of the training course and refresher courses.

REFERENCES

- American Heart Association. 2005. Part 4: Adult Basic life support. *Circulation* **112** (24 Supplement): IV 19-IV 34.
- Arthur, W. Jr., Bennett, W. Jr., Stanush, P.L., McNelly, T.L. 1998. Factors that influence skill decay and retention: a quantitative review and analysis. *Hum Perform* **11**: 57-101.
- Cooper, J.A., Cooper, J.D. 2006. Cardiopulmonary Resuscitation: History, Current Practice and Future Direction. *Circulation* **114**(25): 2839-2849.
- Cummins, R.O., Sanders, A., Mancini, E., Hazinski, M.F. 1997. In-hospital resuscitation: a statement for healthcare professional from the American Heart Association Emergency Cardiac Care Committee and the Advance Cardiac Life Support, Basic Life Support, Pediatric Resuscitation, and Program Administration Subcommittees. *Circulation*; **95**:2211-2212.
- General Medical Council. 1997. *The new doctor: recommendations on general clinical training made under Section 5 of the Medical Act 1983*. London: GMC.
- American Heart Association in collaboration with International Liaison Committee on Resuscitation. 2000. Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular

- Care - An International Consensus on Science. *Resuscitation* **46**:3-430.
- Hazinski, M.F., Nadkarni, V.M., Hickey, R.W., O'Connor, R., Becker, L.B., Zaritsky, A. 2005. Major Changes in the 2005 AHA. Guidelines for CPR and ECC: Reaching the Tipping Point for Change. *Circulation* **112**:IV-206 – IV-211.
- Makker, R., Gray-Siracusa, K., Evers, M. 1995. Evaluation of advance cardiac life support in a community teaching hospital by use of actual cardiac arrest. *Heart Lung* **24**:116-120
- Phillips, P.S., Nolan, J.P. 2001. Training in basic and advance life support in UK medical school: questionnaire survey. *Br Med J* **323**(7303): 22-23.
- Vaillancort, C., Stiel, I.G. 2004. Cardiac arrest and emergency medical service in Canada. *Can J. Cardiol.* **20**: 1081-1090.
- Wayne, D.B., Siddall, V.J., Butter, J. Fudala, M.J., Wade, L.D., Feinglass, J., McGaghie, W.C. 2006. A longitudinal study of Internal Medicine Residents' Retention of Advance Cardiac Life Support Skills. *Academic Medicine.* **81**(10) Suppl S9-S12.
- Wollard, M., Whitfeild, R., Smith, A. Colquhoun, M., Newcombe, R.G., Vetteer, N., Chamberlain, D. 2004. Skill acquisition and retention in AED use and CPR by lay responders: a prospective study. *Resuscitation.* **60**(1):17-28.
- Zheng, Z.J., Croft, J.B., Giles, W.H., Mensah, G.A. 2001. Sudden cardiac death in the US 1989 to 1998. *Circulation* **104**:2158-2163