

## Awareness of cardiopulmonary resuscitation in medical-students and doctors in Rawalpindi-Islamabad, Pakistan

Quratulain Zamir,<sup>1</sup> Amina Nadeem,<sup>2</sup> Arsheen Hassan Rizvi<sup>3</sup>

Medical Students,<sup>1,3</sup> Department of Physiology,<sup>2</sup> Army Medical College, National University Of Sciences and Technology (NUST), Islamabad, Pakistan.  
Corresponding Author: Quratulain Zamir. Email: qurat\_aini@hotmail.com

### Abstract

**Objective:** To assess the level of awareness regarding basic and practical knowledge of cardiopulmonary resuscitation and its importance in the eyes of medical/dental students and doctors.

**Methods:** The cross-sectional study was conducted in medical and dental colleges as well as hospitals of Rawalpindi and Islamabad, Pakistan, from June to September 2011. Non-probability convenience sampling was used and structured questionnaires on basic and practical knowledge of the procedure were distributed. The questionnaire had 26 items related to basic and advanced knowledge of the required skills. Doctors were divided into two groups based on their years of service and practice. Those with less than 5 years' experience were grouped as junior doctors, while rest as senior doctors. Descriptive statistics were employed to analyse the data using SPSS version 17 and Microsoft Excel. Percentages were worked out and the results were interpreted.

**Result:** Of the 1000 questionnaires distributed, 646 (64.6%) were received duly filled and represented the study sample. Of the 646 participants, 34 (5.26%) were dentists, 424 (65.63%) were medical students, 92 (14.24%) were doctors and 96 (14.86%) were dental students. Basic knowledge of doctors was found to be better than that of dentists (n=96; 50% vs. n=8; 23%). Similarly, the advance knowledge of doctors was better than the dentists (n=53; 58% vs. n=11; 31%). The basic knowledge of junior doctors was found to be almost equal to the senior doctors (n=26; 44.75% vs. n=15; 45.5%). The advance knowledge of junior doctors was found to be better than the senior doctors (n=27; 45.37% vs. n=10; 29.48%). Among the students, 157 (37%) of the medical students had basic knowledge of CPR, while 36 (38%) dental students had basic knowledge of the topic. Medical students had more advanced knowledge (n=157; 37%) than dental students (n=34; 35%).

**Conclusion:** The awareness of basic and advance knowledge of cardiopulmonary resuscitation skills in medical/dental students and doctors in Rawalpindi and Islamabad was inadequate.

**Keywords:** Awareness, Cardiopulmonary resuscitation, AED. (JPMA 62:1361; 2012).

### Introduction

Basic life support (BLS) includes recognition of sudden cardiac arrest, heart attack, stroke and foreign-body airway obstruction, cardiopulmonary resuscitation (CPR) and defibrillation with an automated external defibrillator (AED).<sup>1</sup> According to the American Heart Association (AHA) CPR is a component of the "chain of survival". The chain is a sequence of actions that help to give a person having cardiac arrest the greatest chance of survival.<sup>2</sup> About 92% out-of-hospital cardiac arrest subjects lose their lives due to the unavailability of immediate CPR.<sup>3</sup>

BLS includes both immediate support of circulation and ventilation in case of cardiac or respiratory arrest.<sup>4</sup> Cardiac arrest deprives the brain of blood circulation which further causes cessation of breathing. This combined depression of breathing and loss of circulation leads to ischaemia which causes sudden death.<sup>5,6</sup> Compressing on the patient's chest helps push some blood through the heart

to the lungs and into the major arteries of the body, and breathing performed in a mouth-to-mouth manner are termed basic CPR.<sup>7</sup> AEDs are electronic devices used to assess the rhythm of heart at various instances and are also used to give external shock to cardiac muscles to regulate their proper contractions.<sup>8</sup>

In Pakistan we were able to find very little data pertinent to the awareness of the medical personnel, including students, doctors and paramedical staff, regarding this highly effective and easy manoeuvre. The objective of this study was to determine the level of awareness regarding knowledge of skills related to CPR and its practical implementation among medical/dental students and doctors of the twin cities of Rawalpindi-Islamabad.

### Subject and Methods

The cross-sectional study was conducted at medical and dental colleges and local hospitals of Rawalpindi-

Islamabad from June to September 2011. The subjects were selected by non-probability convenience sampling technique with written and informed consent on an individual basis. The individuals were required to fill a structured questionnaire, which consisted of 26 questions regarding basic knowledge and advance knowledge of the skills related to CPR. The aspects on which the respondents were interrogated were about the abbreviations of CPR, emergency medical service (EMS), AED and BLS; steps involved in the performing the manoeuvre; assessment and resuscitation techniques with regards to airway, breathing, circulation in unresponsive victims; and removal of foreign body obstruction.

Students were divided into medical and dental students, while doctors were divided into junior doctors and senior doctors based on the number of years of professional experience. Those with an experience of less than 5 years were marked as junior doctors, and those with more than 5 years were labelled as senior doctors. Though random sampling was done, the number of male and female subjects was kept equal at the time of questionnaire distribution. Descriptive statistics were employed to analyse the data using SPSS version 17 and Microsoft Excel spreadsheet. Percentages were worked out and results were interpreted. The answers were assessed with the help of an answer key prepared on the basis of the Advanced Cardiac Life Support Manual (ACLSM).<sup>9</sup>

### Results

Out of 1000 questionnaires distributed, 354 (35.4%) were excluded as they were either incomplete or were

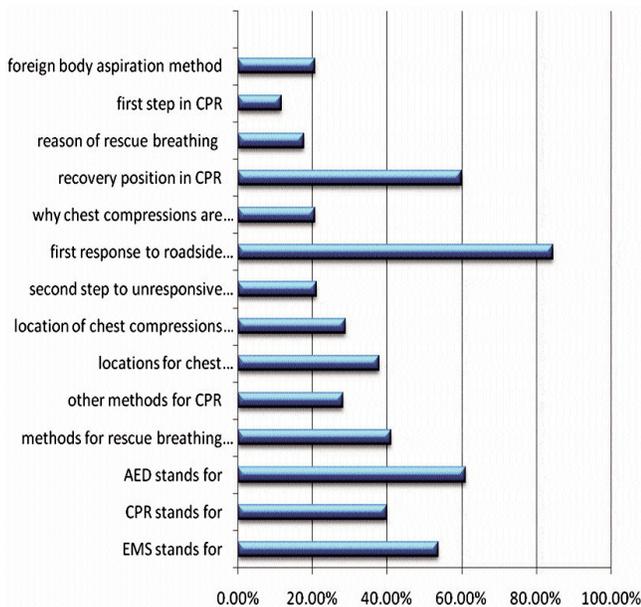


Figure-1: Percentage of correct answers of question 1-17 (except Q.14&15).

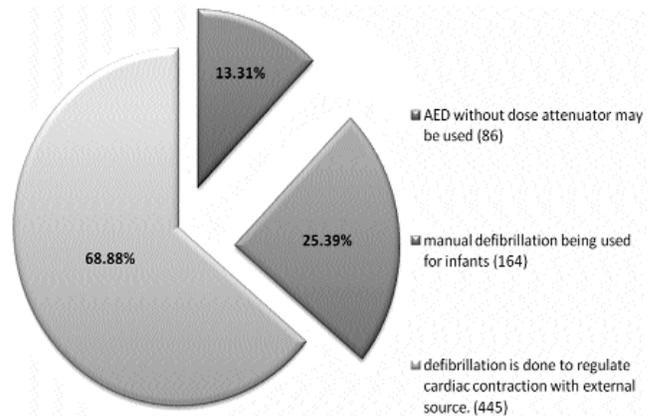


Figure-2: Percentage of responders who had knowledge about the automated external defibrillators (Question 18-20).

missing. The response rate, as such, stood at 64.6% and 646 was the final sample size. Out of the 646 responders, 34 (5.26%) were dentists, 424 (65.63%) were medical students, 92 (14.24%) were doctors and 96 (14.86%) were dental students. There were 382 (59.13%) females and 264 (40.86%) males.

In terms of basic knowledge, only 240 (37.15%) answered the questionnaire correctly (Figure-1). Besides, 394 (60.99%) knew what AED, BLS, EMS and CPR stand for. BLS was correctly answered by 495 (76.63%); EMS by 347 (53.72%); and CPR by 259 (40.09%). Moreover, 86 (13.31%) knew that an AED without dose attenuator may be used, while 164 (25.39%) respondents were aware of manual defibrillation being used for infants, and 445 (68.88%) commented that defibrillation is done to regulate cardiac contraction with external source (Figure-2). Of the total, 173 (26.78%) respondents were aware of the rate and depth of chest compressions and chest compression to

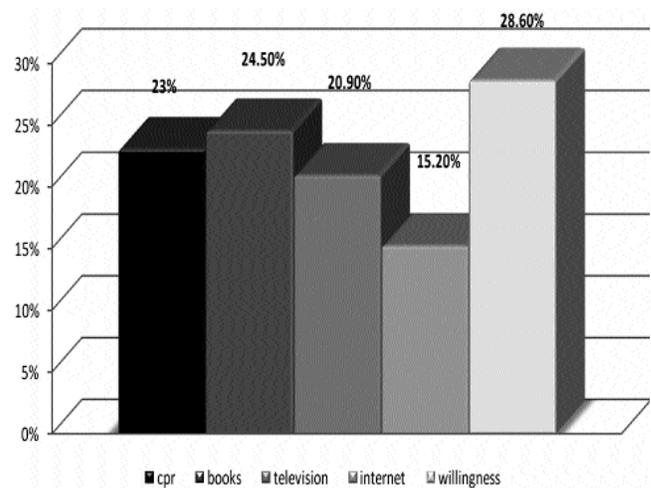


Figure-3: Source of acquiring the knowledge of cardiopulmonary resuscitation.

**Table-1: Percentage of MBBS students having basic and advanced knowledge of cardiopulmonary resuscitation.**

Academic years MBBS	% of Basic Knowledge	% of Advance Knowledge
1	33.11	35.5
2	29.62	29.74
3	40.55	39.13
4	45.35	44.91
5	46.27	45.7

**Table-2: Percentage of BDS students having basic and advanced knowledge of cardiopulmonary resuscitation.**

Academic years BDS	% of Basic Knowledge	% of Advance Knowledge
1	40.63	37.15
2	32.95	31.4
3	40.83	32.5
4	50	48.15

ventilation ratio in different age groups. The fact that the depth of chest compression in adults is 1-1.5 inches was not known to 455 (70.43%) and 550 (85.14%) and 477 (73.84%) did not know the chest compression depth in infants and children is one-half to one-third depth of the chest respectively. Among the participants, 178 (27.55%) knew that the rate of chest compression is 100/min in adults and children; 204 (31.57%) and 181 (28.02%) knew that the chest compression to ventilation ratio is 3:1 in newborns while for adults it is 30:2 respectively. In case of advance knowledge of CPR, 243 (37.59%) answered the relevant questions correctly; 549 (84.52%) said that the first response to a roadside unresponsive person is to call for help; 136 (21%) favoured to activate EMS on finding an unresponsive person; 186 (28.79%) knew that mid-chest is the right place for chest compression in CPR; 245 (37.92%) marked one finger breadth above the nipple line for the location of chest compressions in infants; 464 (71.83%) were not aware of other methods of CPR; 266 (41.18%) responded that mouth-to-mouth and nose is the method of rescue breathing in infants.

Besides, 134 (20.74%) respondents confirmed foreign body aspiration by talking to a person choking while eating; 75 (11.58%) knew that the first step in CPR is chest compressions; 114 (17.65%) knew the reason of rescue breathing; 386 (59.76%) knew to lie down a person on side for recovery in CPR; 134 (20.74%) responded that chest compressions were done to ensure circulation of blood.

As for the source of their information, 149 (23%) said CPR courses; 158 (24.5%) said books; 135 (20.9%) stated television; and 98 (15.2%) said internet (Figure-3).

Those willing to perform CPR were 185 (28.6%), while the rest felt hesitant, and declined. Looking closely on the individual groups, basic knowledge of doctors was better than that of dentists (n=46; 50% vs. n=8; 23%). Similarly the advance knowledge of doctors was better than the dentists (n=53; 58% vs. n=11; 31%). The basic knowledge of junior doctors (n=26; 44.15%) was almost equal to the senior doctors (n=15; 45.5%). The advanced knowledge of junior doctors (n=27; 45.37%) was better than the senior doctors (n=10; 29.48%). Amongst the students 157 (37%) of the medical students had basic knowledge of CPR, compared to 36 (38%) dental students. Medical students also had more advanced knowledge (n=157; 37%) than the dental students (n=34; 35%).

Percentage of basic knowledge of 1st year MBBS/BDS students was found better than 2nd year MBBS/BDS students, while there was a gradual increase in knowledge from second year onwards till the final year (Tables 1 and 2).

## Discussion

The present study showed that the practising and teaching doctors have inadequate knowledge regarding the theoretical and practical skills of CPR which could be the reason that many doctors are usually unable to perform the manoeuvre efficiently or are reluctant to perform it at all. The doctors were unable to respond to many questions regarding the procedure and showed reluctance to fill the questionnaires, fearing that their lack of knowledge would stand exposed. The results were quite similar to the studies conducted by earlier surveys on junior doctors and house officers reflecting their inability and inefficiency to perform CPR due to deficient knowledge.<sup>10,11</sup>

In students, the present study showed gradual increase in knowledge of the CPR from second year onwards to the final year in both medical and dental students which emphasises the importance of regular repetition of CPR courses i.e. the knowledge of the students increased with increase in the exposure to clinical training. Regular practice helps improve the skills and knowledge. The results were very similar to one of the studies conducted for assessing the knowledge of medical, dental, nursing students and doctors by a group of Indian researchers.<sup>12</sup> But the knowledge of first year students was found to be more than the second year students owing to the fact that there is increase in the competition among the medical students and the educational reforms at the high school level have helped the children develop more knowledge of the field they want to opt for. But the overall knowledge of the students was inadequate which was found similar to one of the studies conducted in Karachi.

The present study showed a marked increase in the

theoretical knowledge of the responders who had attended CPR courses. They scored higher than the rest, proving that CPR courses had a positive effect on theoretical knowledge on completion of the courses and the responders who had attended the courses showed better skills. The results were found similar to the study conducted to assess the knowledge of nurses and doctors on CPR by several researchers.<sup>15,16,22-24</sup>

In the present study the knowledge of junior doctors was found to be more than the senior doctors, which was contradictory to the earlier studies on house officers and junior doctors.<sup>10,11</sup> In our study, the senior doctors showed less or decreased knowledge about the theoretical skills which is due to the fact that the knowledge of CPR decreases with time on assessing the extent to which the knowledge of CPR is retained in doctors and nurses.<sup>17-21</sup> This is also because the doctors become negligent in performing each step of CPR accurately with the passage of time in their clinical setup due to lack of concentration and time as also shown by other researches conducted internationally.<sup>17-21</sup> Our study results differ which may be due to the fact that junior doctors are more exposed to the critical patients suffering from cardiac arrest as seen in many hospitals. The emergency department has mostly junior doctors appointed on duty all the time, treating different emergencies so they get a chance to perform the procedure regularly and on a frequent basis.

In terms of limitation, the study did not assess the practical aspect of CPR as many of the doctors were reluctant to even fill the questionnaire and were hesitant to expose their identity and knowledge.

It is recommended that theoretical knowledge of CPR should be part of curriculum in high school and medical colleges; workshops on regular basis should be conducted for medical and dental students to teach the practical aspects of CPR on dummies; CPR courses and workshops should be conducted for junior and senior doctors; the general public should be made aware by campaigns, public messages and media forums about CPR and EMS; proper monitoring system should be ensured to prevent negligence by the doctors in clinical setup; and frequent exams should be conducted to assess the awareness and knowledge of doctors.

### Conclusion

The awareness of basic and advanced knowledge of CPR skills in medical/dental students and doctors in

Rawalpindi and Islamabad was found to be inadequate.

### References

1. Beck JD, Offenbacher S, Williams R, Gibbs P and Garcia R. Periodontitis: a risk factor for coronary heart disease? *Annals of Periodontol* 1998; 3: 127- 41.
2. Joseph Sciammarella. Cardiopulmonary Resuscitation (CPR). eMedicineHealth (launched May 2003). (Online) (Cited 2011 July 18). Available from URL: [http://www.emedicinehealth.com/cardiopulmonary\\_resuscitation\\_cpr/article\\_e\\_m.html](http://www.emedicinehealth.com/cardiopulmonary_resuscitation_cpr/article_e_m.html).
3. CPR & Sudden Cardiac Arrest (SCA) Fact Sheet, June 2011 [internet]. American Heart Association Updated: 12 Apr 2012. (Online) (Cited 2012 January 21). Available from URL: [http://www.heart.org/HEARTORG/CPRAndECC/WhatIsCPR/What-is-CPR\\_UCM\\_001120\\_SubHomePage.jsp](http://www.heart.org/HEARTORG/CPRAndECC/WhatIsCPR/What-is-CPR_UCM_001120_SubHomePage.jsp).
4. Philips P S, Nolan J P. Training in basic and advanced life support in UK medical schools: questionnaire survey. *BMJ* 2001; 323: 22-3.
5. Savary-boriolo G. Basic Life Support: the primary ABC(d) of cardiopulmonary resuscitation. *Ther Umsch* 1996; 53: 624-9.
6. Mayo clinic staff, February 2012. Cardiopulmonary resuscitation (CPR): First aid. Mayo clinic launched 1998. (Online) (Cited 2012 March 15). Available from URL: <http://www.mayoclinic.com/health/first-aid-cpr/FA00061>.
7. Torpy JM, Lynn C, Glass RM. Cardiopulmonary Resuscitation. *JAMA* 2010; 304: 1514.
8. Benjamin Arie. Purpose of Installing Aeds. eHow launched in 1998. (Online) (Cited 2011 December 12). Available from URL: [http://www.ehow.com/facts\\_5615773\\_purpose-installing-aeds.html](http://www.ehow.com/facts_5615773_purpose-installing-aeds.html).
9. Mary Fran Hazinsk. Highlights of the 2010 American Heart Association Guidelines for CPR and ECC. American Heart Association 2012. Texas; 90-1043 10/10. (Online) (Cited 2012 January 3). Available from URL: <http://www.uccaribe.edu/erte/2010Summary.pdf>.
10. Skinner DV, Camm AJ, Miles S. Cardiopulmonary resuscitation skills of preregistration house officers. *Br Med J (Clin Res Ed)* 1985; 290: 1549-50.
11. Casey WF. Cardiopulmonary resuscitation: A survey among junior hospital doctors. *J R Soc Med* 1984; 77: 921-24.
12. Chandrasekaran S, Kumar S, Bhat SA, Saravankumar, Shabbir PM, Chandrasekaran VP. Awareness of basic life support among medical, dental, nursing students and doctors. *Indian J Anaesth* 2010; 54: 121-6.
13. Cooper S, Johnston E, Priscott D. Immediate life support (ILS) training Impact in a primary care setting? *Resuscitation* 2007; 72: 92-9.
14. Passali C, Pantazopoulos I, Dontas I, Patsaki A, Barouxis D, Troupis G, et al. Evaluation of nurses' and doctors' knowledge of basic and advanced life support resuscitation guidelines. *Nurse Education in Practice* 2011; 11: 365-9.
15. Goldstein D H, Beckwith R K: A survey of resuscitation training in Canadian undergraduate medical programs. *CMAJ* 1991; 145: 23-7.
16. Larsson EM, Martensson NL, Alexanderson AE. First aid training and bystander actions at traffic crashes - a population study. *Prehospital and Disaster Medicine* 2002; 17: 134-41.
17. Kano M, Seigel JM, Hyg MS, Bourque LB. First-aid training and capabilities of the lay public: a potential alternative source of emergency medical assistance following a natural disaster. *Disasters* 2005; 29: 58-74.
18. Starr L, Burford EG. First aid/CPR instructors must drill employee teams with lifelike scenarios. *Occupational Health & Safety* 1994; 63: 50-4.
19. Eisenburger P, Safar P. Life supporting first aid training of the public - review and recommendations. *Resuscitation* 1999; 41: 3-18.
20. Handley AJ. Basic Life Support. *Br J Anaesthesia* 1997; 79: 151-8.
21. Anderson GS, Gaetz M and Masse J. First aid skill retention of first responders within the workplace. *Scand J Trauma Resuscit Emerg Med* 2011; 19: 11.
22. Safar P, Berkebile P, Scott MA, Esposito G, Medsger A, Ricci E et al. Education research on life-supporting first aid (LSFA) and CPR self-training systems (STS). *Critical Care Medicine* 1981; 9: 403-4.