

Assessment of the Cardiopulmonary Resuscitation Skills among the Students of Dentistry

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ABSTRACT

Background Cardiopulmonary arrest (CPA) has been defined as “unpredicted & the quick halt/stop in the breathing of patients or/and circulation due to numerous reasons. Cardiopulmonary resuscitation incorporates complete hard work & the practices for the reviving of that individual/person who is in the heart failure. All of the wellbeing professionals, including oral/dental experts, have to be trained and prepared enough to oversee health linked crises.

Aim: To see student’s skills of latest CPR guiding principles

Study design: Cross-sectional study

Place and duration of study: This study of 3 months duration was carried on students of Multan dental college Multan.

Methodology: Eighty Students were chosen randomly. Knowledge concerning CPR was appraised by objective type printed paper. Practical skills/ expertise was then appraised by the SimMan (the high-fidelity simulator). The paper embraced of eighteen true false and 7 MCQ’s. Every query was of one mark and the passing score was 50%.

Results: Men were thirty two while ladies were forty eight. 66(82.5%) participants failed in initial assessment, 72(90%) students reported failure due to compression rate error, 58(72.5%) subjects were failed due to ventilation rate error and 61(76.25%) students failed due to wrong hand position

Conclusion: Level of the knowledge in addition to training concerning the medicinal emergencies of students is below and less than required standard. Hence, it is imperative to place the correct strategies & plans in place to fortify zones of weakness.

Keywords: Basic life support, Cardio-pulmonary arrest, Cardiopulmonary resuscitation, guiding principles, Medical emergencies

INTRODUCTION

Cardiac arrest deliberated as chief source of decease in various portions of earth. Cardiopulmonary arrest (CPA) has been defined as “unpredicted& the quick halt/stop in the breathing of patients or/and circulation due to numerous reasons”¹⁻⁷. All of the wellbeing professionals, including oral/dental experts, have to be trained and prepared enough to oversee health linked crises. In addition to preparation in the necessary methods of the resuscitation, like mouth to mouth ventilation merged with the cardiac pressure, various procedures can similarly be supportive. Dental/oral consultants have to be physically prepared to operate the laryngo scope, an oropharyngeal tube, an Ambu mask, an oxygen-balloon, and the drugs, like an epinephrine and the lidocaine as well⁸.

Cardiopulmonary resuscitation can double or expressively upsurge probability of one’s survival subsequently cardiac arrest⁹. Cardiopulmonary resuscitation incorporates complete hard work &the practices for the reviving of that individual/person who is in the heart failure. For nearby fifty years or near that, early acknowledgment, actuation, defibrillation, swift CPR and vital standards of getting exigent clinical attention or care have saved many lives around this globe. These examples demonstrate significance/ importance of the resuscitation investigates &the usage of these practices in differentclinics¹⁰.

In the latest directions, CPR has been reviewed under the 2 sub-headings which includes ACLS (advanced cardiac life support) & vitalor BLS (basic life support), which are indivisible. Throughout the oral/dental appointments, instances of the heart halt were observed many times, despite this reality that they are uncommon. The health professionals including oral consultants have to be definitely ready and alert for various medical related urgentconditions⁷.

There is always chance of coming across various health obviously amplified with expanding no of the old patients with associated issues or medical emergencies (ME) in dental centers.

Nonetheless, amount of health associated issues cases has various clinical issues. Commonly revealed cases are of syncope, the hypertensive (raised Blood pressure) emergency etc. According to investigation carried out in 2000s, twenty instances of expiry were reported for over ten years. Amongst various ME cases faced in oral facilities, rate was 1.1%-1.4%⁷for CPA’s cases

Like all the other wellbeing experts, CPR skills are also obligatory for each and every oral surgeon. But disappointingly, oral surgeons are nearly without these skills as well as knowledge concerning cardio-pulmonary resuscitation¹¹.

The objective of the study was see student’s skills of latest CPR guiding principles as well as to identify those precautionary measures that have to be adopted for correction of highlighted deficiencies.

METHODOLOGY

CPR has been well-defined by the American Heart Association as “ In case of the cardiac arrest to patient with neither breathing nor pulse, the rescuer must commence with the compressions of thirty rib cage followed by 2 breaths”¹⁰. Students chosen randomly were from Multan Dental College after approval of IRB. Knowledge concerning CPR was appraised by objective type printed paper. Practical skills/ expertise was then appraised by the SimMan (the high-fidelity simulator). The paper embraced of eighteen true false and 7 MCQ’s. 20 Minutes were allotted for this paper. Every query was of one mark and the passing score was 50%. Topics tested are shown in Table 1.

In order to check& see capability of the part takers to accomplish the CPR, we used The SimMan (the high-fidelity simulator) applied test. Great concern was paid to the primary assessment, the rate plus volume, the ventilation, force, the rhythm & the rate of the compression. As described by the 2015 guiding principles of the American heart association, following standards of the CPR was valued;

- Checkered for the responsiveness is the just gasping or without breathing (i.e., without normal breathing) plus no

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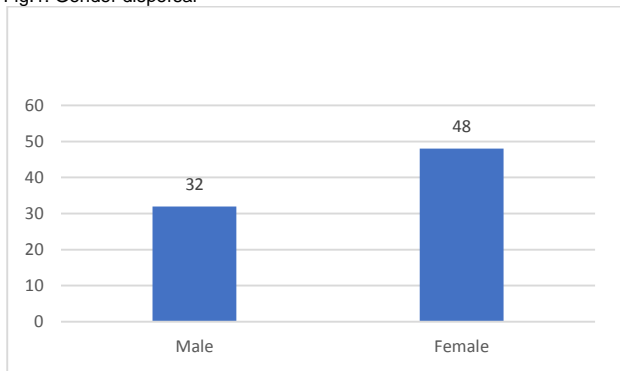
definite pulse noticed within the 10 sec (Pulse check as well as Breathing might be concurrently done in <ten sec)

- Both hands ought to be on smaller half of the sternum
- Rate of compression is in the limit of 100-120/min.
- Compression penetration for the adults is changed to minimum 5 cm (2 inches) but must not exceed 6 cm.
- To allow the complete recoil of chest wall subsequently each compression, rescuers must elude inclined on chest b/w the compressions.
- Trunk compressions must be started beforehand by savior, giving saving breaths (C-A-B as a replacement for A-B-C) to lower the interval to 1st compression. Unaccompanied rescuer should start CPR having 30 compressions to the chest instantly followed by the two breaths.
- For folks having advanced airline in a place and an ongoing CPR, rate of a ventilation of one breath each six sec (ten breaths/ min) is proposed.

RESULTS

Perfoma was completed by eighty students. Men were thirty two while ladies were forty eight (Figure 1). Result of the objective exam has been displayed in (Table 1). Test Pattern (MCQ's) has also been demonstrated in the Table 2. 66(82.5%) participants failed in initial assessment, 72(90%) students reported failure due to compression rate error, 58 (72.5%) subjects were failed due to ventilation rate error and 61(76.25%) students failed due to wrong hand position. Graph 1 shows the Results of the Performance Assessment of the CPR.

Fig.1: Gender dispersal



Graph 1: Outcomes of the performance assessment for CPR

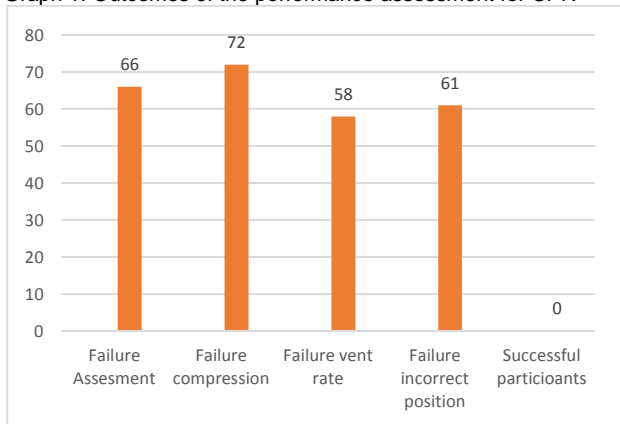


Table 1: Result of objective paper

PASS (Obtaining 50% or more marks)	21(26.25%)
FAIL (< 50% marks)	59(73.75%)
Total	80

Table 2: Test pattern (MCQ's)

Topic	No. of the questions
Theory regarding a CPR	10
Ventilation	5
Managing the fibrillation of ventricle	3
Management of Asystole	3
Ventricular extrasystole	2
Dosage/Drugs	1
Electromechanical dissociation	1

DISCUSSION

Numerous cases of medicinal emergency may well be encountered in the dental setup¹². These may comprise of wide-ranging kind of situations from the syncope, the hypertensive crisis, & an angina pectoris to the CPA cases. Dental/oral surgeons are also considered as the healthcare experts; thus, it is obligatory for dental/oral surgeons as well, to have thorough knowledge and skills in order to treat ME¹¹.

The outcomes of study conducted by Sajid M clearly showed that part takers didn't have requisite trainings & skills to deal with medicinal emergency which is identical to this study¹¹. In our research, 34% partakers qualified the objective type exam which is nearly similar to the outcomes of other study (41%)¹³.

Satisfactory knowledge plus appropriate awareness of the practices & the techniques permit an individual to fruitfully resuscitate & save life of victim. Every wellbeing expert should all the time be aware as well as trained practically concerning BLS^{14,16}.

In our current study, we observed for the retention of the basic life care proficiency in students, undergoing standard training & preparation protocol, where nearly all the students failed in the exam as in study carried out by Pim A. de Ruijter^{17,18}. Expertise to successfully checked the vital signs & to start CPR whenever suitable were kept longer¹⁹. Few other researches also revealed that hands-on expertise/skills in the resuscitation lessen swiftly²⁰. In this investigation, majority of the subjects efficiently evaluate the vital signs, however they were failed to preserve the adequate depth of the chest compression & the ventilation volumes; we think this (hands-on expertise) delay may be owing to dearth of chances for the hands-on practice¹⁸. Various other investigators have scrutinized awareness concerning BLS knowledge among the well-being workers & many other communities²¹⁻²³.

In this research, 70% contestants faced failure due to the compression & the ventilation rate errors which is much greater than findings described by another investigator where only 1.2% of the contestants were fully aware & conscious about general compression-ventilation ratio while 20.4% were aware & conscious of order of the CPR²⁴. In another research by Mohammed Z, 26.7% of junior doctors succeeded in the rate of the chest compressions which is in line to our investigation here thirty per cent succeeded whereas 70% failed²⁵.

Partakers failed in some critical features of the CPR. Moreover, not a major number of contestants accomplish accurate CPR on a simulator. Inexpertly following to the guiding principle of AHA demonstrates many key factors. Some other researches conveyed that practice of BLS may be tough to recall under a tension or stressful situation, as noticed by the poor CPR performance in current research. Secondly, it could be challenging for inexperienced practitioners, like dental HO's or students, to convert proper protocol into the real clinical performance²⁶.

Outcomes of our study validates that here is the deficiency of training in the BLS (basic life support) program. Regular and continuous hands-on courses are required which ought to occur on the annual or the biannual intervals. Graham CA fruitfully demonstrated a beneficial training result in dental members. He recognized those participants who 'qualified/passed' after the training, i.e. those displayed capability of providing the successful & effective BLS (71/75, 94.7%) and also those who were not classified as the competent or capable (4/71, 5.3%)²⁷. Therefore, consistent preparatory sessions for the BLS must be obligatory &

the usage of some media devices are recommended too, for dental work forces in order to recall their knowledge, awareness plus clinical abilities²⁸.

CONCLUSION

We conclude that level of the knowledge in addition to training concerning the medicinal emergencies of students is below and less than required standard. Hence, it is imperative to place the correct strategies & the plans in place to fortify and strengthen their documented zones of weakness.

Conflict of interest: Nil

REFERENCES

- Nishiyama C Long-term Retention of Cardiopulmonary Resuscitation Skills After Shortened Chest Compression-only Training and Conventional Training: A Randomized Controlled Trial. *Academerg medicine* January 2014; 21(1):47-54.
- Yow AG, Rajasurya V, Sharma S. Sudden cardiac death. *StatPearls [Internet]*. 2020 May 30.
- Wong CX, Brown A, Lau DH, Chugh SS, Albert CM, Kalman JM, Sanders P. Epidemiology of sudden cardiac death: global and regional perspectives. *Heart, Lung and Circulation*. 2019 Jan 1;28(1):6-14.
- American Heart Association. 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;112(Supp 3): S640-946. 2. <https://my.clevelandclinic.org/health/diseases/17522-sudden-cardiac-death-sudden-cardiac-arrest> 2019 May 14.
- Grant Fletcher, Thomas Rea. Quah SR. International encyclopedia of public health. Academic Press; 2017 Second Edition
- Yükse IM, Eryigit V, Karaaslan U, Sağlam C. Dentists' Attitudes Toward Up-To-Date Cardiopulmonary Resuscitation Guidelines. *Eurasian J Emerg Med* 2015; 14: 177-82.
- Kavari SH, Chohedri AH. Cardiopulmonary Resuscitation: Knowledge and Personal Experience In Iranian Dentists. *Pak J Med Sci April* 2007;23(2):296-97.
- <https://www.heart.org/en/news/2018/07/12/cpr-is-key-to-survival-of-sudden-cardiac-arrest>
- Travers AH, Rea TD, Bobrow BJ, Edelson DP, Berg RA, Sayre MR, et al. Part 4: CPR overview: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation* 2010;122(Suppl 3): S676-84.
- Sajid M, Jamil. M, Kouser R, Naz S & Javeed M. Evaluation of Cardiopulmonary Resuscitation skills of dental students & House Officers. *Pakistan Oral & Dental Journal*. 2017 Mar 31;37 (1).
- Awata N, Hitosugi T, Miki Y, Tsukamoto M, Kawakubo Y, Yokoyama T. Usefulness of a stool to stabilize dental chairs for cardiopulmonary resuscitation (CPR). *BMC emergency medicine*. 2019 Dec;19(1):1-7.
- OwaidAlsharari A, Alduraywish A, Ali Al-Zarea E, Ibrahim Salmon N, Ali Sheikh MS. Current status of knowledge about cardiopulmonary resuscitation among the university students in the northern region of Saudi Arabia. *Cardiology research and practice*. 2018 Jun 10;2018.
- Almesned A, Almeman A, Alakhtar AM, et al. Basic life support knowledge of healthcare students and professionals in the Qassim University. *Int J Health Sci (Qassim)*. 2014;8: 141-150.
- Al Enizi BA, Saquib N, Zaghoul MS, Alaboud MS, Shahid MS, Saquib J. Knowledge and attitudes about basic life support among secondary school teachers in Al-Qassim, Saudi Arabia. *Int J Health Sci (Qassim)*. 2016; 10:415-422.
- Ahmad A, Akhter N, Mandal RK, Areeshi MY, Lohani M, Irshad M, Alwadaani M, Haque S. Knowledge of basic life support among the students of Jazan University, Saudi Arabia: Is it adequate to save a life? *Alexandria journal of medicine*. 2018;54(4):555-9.
- American Heart Association. Highlights of the 2015 American Heart Association; Guidelines update for CPR and ECC:1-32. www.heart.org/cpr.
- Ruijter PAD et al. Retention of first aid and basic life support skills in undergraduate medical students. *Med Educ Online* 2014; 19:1-10.
- Woollard M, Whitfield R, Smith A, Colquhoun M, Newcombe RG, Vetteer N, et al. Skill acquisition and retention in automated external defibrillator (AED) use and CPR by lay responders: a prospective study. *Resuscitation* 2004; 60: 17-28.
- Madden C. Undergraduate nursing students' acquisition and retention of CPR knowledge and skills. *Nurse Educ Today* 2006; 26: 218-27.
- Al-Mohaisseen MA. Knowledge and attitudes towards basic life support among health students at a Saudi Women's University. *Sultan Qaboos Univ Med J*. 2017; 17 (1):59-65
- Alotaibi O, Alamri F, Almuflleh L, Alsougi W. Basic life support: knowledge and attitude among dental students and Staff in the College of Dentistry, King Saud University. *The Saudi J Dent Res*. 2016; 7:51-56.
- Srinivas HT, Kotekar N, Rao RS. A survey of basic life support awareness among final year undergraduate medical, dental, and nursing students. *Int J Health Allied Sci*. 2014; 3:91-94.
- Kumari KM, Amberkar MB, Alur SS, Bhat PM, Bansal S. Clinical Awareness of Do's and Don'ts of Cardiopulmonary Resuscitation (CPR) Among University Medical Students-A Questionnaire Study. *Journal of clinical and diagnostic research: JCDR*. 2014 Jul 20;8(7):MC08-11.
- Mohammed Z, Arafa A, Saleh Y, Dardir M, Taha A, Shaban H, AbdelSalam EM, Hirshon JM. Knowledge of and attitudes towards cardiopulmonary resuscitation among junior doctors and medical students in Upper Egypt: cross-sectional study. *International journal of emergency medicine*. 2020 Dec; 13:1-8.
- Behrend T et al. Retention of cardiopulmonary resuscitation skills in medical students utilizing a high-fidelity patient simulator. *Medical Student Research Journal*. 2011;01(1):1-4.
- Graham CA, Lewis NF. A scoring system for the assessment of basic life support ability. *J. Eur Resc Counl*. 2000;43(2):111-14.
- Oteir AO, Almhdawi KA, Kanaan SF, Alwidyhan MT, Williams B. Cardiopulmonary resuscitation level of knowledge among allied health university students in Jordan: a cross-sectional study. *BMJ open*. 2019 Nov 1;9(11): e031725.