CARDIOPULMONARY RESUSCITATION: A CROSS-SECTIONAL STUDY TO ASSESS KNOWLEDGE AMONG HEALTH PROFESSIONALS OF PUBLIC SECTOR TERTIARY CARE HOSPITALS OF PESHAWAR

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ABSTRACT

Objective: *To assess the knowledge and awareness of Cardiopulmonary resuscitation (CPR) among health professionals of Public sector tertiary care hospitals of Peshawar.*

Materials and Methods*: It was a cross-sectional study in which 400 health professionals were included through a convenient sampling technique. The data was collected from December 2017 to February 2018 from the three leading public sector tertiary care hospitals of Peshawar. The sample included willing to participate health professionals of the hospitals excluding doctors, nurses and paramedics of Emergency and Cardiology Unit. Prior approvals and consent were obtained before data collection. A standardized questionnaire to test the knowledge of cardiopulmonary resuscitation (CPR) was filled by the Health Professionals. Data analysis was done through SPSS version 22.*

Results: *Among n=364 (91%) health professionals, 51.4% were female, and 48.6% were male. Only 45.3% health professionals were aware of the updated revised guidelines of CPR. Those who attended training in last seven years scored far better (52.4%) than rest (5.45%). While those who got training before 2005 scored the least (1.09%). A total of 65.4% passed, while 36.4% candidates failed the theoretical CPR knowledge-based test.*

Conclusion: *The current study found that the theoretical knowledge of CPR and its updated guidelines was below average among the health professionals of tertiary care hospitals of district Peshawar. Recent training positively affected the retention of CPR knowledge.*

Keywords: *Cardiopulmonary resuscitation CPR, Public sector tertiary care hospitals, Cross-sectional study, Health Professionals.*

INTRODUCTION

Cardiac Arrest is the third leading cause of death in the industrialized world.[1] It is the cessation of cardiac mechanical activity, confirmed by the absence of signs of circulation.[2] Patients lose consciousness and die within one hour after the onset of acute symptoms.3 Outcome following cardiac arrest dependent on critical interventions like effective chest compressions early defibrillation and advanced life support.[4] Resuscitation is defined as the attempt to maintain or restore life by establishing and main-

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taining circulation, airway, and breathing by chest compressions and mouth to mouth breathing through CPR, defibrillation, and other related emergency care.[5] A high-quality CPR includes compression rate of at least 100/min and depth of at least 2 inches (5 cm) in adults. Compression-to-ventilation ratio of 30:2 for single rescuers of adults, children, and infants. The Rescue breaths are given in approximately 1 second. Once an advanced airway is in place, chest compressions can be continuous (at a rate of at least 100/min). The 2010 AHA Guidelines for CPR and ECC recommend a change in the BLS sequence of steps from A-B-C (Airway, Breathing, Chest compressions) to C-A-B (Chest compressions, Airway, Breathing) for adults, children, and infants.[6] Bystander CPR is performed by a person who is not responding as part of an organized emergency response system to a cardiac arrest. Physicians, nurses, and paramedics may be included in this category.[7] Lack of training, information, fear of doing something wrong, etc. prevents many people from starting chest compression.[8] The percentage of trained health staff providing first aid in the case of sudden cardiac arrest in Pakistan is low.[9] Comprehensive nationwide training of the health staff may increase the number of cardiopulmonary resuscitation in hospitals, thus improving the survival probability of the affected patients.[10]

MATERIALS AND METHODS

This was a descriptive cross-sectional study and was carried out in three leading tertiary care hospitals of district Peshawar Khyber Pakhtunkhwa to determine the level of theoretical knowledge of CPR among health professionals of the hospitals. The study was carried out on 364 health professionals through a convenient sampling technique. Health professionals selected included Doctors, nurses, and paramedics, who were willing to participate. Doctors, nurses, and paramedics of emergency and Cardiology unit were not included in the survey. Prior ethical and administrative approval was obtained from research and ethical committee and respective hospital authorities, this study was conducted from December 2017 to February 2018. A self-structured questionnaire (based on 2010 American Heart Association guidelines) was filled after taking consent from the participants. The questionnaire comprised of demographic data followed by ten knowledge analyzing multiple-choice questions. Demographic data consist of name, gender, profession, name of the respective hospital. The questionnaire was filled by the respondents and was returned on the same day. The cut-off value for the knowledge-based survey was kept at 65%. The sample size (n=400) was determined by Cochran's equation, with 95 % confidence interval. All statistical data were analyzed using SPSS version 22. Frequency and percentages were calculated. A chi-square test was carried out for nominal variables.

RESULTS

Of the total (n= 400) health professionals enrolled in the survey, 364 (91%) health professionals completed the survey. 158 (43.4%) doctors, 133 (36.5%) nurses and 73 (20%) paramedics completed the questionnaire (shown in Fig.1). A total 187 (51.4%) female staff and 177 (48.6%) male health staff participated in the survey. The cut-off value for the survey was kept at 65%.

Out of the total respondents, 275 (75.5%) health professionals correctly stated that the reason for initiating CPR was "to prevent permanent brain

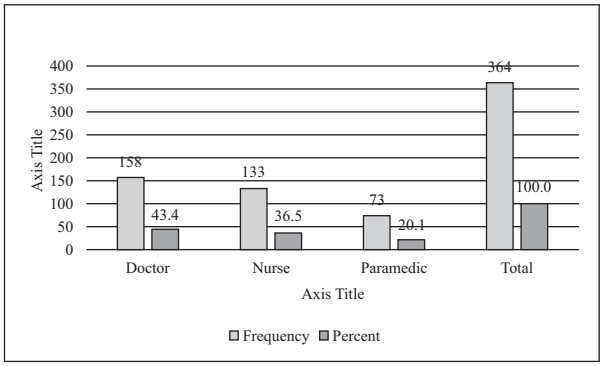

Fig 1: Study Participants Included In the Survey

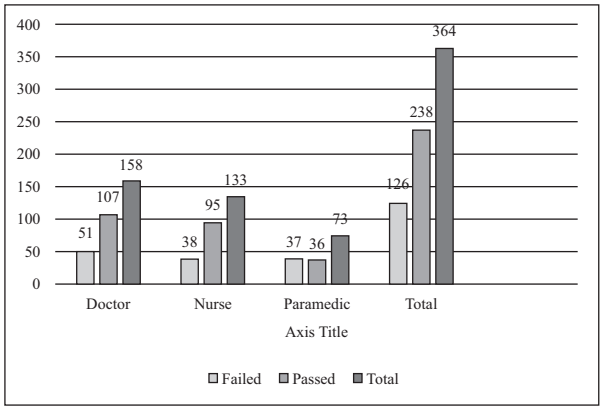

Fig 2: Profession wise Pass / Failure

Table 1: Order of CPR According to New AHA 2010 Guidelines

Order of CPR	Number of Health Staff	Percentage
Airway, Breathing, Chest Compressions (ABC)	150	41.2%
Airway, Chest Compressions Breathing (ACB)	35	9.6%
Chest Compressions, Airway, Breathing (CAB)	165	45.3%*
Don't know	14	3.8%

Table 2: If an Unconscious, Pulseless Individual is seen

Appropriate measure to perform	Number of Health Staff	Percentage
Secure airways	106	29.1%
Start chest compressions	213	58.5%*
Perform an electrocardiogram (ECG/EKG)	24	6.6%
Don't know	21	5.8%

Table 3: Times attended a Workshop/Training on BLS/CPR

Time attended a workshop/training	Status		Total	Percent
	Failed	Pass		
Between 2014 to 2017	41	149	190	52.2
Between 2011 to 2014	19	42	61	16.8
Between 2008 to 2011	10	12	22	6.0
Between 2005 to 2008	2	4	6	1.6
Before 2005	4	4	8	2.2
Never	50	27	77	21.2
Total	126	238	364	

damage." Out of 24.5% respondents who were not able to answer correctly, 35 (9.6%) responded that CPR is initiated to "avoid failure of lungs." 33 (9.1%) stated that CPR is initiated "to delay tissue death in distant parts of the body" while 21 (5.8%) did not know the reason. Responses of the health professionals regarding updated guidelines of CPR (AHA 2010) and "appropriate measure to perform in case of an unconscious, pulseless individual is seen" are given in table (1 and 2, respectively).

Out of total health staff enrolled, 23 (6.3%) stated that, recommended compressions to ventilation/ breathing ratio among adults was "50: 1" while 287 (78.6%) health professionals correctly answered that it was "30:2".33 (9.1%) claimed it as "60:40" while 22 (6.0%) said that they have no knowledge about recommended compressions ratio.

When asked about "advised compression rate per minute for all age groups," 18 (4.9%) said that it was "200 - 300 per minute". 11 (3.0%) stated that it was "300 - 400 per minute". 275 (75.5%) health professionals correctly answered it as "100 - 120 per minute" while 60 (16.5%) said that they do not know about it.

Out of the total n=181 (49.7%) thought that correctly mentioned that depth of chest compression is "2 inches (5 cm) in adults, 1.5 inches (4 cm) in infants". N= 45 (12.4%) stated that it is "4 inches (10 cm) in adults, 3 inches (7.5 cm) in infants". N= 74 (20.3%) stated that it is "1 inch (2.5 cm) in adults, 0.5 inches (1.2 cm) in infants", while n= 64 (17.6%) stated that they don't know about it. When questioned regarding the "technique used for securing airways," 109 (29.9%) health professionals correctly mentioned that it was "head-lift, chin-tilt maneuver." 26 (7.1%) stated that it was "head sideways, chin-lift maneuver." 185 (50.8%) stated that it was "head-tilt, chin-lift maneuver" while 44 (12.1%) said that they do not know about it. Regarding question about "If pulse is present, but no adequate breathing is found," 116 (31.9%) health professionals stated that "they will start chest compressions anyways along with

rescue breaths." Only 184 (50.5%) correctly stated that they would provide "rescue breaths." 21 (5.8%) stated that they "will wait for the patient to gain consciousness," while 43 (11.85) stated that they do not know about that. When asked about "if they hear cracking or popping sounds after continuous cardiopulmonary resuscitation (CPR) indicating possible rib or cartilage fractures, what will you do." 59 (16.2%) stated that "they will stop compressions immediately to prevent further damage." 38 (10.45) said that "they will check for internal bleeding." Only 227 (62.4%) rightly stated that "they will continue providing compressions and rescue breaths anyways," while 40 (11.05) stated that they do not know about it. A total of 238 health staff (65.4%) passed, while 126 (36.4%) candidates failed the questionnaire-based test. Data regarding profession wise failure and pass percentage is given in Fig.2. Nearly 50% candidates attended a CPR course between 2014 and 2017 (data regarding course attendance is given in table 3).

DISCUSSION

The results of this study demonstrate that the theoretical knowledge of CPR among health professionals was below average; 36.4 % candidates failed the questionnaire-based test, which is similar to the study conducted in Pakistan among radiologists and residents from six tertiary care teaching hospitals. Health professionals were not able to manage adult cardio arrest scenarios with overall average knowledge score of 3.41% and 3.64% for consultants and residents, respectively, which is far less than general health professionals in the current study.[11] In the same study only 28.22% responders had attended life support course from 2006 till 2013 whereas 42.74% responders did not attend the course at all. Similarly in current study most of the staff 78.9% were trained at least once in their life, while considerable number (21.1%) never attended any BLS/ CPR course at all. Those who attended training in last seven years scored far better (52.4%) than rest (5.45%). Those professionals who got training before 2005 scored the least (1.09%). Thus emphasizing the importance of new BLS/CPR training on knowledge retention. Of all the health professionals paramedics scored the least (only 9.89% passed the test). Shretha Roshana also stated that those medics/paramedics who had received cardiopulmonary resuscitation (CPR) training more than five years back or no training scored less.[12] The current study shows that fewer males were trained than female in CPR, could be one of the cause females scored better than males.

A considerable number of respondents (24.5%) were not able to answer the main reason for initiating CPR. A significant number (54.7%) of health professionals were unable to state the correct order of CPR according to new AHA 2010 guidelines. 41.5% of the respondents were not able to answer about appropriate measures to perform in case of a "pulseless unconscious individual is found." 21.4% of health professionals were not able to state correctly the recommended compressions to ventilation/ breathing ratio in adults. 24.5% of the respondents were not able to answer correctly the advised compression rate per minute for all age groups. 50.3 % of the respondents were not able to state correctly the recommended depth of chest compression. 70.1 % were not able to answer correctly about the technique used for securing airways. 49.5% respondents were not able to state correctly about what they will do in case if "pulse is present, but no adequate breathing is found." 37.6% respondents did not answer correctly that what they will do if they "hear cracking or popping sounds after continuous CPR indicating possible rib or cartilage fractures."

In the current study, doctors/physicians scored better than the nurses and paramedics. Similarly Källestedt M-LS tested theoretical knowledge about BLS in a Swedish hospital; it was noticed that doctors/physicians scored better knowledge than rest of the staff in the test. However marked improvement in level of knowledge among Nurses and paramedics occurred after training.[13] A large number of respondents (59%) were not able to answer correctly about the latest modifications in the procedure of CPR (AHA 2010), demonstrating severe lack of updated knowledge of this life-saving procedure among health professionals of these hospitals.

CONCLUSION

Theoretical knowledge about Cardiopulmonary resuscitation among medical professionals in tertiary care government hospitals of Peshawar was insufficient. Furthermore, Information about recent modifications in CPR guidelines was also not updated. Tertiary Care health facilities are considered far superior in knowledge and competence than other referral hospitals in Province of Khyber Pakhtunkhwa;

these are last destination of all complicated cases; low knowledge of CPR among health professionals of this hospital is a worrisome finding. This study shows that recent training positively affects the retention of CPR knowledge. Therefore there is a need to train all health professionals to keep them updated about emerging trends in the guidelines.

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