RESEARCH ARTICLE

Cardiopulmonary resuscitation and response of health care professionals in district Chitral-Pakistan: a cross-sectional approach

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Abstract

Objective: To assess the cardiopulmonary resuscitation response and performance experience among healthcare professionals in a secondary care setting.

Method: The cross-sectional study was conducted from November 2019 to December 2020 in Chitral, Pakistan, and comprised healthcare professionals of each gender from selected hospitals. Data was collected using structured interviews based on 23 questions. Correct responses were scored 1, while incorrect or "don't know" responses were scored 0. Data was analysed using SPSS 20.

Results: There were 140 subjects with mean age 36.2±8.47 years (range: 23-57 years). There were 66(47%) nurses, 44(31%) paramedics and 30(22%) physicians. Physicians demonstrated superior knowledge compared to nurses and paramedics ($p<0.05$). Overall, there were 65(46%) participants who correctly identified when cardiopulmonary resuscitation should be initiated, indicating inadequate knowledge.

Conclusion: There were significant gaps in cardiopulmonary resuscitation knowledge among healthcare professionals working in a secondary care setting.

Key Words: Cardiopulmonary resuscitation, CPR, Cardiac arrest resuscitation, Basic life support, Advanced cardiac life support.

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Introduction

Cardiopulmonary resuscitation (CPR) is a critical procedure for managing patients in cardiac arrest when timely intervention is vital for survival.[1] The survival rate of cardiac arrest patients decreases by 7-10% with each minute of delayed intervention.[2] CPR has evolved into a simplified set of skills that can be learned and practised without any formal medical training.[3] It involves a series of manoeuvres aimed at reversing the shutdown state. In a hospital environment, any trained crew member can rapidly initiate this life-saving technique. In countries with advanced healthcare systems, trained teams are usually available to administer CPR, leading to higher survival rates.[4,5] However, in developing countries, including Pakistan, the lack of consistent training and resources among healthcare professionals (HCPs) results in suboptimal CPR performance, particularly in emergency or rural settings. Considering CPR being an important procedure, HCPs should have the competence to initiate and perform it when urgently required, regardless of their training levels or institutional work settings.

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According to international guidelines and recommendations, HCPs should retake a CPR course every two years to maintain and improve their CPR performance skills. It is assumed that HCPs possess the capability to diagnose and treat cardiopulmonary arrest at any time.[6-7] For the better retention of CPR skills, strategies such as feedback from instructors, video-based CPR demonstrations, scenario-based manoeuvers on Mannequins, and multiple practice sessions can be used.[8-13]

This study aimed to ASSESS the knowledge and response regarding CPR of Healthcare professionals in Secondary health care setting.

Subjects and Methods

A cross-sectional study was conducted from November 2019 to December 2020 in Chitral, Pakistan, and comprised HCPs of both the genders from selected hospitals Chitral, Pakistan after taking permission from the District Health Officer (DHO) and Medical Superintendent (MS) of the local public-sector hospital. The included participants were either physicians, nurses or paramedics with atleast one year of proffesional experience. HCPs engaged in patient care during data-collection were excluded. The sample was collected using probability sampling technique. The sample size was calculated using the WHO calculator with confidence level 95%, margin of error 5%, power 80% and proportion

50%. The study was approved by the Ethics Review Committee of the Aga Khan University.[9]

After taking informed consent from all the subjects, data was collected regarding CPR knowledge and attitude using a structured questionnaire having a Cronbach-alpha value of 0.76. Each correct answer was scored 1 and incorrect or "don't know" responses were scored 0. Based on studies conducted in Pakistan, a passing score of 50% or above for Basic Life Support (BLS) training was considered indicative of adequate knowledge and less than 50% is considered as inadequate knowledge.[10] Considering the AHA criteria, passing criteria score of 84% and above indicated excellent knowledge. The primary outcome of the study was the mean difference between knowledge score and CPR skills of the participants related to the diagnosis of out-of-hospital cardiac arrest cases.

Data was analysed using IBM SPSS Statistics 20. Frequencies and percentages were calculated for categorical variables, and mean ± standard deviation was calculated for the continuous variables. The strength of the relationship between the two dependent variables was analysed using Cramer's V test. P<0.05 was considered statistically significant.

Results

There were 140 subjects with mean age 36.2±8.47 years (range: 23-57 years). There were 66(47%) nurses, 44(31%) paramedics and 30(22%) physicians. Gender (Figure 1) and academic details (Figure 2) of the participants were also noted.

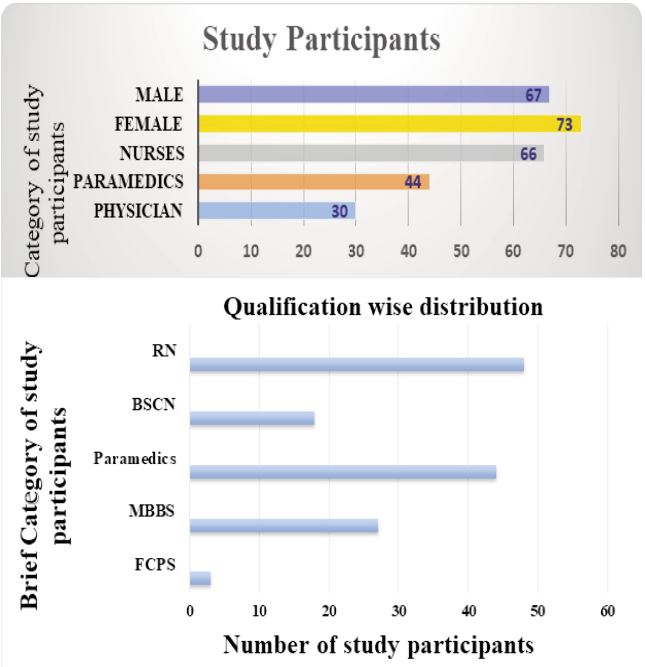

Figure-2: Academic qualification of the participants.

When the participants were asked about the conditions in which they do start CPR, 65(46%) answered correctly; 23(77%) physicians, 24(36%) nurses and 18(41%) paramedics. The question about the reordering of CPR steps as per AHA guidelines was answered correctly by 19(57%) subjects, and they were all physicians 17(57%) (Table 1).

Table-1: Responses to the study questions (n=140)..

Questions	Physicians (n %)	Nurses (n %)	Paramedic (n %)	Total (n %)	P-Value
When do you start "CPR"?					
Correct	23 (77%)	24 (36%)	18 (42%)	65 (46%)	<.001*
Incorrect	7 (23%)	42 (64%)	25 (58%)	74 (53%)	
AHA recommended steps for adult CPR?					
Correct	17 (57%)	22 (33%)	17 (38%)	56 (41%)	0.067
Incorrect	13 (43%)	44 (67%)	26 (60%)	83 (59%)	
Unresponsive/not breathing, airway maintained?					
Correct	21 (71%)	31 (46%)	13 (29%)	65 (47%)	.001*
Incorrect	9 (29%)	35 (54%)	30 (70%)	74 (53%)	
Patient needs CPR, first action if you are alone?					
Correct	10 (34%)	21 (31%)	9 (20%)	40 (29%)	.372
Incorrect	20 (66%)	45 (69%)	34 (79%)	99 (71%)	
Hands position for adult CPR?					
Correct	13 (43%)	16 (23%)	18 (40%)	47 (34%)	.076
Incorrect	17 (57%)	51 (77%)	26 (60%)	93 (66%)	
Role switch during CPR?					
Correct	7 (23%)	21 (31%)	12 (27%)	40 (28%)	.685
Incorrect	23 (77%)	45 (69%)	31 (72%)	100 (72%)	
Rate of chest compression per minute?					
Correct	19 (63%)	30 (45%)	17 (40%)	66 (47%)	.097
Incorrect	11 (37%)	36 (55%)	26 (60%)	73 (53%)	
AHA correct sequence of "Chain of Survival" is?					
Correct	12 (40%)	36 (54%)	18 (40%)	66 (47%)	.32
Incorrect	19 (60%)	30 (46%)	25 (58%)	74 (53%)	
Correct rate of rescue breath for a child?					
Correct	8 (25%)	20 (30%)	5 (12%)	33 (25%)	.093
Incorrect	22 (74%)	46 (70%)	38 (88%)	106(75%)	
Patient is choking, your first intervention?					
Correct	16 (54%)	11 (16%)	9 (21%)	36 (26%)	.001*
Incorrect	14 (46%)	55 (84%)	34 (79%)	103 (74%)	
Your action after defibrillation?					
Correct	16 (54%)	19 (29%)	11 (25%)	46 (33%)	.01*
Incorrect	14 (46%)	47 (71%)	33 (75%)	94 (67%)	
Patient submerged in water, unresponsive, having breathing and pulse, your first response?					
Correct	14 (48%)	27 (40%)	8 (18%)	49 (35%)	.013*
Incorrect	16 (52%)	39 (59%)	35 (81%)	90 (64%)	

*statistically significant. CPR: Cardiopulmonary resuscitation, AHA" American heart Association.

Table-2: Overall knowledge scores.

Knowledge Score	Frequency (%) Excellent	Adequate	Inadequate	P value
Physicians	3(10%)	15 (50%)	12 (40%)	
Nurses	0	24 (36%)	42 (64%)	<0.001*
Paramedics	0	6 (16%)	37 (84%)	

*statistically significant.

The physicians' score was significantly higher than that of the nurses and paramedics (p≤0.05) (Table 2).

Discussion

The current findings highlighted significant gaps in the knowledge and practice of CPR among HCPs in a Pakistani secondary care setting.

Among the participants, only 46% correctly identified the conditions under which CPR should be initiated, with physicians outperforming nurses and paramedics. These findings mirror those of similar studies in low-resource settings.[7] In the current study, physicians demonstrated better CPR knowledge compared to nurses and paramedics, which can be attributed to their higher level of education and specialised training. However, even among physicians, significant gaps were observed, as only 57% of them correctly mentioning CPR steps as per the AHA 2015 guidelines.[11] This underscores the importance of ongoing, structured training programmes for all HCPs, not just those with advanced medical degrees.

The current findings also highlighted key deficiencies in fundamental CPR skills. For example, only 47% of the participants answered correctly regarding airway management for an unresponsive and apnoeic patient, and a mere 34% were aware of the correct hand positioning during chest compressions. These basic skills are crucial in saving lives during cardiac arrest, and the lack of proficiency in these areas can lead to delayed or ineffective responses, directly impacting patient outcomes. In fact, studies have shown that each minute of delay in starting CPR decreases survival chances by approximately 7-10%, which highlights the critical need for timely and competent intervention.[8, 12]

Interestingly, the current study also revealed that many HCPs were unaware of the correct rate of chest compressions and the proper sequence of actions following defibrillation. The question about the recommended step needed during CPR in accordance with the AHA guidelines was answered correctly by 40% of the study participants. Nearly half of the participants did not know about that. This could possibly be because changes in AHA guidelines, and lack of in-service training. The findings are consistent with earlier studies.[13-15] The finding emphasises the importance of periodic CPR recertification, ideally every six months, to ensure that HCPs maintain their skills.

Additionally, the current study revealed a concerning lack of awareness regarding the immediate response to choking, with 74% participants unable to correctly identify the first step. This gap in knowledge is particularly alarming because choking emergencies are common in clinical settings, and an improper response can lead to irreversible harm. The low level of knowledge among paramedics and nurses in this area points to the need for more comprehensive, scenario-based training that includes rare but critical situations, like choking. The current results are consistent with earlier findings.[16] It is therefore recommended that regular in-service training should be considered, possibly after every 3-6 months in order to help HCPs retain CPR knowledge.[17]

The question about hand placement while performing CPR was incorrectly answered by the majority of the current participants. Similarly, the question concerning role switching during CPR was correctly answered by only 28% of the HCPs. This might be because the majority of the participants were not updated on the basics of CPR. These results in line with other studies, but a few Pakistani studies have shown an awareness of the compression rate and correct hand placement during CPR by >60% HCPs.[18-19] Further, in the current study, 22% subjects had knowledge of the compression-to-ventilation ratio in youngsters, which was similar to an earlier report.[17] This is due to the fact that cardiopulmonary arrest is rare in young people compared to the adult population.[19]

The question about immediate act after defibrillation of patient was correctly answered by 34% of the current subjects, which was consistent with earlier findings.[20] The question about the management of an unresponsive patient having a normal pulse and respiration was answered correctly by 36% respondents, which was similar to an earlier report.[18] This might be due to the fact that many medical institutions lack mandatory training for HCPs, and, therefore, the majority of the HCPs lack basic BLS knowledge, which could contribute to poor outcomes in patients in a medical emergency.[4]

This study has a few limitations. Owing to time and budget constraints, practical CPR skills were not assessed. The sample size was small, which can affect the generalisation of the findings. Also, the sample was raised from only one district, which may not be the true representation of the healthcare settings of the entire region.

Despite the limitations, the findings suggest there should be standard BLS and advanced cardiovascular life support (ACLS) training sessions, periodic competency reassessments, and simulation-based practical sessions for HCPs to enhance patient care during life-threatening emergencies.

Moreover, to enhance effective emergency care in public-sector hospitals, implementation of continuous medical education (CME), periodical trainings, and rapid response team role should also be considered. BLS should be a mandatory skill for HCPs regardless of clinical settings.

Conclusion

This study revealed that the HCPs working in secondary sector hospitals of Chitral had inadequate CPR knowledge, which could compromise patient survival during cardiac arrest.

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Conflict of Interest: None.

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AUTHOR'S CONTRIBUTION:
AAK: Conduct of the study, data collection, drafting, data analysis and final approval.
RB: Data analysis, interpretation, revision and final approval.
AN: Final approval.
SB: Data collection and final approval.