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Awareness and Knowledge of Healthcare Professionals Regarding Cardiopulmonary Resuscitation

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ABSTRACT

Background: Cardiopulmonary Resuscitation (CPR) is a vital life-saving skill, and effective emergency response depends on healthcare professionals' knowledge and understanding. This study evaluated CPR awareness and knowledge among healthcare staff at Arif Memorial and Hameed Latif Teaching Hospitals in Lahore, Pakistan. Objective: To assess the level of awareness and knowledge of cardiopulmonary resuscitation among healthcare professionals at Arif Memorial Teaching Hospital and Hameed Latif Teaching Hospital Lahore, Pakistan. Methods: A descriptive cross-sectional study was conducted with 120 randomly selected physicians, nurses, and paramedics. Data were collected using a structured questionnaire adapted from Kwiecień-Jaguś et al. (2020), and analyzed using descriptive statistics. Results: 80% had formal CPR training; 96.7% acknowledged its importance, and 88.3% desired further instruction. While key CPR components were recognized by most, gaps existed in AED use and algorithm knowledge. Mean knowledge score was 2.08 (SD = 1.045) and awareness score 1.07 (SD = 0.361). Conclusion: Although healthcare professionals showed moderate CPR knowledge and awareness, notable gaps persist. Ongoing training aligned with updated CPR guidelines is essential for enhancing emergency preparedness.

INTRODUCTION

Cardiovascular diseases cause about 30% of global deaths, with sudden cardiac arrest (SCA) being a major contributor. CPR remains a critical emergency response that supports life during such events (Tomas & Kachekele, 2023). Around 70% of out-of-hospital cardiac arrests (OHCAs) happen at home, and half are unnoticed (Alamri & Baker, 2022). Following AHA guidelines ensures effective CPR, and nurses need updated knowledge and skills for proper execution. Despite a solid CPR system in England, survival rates for OHCAs were just 8.6% in 2014 (Ashira et al., 2020). With longer ambulance response times, early CPR by healthcare workers is increasingly vital (Andrell et al., 2021), requiring both knowledge and practice (HA & SM, 2020).

Knowing how to perform CPR promptly is essential for improving survival rates in cardiac arrest cases. Trained healthcare professionals can increase in-hospital survival in 7–24% of cases (HA & SM, 2020). However, in some low-income countries, CPR outcomes remain poor. A study showed only 7.4% achieved return of spontaneous circulation (ROSC), and only 1.6% survived 24 hours, largely due to poor CPR performance (Botes & Moepeng, 2020).

In the U.S., more than 356,000 people experience OHCA annually. Bystander CPR improves survival and neurological outcomes, yet its rate remains low across many regions despite its proven effectiveness (Fratta et al., 2020).

China sees 2.5 million deaths from cardiac arrest annually, with OHCA survival under 1%. The public lacks CPR and AED knowledge, and no standardized AED use training exists (Qian et al., 2021). Globally, bystander CPR rates differ greatly: Sweden (68.2%), USA (45.7% adults, 61.4% children), and India (9.8%) (Ravindra et al., 2022).

In Pakistan, coronary heart disease causes about 200,000 deaths yearly. Data is limited, but studies from cities like Islamabad and Karachi show that healthcare workers often lack proper CPR knowledge (Iqbal et al., 2021). A 2009 Karachi study also found that students without CPR training had lower knowledge than those who received instruction (Bilal et al., 2024).

OBJECTIVE

To assess the level of awareness and knowledge of health care professionals about CPR

NULL HYPOTHESIS (H_0)

There is no significant difference in the awareness and knowledge of CPR among health care professionals.

ALTERNATIVE HYPOTHESIS (H_1)

There is significant difference in the awareness and knowledge of CPR among health care professionals.

METHODOLOGY

This descriptive cross-sectional study was conducted over eight months to assess healthcare professionals' awareness and knowledge of CPR at Arif Memorial and Hameed Latif Teaching Hospitals in Lahore, Pakistan. These teaching hospitals, operating under the RLK Group, were selected due to their well-equipped facilities and active role in

medical education. A total of 120 healthcare professionals were selected using simple random sampling, ensuring equal chances of selection across all roles. Inclusion criteria included currently employed professionals willing to participate during the data collection period, while non-clinical staff and those unavailable were excluded. Data was collected using a validated questionnaire adapted from Kwiecień-Jaguś et al. (2020), with a validity score of 0.98 and reliability of 0.8. Ethical approval was obtained, informed consent was secured, and confidentiality was maintained. Data analysis was performed using SPSS, applying descriptive and inferential statistics to summarize knowledge and awareness levels.

RESULTS

TABLE 1: DEMOGRAPHIC DETAIL OF HEALTH CARE PROFESSIONALS

Demographic data	Frequency(n)	Percentage (%)
Age groups		
Under 30	104	87%
30 – 40	12	10%
41 – 50	4	3%
Gender		
Male	76	63%
Female	44	37%
Occupation		
Physician	42	35%
Nurse	68	57%
Paramedic	4	3%
Healthcare Assistant	6	5%
Year of Experience		
Less than 1 Year	58	48%
1-5 Years	53	44%
6-10 Years	7	6%
11+ Years	2	2%
Have you ever received formal CPR training?		
Yes	96	80%
No	24	20%
What type of CPR certification do you have?		
Basic Life Support	76	63%
Advance Cardiac Life Support	11	10%
Pediatric Advanced Life Support	4	3%
None	29	24%
Do you feel that CPR knowledge is important for your role?		
Yes	116	97%

Not sure	4	3%
Would you be interested in more CPR training or updates?		
Yes	106	88%
No	1	1%
Maybe	13	11%

The demographic details of the healthcare professionals participating in the study are summarized in Table 1. Most participants (87%) were under the age of 30, followed by 10% aged 30–40, and only 3% aged 41–50. Males constituted a larger portion of the sample at 63%, while females made up 37%. In terms of occupation, nurses were the majority (57%), followed by physicians (35%), healthcare assistants (5%), and paramedics (3%). Regarding experience, 48% had less than one year of work experience, and 44% had 1–5 years, while only 6% had 6–10 years, and 2% had over 11 years. A significant number (80%) reported having received formal CPR training, with 63% certified in Basic Life Support, 10% in Advanced Cardiac Life Support, 3% in Pediatric Advanced Life Support, and 24% having no certification at all. Almost all participants (97%) acknowledged the importance of CPR knowledge for their role, and 88% expressed interest in receiving further CPR training, while only 1% were not interested and 11% were unsure.

TABLE 2: AWARENESS AND KNOWLEDGE OF HEALTHCARE PROFESSIONALS ABOUT CPR

Awareness and knowledge of Healthcare professionals	**Frequency(n)**	**Percentage (%)**
What does the abbreviation BLS stand for?		
Basic Life Support	91	76%
You find your friend in the middle of the road—he is unconscious, does not react, and does not breathe properly. What do you do first?		
I make sure we are both safe	42	35%
Having confirmed that the victim does not react even to strong stimuli such as shaking or loud shouts for help, what will you do next?		
Call an ambulance	67	56%
The correct place for the compression of the chest in an adult is		
The Centre of the chest	73	61%
The correct place for the compression of the chest in an infant is		
Two fingers placed in the central part of the sternum on the breast line	58	48%
The correct depth for chest compression in children during BLS is		

1/3 of the chest depth	64		53%
The correct frequency of chest compressions during CPR for adults			
At least 100 compressions per minute	58		48%
We check for a pulse in an adult on the			
Carotid artery	92		77%
The ratio of chest compressions to breaths during CPR in			
30:2		72	60%
During the basic resuscitation procedure, the condition of the victim should be assessed			
Every 5 cycles (30 chest compressions and 2 rescue breaths)	90		75%
What does the abbreviation AED stand?			
Automated External Defibrillator	72		60%
The correct placement of defibrillation electrodes from the AED set is on the front chest, always with the long axis parallel to the long axis of the body			
One on the right side of the sternum, below the clavicle	70		58%
Which of the following is the correct sequence of the use of AED defibrillator?			
Switch on the AED, apply the electrodes, analyze the rhythm, make sure no one touches the victim, discharge	68		57%
Which of the following is the algorithm for basic resuscitation in an adult?			
Make sure both you and the victim are safe, call an ambulance, check for a pulse, begin CPR	68		57%
The 2015 ERC guidelines concerning basic resuscitation operations recommend the following algorithm of procedure			
Clear the airway, check the breathing, check the pulse	41		34%
If your friend suddenly shows symptoms of choking, what will you do?			
Compress his epigastrium several times	54		45%
Rescue breaths in an infant are performed			
Mouth-to-mouth with the nostrils pinched closed	67		56%

Table 2 presents the awareness and knowledge of healthcare professionals regarding CPR. A majority (76%) correctly identified the abbreviation **BLS** as *Basic Life Support*. When asked about the first action upon finding an unconscious person, only 35% chose the correct safety-first approach. For the next step after confirming unresponsiveness, 56% correctly said they would call an ambulance. About 61% knew the correct chest

compression location in adults, while 48% answered correctly for infants. Regarding compression depth in children, 53% responded accurately, and 48% knew the proper compression rate for adults. A high percentage (77%) correctly identified the **carotid artery** as the site to check an adult's pulse. The proper compression-to-breath ratio of **30:2** was known by 60% of participants. Most (75%) were aware that a victim's condition should be reassessed after every 5 CPR cycles. For **AED awareness**, 60% correctly expanded the abbreviation, 58% knew the correct electrode placement, and 57% identified the proper usage sequence. Regarding the **CPR algorithm**, 57% gave the correct adult resuscitation steps, but only 34% were aware of the 2015 ERC guidelines for basic resuscitation. When asked about **choking response**, 45% selected the correct epigastric compressions, and 56% correctly identified that **infant rescue breaths** are given mouth-to-mouth with the nostrils closed. Overall, while many participants had basic CPR knowledge, significant gaps remain in several critical areas.

DISCUSSION

DEMOGRAPHIC COMPARISON

When comparing our study's demographic data with other research, several similarities and differences emerge. In our study, the majority of participants (87%) were under 30 years of age, which aligns with Iqbal et al. (2021), where 72.5% were also under 30. However, Mersha et al. (2020) and Chaudhary et al. (2023) had more diverse age distributions, with a higher proportion of participants in the 30–40 age group. Gender distribution in our study showed more males (63%), consistent with Mersha et al. (65%) and Iqbal et al. (61%), whereas Chaudhary et al. had a predominantly female sample (89.5%). In terms of profession, our study had a majority of nurses (57%) followed by physicians (35%), which is similar to Mersha et al., where nurses made up 52.9%. However, Khan et al. (2023) reported a much higher proportion of nurses (79.7%) and fewer doctors (7.5%). Regarding experience, nearly half of our participants (48%) had less than one year of experience, in contrast to Khan et al., where 40% had over nine years of experience, and Mersha et al., where the majority had 2–5 years. Our CPR training rate (80%) was much higher than Chaudhary et al. (15.7%) and slightly higher than Iqbal et al. (79.4%), indicating relatively better exposure to formal CPR education among our participants.

RESULT COMPARISON

Compared to other studies, our research showed higher levels of CPR knowledge, certification, and positive attitude among healthcare professionals. At the University of Gondar Hospital, only 25.1% of participants had adequate knowledge of adult CPR, and 60.8% had a positive attitude—much lower than our findings where 80% were CPR-certified and 96.7% believed CPR knowledge was essential for their role (Mersha et al., 2020). In a Nepal study, only 12% of healthcare professionals had sufficient BLS knowledge, while the majority had inadequate or intermediate understanding, unlike our participants who demonstrated stronger comprehension and high interest (88.3%) in further training (Chaudhary et al., 2023). A study conducted in Lahore found that 83% of

doctors had poor CPR knowledge, and only 17% were knowledgeable—significantly lower than our mean CPR score of 1.20, although both studies showed a favorable attitude towards CPR (Iqbal et al., 2021). In Khyber Pakhtunkhwa, healthcare providers lacked proper BLS knowledge despite experience, supporting our observation that even trained staff had gaps in specific CPR practices and required refresher courses, as 88.3% of our respondents also desired further training (Khan et al., 2023).

LIMITATIONS

- The study used a cross-sectional design, which only captures data at a single point in time and does not allow for assessment of changes over time or causality.
- Data was collected through self-reported questionnaires, which may introduce bias or inaccuracies due to overestimation or underreporting of knowledge or practices.
- The study was limited to two hospitals in Lahore, and the findings may not be generalizable to healthcare professionals across other regions or hospital settings in Pakistan.
- The sample size was relatively small (n=120), which may limit the statistical power and the ability to detect significant associations.
- The study did not include direct observation of CPR skills, so actual performance competence could not be evaluated.

CONCLUSION

The findings of this study revealed that while a majority of healthcare professionals demonstrated a positive attitude and basic awareness regarding cardiopulmonary resuscitation (CPR), there remain notable gaps in knowledge and practical understanding of essential CPR steps and techniques. Most participants recognized the importance of CPR in their clinical roles, and a significant number had received formal CPR training, particularly in Basic Life Support (BLS). However, inconsistencies in responses related to compression depth, AED use, and CPR sequences highlight the need for regular refresher courses and hands-on training sessions. The study emphasizes the urgent requirement for institutional support in implementing structured and ongoing CPR training programs to ensure healthcare professionals are fully equipped to respond to cardiac emergencies effectively.

RECOMMENDATIONS

- Conduct longitudinal studies to assess changes in CPR knowledge and skills over time after training interventions.
- Include a larger and more diverse sample from multiple hospitals and regions to improve generalizability.
- Investigate barriers to effective CPR training and implementation among healthcare professionals.
- Compare CPR knowledge among different healthcare professional groups (e.g., physicians vs. nurses vs. paramedics).
- Investigate the correlation between CPR knowledge and actual patient outcomes in hospital settings.

- Assess public awareness and compare it with professional knowledge to identify broader educational needs.

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