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Knowledge, Attitude and Practice of Cardiopulmonary Resuscitation Among Health Professionals

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ABSTRACT

Cardiopulmonary resuscitation (CPR) stands as a vital life-saving technique, predominantly administered by dedicated healthcare professionals and technicians engaged in active practice or ongoing study. Literature showed different study regarding KAP (knowledge, attitude and practice) of CPR among students and professionals of medical field. This study focus the level of KAP in healthcare technicians (BS surgical technicians, MLT, dentist, radiologist and anesthetists). The objective of the study states the questionnaire development and then finding the validity and reliability. The validated questionnaire is then applied on the technicians for evaluating knowledge, attitude and practice of CPR among them. It is a descriptive comparative study. About 700 participants were enrolled according to inclusion criteria i.e. healthcare technicians. Both male and female were taken. The questionnaire was made into three domains of knowledge, attitude and practice with 14, 10 and 8 items respectively. The face, content validity and internal consistency was evaluated. The validated questionnaire was then applied to the participants for finding KAP. The mean score of each domain is calculated and interpretation was done. Content validity was evaluated with Kappa coefficient as 0.95. Further pilot testing (n=30) showed no errors in the questionnaire, the Cronbach's Alpha Score was calculated >0.7 showing good internal consistency. The mean age of the subjects was 31.47 ± 4.607 (n=700). Frequency of all the likert scale was found for each items in all domains. There was no significant difference found regarding the gender (p-value= < 0.05). Cut-off point was calculated as 3.4, all the mean scores were calculated for each items. The study concludes the moderate level of knowledge, attitude and practice of CPR in healthcare technicians.

INTRODUCTION

Cardiopulmonary resuscitation (CPR) is an essential component of basic life support (BLS) and the accepted first-line of reaction to a cardiac arrest prior to defibrillation and advanced life support (ALS). It is an essential part of basic life support and the initial measure taken when a person has cardiac arrest before defibrillation and advanced life care are given. (Association, 2016) Early defibrillation and cardiopulmonary resuscitation (CPR) may be helpful in several situations to increase survival and neurologic outcomes. (RUBEEN *et al.*, 2013) If CPR is delayed, the entire chain of survival is compromised, and patient outcomes rapidly deteriorate (Behrend *et al.*, 2011). Theoretical knowledge and practical skills in Basic Life Support (BLS) and Advanced Life Support (ALS) are among the most critical determinants of cardiopulmonary resuscitation (CPR) success rates. Both BLS and ALS movements need a well-trained team, as cardiorespiratory arrest demands rapid, efficient, and integrated actions, which are better executed by a team than by a single team member (Lima *et al.*, 2009). CPR training should be completed about every seven months to ensure that the requisite high levels of CPR quality are maintained (Woollard *et al.*, 2006).

In the recent years, growing quantitative evidence has

shown that effective CPR delivery is essential for cardiac arrest survivors to survive. The need for CPR training is rising globally. Currently, over 90% of cardiac arrest victims outside of a hospital pass away. Despite the evidence that suggests that high-quality CPR delivery is necessary, a concerning body of studies has shown that CPR quality is extremely erratic in actual usage. However, standardized resuscitation training is not yet commonplace in developing nations like ours. Only a small number of studies from developing nations have examined how well-informed, experienced, and skilled medical professionals are in doing CPR (Abella, 2013; Association, 1966).

The knowledge and skills acquired during CPR training can be just as useful outside the workplace as within it, giving people the tools they need to increase a friend's or family member's chances of survival if their heart stops outside a hospital setting (Abella, 2013). Basic Life Support and Advanced Cardiovascular Life Support courses have been found to have extremely varying quality, and they typically do not consistently guarantee that students will graduate from programmes with the psychomotor abilities necessary to execute high-quality CPR. Furthermore, in the traditional professional CPR training approach, refresher training is only required every

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two years (or more). According to longitudinal research, many providers' CPR performance declines significantly after just three months (Perkins *et al.*, 2008).

CPR competence is defined as the ability to perform CPR in a cardiac arrest event using cognitive knowledge and psychomotor abilities. CPR competence is defined as the learning and retention of CPR cognitive information as well as psychomotor abilities. CPR skill retention is defined as the ability to do CPR effectively at a later time after receiving CPR training. CPR knowledge and skill retention are important aspects in assessing CPR competency (Broomfield, 1996). Successful management of patients who experience a life-threatening event, such as cardiac arrest, depends on the competency and expertise of healthcare professionals, according to Berg, Hemphill, Abella, Aufderheide, Cave, and Hazinski. (Aziz *et al.*, 2020) According to Bull and Alex, many health professionals do not feel the necessity for learning cardiopulmonary resuscitation skills and knowledge, while others do. (Ihunanya *et al.*, 2020)

In a systematic review done in 2019, consisting from different study from 2005 to 2018, related to the knowledge of CPR. The subjects are total 35,421, which were then analysed for their knowledge by grouping them as some with no skill, some with training session and some with highly trained participants. The results showed that repeated training sessions are an important component for improving CPR performance skills (Riggs *et al.*, 2019). According to a study done in 2020, it was concluded that although physical therapists are generally knowledgeable about basic life support, their practical abilities are insufficient. (Sheeraz *et al.*, 2020).

The attitude and competence of the medical personnel performing CPR are the key determinants of its quality. Resuscitation education needs to be improved if patients who have suffered cardiopulmonary arrest are to survive twice as long. The American Heart Association (AHA) has advocated include laypeople in CPR training courses since 1973 in order to increase survival rates. Later, the AHA proposed that morbidity and death from out-of-hospital cardiac arrest may be significantly decreased if 20% of the adult population received CPR training (Thorén *et al.*, 2004). Healthcare professionals' (HCPs) perspectives on cardiopulmonary resuscitation (CPR) scenarios may influence how they act in such circumstances. The best predictor of the intention to perform CPR among laypeople is attitude, which is considered as a key component of competency (Magid *et al.*, 2021; Silverplats *et al.*, 2022; Vaillancourt *et al.*, 2013). More frequently than the present 2-year recertification requirement, practice is needed to achieve CPR quality performance, including optimal chest compression rate and depth, compression fraction, and minimal tilting. "Booster training" using in-person simulation-based CPR sessions as brief as 30 minutes is one of the more recent ways. The AHA RQI programme, which acknowledges the advantages of feedback and periodic skill training every three months, is founded on these findings (Cheng

et al., 2015).

The need for CPR training is rising globally. However, standardized resuscitation training is not yet a common practice in developing nations like ours. All health care providers, even those who are not medical professionals, were required to complete CPR training classes in various developed nations. However, in our environment, the situation is different because most healthcare professionals enroll in CPR training courses of their own volition, with the exception of a small number of centers where it is required (Olajumoke *et al.*, 2012).

Cardiopulmonary resuscitation is a life-saving technique used to keep patients alive until more medical attention can be given. It will be essential for medical professionals to master the basics of CPR. This study was conducted to assess clinical year medical students' knowledge, attitudes, practices, and related aspects. A basic random sampling method was employed to evaluate the pupils. Data was gathered using a structured questionnaire that asked questions regarding knowledge, attitudes, and practices related to cardiopulmonary resuscitation. For this study, 98% of respondents responded in total. A total of 93.3% of those surveyed, including fifth-year students (36.2%), fourth-year students (34.1%), and interns (23%), had strong CPR knowledge. Students made up 80.7% of the study participants who had never performed CPR (Tsegaye *et al.*, 2015).

Questionnaire or a scale is a tool that can give quick information statistically by filling a set of items/questions (Malhotra, 2006). Creating a questionnaire or a scale is a challenging step-by-step process. Making a questionnaire, communicating with healthcare professionals, conducting a pilot test in which a variety of participants who met the inclusion criteria filled out the form while focusing on the wording, which assisted in assessing the questionnaire's writing so that it could be easily understood by the population, and finally determining the questionnaire's accessibility through its validation are all necessary steps in developing a good questionnaire (Gillham, 2008; Schnall *et al.*, 2018; Singh, 2017).

Rationale and Significance

To the existing knowledge no known questionnaire is available which can measure the knowledge, attitude and practice towards the use of CPR in different paramedical staff, playing a vital role during the life savings events. The primary objective of this research is to develop a comprehensive questionnaire to assess the knowledge, attitudes, and practices of cardiopulmonary resuscitation (CPR) among health professionals. Additionally, the study aims to rigorously establish the validity and reliability of the developed questionnaire. Its overarching purpose is to discern and analyze the existing level of CPR knowledge among medical professionals. The ultimate goal is to inform the development of a targeted medical education strategy tailored to address these knowledge gaps. Furthermore, the research seeks to delve into the attitudes and practices of medical professionals pertaining

to CPR, thereby contributing valuable insights for the enhancement of healthcare practices in this domain.

MATERIALS AND METHODS

It was a descriptive cross sectional study completed in 1 year of duration. The study was conducted in Rehman Medical Institute (RMI), Peshawar, Hayatabad Medical Complex (HMC), Peshawar and Khyber Teaching Hospital (KTH), Peshawar.

Participants

Sample size was calculated by Raosoft, which was

about 400 with a 99% level of confidence. About 700 subjects were enrolled to minimize bias. Non-probability convenience sampling was used to enroll the subjects. The paramedical staff including BS dental, anesthesia, radiology, MLT and surgical were included (both male and female). Physicians (MBBS), Physical Therapists and other than health professionals were excluded.

Questionnaire Development Process

The questionnaire development process includes 10 steps (York, 19th August' 2015), given in the flow diagram below.

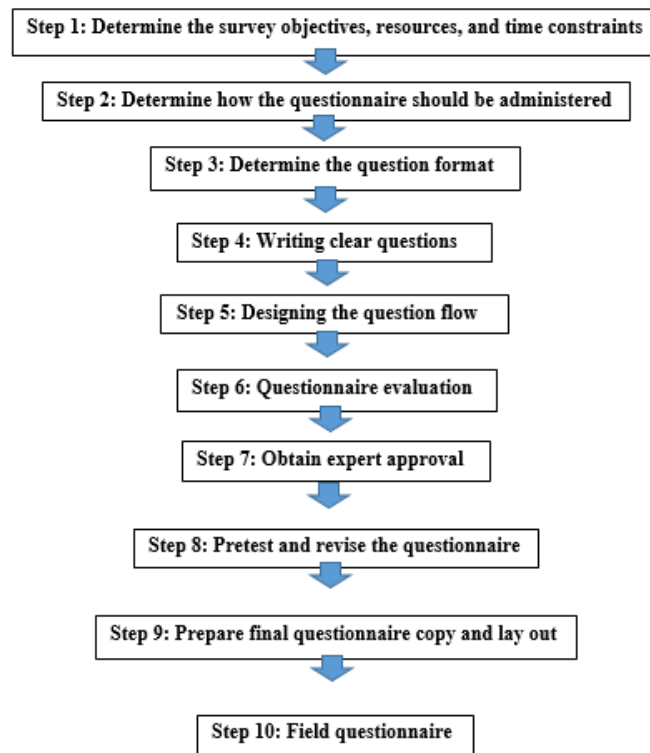


Figure 1: Tool Development Process

Data Collection Procedure and Analysis

After the approval from the research and ethical committee, the questionnaire development steps were followed. The self-administered questionnaire after the amendments was applied on the 10 participants. Face and content validity was determined. Then the questionnaire was filled by health professionals and about 700 participants. The questionnaire was administered through Google forms and face to face interview. Internal consistency of the questionnaire was found. After this the mean score for knowledge, attitude and practice was evaluated by calculating the mean score (cut-off) value of the likert questionnaire.

The statistical data was examined using SPSS version 29 and Excel 2013. For the demographic data, descriptive statistics were used. The content validity of each item in the S-CVI/Ave and S-CVI/UA (Polit *et al.*, 2007) was determined by utilizing the content validity index and Kappa coefficient. Pre testing as done for face

validity. The internal consistency of the questionnaire was assessed using Cronbach's alpha (CA) score (0.70) (Brown, 2002). Mann Whitney U Test was performed for analyzing the difference between gender with significant p-value <0.05. Cut off point was 3.4, which was taken from the previous available literature (Sullivan & Artino Jr, 2013). Total score was calculated by using formula $Total\ scores = \sum (f_i \times Likert\ scale\ Score)$ and then mean score was calculated through $Mean\ Score = \sum (f_i \times Likert\ Item\ Score) \div Number\ of\ Respondents$.

RESULTS AND DISCUSSIONS

Face Validity

In face validity, a questionnaire was filled out by 30 experts who gave their reviews about the construction of the items. No errors were found in the construct of the questionnaire. The questionnaire was thus finalized for finding the knowledge, attitude and practice of CPR among the healthcare professionals.

Content Validity

Excel 2013 was used to analyze the content validity. Each item's content validity index (CVI) was determined, and the scale's expert agreement was assessed using the Kappa score. Every item has a CVI in the range of 0.9–1. The scale's content validity index (S-CVI/Ave) came out to be 1.0233. The S-CVI/UA ratio was 0.733 and the overall agreement was 28.

Table 1: Overall CVI of Knowledge, Practice and Attitude (n=10)

Variables (n=10)	Value
S-CVI/Ave	1.0233
Total agreement	28
S-CVI/UA	0.9333

Internal Consistency

The Cronbach's alpha score was utilized to determine internal consistency, with a typical value of >0.7 (Brown, 2002). The table below displays the results of the internal consistency test for knowledge, attitude and practice (p-value < 0.001).

Demographic Analysis

The mean and standard deviation of age was 31.47±4.607 years with minimum age of 25 and maximum 42 years and working experience of the subjects was 5.02±3.826 years with the range of 1-18 years.

The computed Kappa coefficient of 0.95 indicated that the expert was in agreement with the majority of the scale's items. Most of the items show value of "k" as 1, while question 1 of "Attitude Domain: and question 1 and 2 of "Practice Domain" shows the value of "k" as 0.899, all showing excellent score thus questionnaire was finalized for pilot testing.

Table 2: Internal Consistency

Variables (700)	Cronbach's Alpha Score
Knowledge items	0.724
Attitude items	0.730
Practice items	0.706

The frequency of gender, including both male and female subjects with the value of 354 and 346 respectively. About 160 subjects were from RMI, 272 from HMC and 268 from KTH were enrolled in the study. Among the 700 subjects from various paramedical fields the frequency for each field includes, BS surgical technicians with 146, BS radiology technicians with 266, BS dental technology with 68, BS anesthesia technicians with 83 and MLT with 137 subjects.

Between the Group Analysis

Mann Whitney U Test was used to analyze knowledge, attitude and practice in both gender i.e. male and female.

FREQUENCY FOR GENDER

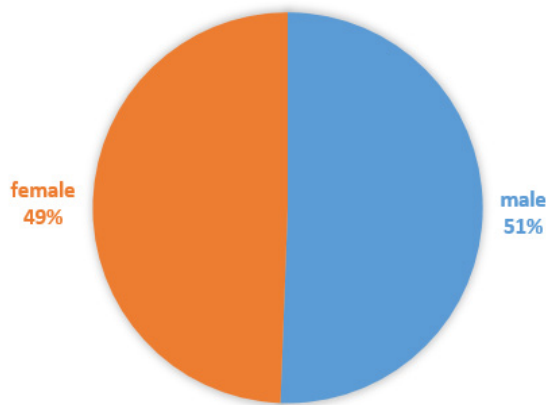


Figure 2: Chart Presenting Gender Distribution

The result of test shows non-significant difference between the gender i.e. male and female with the P-Value of > 0.001 which concludes that there is same level of knowledge, attitude and practice for CPR in accordance with the gender.

Scores Interpretation

The mean score for the whole questionnaire of the 5-likert scale was 3.4. Question 2, 9 and 13 shows a negative interpretation in their mean score compared

FREQUENCY FOR PROFESSIONS

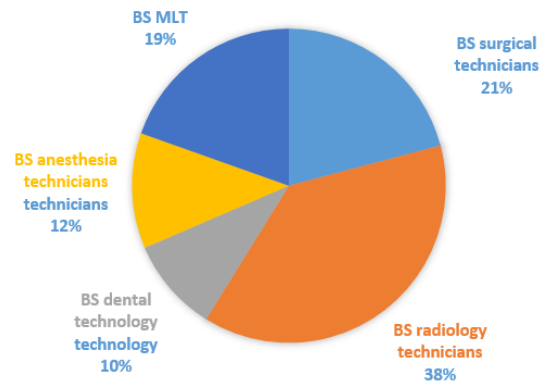


Figure 3: Chart Presenting Profession Distribution

to the cut-off value (questionnaire mean score) as 1.75, 1.76 and 2.64 respectively, which means there is lack of knowledge in healthcare professionals regarding sequence of CPR which is updated as CAB (circulation, airway and breathing), appropriate compression to ventilation ratio for an adult with one rescuer and AED application CPR is after 2 minute according to new guidelines. All the other items of knowledge has positive interpretation in comparison to the mean score which means the knowledge is up to date in the subjects.

Table 3: Mean Score and Interpretation for Knowledge Domain of CPR

S.no.	Knowledge Question (n=700)	Likert scale	Frequency (%)	Multiply by likert scale frequency	Total score	Mean score	Interpretation
1	Imagine you witness a person collapsing suddenly in front of you, the first step is to initiate CPR at the scene immediately according to latest guidelines available.	Strongly agree	219 (24.4)	1095	2848	4.07	Positive
		Agree	310 (44.3)	1240			
		Neutral	171 (31.3)	513			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
2	In the past, the recommended CPR sequence was ABC (Airway, Breathing, Chest Compressions), but according to the latest guidelines, the sequence is now suggested as CAB (Compressions, Airway, Breathing).	Strongly agree	0 (0)	0	1223	1.75	Negative
		Agree	0 (0)	0			
		Neutral	78 (11.1)	234			
		Disagree	367 (52.4)	734			
		Strongly disagree	255 (36.4)	255			
3	The primary purpose of performing CPR on a collapsed person is to restore blood circulation and sustain breathing	Strongly agree	190 (27.1)	950	2713	3.88	Positive
		Agree	233 (33.3)	932			
		Neutral	277 (39.6)	831			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
4	Imagine you are in an emergency situation where CPR is being administered on an adult. The technique for adult is using a fist and placing the hand at the center of the chest while initiating CPR	Strongly agree	283 (40.4)	1190	2858	4.08	Positive
		Agree	417 (59.6)	1668			
		Neutral	0 (0)	0			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
5	Imagine you are in an emergency situation where CPR is being administered on a child. The technique is using a fist and placing the hand at the center of the chest while initiating CPR on a child	Strongly agree	98 (14.0)	490	2898	4.14	Positive
		Agree	602 (86.0)	2408			
		Neutral	0 (0)	0			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
6	During CPR on an adult, the recommended compression depth should be 2.5 inches	Strongly agree	319 (45.6)	1595	3109	4.44	Positive
		Agree	371 (53.0)	1484			
		Neutral	10 (1.4)	30			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			

7	In infant CPR, the recommended compression depth is one third of the chest depth	Strongly agree	142 (20.3)	710	2707	3.86	Positive
		Agree	323 (46.1)	1292			
		Neutral	235 (33.6)	705			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
8	The recommended compression frequency per minute in CPR is 120	Strongly agree	243 (34.7)	1215	2886	4.12	Positive
		Agree	300 (42.9)	1200			
		Neutral	157 (22.4)	471			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
9	The appropriate compression to ventilation ratio for an adult with one rescuer is 30 compressions to 2 ventilations.	Strongly agree	0 (0)	0	1235	1.76	Negative
		Agree	0 (0)	0			
		Neutral	115 (16.4)	345			
		Disagree	305 (43.6)	610			
		Strongly disagree	280 (40.0)	280			
10	When two rescuers are present during adult CPR, the recommended compression to ventilation ratio is 15 compressions to 2 ventilations	Strongly agree	166 (23.7)	830	2902	4.15	Positive
		Agree	470 (67.1)	1880			
		Neutral	64 (9.1)	192			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
11	The appropriate compression to ventilation ratio for a child with one rescuer is 30 compressions to 2 ventilations.	Strongly agree	338 (48.3)	1690	3078	4.39	Positive
		Agree	302 (43.1)	1208			
		Neutral	60 (8.6)	180			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
12	When two rescuers are present during child CPR, the recommended compression to ventilation ratio is 15 compressions to 2 ventilations	Strongly agree	310 (44.3)	1550	3050	4.36	Positive
		Agree	330 (47.1)	1320			
		Neutral	60 (8.6)	180			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
13	AED (Automated External Defibrillator) is applied during CPR after 2 minutes of compressions and rescue breaths	Strongly agree	0 (0)	0	1845	2.64	Negative
		Agree	0 (0)	0			
		Neutral	445 (63.6)	1335			
		Disagree	255 (36.4)	510			
		Strongly disagree	0 (0)	0			
14	After administering a shock with an AED, chest compressions for 2 minutes should be performed before considering a second shock	Strongly agree	0 (0)	0	2414	3.45	Positive
		Agree	314 (44.9)	1256			
		Neutral	386 (55.1)	1158			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			

All the items of attitude domain has a positive interpretation showing that, all the subjects have shown good value for attitude, with the exception of item 6 which states that attitude towards the CPR as a crucial component of life saving technique specific in cardiac arrest with the mean score of 3.05 which is <3.4.

Table 4: Mean Score and Interpretation for Attitude Domain of CPR

S. no.	Attitude Question (n=700)	Likert scale	Frequency (%)	Multiply by likert scale frequency	Total score	Mean score	Interpretation
1	Regular CPR practice and training is necessary for healthcare professionals	Strongly agree	302 (43.1)	1510	3102	4.43	Positive
		Agree	398 (56.9)	1592			
		Neutral	0 (0)	0			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
2	CPR training should be included as a mandatory part of the curriculum for both medical and non-medical fields	Strongly agree	293 (41.9)	1465	3093	4.19	Positive
		Agree	407 (58.1)	1628			
		Neutral	0 (0)	0			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
3	Attending CPR workshops or training is important for individuals, regardless of their profession or background	Strongly agree	251 (35.9)	1255	2610	3.73	Positive
		Agree	8 (1.1)	32			
		Neutral	441 (63.0)	1323			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
4	Anyone can effectively perform CPR without prior practice in an emergency situation	Strongly agree	0 (0)	0	2437	3.48	Positive
		Agree	435 (62.1)	1740			
		Neutral	167 (23.9)	501			
		Disagree	98 (14.0)	196			
		Strongly disagree	0 (0)	0			
5	It is important to continuously update and share knowledge of CPR to ensure preparedness for life-saving situations	Strongly agree	209 (29.9)	1045	2973	4.24	Positive
		Agree	455 (65.0)	1820			
		Neutral	36 (5.1)	108			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
6	CPR is a crucial intervention that can significantly increase the survival rate of individuals experiencing cardiac arrest	Strongly agree	231 (33.0)	1155	2133	3.05	Negative
		Agree	0 (0)	0			
		Neutral	40 (5.7)	120			
		Disagree	429 (61.3)	858			
		Strongly disagree	0 (0)	0			
7	Increasing awareness of CPR can be achieved through educational programs in schools, workplaces, and public spaces	Strongly agree	119 (17)	595	2085	4.01	Positive
		Agree	467 (66.7)	1868			
		Neutral	114 (16.3)	342			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			

8	CPR training is an effective way to equip individuals with life-saving skills and increase their confidence in responding to emergencies	Strongly agree	119 (17.0)	595	2773	3.96	Positive
		Agree	447 (63.9)	1788			
		Neutral	130 (18.6)	390			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
9	CPR is perceived to be time-consuming and difficult to perform, making it challenging for individuals to respond effectively during critical moments	Strongly agree	147 (21.0)	735	2843	4.06	Positive
		Agree	449 (64.1)	1796			
		Neutral	104 (14.9)	312			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
10	CPR should only be performed by senior doctors, as their experience ensures the best outcomes in critical cases	Strongly agree	157 (22.4)	785	2474	3.53	Positive
		Agree	132 (19.8)	528			
		Neutral	339 (48.4)	1017			
		Disagree	72 (10.3)	144			
		Strongly disagree	0 (0)	0			

The mean score and interpretation of practice of CPR in paramedical healthcare technicians, almost all the questions interprets a positive response thus estimating a good practice level of CPR. For question 7 “before

starting CPR, it is important to check for the presence of a carotid pulse in the neck to confirm the absence of circulation”, showed a negative interpretation of practice in paramedical staff.

Table 5: Mean Score and Interpretation for Practice Domain of CPR

S. no.	Practice Question (n=700)	Likert scale	Frequency (%)	Multiply by likert scale frequency	Total score	Mean score	Interpretation
1	Imagine you witness a person collapsing in front of you. Starting chest compressions immediately upon encountering a collapsed person is the appropriate first response to maximize chances of survival	Strongly agree	259 (37.0)	1295	2998	4.28	Positive
		Agree	414 (59.1)	1656			
		Neutral	0 (0)	0			
		Disagree	20 (2.9)	40			
		Strongly disagree	7 (1.0)	7			
2	If someone is unresponsive and not moving even after a response, it is crucial to start CPR immediately to provide life-saving assistance	Strongly agree	312 (44.6)	1560	3051	4.36	Positive
		Agree	277 (39.6)	1180			
		Neutral	89 (12.7)	267			
		Disagree	22 (3.1)	44			
		Strongly disagree	0 (0)	0			
3	You arrive at the scene of an accident and find an unresponsive person. If there is a suspicion of a cervical injury, using the jaw thrust maneuver is the recommended approach during CPR	Strongly agree	370 (52.9)	1850	3140	4.49	Positive
		Agree	316 (45.1)	1264			
		Neutral	2 (3)	6			
		Disagree	8 (1.1)	16			
		Strongly disagree	4 (6)	4			

4	When encountering a person who is choking while eating, performing the Heimlich maneuver to clear the airway obstruction is the recommended action	Strongly agree	412 (58.9)	2060	3132	4.47	Positive
		Agree	251 (35.9)	1004			
		Neutral	0 (0)	0			
		Disagree	31 (4.4)	62			
		Strongly disagree	6 (9)	6			
5	You arrive at the scene of an emergency and encounter a situation with a person experiencing major bleeding. It is important to prioritize personal safety by taking measures to protect yourself before proceeding to provide assistance	Strongly agree	397 (56.7)	1985	3117	4.45	Positive
		Agree	239 (34.1)	956			
		Neutral	48 (6.9)	144			
		Disagree	16 (2.3)	32			
		Strongly disagree	0 (0)	0			
6	In an emergency situation where no AED is available, it is important to immediately initiate CPR and continue until an AED arrives at the scene	Strongly agree	314 (44.9)	1570	3106	4.44	Positive
		Agree	378 (54.0)	1512			
		Neutral	8 (1.1)	24			
		Disagree	0 (0)	0			
		Strongly disagree	0 (0)	0			
7	Before starting CPR, it is important to check for the presence of a carotid pulse in the neck to confirm the absence of circulation	Strongly agree	0 (0)	0	2345	3.35	Negative
		Agree	285 (40.7)	1140			
		Neutral	375 (53.6)	1125			
		Disagree	40 (5.7)	80			
		Strongly disagree	0 (0)	0			
8	You are witnessing an emergency situation involving an unconscious mother and a child. The same method of CPR can be used for both children and mother, with appropriate modifications to the depth and rate of chest compressions for each	Strongly agree	219 (31.3)	1095	2743	3.92	Positive
		Agree	217 (31.0)	868			
		Neutral	252 (36.0)	756			
		Disagree	12 (1.7)	24			
		Strongly disagree	0 (0)	0			

Correlation among Knowledge, Attitude and Practice

The Pearson Correlation Test is applied to see the correlation among knowledge, attitude and practice. The correlation of knowledge to attitude and practice show a moderately negative correlation. The attitude shows a

moderately negative correlation with knowledge and a moderately positive correlation with practice. In case of practice, a moderately negative correlation is indicated with knowledge and moderately positive correlation with attitude.

Table 6: Pearson Correlation Test

	Knowledge	Attitude	Practice
Knowledge	-	-0.567	-0.425
Attitude	-0.567	-	0.414
Practice	-0.425	0.414	-

Discussion

CPR techniques are simple and can be performed by a layman. Even though immediate response to a cardiac arrest challenging in resource limited and developing countries, having the basic knowledge, skill and attitude is an essential part of medical service providers. Even though it can be difficult to respond immediately to a cardiac arrest in poor and resource-constrained nations, medical service providers must possess the fundamental information, abilities, and attitudes (Baksha, 2010).

The current study explains the development of self-structured questionnaire to find the knowledge, attitude and practice of cardiopulmonary resuscitation (CPR) in medical professionals. The literature was critically appraised and questionnaire was developed consisting of three domains with items representing them. The 1st is “Knowledge Domain” consists of 14 items, 2nd is “Attitude Domain” with 10 items and 3rd is “Practice Domain” with 8 items. The study also evaluates the knowledge, attitude and practice in healthcare technician, including radiologists, laboratory technicians, BS dental technology, anesthesia and BS surgical technicians. The response towards knowledge, attitude and practice was similar regardless of the gender and profession included in the study, as the p-value is >0.05 .

Regarding the knowledge domain, almost all the items included has positive interpretation, when comparing the mean score with the cut-off value of 3.4, which shows that the paramedical healthcare staff has the knowledge of CPR. Some items also showed negative interpretation including the knowledge about new sequence of CPR recommended by new guidelines as CAB instead of ABC protocol (Lee, 2012; Witt, 2019), appropriate compression to ventilation ratio for an adult with one rescuer as 30:2 (Babbs & Nadkarni, 2004) and AED application CPR is after 2 minute according to new guidelines (Perkins *et al.*, 2015). A study done by Senchez *et al.*, evaluates the knowledge in medical staff regarding CPR. Results based on evidence strongly imply that participants do not receive CPR training in accordance with international norms. 10.1% of participants never completed a refresher course, despite 64.7% of participants attending at least one CPR session after 2010. Thirty percent of faculty members, ninety percent of medical residents, and seven percent of nursing staff did not complete the AHA-mandated training. The emergency department at hospitals (one course every two years). According to the findings, health staff members acquire a greater degree of CPR expertise the more classes they take (Sánchez García *et al.*, 2015). Another study was done in September’ 2023, on CPR knowledge in ambulance staff. A total of 400 ambulance employees were hired on purpose. Most (75%) did not have the necessary equipment in accordance with national and AHA criteria. The participants’ has knowledge output which means that 62.25% of them had poor knowledge of CPR and just 12.25% had good or very good knowledge. Both ambulance personnel and their equipment are lacking in terms of CPR knowledge and

proficiency. Their knowledge of how to use the equipment in the ambulance in an emergency was incomplete. Thus, it is necessary to teach them how to use EMS equipment and perform CPR (Kumar *et al.*, 2023).

In Attitude Domain, item 6 showed a negative interpretation, comparing to mean score. The item states that “CPR as a crucial component of life saving technique specific in cardiac arrest”, the attitude regarding this statement has not shown a good value. The literature the significance of providing cardiac arrest patients with high-quality cardiopulmonary resuscitation (CPR) has grown during the past ten years. Regarding the proper compression rate, depth, and degree of chest recoil required for effective CPR, numerous specialists concur (Cunningham *et al.*, 2012). The survey was completed by 1012 medical students from 14 different countries and 99 different universities. Only 69.7% of participants in the total attended a BLS or BLS/AED course offered by the university. For 84.3% of them, it was a requirement for their degree. A whopping 78.6% thought they could save someone, and 57.8% were aware of the proper compression rate. There is a dearth of information regarding cardiac arrest and CPR among medical students in Europe prior to their graduation, and this needs to change (Baldi *et al.*, 2019). Another research include 475 students from 15 faculties; their median age was 22.8 years (interquartile range: 21.2–24.5 years). The majority (82.5%) are aware of CPR, 29.7% have received training in it, and 77.3% of those who have trained felt competent enough to perform CPR. Nigerian university students have a strong understanding of and enthusiasm towards learning and using cardiopulmonary resuscitation. On the other hand, not many students possess the skills necessary to perform bystander cardiopulmonary resuscitation (Adewale *et al.*, 2021).

The domain covering the practice regarding CPR has all the items with positive interpretation with the mean score which shows that almost all the fields of Paramedical Health Sciences has a good practice in CPR. Although item 7 “Before starting CPR, it is important to check for the presence of a carotid pulse in the neck to confirm the absence of circulation” has mean score of 3.37 which is almost near to the cut-off value of 3.4 indicates a little negative interpretation. Similar studies had been done in past literature (Pettersen *et al.*, 2018). A total of 350 healthcare professionals from various departments participated in the study. In terms of the local minimum passing test score, only 57 (16%) and 88 (25%) scored above 50% in the written and practical examinations, respectively. In terms of the worldwide minimum passing test score on CPR, only 13 (4%), and 30 (9%) scored above 75% in the written and practical tests, respectively. Even though the majority of providers claimed to have done CPR in the past, the level of CPR knowledge and abilities demonstrated by all cadres and in all departments was low (Kaihula *et al.*, 2018).

The study has some limitations, as the knowledge, attitude and practice was predicated on a questionnaire

that measures cognitive level that is essentially theoretical. Conversely, pragmatic psychomotor abilities and theoretical understanding are both necessary for performance. So practical based evaluation regarding CPR is necessary.

CONCLUSION

The study's results showcase a comprehensive evaluation of healthcare professionals' proficiency, encompassing their knowledge, attitude, and practical application of CPR. The healthcare paramedical staff, comprising anesthetists, dentists, BS surgical technicians personnel, medical laboratory technicians (MLT), and laboratory technicians, demonstrated commendable competence across all domains of CPR, reflecting a high level of proficiency in knowledge, attitude, and practice.

Future studies can be conducted on students related to medical field as all can come with different emergency situation. Studies can be conducted to find ways to improve knowledge, attitude and practice of CPR.

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