

Knowledge, Awareness & Practices towards cardiopulmonary resuscitation among healthcare workers in a medical university - A cross sectional survey on healthcare workers.

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Abstract

Cardiopulmonary Resuscitation (CPR) is a crucial life-saving technique that can significantly improve the clinical outcome of patients experiencing cardiac arrest. This survey aims to assess the knowledge, attitude, skills, and awareness of Basic Life Support among healthcare professionals in various settings, including medical colleges, corporate hospitals, government hospitals, government medical colleges, and other health care facilities. In this cross-sectional study, data was collected from 683 healthcare professionals, comprising of 382 females and 304 males. The sample included 62

faculty members, 80 postgraduates, 60 interns, 114 MBBS undergraduates, 193 nurses with MSc or BSc degrees, and the remaining participants belonged to other healthcare professions. The results of this survey will provide valuable insights into the challenges and gaps in resuscitation training and practices among different healthcare professionals in different healthcare facilities. This information will guide the development of effective strategies and solutions to enhance resuscitation training programme in our institution. We extend our gratitude to all participants for taking part in this survey and sharing their time and knowledge.

Introduction

Early detection and intervention of cardiac arrest is crucial for saving lives [1]. Basic Life Support [BLS] includes both prompt recognition and immediate support of ventilation and circulation in case of respiratory or cardiac arrest.[2]. Healthcare professionals (HCPs) in emergency departments (EDs) and other healthcare settings require cardiopulmonary resuscitation (CPR) skills, which are critical for saving lives [3]. High-quality CPR significantly improves patient outcomes, irrespective of the initial condition of the patient and the duration of cardiac arrest [3]. CPR is a set of skills that can be learned by anyone, regardless of their medical background [4]. This allows any trained hospital staff member to quickly administer this life-saving treatment [5]. Performing CPR correctly can greatly increase the likelihood of return of spontaneous circulation (ROSC) and survival. Healthcare professionals are expected to have a thorough knowledge of CPR guidelines as they encounter several life-threatening emergencies every day [6]. Health professionals should have basic knowledge on the fundamental aspects of basic life support (BLS) and advanced cardiac life support (ACLS) and perform high-quality CPR to improve survival from cardiac arrest [7-10]. Sudden cardiac death (SCD) is responsible for 15-20% of all deaths, making cardiovascular disorders the leading cause of death worldwide [11][12]. Most out-of-hospital cardiac arrests (OHCAs) occur in patients who are experiencing their earliest clinical symptoms of the underlying disease or who are diagnosed but are considered at low risk [13]. CPR techniques are designed to keep oxygenated blood flowing to essential organs, especially the brain, which is extremely vulnerable to oxygen deprivation and can result in lasting brain damage in as little as a few

minutes, with death occurring in less than ten minutes [14]. The benefit of resuscitation decreases by up to 10% each minute following the beginning of cardiac arrest without warning [15]. The American Heart Association's 2020 guidelines outline six links in the chain of survival that includes activation of emergency response, High Quality CPR, Defibrillation, Advanced Resuscitation, Post Cardiac arrest care, & Recovery [16]. High-quality CPR can considerably raise the likelihood of survival for those who experience sudden cardiac arrests [17-18]. CPR training and familiarization with automated external defibrillators (AEDs) should be included in secondary school curriculum, according to the American Heart Association [19].

Despite the widespread recognition of CPR's importance and its efficacy as a resuscitative intervention for patients in cardiac arrest, medical students and younger doctors in both high- and low-income nations lack knowledge, training, and practice [20-24]. Additionally, many people are afraid of contracting infectious infections if they conduct cardiac compression with mouth-to-mouth ventilation [25]. The survival rate for patients has increased as a result of targeted education on CPR for emergency medical clinicians and the general population [26]. Furthermore, there is a dearth of data describing knowledge and attitude of health care providers in the direction of conducting CPR in clinical settings. No studies on assessments of CPR knowledge and attitudes have been conducted in our nation, despite extensive research on the epidemiology of cardiac arrest in many industrialized nations. This study aimed to evaluate the knowledge and attitudes of healthcare practitioners in clinical practice regarding CPR. Moreover, this research was critical in providing data for planners and programmers to use in combating cardiac

arrest and its complications by promoting the adoption of CPR training and guidance in our country. Adequate knowledge, positive attitudes, and proper practices among healthcare providers regarding cardiopulmonary resuscitation (CPR) are essential to enhance patient outcomes following cardiac arrest. In this study, the focus was on evaluating the knowledge, attitudes, and practices related to the management of adult patients with cardiac arrest among healthcare professionals.

Materials and methods

The study was conducted in Santosh Deemed to be University after all ethical clearance for a period of 15 days, 1st – 15th September 2023.

During a 15-day period in September 2022, a hospital based cross-sectional study was conducted at Santosh. Data was collected and analyzed using statistical methods.

Name

AGE

Your answer

Hospital

Your answer

Department

Your answer

Sex

- Female
- Male

Profession

- Faculty/ consultant
- PG student
- Intern
- MBBS student
- Nurses GNM, BSC, MSC
- Technicians Dental BDS, MDS

Medical College and Hospital, This survey was conducted to assess the knowledge, skills, and awareness of healthcare professionals regarding cardio-pulmonary resuscitation (CPR) and for assessing the lacunae in the training and implementation of CPR training in the medical and paramedical staff.

The survey, consisting of 20 multiple-choice questions, was created using both Google Forms and physical forms and was filled out by 683 participants including nurses, medical students, post-graduates, faculty, and consultants. The responses were collated and analysed by inbuilt statistical software. This knowledge was tested anonymously and without prior intimation about the survey.

- Physiotherapy
- Healthcare workers in Lab, Radiology, Blood bank, Microbiology, biomedical, Manifold, CSSD, ETC
- Administrators Medical
- Administrators Non-Medical

Other: _____

Designation

Your answer

Years of work experience

Your answer

A 53yrs old man becomes unresponsive, the man doesn't respond when you tap on his shoulders. What is the best next plan of action?

- Check pulse
- start high quality CPR
- start providing rescue breath
- Shout for help

What is the correct sequences of BLS steps according to 2020 AHA guidelines?

- A-B-C
- B-A-C
- C-A-B
- B-C-A

What is the ratio of chest compression to breath in Adult CPR?

- 30:2
- 15:2
- 10:2
- 100:2

What is the rate of chest compression in adult CPR?

- 60-80 /min
- 80-100 /min
- 120-140 /min
- 100-120/min

Depth of chest compression of an adult compression?

- 2-3 cm approx.
- 5-6 cm approxi
- 8 cm approx.

- 6-8 cm approx.

You have patient in ward with ECG tracing on monitor in an unresponsive patient, on examination pulse is not palpable.

What is the best next step in management?

- start CPR
- Check ECG Leads
- check pulse again by some other person
- check blood Pressure

Other: _____

What is the next appropriate step if no pulse is present?

- start CPR and call for help
- call for help
- check pulse again
- give rescue breaths

What is the Manoeuvre that can be used to open the airway?

- Head tilt, chin lift
- Jaw thrust
- Head tilt, neck lift
- Avoid opening airway

What action should you PERFORM while the AED is analyzing heart rhythm?

- Check Pulse
- Continue compression
- Give rescue breaths
- Stand clear of victim

What is the basic difference between BLS& ACLS. All findings/sentences are true except?

- BLS can be performed by layman and ACLS by healthcare professionals
- BLS and ACLS requires i. v medications and defibrillation
- BLS, right sequence is CAB & pulse rechecked every 2 min
- There are six chains of survival in BLS/ACLS as per 2020 CPR update

What does activation of EMS means?

Inform about the unresponsive pulseless victim to the nearby healthcare facility or 112,102

- Inform emergency response system, ambulance 112/102 etc.
- Inform the nearby healthcare Facility/ ambulance with complete details about the responsive victim

Other: _____

Best site for Pulse check in adult resuscitation?

- Radial Pulse
- Carotid Pulse
- Femoral Pulse
- Brachial Pulse

When will you check pulse again during CPR?

- After every cycle of CPR
- 30secs.
- 2mins
- 3mins

Have you ever performed CPR; do you feel confident in performing CPR?

- Confident for Performing CPR.
- Not confident for Performing CPR.
- No experience of Performing CPR

Do u have any CPR education/training, If so, what type?

- Only theory
- Both theory practical
- No CPR education
- Valid BLS certified training

When have you attended your last BLS training?

- within last 2 year
- more than 3 years back
- more than 5 years back
- more than 5-10 years back

Most commonly drug used in CPR resuscitation

- Atropine
- Adrenaline
- Naloxone
- Noradrenaline

For defibrillation, Shock Delivery during CPR, All are true except

- Double sequential defibrillation is not useful in Resuscitation.
- Single shock, max energy, biphasic is preferred method.

initial shock 100 joules, then 200 joules followed by 300 joules in unresponsive pulseless victim.

- Defibrillation leads to myocardial stunning and then again regenerating normal rhythm by CPR post shock delivery.

Maximum oxygen can be delivered during Resuscitation by using

- Facemask 6 to 10 liters
- AMBU Bag with Reservoir bag and o2 flow 15 liters
- nasal prongs 2 to 6 liters
- high flow mask 10 liters

CPR survivor, likely associated with bad neurological outcome could be best related to

- Time duration of ROSC After cardiac arrest
- Dosage of drugs during CPR
- Dosage of shocks delivered during CPR
- Dosage of oxygen therapy during CPR

Results

The survey received a total of 683 responses during the 15-day study period.

Total Participants included 62 faculty members, 80 postgraduates, 80 medical students, 70 technicians, and 200 nursing staff, with work experience ranging from no clinical experience to 20 years.

Results from the 20-question survey revealed a significant knowledge gap and lack of awareness regarding cardio-pulmonary resuscitation.

Even experienced healthcare professionals demonstrated significant gaps in knowledge about recent changes in CPR guidelines.

The findings of this survey indicate a significant gap in knowledge & Practice among healthcare professionals in relation to CPR.

The results highlight there is urgent need for increased awareness, training, and correct knowledge in CPR practices. Addressing these deficiencies has the potential to enhance healthcare professionals' confidence and improve their efficiency in practice.

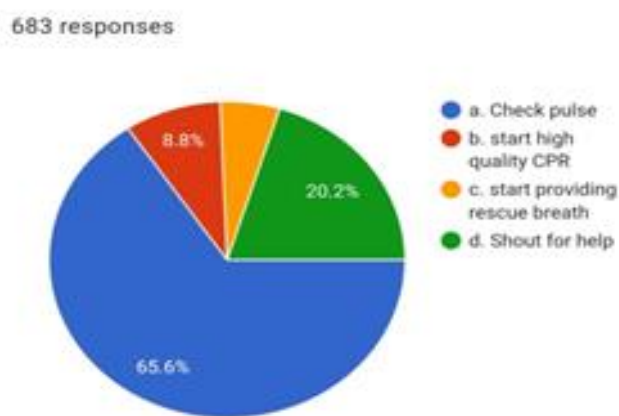


Fig 1: A pie chart showing the best appropriate action in an unresponsive victim

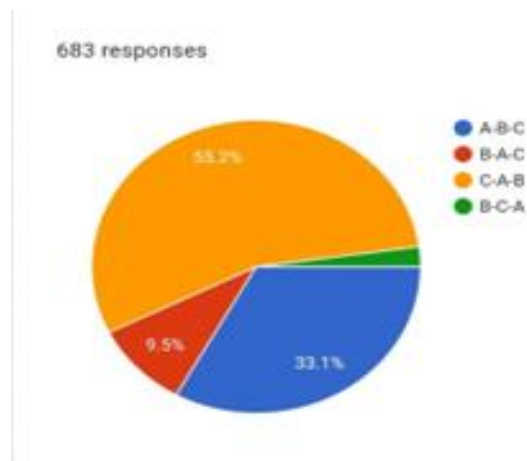


Fig 2: Pie chart illustrating knowledge about appropriate sequence of BLS as per 2020 AHA guidelines.

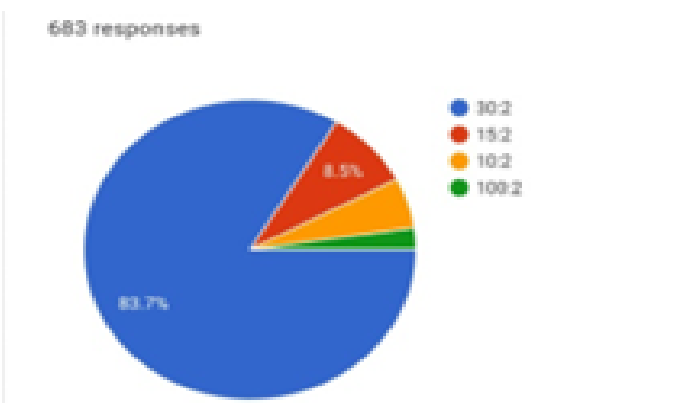


Fig 3: A pie chart is presented to illustrate the percentage distribution of knowledge among healthcare professionals regarding the appropriate chest compression to ventilation ratio during adult CPR.

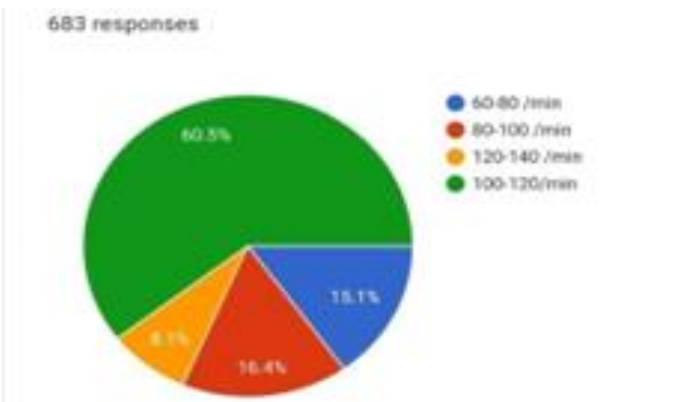


Fig 4: A pie chart depicting the distribution of participants' knowledge on the rate of CPR given, indicating that the majority (60.5%) responded with a range of 100 -120 compressions per minute.

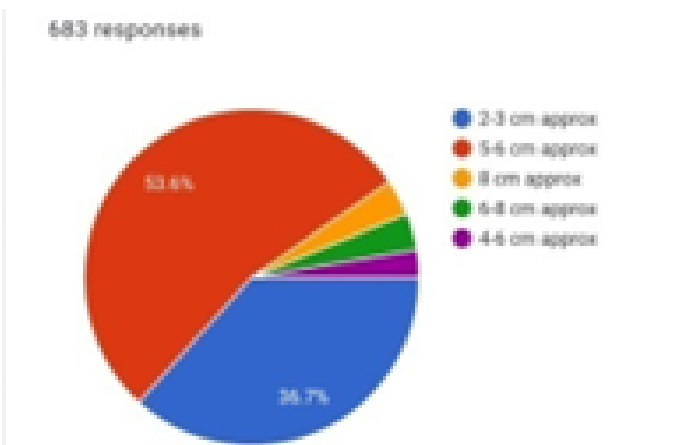


Fig 5: Pie chart showing responses for depth of chest compression in Adult CPR.

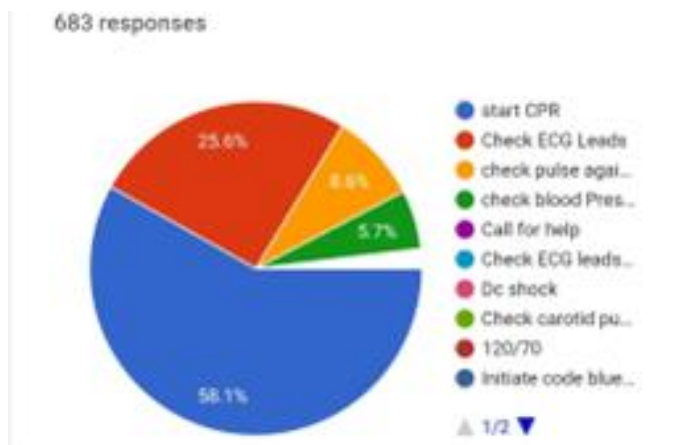


Fig 6: Pie chart for best action in a patient with ECG tracing without pulse

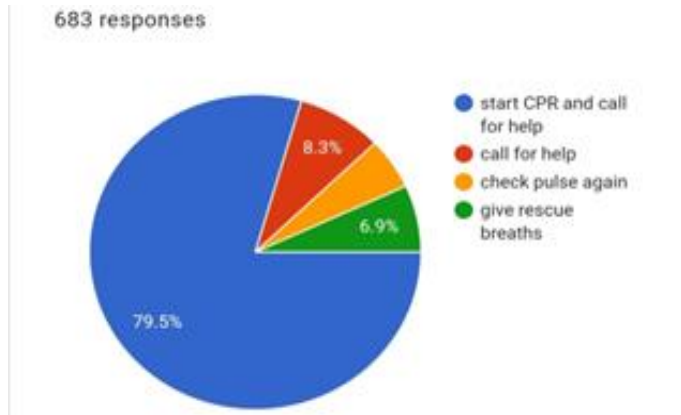


Fig 7: Responses for best next appropriate step, if no pulse is palpable.

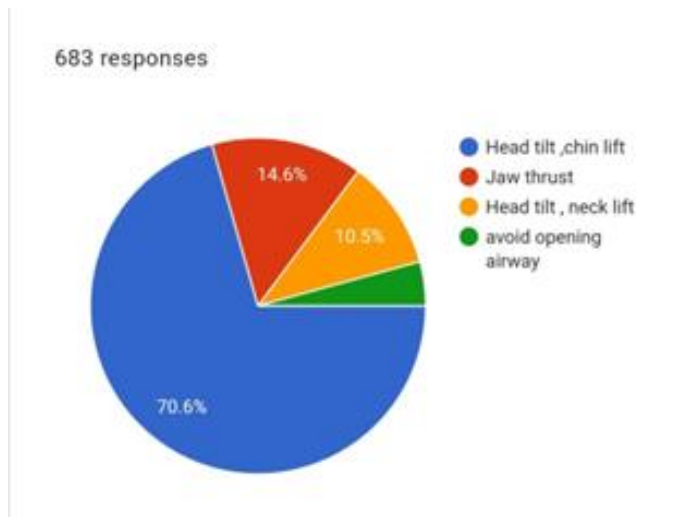


Fig 8: Pie chart of appropriate airway Manoeuvre knowledge.

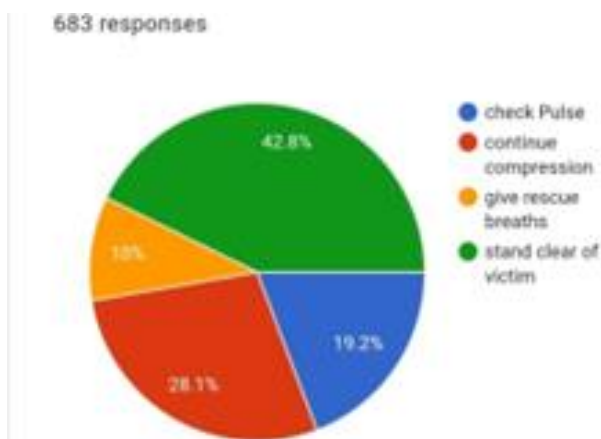


Fig 9: A pie chart is presented to display the percentage distribution of knowledge among participants regarding the correct plan during rhythm analysis by AED.

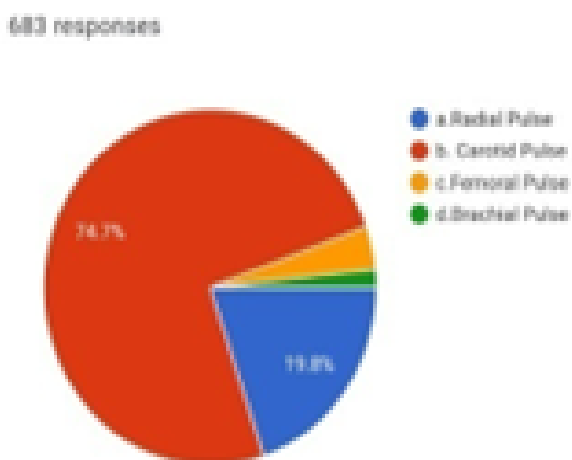


Fig 12: Pie diagram about appropriate pulse check site.

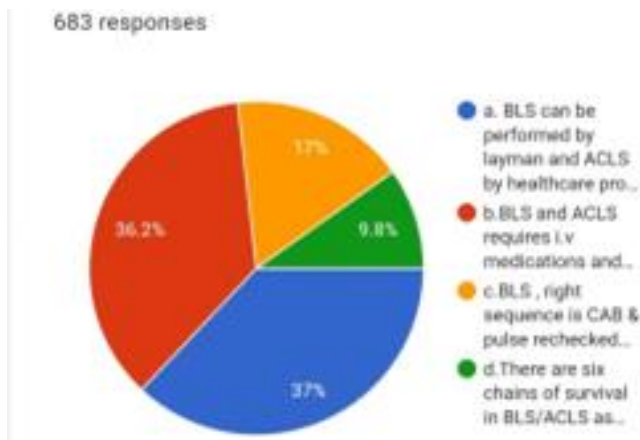


Fig 10: Knowledge about difference in BLS and ACLS among survey responders.

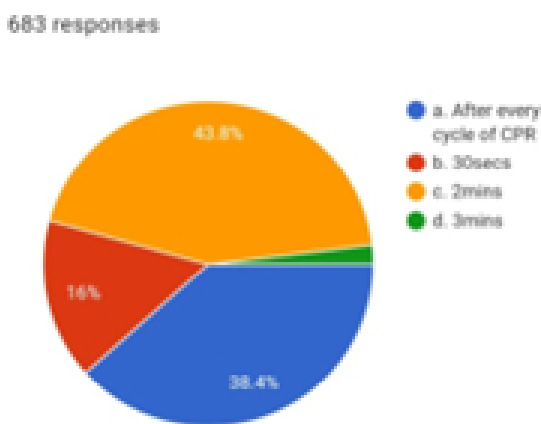


Fig 13: Pie diagram for how and when to repeat pulse check during CPR.

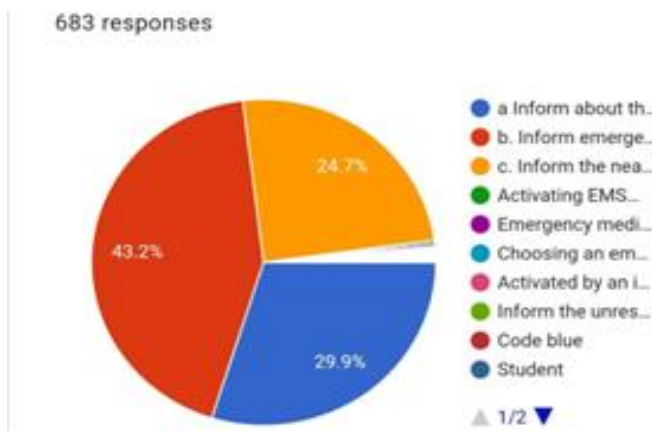


Fig 11: proper activation of EMS, how to go about it.

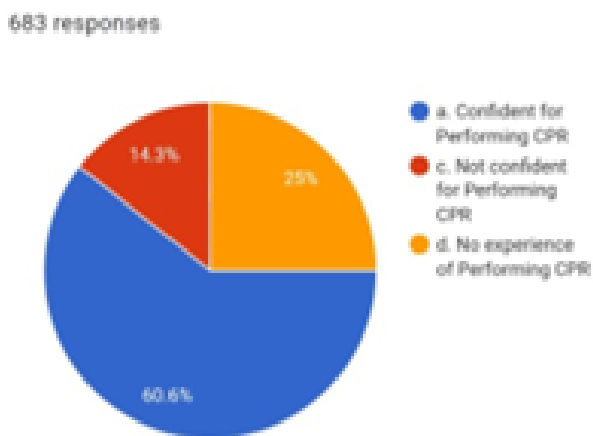


Fig 14: Responses about the adequacy of training and confidence in performing CPR

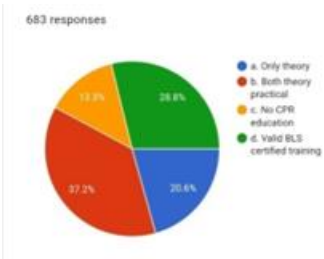


Fig 15: Pie chart depicting type of CPR training among survey responders. Less than 30 % had valid certification in CPR.

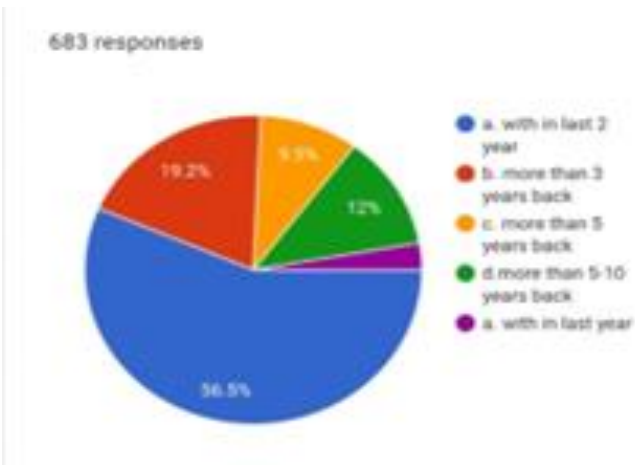


Fig 16: Pictorial representation of most commonly used drug in CPR training among responders.

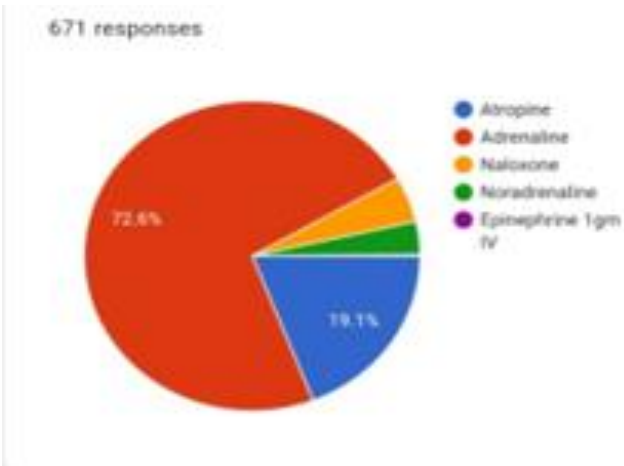


Fig 17: Pie chart about the most commonly used drug during CPR. Majority of responders were clear of this basic fact.

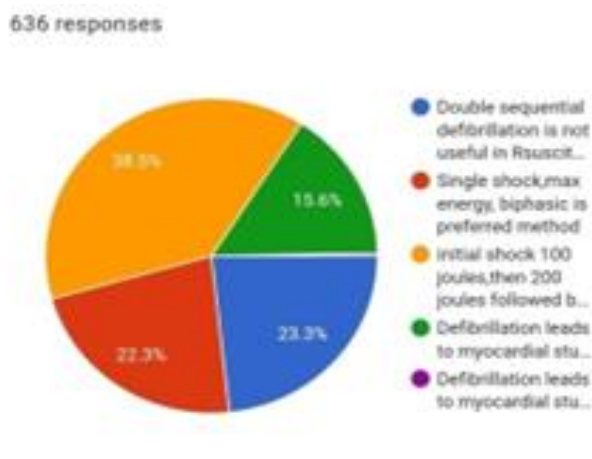


Fig 18: pie chart representing knowledge about defibrillation among responders.

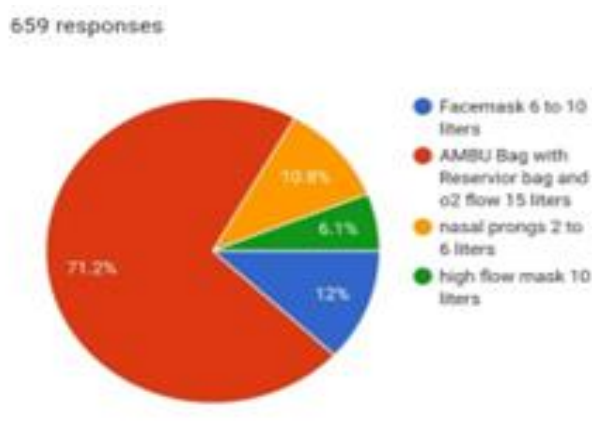


Fig 19: Represents the responses about device with highest oxygen delivery during BLS.

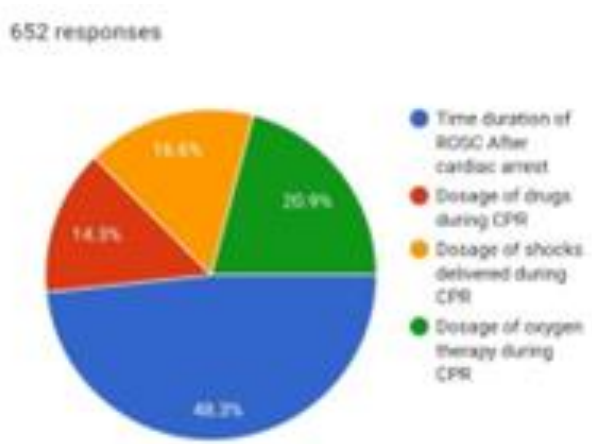


Fig 20: Pie chart of probable cause of poor neurological recovery amongst the CPR Survivors

The initial survey questions reveal a majority of responders are clear about the steps of BLS, how to initiate and perform basic airway man oeuvres and good quality CPR as per the recent guidelines.

The survey also brought to light certain discrepancies in knowledge. When asked about the correct action to be taken while the rhythm is being analysed by the AED, it was correctly answered by only 43% of the responders.

The most erroneous confusion was about the need to continue chest compressions while rhythm analysis is going on, which as can be seen will interfere in proper rhythm analysis and shock delivery.

The differentiation between BLS and ACLS was also unclear to majority as only 37% correctly reported BLS being performed by laymen. The role of AED was also not clear as most responders believe it to be a part of ACLS while in reality it is included in BLS and timely defibrillation is crucial to improving CPR outcomes.

Activation of emergency medical services is a crucial link in the chain of survival as it ensures early defibrillation and transfer to appropriate medical facility for post arrest care. Surprisingly, less than 50 % of the responders are aware of correct protocol for activating an emergency medical response timely and correctly. This has to be taught and reinforced repeatedly during CPR training, as well as the regional specifications in terms of alternative ambulance numbers.

Only about 29% of the responders have a valid BLS certification from a recognized institution, though a majority of these responders have reported being trained in the CPR algorithm in the last two years as a part of the major thrust in institutional CPR training by the Dept of Anaesthesiology and Critical Care of SMCH group.

Conclusion

The lack of CPR knowledge in our day-to-day life is evident. The present study highlights the urgency and the impact of institutionalized training in CPR among healthcare professionals. BLS should be an essential component of education and curriculum. Regular workshops or programs should be conducted to reinforce the knowledge and skills.

It is crucial to make these courses mandatory for healthcare professionals at the time of recruitment. Our university is conducting regular workshops for under graduates, postgraduates, technicians, and nursing students. This study and other similar local surveys to assess the gaps in CPR training and application in each institution should be useful in streamlining further planning and implementation of training for each level of healthcare professionals to improve their existing knowledge profile and clinical competency.

Cardiac life support -basic and advanced training should be mandatory for undergraduate and postgraduate medical training, compulsory eligibility criteria for employment in critical areas, a part of the regular skill upgradation programme during employment and tied to appraisal and promotions within departmental frame works.

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