To Assess Knowledge, Attitude and Practice on the Use of Automated External Defibrillation (AED) by Emergency Medical Services (EMS) Providers in Pune, India

Parag Rishipathak[1], Shrimathy Vijayaraghavan[2], Anand Hinduja[3]

[1]Professor & Director, Symbiosis Centre for Health Skills, Symbiosis International (Deemed University), Pune, India, [2]Medical Officer, Academics, Symbiosis Centre for Health Skills, Symbiosis International (Deemed University), Pune, India, [3]Adjunct Faculty, Symbiosis Centre for Health Skills, Symbiosis International (Deemed University), Pune, India

Abstract

Introduction: An Out of Hospital Cardiac Arrest (OHCA) is defined as the loss of cardiac mechanical function that occurs outside of the hospital setting and confirmed by the absence of signs of systemic circulation. OHCA has a very low survival rate. Timely provision CPR and Rapid Defibrillation during Cardiac Arrest requires adequately trained and qualified personnel. It is therefore important to understand the current level of Knowledge, Attitude and Practice (KAP) with regards to AED amongst EMS responders.

Objective: To assess Knowledge, Attitude and Practice on the Use of Automated External Defibrillation (AED) by Emergency Medical Services (EMS) Providers.

Methodology: The Knowledge, Attitude and Practice (KAP) study was conducted amongst 120 Emergency Medical Services Providers at SCHS, Pune, India. A previously tested and validated KAP questionnaire by Marcus EH Ong et.al[9] was utilized for the study. The final questionnaire consisted of 15 items spanning 3 parameters -5 items testing Knowledge, 8 items measuring Attitude and 2 items measuring Practice related to use of AED.

Discussion: The study was aimed at assessing the current knowledge, attitude and practices with regards to AED amongst EMS respondents. Most respondents reflected positive attitude towards utilizing AED in out of Hospital Cardiac Arrest patients.

Conclusion: The study reemphasizes the need for formal training on AED usage. Although the study is limited by its sample size, it provides broad perspective on the subject.

Keywords: *Out of Hospital Cardiac Arrest (OHCA), Automated External Defibrillator (AED), Emergency Medical Services(EMS), Knowledge, Attitude and Practices (KAP).*

Introduction

An Out of Hospital Cardiac Arrest (OHCA) is defined as the loss of cardiac mechanical function that occurs outside of the hospital setting and confirmed by the absence of signs of systemic circulation. Many OHCA patients develop early symptoms several hours before the event, which may lead them to seek medical help from primary care physicians (PCPs) or other out-of-hospital ambulatory care settings where he gets a cardiac arrest[1].

OHCA has a very low survival rate. With each minute delay in defibrillation from the onset of cardiac arrest, the probability of survival decreases by 10%.[2]

Corresponding Author:
Dr. Parag Rishipathak
Professor & Director, Symbiosis Centre for Health Skills, Symbiosis International (Deemed University), Pune, India
e-mail: director_schs@siu.edu.in

Cardio Pulmonary Resuscitation (CPR)is a simple but effective procedure that allows almost anyone to sustain life in the early critical minutes after cardiac arrest[3]. The administration of CPR immediately after the onset of cardiac arrest is associated with improved survival and better quality of life among survivors.

Apart from CPR, Early defibrillation is essential in management of cardiac arrest. An automated external defibrillator (AED) allows lay rescuers to advance defibrillation by starting treatment before emergency medical services (EMS) arrive on the scene.[4] They are easy to use, accurate, and can be used safely and effectively.[5]

Use of automated external defibrillators (AEDs) is now an important component of emergency medical systems, and recent advances in AED technology have allowed expansion of AED use to non-traditional first responders and even the lay public.[6]

A study conducted by Ross A pollock *etal*[7] in 2018 concluded that bystander AED use before EMS arrival in shockable rhythm was associated with better survival and functional outcomes.

The crucial key lies in prehospital management. Early defibrillation in the prehospital phase

Can significantly increase the chance of survival.[8] Emergency Medical Service Providers are very important link in the Chain of Survival. Timely provision CPR and Rapid Defibrillation during Cardiac Arrest requires adequately trained and qualified personnel.

It is therefore important to understand the current level of Knowledge, Attitude and Practice (KAP) with regards to AED amongst EMS responders. This can tide further interventions to improve the KAP levels and ensure better qualified EMS responders to deal with OHCA.

Objective

To assess Knowledge, Attitude and Practice on the Use of Automated External Defibrillation (AED) by Emergency Medical Services (EMS) Providers.

Methodology

The Knowledge, Attitude and Practice (KAP) study was conducted amongst 120 Emergency Medical Services Providers at SCHS, Pune, India. A previously tested and validated KAP questionnaire by Marcus EH Ong et.al[9] was utilized for the study. The original 29 item questionnaire intended for usage in General Practitioners was modified to suit the present study. The final questionnaire consisted of 15 items spanning 3 parameters -5 items testing Knowledge, 8 items measuring Attitude and 2 items measuring Practice related to use of AED.

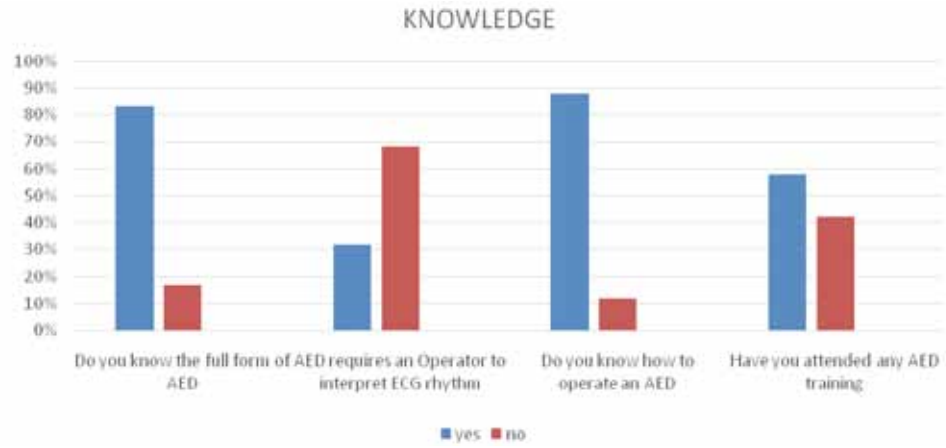
Informed consent was obtained from the respondents. The respondents were instructed to answer every item on the questionnaire either in YES or NO in front of the respective statement of Knowledge, Attitude and Practice. All items were to be mandatorily filled. The students were given 30 minutes to answer the questionnaire and to submit it. Only completely filled questionnaire were accepted for data analysis. The data collected was tabulated and statistically analysed using SPSS version 23.

Any queries pertaining to questionnaire was clarified at the time of collection of data.

Results

It was observd that the average age of the respondents was between 21 to 25, and 88% of them were female. Further, 17% had a valid basic cardiac life support (BCLS) certificate, and 14% had a valid advanced cardiac life support (ACLS) certificate**.**

As seen in Figure 1.,In terms of Knowledge, 83% of the respondednts could write the AED abbreviation correctly while around 88% claimed that they know how to operate an AED.As many as 32% of the respondents answered incorrectly stating that AED required an operator to interpret ECG rhythm. Only 58% of the respondents had attended any formal AED training in the past.



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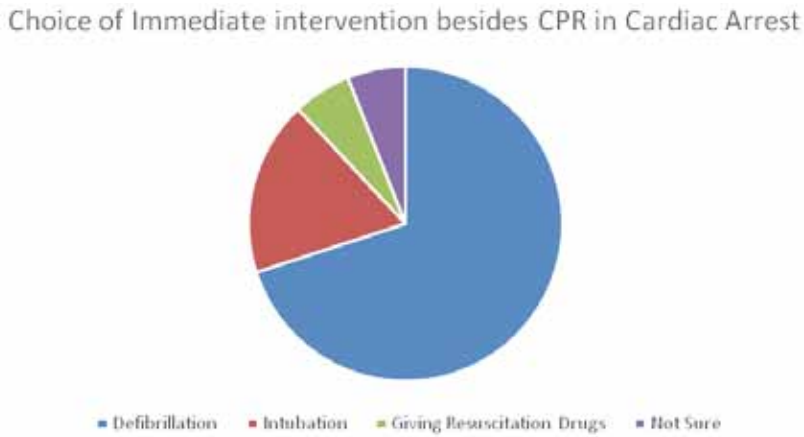

Figure 2.

As seen in figure 2. Majority (70%) of the respondents identified Defibrillation as the correct immediate intervention besides CPR in Cardiac Arrest.

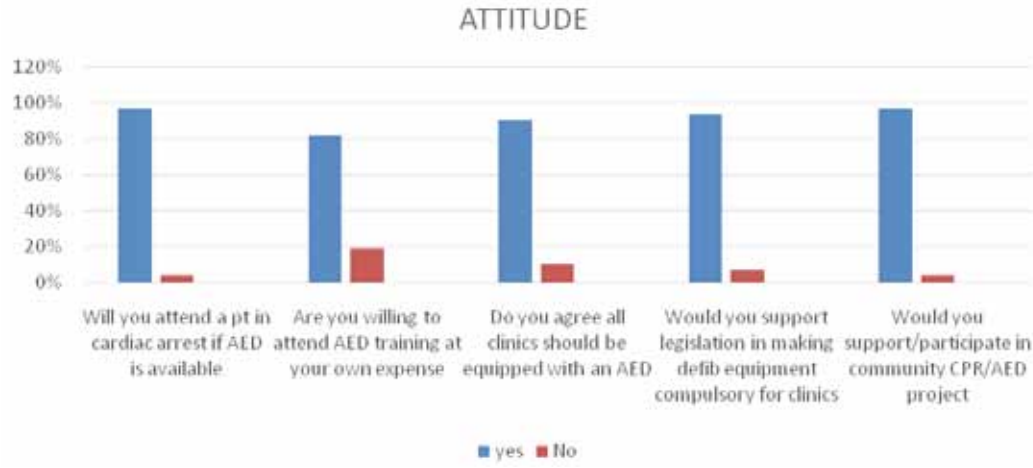

Figure 3.

As seen in figure 3., in terms of attitude 96% answered in affirmative when asked if they would attend a patient in cardiac arrest if AED is available. 90% agreed that all clinics should be equipped with AED and 92% supported the idea of bringing legislation in making defibrillatory equipment compulsory for clinics. Almost all (96%) respondents were willing to participate in community CPR/AED projects.

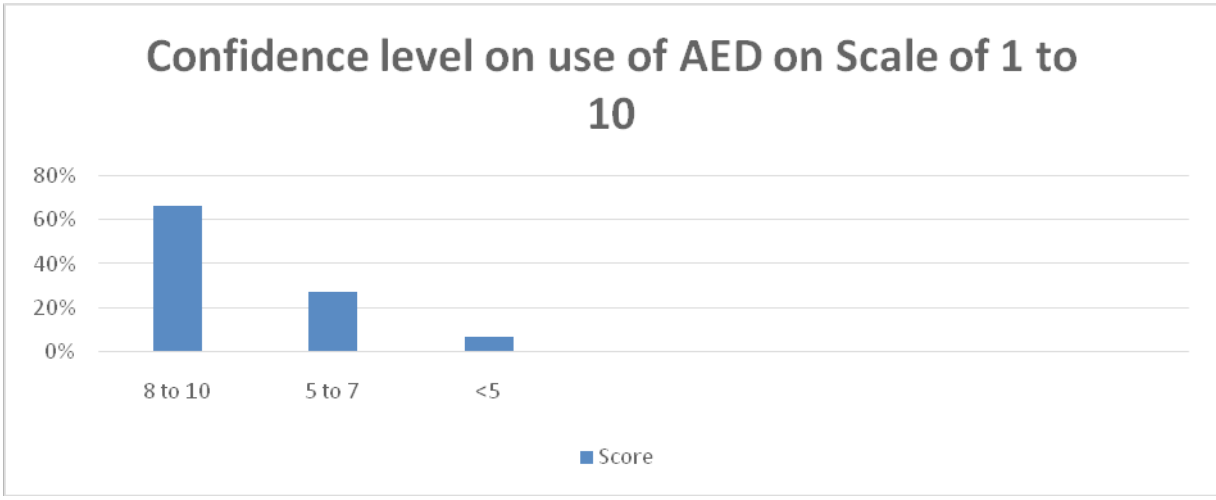

Figure 4

As depicted in figure 4,66% of the respondents exuded a high degree of confidece on the usage of AED.

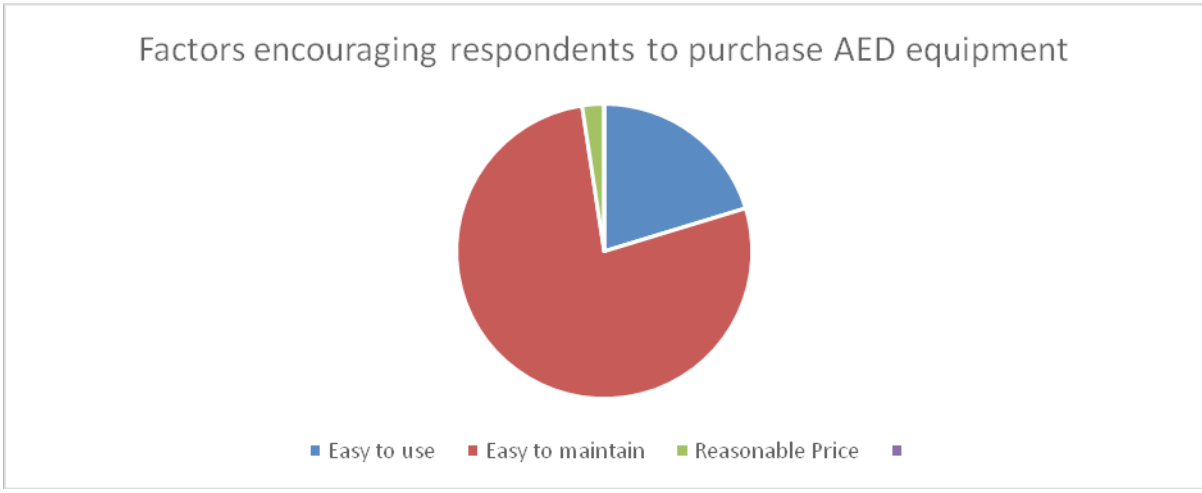

Figure 5.

As seen in figure 5.,84% of the respondents felt 'ease of use" as the key drive to purchase AED.

In terms of Knowledge, 62.2 % responded that they would perform mouth to mouth CPR.

77.04% of the rspondents suggested that they would go ahead with both compression and ventilation.

Discussion

The study was aimed at assessing the current knowledge, attitude and practices with regards to AED amongst EMS respondents.

The findings are encouraging in part while providing with valuable perspective for bringing improvements in certain areas. A sizable number of respondents

incorrectly percieved that percieved that AED requires operator to interpret ECG rhythm. This can be attributed to lack of formal training for AED as was found in the case of 58% of respondents. The optimum utilization of any equipment largely depends on the training of the operator. Training not only enhances knowledge, but also improves attitude towards usage and enhances utilization in emergency situations. It also helps in clearig misconceptions and allay fears.

Most respondents reflected positive attitude towards utilizing AED in out of Hospital Cardiac Arrest patients. The confidence level towards its utilization can be further improved by periodic hands on training. Majority respondents will in to attend AED training at their own expense and were optimistic about purchasing AED if they found it simple to use. Interestingly, price was not a significant factor while making a purchase decision. Respondents overwhelmingly supported the idea of legislation to make AED compulsory for clinics. This finding is important for policy makers on wider iimplementation of AEDs at clinic level in managing Out of Hospital Cardiac Arrest.

Majority of respondents appreciated the significance of ventilation during CPR and were ready to perform mouh to mouth ventilation. Given a choice between compression only and both compression and ventilation,majority of respondents chose both compression and ventilationas they found it more effective in comparison to compression only during CPR in Out of Hospital Cardiac Arrest.

Conclusion

The study amongst EMS responders throws light on the knowledge, attitude and practices with regards to AED usage. The study reemphasizes the need for formal training on AED usage. Although the study is limited by its sample size, it provides broad perspective on the subject. AED is a lifesaving modality in Out of Hospital Cardiac Arrest and optimizing its usage is the need of the hour.

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