ORIGINAL RESEARCH PAPER

Anaesthesiology

AWARENESS OF CPR IN THE CONTEXT OF COVID 19 PATIENTS AMONG MEDICAL, NURSING AND PARAMEDICAL STUDENTS AT TERTIARY HOSPITAL

KEY WORDS: knowledge, medical students, COVID-19 patients, cardiopulmonary resuscitation.

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ABSTRACT

Background: Awareness of CPR during the emerging COVID 19 pandemic is paramount to ensure the provision of essential lifesaving medical care in emergency situation. This study aims to evaluate awareness of knowledge and attitudes towards cardiopulmonary resuscitation in context to COVID 19 among medical, nursing and paramedical students. **Material and Methods:** A cross-sectional, questionnaire-based study was conducted to assess practical knowledge and attitude among medical students by means of questions related to CPR in COVID 19 infected patients. Results: Study participants were Nursing students (n=90), paramedical technician students (n=80), Junior residents(n=30), III/II MBBS (n=90) & Interns (n=110), total were 400. Majority were male (57.75%) as compared to females (42.25 %). In the questionnaire, out of total 20 questions initial 15 questions were related to cardiopulmonary resuscitation in general, followed by 5 questions related to cardiopulmonary resuscitation in COVID 19 patients. We noted that study participants had average knowledge of CPR & poor knowledge of CPR in COVID 19 patients. In present study, we noted that, majority of students scored ≥ 70 % score (58.5%), followed by 51-70 % score (33%) and ≤ 50 % score (22.5%). **Conclusion:** The current study provides a comprehensive assessment of the knowledge, attitudes among medical, nursing and paramedical students toward COVID-19 & that they had poor knowledge of CPR in COVID 19 patients. Implementation of formal medical education based on recommended CPR guidelines and drills is needed to be conducted regularly to improve student awareness.

INTRODUCTION

The global pandemic of coronavirus disease (COVID-19) has created significant and widespread disruptions in health care organizations and societies across the world.

We know that medical students plays an important role in patient care during Spanish flu pandemic in 1918 and during the polio epidemic in 1952 in Denmark[1]. Medical students are often seeing as frontline clinician in health care system around the world. It is essential for institution to increase their knowledge about the pandemic. According to data from SARS outbreak in 2002 health care workers accounted for 21% of all infection worldwide. So it is likely that health care system can utilize students in patient care. Consequently it is vital to determine the knowledge level of medical students about CPR in COVID 19.

Resuscitation poses a risk to health care workers, and modifications to our traditional approach needs to change.[2] It is therefore important to assess the knowledge, attitudes and practices of the population to guide these efforts.

The rapid spread of the severe acute respiratory syndrome coronavirus 2 and the potential for severe illness associated with the infection have led the International Liaison Committee on Resuscitation, the American Heart Association, the UK Resuscitation Council, and other international societies to propose modified guidelines for cardio pulmonary resuscitation (CPR) during the coronavirus disease (COVID-19) pandemic.

In India we as health care professionals have adopted and implemented these new recommendations for CPR procedures in the context of the COVID-19 pandemic; however, there has been no incorporation of COVID-19 context CPR procedures into the official medical education curriculum. Therefore, it is unclear whether medical students have recognized the changes in CPR procedures.

With this background, the present study aims to recognize whether medical and paramedical students have gained adequate knowledge and practicing safety during cardiopulmonary resuscitation in patients infected with covid19.

The evidence provided in this study can be used to modify CPR and ALS content in the core curriculum and to incorporate guidelines for undergraduate resuscitation education in response to the current COVID-19 pandemic as well as in future pandemics.

MATERIAL AND METHODS

Study design and setting -A descriptive, cross-sectional study was conducted to find the knowledge about CPR in context to COVID-19 patients at tertiary care teaching hospital, BKL Walawalkar Rural Medical College And Hospital, Sawarde, Chiplun, Ratnagiri, Maharashtra, India from Dec 2021 to August 2022.

Study participants- Medical, paramedical and final year nursing students studying at BKLW institute were invited to participate in study. This institute runs nursing, medical as well as paramedical courses. CPR training is included in medical as well as paramedical and nursing course.

A cross-sectional, questionnaire-based study was conducted at tertiary care teaching hospital, BKL Walawalkar Rural Medical College And Hospital, Sawarde, Chiplun, Ratnagiri, Maharashtra, India from Dec 2021 to Aug 2022.

We creat a self-developed questionnaire, which was assessed for content and construct validity by way of expert includes senior faculty of 2 anesthetist, 2 general medicine and 2 PSM department.

The questionnaire consists of 20 multiple choice questions. Proper explanation about the objectives of the study was performed. 28.5% of the registered students in the college of nursing participated in this study, whereas 25.6% participated from paramedical course. Moreover, 48.6% of the registered students studying MBBS course participated in this study. The respondents were invited to fill the questionnaire. The data collection is performed and accomplished by author and co-author participated in this study.

Ethical consideration-

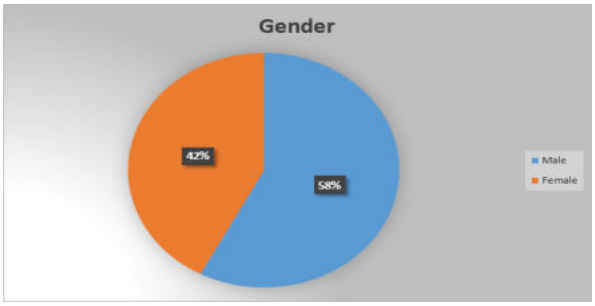
This study was exempted from review by the Ethics Committee of the hospital. Verbal consent was taken from the respondent after explaining the importance of the study and steps involved in data collection before proceeding, willing to participate and sparing time to provide information. It was also emphasized that they were free to withdraw at any stage of the study, without giving any reason. The authors assured the confidentiality of personal identification, and other information and opinions provided would be anonymous and confidential. The questionnaire was distributed as a Google form through E-mail and physical form to them who don't have email. Score were assigned as high knowledge if it is >70%, moderate if it is between 50-70% and low if it is <50%.[3]

RESULTS

Total Study participants were 400 out of which final year Nursing students 22.5% (n=90), Junior residents 7.5% (n=30), Interns 27.5% (n=110), Paramedical Technician student 20% (n=80) & MBBS III/II 22.5% (n=90). Majority were male (57.75%) as compared to females (42.25 %).

Table 1- Demographic characteristics

Characteristic	No. of students	Percentage
Gender		
Male	231	57.75%
Female	169	42.25%
Class	No. of students	
Nursing students	90	22.50%
Junior Residents	30	7.50%
Interns	110	27.50%
MBBS III/II	90	22.50%
Paramedical Technician Students	80	20.00%



In the questionnaire, out of total 20 questions initial 15 questions were related to cardiopulmonary resuscitation in general, followed by 5 questions related to cardiopulmonary resuscitation in COVID 19 patients.

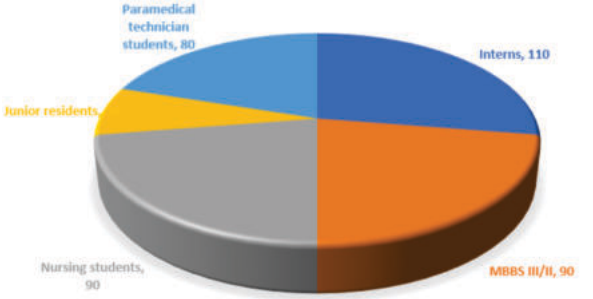


Table 2- Question wise score

Question	Correct answer		Wrong answer	
	N	%	N	%
Safety in BLS	301	75.25	99	24.75
Abbreviation of BLS	341	85.25	59	14.75
Location for chest compression	267	66.75	133	33.25
Adult CPR	259	64.75	141	35.25
Activating EMS	249	62.25	151	37.75
Abbreviation of AED	269	67.25	131	32.75
Rate of chest compression during CPR	287	71.75	113	28.25
Abbreviation of EMS	308	77	92	23
Depth of compression	232	58	168	42
Ratio of CPR	245	61.25	155	38.75
Sequence of CPR	201	50.25	199	49.75
CPR without mouth-to-mouth	190	47.5	210	52.5
Rescue breathing in infants	209	52.25	191	47.75
Chest compression and ventilation ratio	243	60.75	157	39.25
Symptoms of choking	289	72.25	111	27.75
Suctioning in COVID 19	201	50.25	199	49.75
Bag mask ventilation COVID 19 patients	194	48.5	206	51.5
Position of chest compression	203	50.75	197	49.25
Sequence of CPR	382	95.5	18	4.5
Response in COVID 19 positive patient with cardiac arrest	221	55.25	179	44.75

In present study, we noted that, majority of students scored ≥ 70 % score (58.5%), followed by 51-70 % score (33%) and ≤ 50 % score (22.5%)

Table 3 - Distribution of correct answer

Score	Total %	Nursing students (%)	Paramedical Technicians (%)	Junior Residents (%)	III/II MBBS (%)	Interns (%)
≤ 50 %	22.5 %	9 (2.25 %)	6 (1.5 %)	31 (9.75 %)	3 (0.75 %)	29 (7.5 %)
51-70 %	33 %	3 (0.75 %)	36 (9 %)	17 (4.25 %)	40 (10 %)	36 (1%)
≥ 70 %	58.5 %	36 (9 %)	13 (3.25 %)	72 (18 %)	25 (6.25 %)	112 (22 %)

Table 4- Awareness of knowledge and attitude about CPR in the context of COVID 19

Question	Correct answers					Total (n=400)
	Nursing students (n=90)	Junior Resident (n=78)	Paramedical Technicians (n=32)	III/II MBBS (n=110)	Interns (n=90)	
Suctioning in COVID 19	39 (43.33 %)	50 (64.1 %)	15 (46.88 %)	43 (39.09 %)	54 (60 %)	201 (50.25 %)
Bag mask ventilation COVID 19 patients	35 (38.89 %)	47 (60.26 %)	13 (40.63 %)	41 (37.21 %)	58 (64.44 %)	194 (48.5 %)
Position of chest compression	37 (41.11 %)	52 (66.67 %)	14 (43.75 %)	45 (40.91 %)	55 (61.11 %)	203 (50.75 %)

Sequence of CPR	86 (95.56 %)	76 (97.44 %)	28 (87.5 %)	104 (94.55 %)	88 (97.78 %)	382 (95.5 %)
Response in COVID 19 positive patient with cardiac arrest	42 (46.67 %)	54 (69.23 %)	11 (34.38 %)	53 (48.18 %)	61 (67.78 %)	221 (55.25 %)

DISCUSSION

To the best of our knowledge, this is the first survey to study nursing, medical and paramedical students' awareness of the recommended CPR and airway management procedures for the COVID-19 pandemic in India.

In COVID-19 era, CPR, due to some components being high aerosol-generating procedures (AGPs), has become high-risk procedure for the healthcare workers. Cardiopulmonary resuscitation is a complex maneuver that includes chest compression, defibrillation, and airway management, and many of these can generate aerosol.[4] The risk to the rescuers is maximum at the time of aerosol generating procedures like intubation, bedsides suctioning. All contact and transmission base precautions and aerosol minimizing strategies must be rigorously followed to ensure safety of the healthcare workers in such infectious environment. Instead of "Primum non nocere" (first do no harm), we are forced to change to "Primum non nocere ad te" (first do no harm to yourself).[5] If the patient with an unknown status/suspected/ confirmed COVID-19 had out of the hospital cardiac arrest, hands-only CPR could be performed only after covering the mouth and nose of the patient with the face mask or cloth. During in-hospital cardiac arrest, patients should be shifted to a negative pressure ventilation room and health care workers should wear personal protective equipments.

This study indicates that there was inadequate knowledge of CPR procedures in context to COVID-19, which is related to the fact that concepts of aerosol transmission are less strongly emphasized in conventional CPR. It is therefore reasonable for the faculty at medical schools to implement a new curriculum for CPR procedure in the context of the COVID-19 pandemic in each medical, nursing and paramedical courses.
In similar study conducted by Hiromi Machino, et al[7] in Japan, multiple regression model for scores about COVID 19 context CPR and year level in medical school, the 4th and 5th year students scored the highest in the COVID 19 context CPR and airway management procedure tests, for the reason that medical students are mainly taught COVID 19 related topics in a small-group emergency medicine rotation in the preclinical clerkship (4th year students) and clinical clerkship (5th year students) at Japan university.

In a similar survey that investigated medical students' awareness of medical knowledge related to COVID-19 in Turkey, showed that final year students vs first year student as a positive prediction of score, only 34% of final-year medical students knew CPR procedures in the context of the COVID-19 pandemic.[4]

In Malaysia, a study was undertaken on the knowledge of and confidence in performing lifesaving procedures in the face of the COVID-19 pandemic among emergency health professionals such as physicians, paramedical assistants, and nurses. The results showed that 68.9% of subjects had a high level of knowledge about airway management and cardiopulmonary resuscitation for COVID-19 patients.[6]

Limitation

As our targets were medical and paramedical students, one could argue that the difference in the level of awareness could be obtained from practice and after period of experience. Other limitation was that, attitude and the practical skills of basic life support could not be assessed.

There is need to enhance the knowledge of the medical as well as paramedical students towards CPR in COVID-19 affected patients. We would also recommend that related healthcare authorities and associations can work towards including CPR in context to COVID 19 infected patients in curriculum.

It is recommended that refresher courses and simulation training on CPR in context to COVID19 affected patients should be provided for medical and paramedical students.

A further study that includes more diverse components, such as knowledge, skills, and attitude, is needed after fully implementing COVID context resuscitation.

CONCLUSION

The current study provides a descriptive assessment of the knowledge among medical and paramedical students toward CPR in COVID-19 patients.

There is need to enhance the knowledge of these students towards CPR in COVID 19 infected patients. There is need for related healthcare authorities and associations to work towards implementation of a formal medical education curriculum on COVID 19 in context to CPR and airway management.

It is recommended that refresher courses and simulation to prepare them to face pandemic in future about training on CPR in context to COVID 19 infected patients should be provided for nursing, medical and paramedical students.3.

Repeated drills need to be formulated and conducted regularly.

Acknowledgements-
We would like to thank all of the participants for their co-operation.

Conflict of Interest: None to declare

Source of funding: Nil

1. When you find someone unresponsive in the middle of the road, what will be your first response? (Note:You are alone there)
a) Open airway b) Start chest compression c) Look for safety d) Give two breathings
2. What is the abbreviation of "BLS"?
a) Best Life Support b) Basic Life Support c) Basic Lung Support d) Basic Life Services
3. What is the location for chest compression?
a) Left side of the chest b) Right side of the chest c) Mid chest d) Xiphisternum
4. Depth of compression in adults during CPR
a) 1½ – 2 inches b) 2½ – 3 inches c) 1 – 1½ inches d) ½ – 1 inch
5. If you confirm somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?
a) Start CPR b) Activate EMS c) Put him in recovery position d) Observe
6. What does abbreviation AED stands for?
a) Automated External Defibrillator
b) Automated Electrical Defibrillator
c) Advanced Electrical Defibrillator
d) Advanced External Defibrillator
7. Rate of chest compression in adult and Children during CPR
a) 100 / min b) 120 / min c) 80 / min d) 70 / min
8. What does abbreviation EMS stands for?

a) Effective Medical Services
b) Emergency Management Services
c) Emergency Medical Services
d) External Medical Support

9. Depth of compression in Children during CPR
a) 1½ – 2 inches
b) 2½ – 3 inches
c) One-half to one-third depth of chest
d) ½ – 1 CM
10. Ratio of CPR, single rescuer in adult is a) 15:2 b) 5:1 c) 30:2 d) 15:1
11. What is the location for chest compression in infants?
a) One finger breadth below the nipple line
b) One finger breadth above the nipple line
c) At the intermammary line d) At Xiphisternum
12. If you do not want to give mouth-to-mouth CPR, the following can be done EXCEPT
a) Mouth-mask ventilation and chest compression
b) Chest compression only
c) Bag mask ventilation with chest compression
d) No CPR
13. How do you give rescue breathing in infants?
a) Mouth-to-mouth with nose pinched
b) Mouth-to-mouth and nose
c) Mouth-to-nose only
d) Mouth-to-mouth without nose pinched
14. In a new born the chest compression and ventilation ratio is a) 15:2 b) 5:1 c) 30:2 d) 3:1
15. If you and your friend are having food in a canteen and suddenly your friend starts expressing symptoms of choking, what will be your first response?
a) Give abdominal thrusts
b) Give chest compression
c) Confirm foreign body aspiration by talking to him
d) Give back blows
16. You are witnessing a victim suspected COVID 19 having oral secretions, which catheter will you be use for suctioning ?
a) Open suction catheter
b) Central suction catheter
c) Don't know
17. You are witnessing a cardiac arrest in COVID 19 patient, what's next
a) No CPR
b) Mouth -mask ventilation & chest compression
c) Bag -mask ventilation & chest compression
d) No Bag -mask ventilation, only chest compression
18. You have witnessed a cardiac arrest in COVID 19 positive patient, who is in prone position what is position of chest compression
a) Left side of chest b) Right side of chest c)Mid Thoracic region
19. What is sequence of CPR in COVID 19 positive patient
a) ABC b) BCA c) CAB d) BAC
20. You have witnessed cardiac arrest in COVID 19 positive patient during CPR you will
a) Check response by approaching the vitims head b) Check for response without approaching the vitims head c) Don't know

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