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AN EDUCATION INTERVENTION TO ASSESS KNOWLEDGE AND PRACTICES ABOUT CARDIO- PULMONARY RESUSCITATION (CPR) AMONG NURSES AND NURSING STUDENTS OF TERTIARY CARE HOSPITAL IN GUJARAT, WEST INDIA.

Heena Khan[1], Mukesh Kumar B Vora*[2] and Neeta Bose[3]

[1]Department(s) and institution(s): Undergraduate MBBS student, GMERS Medical College & General Hospital, Gotri, Vadodara, Gujarat (India).

[2]Department(s) and institution(s): Department of Pharmacology, GMERS Medical college & General hospital, Gotri, Vadodara, Gujarat (India).

[3]Department(s) and institution(s): Department of anesthesiology, GMERS Medical college & General hospital, Gotri, Vadodara, Gujarat (India).

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***Correspondence for Author**
Dr. Mukesh Kumar B Vora
Department of Pharmacology, GMERS Medical College & General Hospital, Gotri, Vadodara, Gujarat (India)

ABSTRACT

Background: Of all healthcare professionals, nurses are often the first to discover a patient of cardiopulmonary arrest (CPA) in any part of the hospital, be it the "emergency" or the "in-patient" wards. Therefore, it is very important to know competency of knowledge & practices in cardiopulmonary resuscitation (CPR) for save the life of patient. Therefore, the study aims to assess knowledge and practices and to evaluate the impact of an educational intervention about cardiopulmonary resuscitation among nursing students and nurses at our institute. **Material and method:** In education intervention study, we have enrolled nursing students and nurses of tertiary care teaching hospital, Vadodara, Gujarat (India). The educational intervention in the form training was given and divided into a theoretical and a practical part. For the purpose of study, questionnaires regarding knowledge and practices were developed and peer viewed by expert faculty of our institute. The questionnaires were same in pre-training and post training. At the end of study, we had evaluated the effectiveness of educational intervention among nurses and nursing students by using paired t-test.

Results: In study results, knowledge score in nursing students in pre-training 4.14 ± 1.38 and post training 9.54±1.46 ($p<0.0001$, $t=20.47$, paired t-test), in practice score pre training 3.51±1.04 and post training 4.54±1.12 ($p=0.007$, $t=3.73$). In nurses, knowledge score in pre-training 5.81±2.21 and post training 10.15±1.44 ($p<0.0001$, $t=19.82$) in practices score, pre training 2.27±1.02 and post training 4.25±1.08 ($p<0.0001$, $t=18.70$). Both the results were also found statistically significant in nurses as well as nursing students. **Conclusion :** We conclude from present study, there are significant increased knowledge and practices of Basic life support (BLS)/ CPR after giving training to nursing students as well as nurses. That means education to the health care professional lead to not only improvement but also update their knowledge regarding BLS/CPR.

KEYWORDS: Basic life support, Cardio-pulmonary resuscitation, nurses, nursing student.

INTRODUCTION

Cardiopulmonary resuscitation, commonly known as CPR, is an emergency procedure performed in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person who is in cardiac arrest. It is indicated in those who are unresponsive with no breathing or abnormal breathing, e.g agonal respiration. [1]

CPR alone is unlikely to restart the heart. Its main purpose is to restore partial flow of oxygenated blood to the brain and heart. The objective is to delay tissue death and to extend the brief window of opportunity for a successful resuscitation without permanent brain damage. [2]

Of all healthcare professionals, nurses are often the first to discover a patient of cardiopulmonary arrest (CPA) in any part of the hospital, be it the "emergency" or the "in-patient" wards. Therefore, it is needless to say that their competency of knowledge & practices in cardiopulmonary resuscitation (CPR) is a critical factor in determining successful outcomes in patients who develop CPA. [3, 4, 5]

Of all patient care areas, the emergency and ICU are the places where most of the CPAs are witnessed as the critically ill or injured children are admitted or transferred to these areas. Therefore, the competence of the nurses posted in these acute care areas becomes very important.[6] However, evidence is compelling to show that CPR knowledge and skills

are poorly retained across nursing populations [3,4,5]. It is very little data is present which addresses the awareness of nursing staff towards the effective used of cardiopulmonary resuscitations in India.

Lack of resuscitation skills of nurses in basic life support (BLS) including CPR and advanced life support (ALS) has been identified as a contributing factor to poor outcomes of cardiac arrest patient. [4]

With this background, aim of present study was to assess knowledge and practices of Cardio pulmonary resuscitation and to evaluate the impact of an educational intervention among the nurses and nursing students in tertiary care teaching hospital, Gotri, Vadodara, Gujarat (India)

MATERIAL AND METHODS

After obtaining ethical committee approval of our institute, purpose of study was explained to the participants and informed consent was taken from them. The participants were informed that their participation in the study will be anonymous, voluntary and assurance was given about confidentiality of the information.

In this educational intervention study, all nursing students (n=37) and nurses (n=84) of Gujarat Medical Education and research society (GMERS) medical college & general hospital, Gotri, Vadodara, Gujarat (India) were enrolled by convenient sampling method.

For the purpose of the study, a questionnaires form contained a Knowledge (n=13) and practice (n=07) based and validated by expert faculty. The correct responses were given a score of '1' and the wrong responses '0', maximum possible score of '20' was there. We have circulated questionnaires to all nurses and nursing student simultaneously both pre-training and post training. Time was given 30 minutes to fill up the questionnaire. Any clarification needed in about understanding the questionnaires was given and provided additional time those who have requested. The questionnaires were same in pre-training and post training.

The educational intervention was divided into a theoretical and a practical part. The theoretical part consists of a presentation which include all details about the CPR (Indication, precaution, importance of CPR, various steps of CPR etc.) followed by practical

session includes video & practical demonstration and hand on training of correct steps of CPR by using mannequin.

At the end of study, we have measured changes in the knowledge and practices of CPR among nurses and nursing students between pre-intervention and post intervention and evaluated the impact of effectiveness of educational intervention among nurses and nursing students.

To analyze the data, the method of descriptive statistics (mean) and analytical statistics (paired t-test) were used with med cal software.

RESULTS

In our study, total (n= 121) nursing students and nurses enrolled, of them nursing students (n= 37) and nurses (n=84) participated in study. Table 1 shown demographic detail of participants.

Table 1: Demographic Details of Students

Sr. No	Students	Male	Female	Total
1	Nursing student	01	36	37
2	Nurses	20	64	84

According to table 2, there was statistically significant difference in mean marks between the two study group (nursing students and nurses) about knowledge of cardiopulmonary resuscitation. ($p<0.0001$, paired t-test)

Table 2: Mean marks of before and after CPR training nursing students and nurses (Knowledge based questions)

Sr. No	Year of students	Pre-test score ± SD	Post test score± SD
1	Nursing students	4.14 ± 1.38	9.54 ± 1.46
2	Nurses	5.81 ± 2.21	10.15 ± 1.44
	$p < 0.0001$, Paired t-test		

According to table 3, there was statistically significant difference in mean marks between the two study group (nursing students and nurses) about practices of cardiopulmonary resuscitation. ($p<0.0001$, paired t-test)

Table 3: Mean marks of before and after CPR training nursing students and nurses (Practiced based questions)

Sr. No	Year of students	Pre-test score ± SD	Post test score± SD
1	Nursing students	3.51 ± 1.04	4.54 ± 1.12
2	Nurses	2.27 ± 1.02	4.25 ± 1.08
	$p < 0.0001$, Paired t-test		

In further question wise analysis, analysis in questions wise, there was statistically significant increased post test score than pre-test score of knowledge about CPR and also practices of CPR in nursing students and nurses (Table 4a & 4b) , (Table 5a & 5b) respectively in each questions after training.

Table 4a: Question wise analysis of knowledge of CPR amongst nursing students (n=37)

Sr. No.	Questions	Pre-test Score (%)	Post Test Score (%)
1	What is the full form of "CPR"?	100	100
2	Which of following is indication of CPR?	40.54	67.57
3	When are chest compression indicated?	45.95	64.86
4	What is the location for chest compression?	16.22	89.19
5	What is the location for chest compression in infants?	35.14	35.14
6	Where is the best site to assess the pulse?	5.41	43.24
7	Depth of compression in adults during CPR	21.62	78.38
8	Depth of compression in Children during CPR	16.22	67.57
9	Depth of compression in neonates during CPR	24.32	83.78
10	Rate of chest compression in adult and Children during CPR	0	97.3
11	What is the ratio of chest compressions to breaths that should be given to an adult in Cardiac arrest if you are alone during the resuscitation?	18.92	97.3
12	In a new born the chest compression and ventilation ratio is	8.11	75.68
13	What is full form EMS?	81.08	83.78

Table 4b: Question wise analysis of knowledge of CPR amongst nurses (n=84)

Sr. No.	Questions	Pre-test Score (%)	Post Test Score (%)
1	What is the full form of "CPR"?	96.43	96.43
2	Which of following is indication of CPR?	85.19	89.29
3	When are chest compression indicated?	58.33	63.1
4	What is the location for chest compression?	19.05	66.67
5	What is the location for chest compression in infants?	40.48	95.24
6	Where is the best site to assess the pulse?	46.43	86.9
7	Depth of compression in adults during CPR	48.81	88.1
8	Depth of compression in Children during CPR	21.43	83.33

9	Depth of compression in neonates during CPR	28.57	69.05
10	Rate of chest compression in adult and Children during CPR	25	63.1
11	What is the ratio of chest compressions to breaths that should be given to an adult in Cardiac arrest if you are alone during the resuscitation?	30.95	75
12	In a new born the chest compression and ventilation ratio is	25	79.76
13	What is the full form of EMS?	58.33	59.52

Table 5a: Practiced based question wise analysis of CPR amongst nursing students (n=37)

Sr. No.	Questions	Pre-test Score (%)	Post Test Score (%)
1	You are walking past a patient's room during visiting hours and are called by a relative who says that the patient has just collapsed. What should you do first? (Note: You are alone there)	89.19	89.19
2	If you confirmed somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?	16.22	89.19
3	If you do not want to give mouth-to-mouth CPR, the following can be done EXCEPT	67.57	54.05
4	How do you give rescue breathing in infants?	43.24	35.14
5	You are witnessing an infant who suddenly started choking while he was playing with the toy, you have confirmed that he is unable to cry (or) cough, what will be your first response?	54.05	83.78
6	You are witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it. He has Coming in causality with spontaneous breathing, but he is unresponsive. What is the first step?	5.41	5.41
7	A 50-year-old gentleman with retro-sternal chest discomfort, profuse sweating and vomiting. What is next?	75.68	100

Table 5b: Practiced based question wise analysis of CPR amongst nurses (n=84)

Sr. No.	Questions	Pre-test Score (%)	Post Test Score (%)
1	You are walking past a patient's room during visiting hours and are called by a relative who says that the patient has just collapsed. What should you do first? (Note: You are alone there)	54.76	78.57
2	If you confirmed somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?	39.29	39.29

3	If you do not want to give mouth-to-mouth CPR, the following can be done EXCEPT	2.38	66.67
4	How do you give rescue breathing in infants?	15.48	76.24
5	You are witnessing an infant who suddenly started choking while he was playing with the toy, you have confirmed that he is unable to cry (or) cough, what will be your first response?	63.1	63.1
6	You are witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it. He has Coming in causality with spontaneous breathing, but he is unresponsive. What is the first step?	3.57	57.14
7	A 50-year-old gentleman with retro-sternal chest discomfort, profuse sweating and vomiting. What is next?	46.43	48.81

DISCUSSION

According to present study finding that there was significant difference between the two groups (nursing students and nurses) in term of mean difference score both knowledge and practice aspect of Cardio pulmonary resuscitation/ Basic life support after education intervention.

In India, of all healthcare professionals, nurses are often the first to discover a patient of cardiopulmonary arrest (CPA) in any part of the hospital, be it the "emergency" or the "in-patient" wards. Keeping this mind we included nursing and nurses were included in our study. [3,4, 5]

In present study, more number of female participants were responded that male students indicating more number of female enrolling for course. This was supported by study conducted in Malaysia by chew & Yazid [7] which also had more number of female respondents.

According to result of present study (table 2), all nursing students were little or average knowledge about BLS/CPR before giving training (Pre- test mean marks 4.14 ±1.38). But after CPR training showing video and practical demonstration on mannequin, mean marks were rose. (Post test mean marks 9.54 ± 1.46). Post training mean marks were increased in nurses also regarding Knowledge of CPR. The study conducted by Shanta chandrasekaran et al. [8] was found that improvement of knowledge about BLS/CPR after giving training by society for Emergency medicine, India. Our study results supported this study.

In table 3 results showed, all nursing students as well as nurses are practices poor in before training but the practices were improved after training.

The study conducted by Avabratha et al. [9] reported (45.2%) of the medical interns of three medical colleges in coastal Karnataka had inadequate knowledge regarding resuscitation which was same in our study before training.

M Keenan et al. [10] study was found that action is needed to ensure all nurses receive BLS training and practices this skill regularly in order to retain their knowledge. N

Florian Laurent et al. [11] study was found the students in their final year of their pre-doctoral dental education who were assessed that they did not demonstrate competence in their handling of a patient in cardiac arrest. The results were indicated that it is necessary to provide periodical training to dental students about CPR techniques, in particular through a reactivation of their knowledge and practice in order to enhance their capacity to recognize and manage cardiac arrest and to become well-qualified practitioners. In our study results, training after CPR/BLS, there was significant increased knowledge and practices about the CPR/BLS and there is strong support about periodical training required in health care professional.

Raghav Sharma et al.[12] study found giving training of basic life support (BLS) and performing BLS plays a vital role in attaining BLS knowledge by all health care professional like medical, dental interns, nurses and nursing students. There is an absolute clear need for review and structured training of Basic Life Support (BLS)/Cardiopulmonary resuscitation education for health care provider include medical, dental and nurse in academic curriculum. This will go a long way in improving the outcome of BLS delivery by interns (the future health care providers), thus immensely benefitting the society and also boosting the morale of the interns. In our study results, pre-test score was low as compare to post test score. The results were suggested after giving training not only increased knowledge score but also update their knowledge and practices of both nursing students as well as nurses.

There was one study found that there is a lack of awareness regarding BLS among medical faculties, this is a serious issue that needs to be promptly visualized. The study recommended BLS and other resuscitation skills should be a part of the undergraduate curriculum and students should master the skills during their studies. [13]

Another Indian study conducted by Gupta et al [14] on health care professional like dentists on Udupi and Manglore, majority of the dental participants recalled having received training on CPR. Our results were also supported this study which was increased knowledge after training on CPR.

Other study Sahithi reddy et al. [15] was found that there is significant lack of knowledge amongst dental students. This study emphasizes the need for all health care professional regularly update knowledge & skills regarding BLS along with hand on training.

CONCLUSION

CPR plays vital role in saving life of patients. According to study results, we conclude that there is significant increased knowledge and practices of Basic life support (BLS)/ CPR after education about CPR training to nursing students as well as nurses. That means education to the health care professional lead to not only improvement but also update their knowledge regarding BLS/CPR.

So, we recommended BLS/CPR and other resuscitation skills should be a part of the nursing curriculum, they should master the skills during their studies and before practicing in real life scenario. Also include this course during services tenure of nurse.

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