Original Research Article

Assessment of CPR knowledge among clinical radiography students at a tertiary institution in Nigeria

ABSTRACT

Background: Current state of practice of medical imaging now encompasses advance supportive care to patient, in addition to the supportive care offered for the stabilization of patient before radiologic procedures. Advance supportive care, such as Cardiopulmonary Resuscitation (CPR) is offered to patient who may have cardiopulmonary arrests.

Objective: To assess the knowledge of cardiopulmonary resuscitation (CPR) among clinical radiography students of a tertiary institution in Sokoto.

Methods: A cross section study employing a semi-structured and self-administered questionnaire, consisting of two section, designed with the aim of the study were distributed among 82 clinical radiography students (300 – 500 level), in the 2017/2018 academy session of the tertiary institution (Usmanu Danfodiyo University) in Sokoto. The data were extracted using SPSS version 20 and analysed using descriptive and inferential statistics.

Results: A total of 75 questionnaire were returned, yielding a response rate of 91.5%. Respondents comprised 53 male and 22 female aged 20 to 34 years with mean age of 27 years. It was observed that 68% of the students had never had a CPR training and about 4% of the respondents knew the recommended compression to ventilation ratio during a CPR. While 1.3% knew the recommended chest compression to be performed each minute when giving CPR. Majority of the respondents (94.7%) were of the opinion, that CPR training should be made mandatory for all clinical radiography students.

Conclusion: Base on the evidence presented within this study, there is knowledge gap in the practice of cardiopulmonary resuscitation (CPR) among clinical radiography students, as majority of the students do not have adequate knowledge on the practice of CPR.

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Keywords: Cardiopulmonary resuscitation (CPR), Clinical Radiography students, Radiography, Sokoto.

INTRODUCTION

Cardiopulmonary Resuscitation (CPR) is a vital life-saving technique that involves the use of chest compressions and artificial ventilation to maintain continuous circulatory flow and oxygenation during cardiac arrest [1, 2, 3, 4]. It is important in the emergency management of patient with cardiac arrest and plays essential role in their survival. Other emergency cases in which CPR is employed include suffocation, near drowning, and electrocution injuries, or any other situation in which a person's breathing or heartbeat have stopped [3]. According to studies, CPR protects brain viability after as much as 10 minutes without circulation and increases survival rates in cases of ventricular fibrillation from 20% to 40% [5,6].

In modern radiology practice, apart from supportive care offered for stabilization of the patient before radiologic procedures, advance supportive care, such as Cardiopulmonary Resuscitation (CPR) is offered to patient who may have cardiopulmonary arrests. Cardiopulmonary resuscitation in such patients is an essential link in the patient survival and can serve as a life-saving time between early access to emergency care and early defibrillation [7].

According to Rosón et al., the prognosis of cardiopulmonary arrest is proportional to the training of the personnel caring for the patient, and inversely proportional to the time that transpires between the cardiopulmonary arrest and the start of effective reanimation [8]. Therefore, timely initiation of CPR by a well-trained radiographer in the X-ray diagnostic room, is critical to the survival of a patient who may be having a cardiac arrest, or suffering from cardiac arrest as a result of reactions to contrast media used. However, a delay in commencing such a life support procedure could lead to poor survival outcome.

In view of this, CPR as a basic life support was made a component of medical radiography curriculum in Nigeria [9], as recommended by International Liaison Committee on Resuscitation in a consensus document, stating that instruction in CPR be incorporated as a standard part of the school curriculum [10]. Also, the American Heart Association recommended that schools should establish a goal to train every teacher in CPR and first aid and train all students in CPR as part of their preparation for a response to medical emergencies on campus.

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However, from observation, there is little attention paid toward CPR training of radiography students in Nigeria, and as a result of these, we conducted this research study, using one of the tertiary institution in the country offering radiography training to students as a case study, in order to assess their knowledge of CPR.

MATERIALS AND METHODS

A cross section study assessing the knowledge of cardiopulmonary resuscitation (CPR) among clinical Radiography students (300 – 500 level) of the Usmanu Danfodiyo University Sokoto, in the 2017/2018 academic session. The pre-clinical year radiography students were excluded from the studies. Ethical approval was obtained from the research ethics committee of the radiography Department, Usmanu Danfodiyo University Sokoto. Permission to conduct the research was obtained from the head of department of radiography before the study questionnaires were administered to the participants who consented to taking part in the study.

A semi-structured and self-administered questionnaire, consisting of two section, designed in line with study objective, were distributed among 82 clinical radiography students. The two section of the questionnaire sought to seek information on demographics, general knowledge and technical knowledge of CPR practice. The general knowledge section was a combination of ten question that needed to be answered using three specific responses of (No, Yes and don't know). While the technical knowledge section was a combination of eighteen multiple choices questions. The data were analysed using a descriptive statistic and frequency distribution.

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RESULTS

A total of 82 questionnaires were distributed, 75 were completed and returned, giving a response rate of 91.5%. Distribution of students according to level of study were 30.7 %, n = 23 (300L); 44 %, n = 33 (400L); 25.3 %, n = 19 (500L) respectively. The respondents comprised 53 male and 22 female aged 20 to 34 years with mean age of 27 years. Table 1 shows the age range and sex distribution of the participant for each level.

Table 1: Age and sex distribution of participants for each level

Levels	Age Range (Years)	Male	Female	Percentages (%)
300	20 – 25	15	8	30.7
400	20 - 33	25	8	44
500	21 - 33	13	6	25.3
Total		53	22	100

Table 2 shows response with regards to training and certification in CPR procedure, for each level

Table 2: Rresponse with regards to training and certification in CPR procedure for each level

CPR Training	300 Level (%)	400 Level (%)	500 Level (%)
Ever had CPR Training			
Yes	8(34.8%)	5(15.2%)	3(15.8%)
No	15(65.2%)	21(63.6%)	15(78.9%)
No response (-)	0(0%)	7(21.2%)	1(5.3%)
Total	23(100%)	33(100%)	19(100%)
CPR certified in the past 2 years			
Yes	4(17.4%)	4(12.1%)	0(0%)
No	18(78.3%)	26(78.8%)	18(94.7%)
No response (-)	1(4.3%)	3(9.1)	1(5.3)
Total	23(100%)	33(100%)	19(100%)

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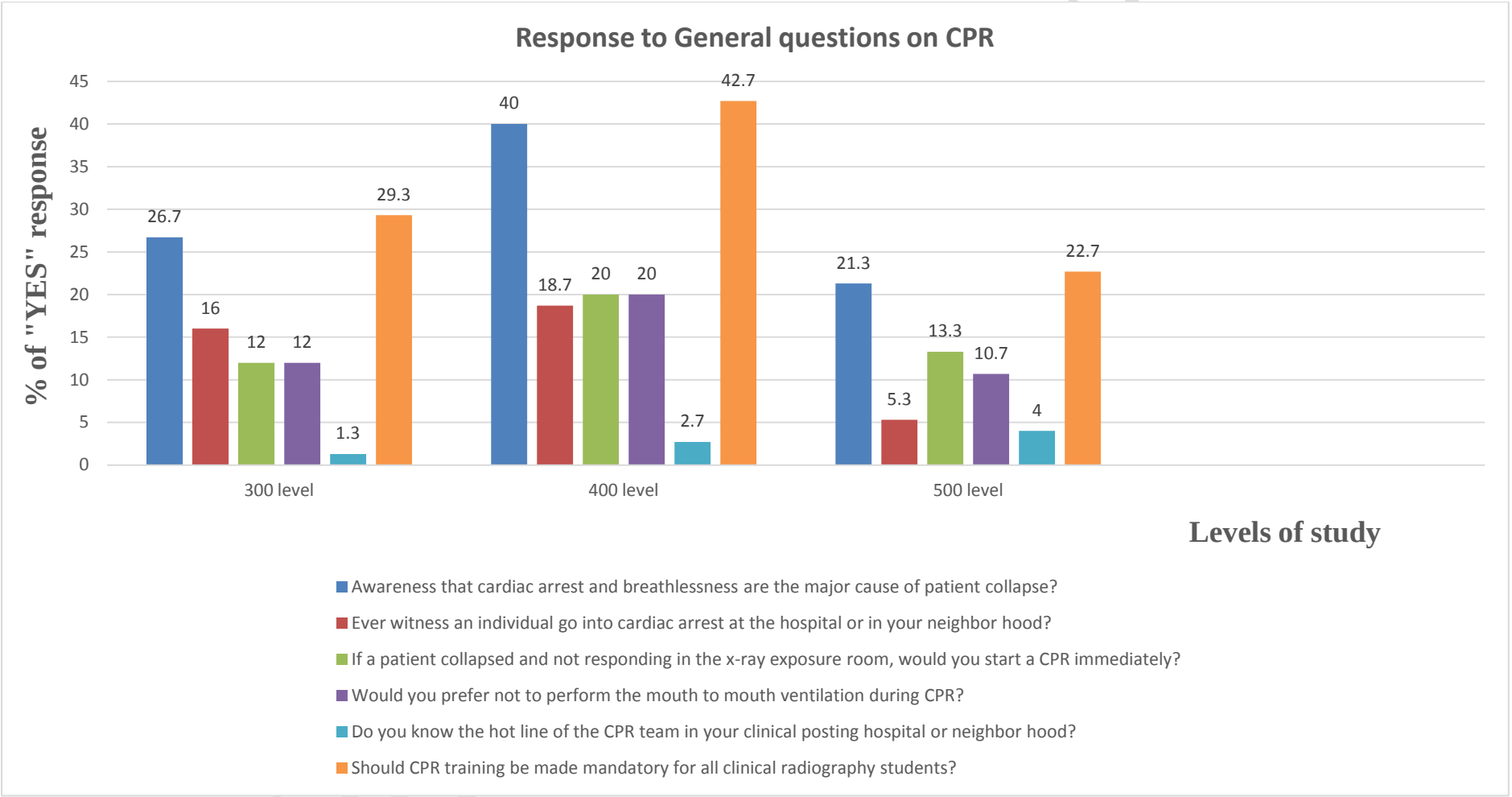

Fig 1: Response to general questions on CPR

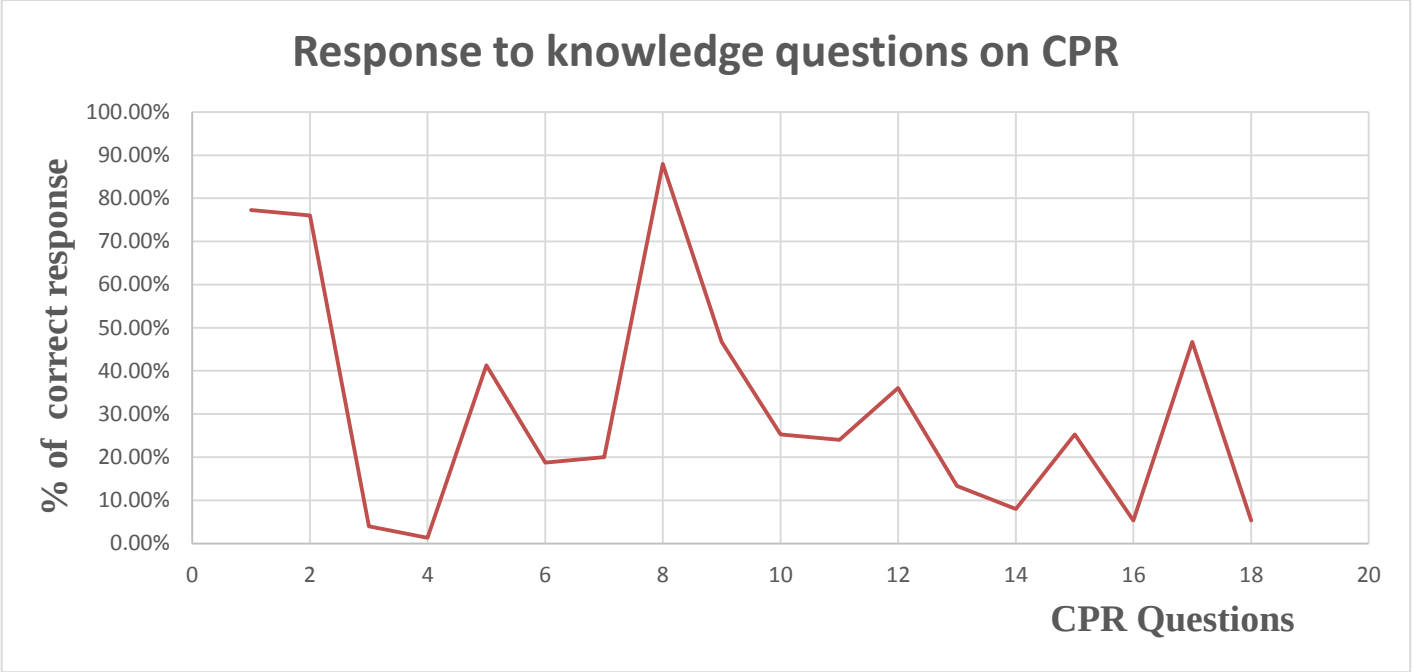

Fig2: Response to knowledge questions on CPR

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111 Table 3 shows frequency distribution of correct responses to knowledge
112 questions on CPR

ITEMS	300 lv	400 lv	500 lv	n (%)
1. The best way to open the airway prior to giving mouth-to-mouth ventilation is R: To tilt the head back and lift the chin up	17	26	15	58(77.3)
2. CPR is most effective R: When started immediately after the patient collapsed	18	24	15	57(76)
3. The recommended compression to ventilation ratio is R: 30:2	0	1	2	3(4)
4. The recommended chest compression to be performed each minute when giving CPR is R: 100	1	0	0	1(1.3)
5. The chest compression landmark on adult is at R: The centre of the chest	8	16	7	31(41.3)
6. Chest compressions should be performed on an infant R: With two fingers of one hand while doing CPR	4	6	4	14(18.7)
7. The steps of CPR in the correct sequence is R: Compression, maintain a patent airway and artificial breathing	5	6	4	15(20)
8. The CAB of resuscitation represents R: C= Compression, A= Airway, B= Breathing	20	29	17	66(88)
9. The chance of saving a victim when CPR is performed correctly is R: 75	12	16	7	35(46.7)
10. Children become adults in CPR terms by R: 12 years	6	7	6	19(25.3)
11. When dealing with a conscious choking patient, the treatment or action to be taken is R: An abdominal thrust (also called Heimlich manoeuvre)	7	4	7	18(24)
12. Victims are to be given another rescue breath, if the? R: Chest does not rise after delivering the first rescue breathe	6	14	7	27(36)
13. When should you start CPR on an INFANT OR CHILD? R: If no pulse or if pulse is <60	4	5	1	10(13.3)
14. Where should you check the pulse on an infant? R: Brachial	2	3	1	6(8)

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15. Where should you check the pulse on a child or an adult? R: Carotid	9	9	1	19(25.3)
16. When should you call emergency CPR unit for a child or infant? R: After 5 cycles or 2 minutes of CPR	0	3	1	4(5.3)
17. What is the most common cause of cardiac arrest in an infant/child? R: Respiratory Arrest	8	19	8	35(46.7)
18. How many seconds should it take for one cycle of CPR? R: 22 seconds	2	2	0	4(5.3)

DISCUSION

General knowledge of CPR practice

In this study, it was observed that 68% of the students have never had a CPR training and this cut across all level in the clinical year. Only 10.7% of the student claims to have been CPR certified in the past 2 year, as shown on table 1.

However, on further assessment, majority of the respondent (88%) answered correctly to the question seeking to know if "they are aware that cardiac arrest and breathlessness are the major cause of patient collapse". About 58.7% admitted not to have ever witnessed an individual go into cardiac arrest at the hospital or at their neighbourhood, whereas 40% agreed to have witness one, as shown on Fig 1.

When further asked if they confirm a collapsed patient is not responding to them, even after shaking and shouting at the patient in the x-ray diagnostic room, would they start a CPR action immediate? 45.3% said they would, while 18.7% said no they will not and 36.0% of the participants are unsure on what to do.

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On preference to performing the mouth to mouth ventilation during CPR, the participant had different opinion, 42.7% prefer to give a mouth to mouth ventilation, while 30.7% said no to it and 26.7% of the participant are unsure of what to do.

It was also noted that majority of the participant (77.3%) did not know the hotline of the CPR team in teaching hospital or hospital where they go for clinical posting or even a bystander in their neighbourhood. This could probably mean that this health institutions do not make available the CPR team hotline to students or there is none existing, or the participant have not made any effort to know these hotlines.

More so, it was further observed that the majority of the participant (94.7%) agreed that CPR training should be made mandatory for all clinical radiography students and also as a graduation requirement.

Technical knowledge of CPR practice

In the evaluation of technical knowledge of CPR practice among the students, we observed that 77.3% of the students are knowledgeable in the best way of opening the airway prior to giving mouth-to-mouth ventilation, 76% knows that CPR is most effective when started immediately after the collapse of a patient, and 88% of the student knew what CAB of resuscitation represents in CPR practice.

However, the result from table 3 clearly shows that their knowledge was in adequate in the performance of the CPR. Only 4% of the students knew the recommended compression to ventilation ratio during a CPR, 1.3% knew the recommended chest compression to be performed each minute when giving CPR, and 20% knew the steps of CPR in the correct sequence, while 58.7% of the student did not know the chest compression landmark on an adult.

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On further assessment of their knowledge of CPR practice on infants, questions seeking to know "the Chest compressions to be performed on an infant, When to start a CPR on an infants or child, where to check for the pulse on an infant, When should they call emergency CPR unit for a child or infant, and what is the most common cause of cardiac arrest in an infant/child ". 0nly 18.6%, 13.3%, 8%, 5.3% and 46.7% respectively of the students, knew the right answers to the questions.

This deficiency in knowledge observed in this study, is similar to that observed in other studies among medical students [1,12,13], health care professionals [14,15,16], and laymen [17].

CONCLUSION

Base on the findings of this research study, it is evident that there is a knowledge gap in the practice of cardiopulmonary resuscitation (CPR) among clinical radiography students, as majority of the students do not have adequate knowledge on the practice of CPR. The reason for this deficiency could be due to the fact that formal CPR training ends at second year undergraduate program as stipulated in the radiography curriculum, and there is no room for subsequent retraining even at the clinical year. Secondly, the lack of CPR training and demonstration at various hospitals where clinical posting are conducted.

RECOMMENDATION

There is a need for CPR training to be made mandatory for all clinical radiography students. CPR training and re-training program should be incorporated into clinical posting done within the radiography department.

More so, tertiary health institutions should endeavour to provide hotlines of CPR team to students undergoing training and the general public. Such information will aid in saving life's in cases of emergencies within the various department of the hospitals.

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The knowledge CPR should be made as a requirement for employing a radiographer in Nigeria, just as it is obtainable in other developed countries such as United Kingdom (Uk).

Continuous professional development in CPR should also be encourage among radiographers.

CONFLECT OF INTEREST

None to be declared by any of the authors.

LIMITATIONS

The findings of this study were based on the participant response, there could be some of the participant that may have not given sincere response to some of the questions on the questionnaire. Other limitation such as not returning the questionnaire by the participant was encountered.

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