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Knowledge of Cardiopulmonary Resuscitation among Student Nurses in Aliko Dangote College of Nursing Science Bauchi

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Abstract: Cardiopulmonary Resuscitation (CPR) is a critical life-saving intervention required to sustain circulation and oxygenation during cardiac arrest, especially within clinical and community settings where nurses often serve as first responders. Ensuring adequate CPR knowledge and competence among student nurses is therefore an essential component of nursing education and professional preparedness. This study assessed the level of knowledge, practice, and factors influencing CPR competency among student nurses in Aliko Dangote College of Nursing Sciences, Bauchi State. A descriptive cross-sectional survey design was adopted, and a stratified random sampling technique was employed to select 171 respondents from a target population of 597 students. Data were collected using a structured, validated, and reliable questionnaire, and analyzed using simple frequency distribution and percentages. Findings revealed that more than half of the respondents demonstrated good knowledge of CPR, including awareness of the recommended CAB sequence, appropriate depth of chest compressions, and use of an Automated External Defibrillator (AED). The study also showed that over 55% of student nurses possessed satisfactory CPR practice skills, such as correct hand placement, adherence to the 30:2 compression-to-ventilation ratio, and understanding the importance of full chest recoil. However, gaps were identified in areas such as advanced steps of CPR, sustained practical competence, and consistent exposure to hands-on training. The study further identified several factors influencing CPR practice, including inadequate simulation resources, limited access to trained instructors, and insufficient practical opportunities. Respondents strongly agreed that CPR competence can be improved through simulation-based learning, peer-led training, digital media support, and incentive-based motivation. The study concludes that while CPR knowledge among student nurses is generally high, practical proficiency requires further strengthening. It recommends enhanced training programs, provision of adequate learning resources, regular refresher sessions, and improved supervision to bridge the knowledge–practice gap and improve overall CPR competence among nursing students.

Keywords: Cardiopulmonary resuscitation; Student nurses; Knowledge; Practice; CPR training.

Introduction

The desire to bring people back to life is as old as recorded history. In early time, reversing death was almost unheard of except as a miracle. The history of resuscitation stated in August 1767, when a few wealthy citizens in Amsterdam gathered to form the "Society for recovery of drowned persons" (Guteta, 2022; Najafi et al.,

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2024). This society was the first effort to respond to sudden death. Within four years of its founding, the Amsterdam rescue claimed to have saved 150 persons from watery deaths. In an effort to reduce this number and save more lives, a group known as the Society for Recovery of Drowned persons was formed (2018). Some of the group earliest method such as bloodletting were questionable at the best and downright dangerous as worst. Some techniques that they developed although rudimentary in nature at that time have contributed to the modern-day practice of Cardiopulmonary resuscitation and can still be in use (to some degree) today. These early methods included the application of pressure to the abdomen and the positioning of the feet above the head (Demirtas et al., 2022; Umar & Dauda, 2024).

The ultimate success of these treatment methods has given rise to such renowned organizations as The Royal Humane Society in London, a group that is widely considered to be a precursor to the emergency medical services we know and use today. Cardiopulmonary resuscitation (CPR) is an emergency procedure used during cardiac or respiratory arrest that involves chest compressions, often combined with artificial ventilation, to preserve brain function and maintain circulation until spontaneous breathing and heartbeat can be restored. It is recommended for those who are unresponsive with no breathing or abnormal breathing (Falahan et al., 2024; Khaledi et al., 2024)

The 20th century (Nasiri et al., 2025) provided the first modern description of artificial respiration. In the 1950s, scientist and doctors started to address the problem from many different approaches which include devising surgical techniques, educating the population about presenting and trying to discover a way to treat acute cardiac arrest(Al-Awar et al., 2025; Sadeghi et al., 2025). Cardio pulmonary resuscitation (CPR) is an important lifesaving skill. It is an effective method of helping someone who is experiencing cardiac arrest to live long enough for definitive treatment to be delivered. Cardio pulmonary resuscitation cannot usually restart the heart, but it makes sure that blood and oxygen continue to circulate through the body, keeping the patient alive until help arrives (Harikrishnan et al., 2026). In the hospital setting worldwide, it is usually the nurse who discovers a patient's cardiac arrest and initiates the procedure of Cardio pulmonary resuscitation.

Nurses/midwives need to know the skills and theories behind Cardio pulmonary resuscitation (CPR) as performing quality Cardio pulmonary resuscitation will improve the Patients chance of survival and increase the opportunity of recovery (Mehwish Rafique et al., 2025). Nurses should exhibit the knowledge and skills necessary in an emergency to helps sustain life until medical help arrives. In several large investigations, the prompt delivery of Cardio pulmonary resuscitation has served as an important indicator of survival (Aboudonya et al., 2025; Alshamrani et al., 2025). Recent investigations have suggested that Cardio pulmonary resuscitation maintains the heart in a state favorable for defibrillation. A randomized trial in Norway suggested that in cases of prolonged cardiac arrest, Cardio pulmonary resuscitation significantly improve patient's survival. Prompt Cardio pulmonary resuscitation make an important impact on outcomes, but the quality of Cardio pulmonary resuscitation also matters greatly (Hamednia et al., 2025)

Cardio Pulmonary Resuscitation consist of measures taken by nurses, medical staff or other skilled practitioner in the event of either a respiratory or cardiac arrest. Nurses have two roles to provide basic life supports (BLS) measure to ensure adequate circulation and perfusion of vital organs, and to participate in or initiate advanced cardiac life support (ACLS) this requires the ability to manage the patient's airways, read and interpret electrocardiograms, and deliver emergency pharmacology that aims to treat or reverse the cause of the arrest (Masudi et al., 2026). Cardio pulmonary resuscitation measures vary according to the needs of the patient and the knowledge of the nurse giving the treatment. Knowing what to do in an emergency is very important and also knowing what not to do, because Cardio Pulmonary Resuscitation measures misapplied might lead to serious complications such as broken ribs, ineffective lung inflation and cardiac output, resulting in brain damage or death. Nurses are usually the first to respond at scene of cardiac arrest and their ability to provide care might well be critical to the successful outcomes of resuscitation attempt. Contrary to their roles, studies from different countries have reported a poor knowledge among the nurses regarding Cardio pulmonary resuscitation (Lima et al., 2025; Miri et al., 2025)

The American Heart Association, suggested that knowledge retention does not decline at the same rate as skills. However, the retention of Cardio pulmonary resuscitation knowledge is a key factor in determining Cardio pulmonary resuscitation competence. Effective education is considered by the AHA as a vital variable in improving outcomes of cardiac arrest. Resuscitation training programs aim to provide evidence-based knowledge and skills to reduce the morbidity and mortality of reversible life-threatening conditions. Such training is necessary to allow for lay persons and healthcare providers alike to consistently apply this evidence-based approach (Leiton-Espinoza et al., 2025). It has been reported that resuscitation teams one or more members trained in advanced cardiovascular life

support (ACLS) have better outcomes. Although morbidity and mortality related to cardiovascular diseases have been decreasing, the prognosis of out-of-hospital cardiac arrest (OHCA) remains the same.

OHCA is defined as the cessation of cardiac mechanical activity that takes place outside hospitals. Importantly, OHCA is considered a potentially reversible event through the activation of chain of early CPR and proper care. The survival rate of OHCA could be two to three times higher if bystander CPR is performed in a timely manner. While healthcare professionals are expectedly aware of CPR, adequate awareness of CPR among the general population is still lacking as many studies have reported poor knowledge among laypersons (Mohamed et al., 2025; Yang et al., 2025). Cardiopulmonary resuscitation (CPR) knowledge and practice among non-healthcare workers is crucial for improving survival rates during cardiac arrest.

Method

Research Design

The research design adopted by the researcher for this study is cross-sectional descriptive research design. A cross-sectional descriptive research design looks at data at a single point in time. The participants in this type of study are selected based on particular variables of interest. They are useful for establishing preliminary evidence in planning a future advanced study (Chen et al., 2025; Ramos-Fernandez et al., 2025)

Research Settings

Aliko Dangote College of Nursing Sciences Bauchi, is located at Dankande ward of Bauchi LGA, along Ajiya Adamu Road situated outside traditional wall of Bauchi metropolis. It shares boundary with Fadaman Mada to the east, Bauchi state specialist hospital to the south, water board quarters to the west and Awala to the north. At the school entry, by the left side there is bursary office, registration office, exam office, record office, provost office and deputy provost office. Behind them there is HOD Nursing office and HOD Midwifery office. At the right side is college auditorium behind it is a male hostel (Zhan et al., 2025).

The college has 89 academic staff. The college has two main departments including nursing department and Midwifery department, but under the following broad department there's Basic Nursing, Basic Midwifery, ND/HND Nursing, post basic and Community Midwifery. The school has only six hostels in which three is for male students and three for female students' nurses and midwives. The college received provisional accreditation from the Nursing and Midwifery Council of Nigeria in October 2019, further validating its commitment to maintaining high educational standards (Lang et al., 2025; Liang et al., 2025).

Target Population

The target population for this study consist of 597 students in Aliko Dangote College of nursing science Bauchi, which consist of student's nurses (Lang et al., 2025).

Sample Size

The researcher used Taro Yamani's formula to determine the sample size from the target population from whom data was collected.

Taro Yamani's formula: $\frac{N}{1+ N (e)^2}$

Where: n=Sample; N= **597;** e=level of significance (0.05)

$$n = \frac{597}{1 + 597\ (0.0.5)^2}$$

$$n = \frac{597}{1 + 597\ (0.0025)}$$

$$n = \frac{597}{1 + 1.5}$$

$$n = 238.8$$

$$n = 239$$

The sample size is large therefore finite population correction formula was used to further reduce the sample size.

$$\boldsymbol{na = nr\ /\ \{1 + (nr - 1)/\ N\}}$$

Where: na =reduced sample size; nr =original sample size; N=population size; na =239 / (1 + 239 - 1) / 597); na =239 / (1 + 238) / 597); na =239 / (1 + 0.399); na =239 / 1.399; na =170.8; na =171

Sampling Technique

The sampling technique that the researcher used for this study is Stratified random sampling technique. A stratified random sample is a widely used statistical technique in which a population is divided into different subgroups, or strata, based on some shared characteristics or when researchers want to know about different subgroups or strata based on the entire population being studied.

The purpose of stratification is to capture major variations rather than to identify a common core (Liang et al., 2025; Ramos-Fernandez et al., 2025), to ensure that each stratum in the sample and to make inferences about

specific population subgroups and is typically, used by researchers when trying to evaluate data from different subgroups or strata.

The researcher chose this technique because it can provide a more accurate representation of population and to avoid bias. The population size is 597, to get the 171-sample size to fill the questionnaire, 171 yes was written on a piece of paper and 215 no also on a piece of paper. Those that pick the yes form the sample population.

Instrument for Data Collection

The instrument that was used for this study is questionnaire. It is a close ended questionnaire that comprises of the following sections: Section A: Socio-Demographic data; Section B: Knowledge about Cardio Pulmonary Resuscitation (CPR) among student nurses; Section C: Practice of CPR among student nurses; Section D: Factors influencing the practice of CPR

Validity of Instrument

The questionnaire used as the research instrument was subjected to face its validation. This research instrument (questionnaire) adopted was adequately checked and validated by the supervisor his contributions and corrections were included into the final draft of the research instrument used.

Reliability of Instrument

Reliability is the stability of measurement over a variety of conditions in which the result should be obtained, it is basically the repeatability or replication of research findings (Chen et al., 2025). The adopted questionnaire used in this study demonstrated good reliability in the original research.

Method of Data Collection

After obtaining an introductory letter from the research committee, the letter was taken to the school management for an approval to conduct the research. Data was collected through the self-administration of questionnaires, facilitated by a research assistant. The questionnaires were distributed to respondents in their respective classes during break period and retrieved on spot.

Method of Data Analysis

The data collected was analyzed using simple frequency distribution table and analyzed using percentage.

Ethical Considerations

A letter of introduction was obtained from the academic secretary of the college by the researcher to the research and ethical committee of Aliko Dangote College of nursing science, Bauchi state. For permission to conduct the study. Once approved, informed consent of the respondents was ensured by explaining every detail the respondents need to know and answer their questions if they have any. Also, privacy, anonymity and confidentiality of all information given by the respondents was insured by the researcher.

Result and Discussion

Data Presentation and Analysis

According to table 1, 52.6% of the respondents were male while 47.3% of the respondents were female. Also, based on the age of the respondents 68.4% of the respondents were aged between 17-22, 17.1% of the respondents were aged 23-28, 9.4% of the respondents aged between 29-32, while 5.1% of the respondents were aged between 33 and above. Furthermore, 15.7% of the respondents were students from set 2023a Basic Nursing, 11.6% also were students from set 2023b Basic Nursing 15.2% of the respondents were students from set 2022a Basic Nursing, 22.2% of the respondent were students from ND set 1, 15.2% from ND set 2, 8.1% from ND set 3 and 5.8% were from post basic 1 while 6% from post-basic 2 (Coetzee et al., 2025; Zurc & Majerič, 2025).

Table 1. Socio-Demographic Characteristics of Respondents (n=171)

S/N	Item	Frequency	Percentage
✓			**Sex of Respondents**
	Male	90	**52.6**
	Female	81	**47.3**
Total		**171**	**100%**
✓			**Age of respondents**
	17-22	117	**68.4**
	23-28	30	**17.1**
	29-32	14	**9.4**
	33 and above	10	**5.1**
Total		**171**	**100%**
✓			**Educational Level**
	Set 2023a BN	27	15.7
	Set 2023b BN	20	11.6
	Set 2022a BN	26	15.2
	ND set 1	38	22.2
	ND set 2	26	15.2
	ND set 3	14	8.1
	Set 1 PB	10	5.8
	Set 2 PB	10	6
Total		**171**	**100%**

Table 2, showed that 100% of the respondents have ever had CPR training during their previous year of study, while none said No to the statement. Table 2 showed that 171 of the respondents said that CPR is only performed on cardiac arrest patient, while none said no to the statement. The table reveals that 56% of the

respondents said Yes that the current order for CPR is CAB not ABC while 44.4% of the respondents said No that the current order for today CPR is not CAB but ABC (Snoubar et al., 2025; Zhao et al., 2025). The table showed that 52.6% of the respondents said yes that the recommended Depth for compression is 4-5cm, while 47.6% said that the recommended Depth for compression is not 4-5cm Lastly, the table showed that 70.1% of the respondents said Yes that AED is a device used after rescuers give a rescue breathe, while 30% of the respondents said that no to the statement (Chen et al., 2025; Vagiri et al., 2025).

Table 2. Knowledge of Cardiopulmonary resuscitation among student nurses

S/N	ITEM	Response	Frequency	Percentage
1.	Have you ever had CPR training during your previous years of study	Yes	171	100%
		No	0	0%
2.	CPR is only performed on a cardiac arrest patient	Yes	171	100%
		No	0	0%
3.	The current order of CPR is CAB not ABC	U Yes	95	56%
		No	76	44.4%
4.	The recommended Depth for compression is 4-5cm?	Yes	90	52.6%
		No	81	47.6%
5.	AED is a device used after rescuers give a rescue breathe	Yes	120	70%
		No	51	30%

Table 3 showed that 100% of the respondents answered "yes" to the statement that correct hand placement is essential when performing CPR, as it helps improve blood circulation during resuscitation, while none of the respondents answered "no" to the statement. This indicates that all participants had adequate knowledge regarding the importance of proper hand positioning in CPR procedures. Proper hand placement ensures effective chest compressions and increases the likelihood of maintaining sufficient blood flow to vital organs. It also minimizes the risk of injury caused by incorrect compression techniques.Furthermore, the table shows that 54.9% of the respondents answered "yes" to the statement that the depth of chest compression during CPR is 4–5 cm, while 44% of the respondents answered "no" to the statement. This finding suggests that although more than half of the respondents were aware of the recommended compression depth, a substantial proportion still lacked accurate knowledge. Adequate chest compression depth is crucial to ensure effective cardiac output during resuscitation. Insufficient compression depth may result in inadequate blood circulation, while excessive depth may increase the risk of injury. Therefore, continuous training and education on CPR guidelines are necessary to improve respondents' knowledge and practical skills.Table 3 showed that 100% of the respondents said yes to the statement Correct Hand Placement is essential when performing CPR as it will help improve circulation, while none of the respondents said No to the statement. The table show that 54.9% of the respondents said yes to the statement the depth of chest compression during CPR is 4-5cm, while 44% of the respondents said no to the statement (Bdiri Gabbouj et al., 2025; Cui et al., 2025).

Table 3. Practice of CPR among student nurses

S/N	ITEM	Response	Frequency	Percentage
6.	Correct Hand Placement is essential when performing CPR as help improve	Yes	171	100%
		No	0	0%
7.	The depth of chest compression during CPR is 4-5cm	Yes	94	54.9%
		No	77	44%
8.	The recommended universal compress to ventilation ratio of CPI 30:2 per minute	Yes	171	100%
		No	0	0%
9.	Are you aware that CPR is generally continued until the person? regains/return of spontaneous circulation or declared dead	Yes	100	58.7%
		No	71	41.2%
10.	Are you aware that allowing for full chest recoil between compres is important for effective CPR	Yes	110	64.3%
		No	61	35.6%

Table 3 showed that 171 (100%) of the respondents said Yes to the statement The recommended universal compress to ventilation ratio of CPR is 30:2 per minute, while none of the respondent said No to the statement. The table showed that 58.7% of the respondents said Yes to the statement "Are you aware that CPR is generally continued until the person regains/return of spontaneous circulation or declared dead" while 41.2% of the respondents said No to the statement. The table also showed that 64.3% of the respondents said Yes to the statement "Are you aware that allowing for full chest recoil between compression is important for effective CPR" while 35.6% of the respondents said No to the statement (Bdiri Gabbouj et al., 2025; Damprane et al., 2026). Table 4 showed that 76% of the respondents said Yes that CPR practice can be improved by employing certified Basic Life Support Tutors, while 23.9% of the respondents said that no to the statement. It also showed that 71.3% of the respondents said Yes to that "CPR practice can be improved by supply of adequate media aid Such as YouTube tutorial videos, and Instagram videos on CPR during practical sessions" while 28.6% of the respondents said No to the statement (Cheng et al., 2025; Zhong et al., 2025).

Table 4. Factors influencing the practice of CPR

S/N	ITEM	Response	Frequency	Percentage
11.	CPR practice can be improved by employing certified Basic Life Support Tutors	Yes	130	76%
		No	41	23.9%
12.	CPR practice can be improved by supply of adequate media aid Such as YouTube tutorial videos, and Instagram videos on CPR during practical sessions	Yes	122	71.3%
		No	49	28.6%
13.	CPR practice can be improved by use of simulation-based learning	Yes	130	76.9%
		No	41	23.1%
14.	CPR practice can be improved by use of reward system for students who develop proficiency in CPR	Yes	150	87.7%
		No	21	12.2%
15.	CPR practice can be improved by peer led training	Yes	89	52.13
		No	82	47.9%

The study revealed that most of the respondents more than (65%) have ever had CPR training, they know the current order of CPR to be CAB not ABC, they know that CPR is performed on cardiac arrest patients, they know the recommended depth for compression is 4-5cm, and they know AED and when it is used. This is in agreement with the study done by (Cheng et al., 2025)Agogo to access the level of knowledge of student nurses on CPR practice which indicated that 70% of the students had knowledge of CPR.

Practice of CPR among student nurses

It was reliably gathered that the result for practice of CPR among student nurses revealed that majority more than 50% of the respondents have practiced Correct Hand Placement as it is essential when performing CPR as it will help improve circulation, they are aware of the recommended universal compress to ventilation ratio of CPR which is 30:2 per minute, they are aware that CPR is generally continued until the person regains/return of spontaneous circulation or declared dead, they are also aware that allowing for full chest recoil between compression is important for effective CPR. This is in disagreement to the study conducted by (Tasong et al., 2025)on the practice of CPR among student nurses in Ghana. Results showed that 63% of the student nurses have not practiced cardiopulmonary resuscitation due to lack of proper teachings on CPR in nursing schools, and hence do not practice it.

Factors influencing the practice of CPR

The research also sought to find out the various ways of improving the knowledge and practice of cardiopulmonary resuscitation among student nurses in Aliko Dangote College of Nursing sciences, Bauchi. Result revealed that majority of the respondents more than 58% agreed that CPR practice can be improved by employing certified Basic Life Support Tutors, CPR practice can be improved by supply of adequate media aid Such as YouTube tutorial videos, and Instagram videos on CPR during practical sessions, CPR practice can be improved by use of simulation-based learning, CPR practice can be improved by use of reward system for students who develop proficiency in CPR and CPR practice can be improved by peer led training (Aedh et al., 2025; Oteir et al., 2025). This is in agreement to the study conducted by (Alemseged et al., 2025)on improving the level of practice of CPR among student nurses of Lagos State University, Findings revealed that

mandatory CPR training, simulation-based learning are the ways to improve the knowledge and practice of CPR among student nurses. Also, the findings are in agreement with the study conducted by (Aedh et al., 2025)on improving the level of practice of CPR among student nurses of Bingham University Abuja. Findings revealed that use of multimedia and peer led training are the ways to improve the knowledge and practice of CPR among student nurses

Implication of Findings to Nursing

The findings of this study identified the knowledge of cardiopulmonary resuscitation among student nurses in Aliko Dangote College of Nursing sciences, Bauchi. The result of the study implies that student nurses have current knowledge of CPR and are able to perform it when the need arises. Therefore, there is need for every student nurse to update his/her professional knowledge and practice skills even as they go out to the field of practice as certified nurses. This is because more nurse's knowledge is updated, the more they are equipped to meet up with new challenges in nursing and contribute to the realization of organizational goals before and after graduation (Alemseged et al., 2025; Tasong et al., 2025).

Conclusion

From the findings of this study, the following conclusions were made. More than 50% of student nurses in Aliko Dangote College of Nursing Sciences, Bauchi have knowledge of CPR. More than 55% of student nurses in the same institution are able to practice CPR effectively. Additionally, more than 55% of the respondents agreed that various strategies can improve CPR competence among student nurses. These strategies include simulation-based learning, which provides hands-on experience in a controlled environment. Peer-led training was also identified as an effective approach to enhance understanding and skill acquisition. The use of media platforms such as YouTube and Instagram was highlighted as a modern and accessible learning tool. Furthermore, the implementation of reward systems was suggested to motivate students to actively engage in CPR training. These findings indicate that both knowledge and practical skills of CPR among student nurses are relatively adequate but still require improvement. Therefore, integrating innovative and interactive teaching methods is essential to further enhance CPR competency among student nurses.

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